



# Press Release

International Academy of CIO (IAC)

The 17th Waseda-IAC World Digital Government Ranking  
2022

November 2022

Waseda University Institute of Digital Government

# Preface

The Institute of Digital Government at Waseda University in Japan, in cooperation with the International Academy of CIO (IAC) has released the 17th Waseda World Digital Government Rankings Survey 2022, which marks digital transformation in over advanced digital 64 countries.

The Institute was established in 2002, and the ranking survey model was created in 2005 by Prof. Dr. Toshio Obi, a Founder of the Institute and President of IAC at the time of the First Ranking Survey. Dr. Obi was awarded a spot on “The World’s Most Influential 100 People in Digital Government in 2018” by “Apolitical”, a UK based Think tank.

In 2022, both the Institute and the ranking survey are mainly managed by Prof. Dr. Naoko Iwasaki of Waseda University.

We hope this survey will be able to contribute precious value globally to all parties concerned. The peoples have unfortunately suffered from the serious COVID-19 pandemic all over the world, but we are sure that Digital Government can offer effective solutions regarding pandemic issues. This edition is extremely significant in the process of UN SDGs, as well as being the 17th memorial anniversary ranking report for digital innovation. We appreciate with thanks the Research Fellows at APEC Digital Government Research Center under the guidance of the Institute for their great contribution. Also, both the researchers of the Institute of Digital Government at Waseda University and International experts in 9 worldwide universities of IAC listed in the end.

Prof. Dr. Toshio Obi and Prof. Dr. Naoko Iwasaki  
On behalf of Waseda University and IAC

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## A. Executive Summary- Overall Review

- The Waseda-IAC 17th Annual Rankings of World Digital Government Survey evaluated by the Institute of Digital Government, Waseda University established by Dr. Toshio Obi, has released the results of 2022 ranking survey as the 17th consecutive years. The evaluation has been conducted in cooperation with excellent experts of major member universities in International Academy of CIO (IAC).
- The 2022 Ranking Survey with 10 Indicators marks Denmark at first place as the same last year, followed by New Zealand in 2nd post. the Canada ranks in 3rd, Singapore in 4th, USA in 5th, UK in 6th, South Korea in 7th, Estonia in 8th, Taiwan in 9th, and Japan ranks 10th in the top group.
- As a matter of fact, most governments above mentioned have increased their excellent achievements in both citizen-centric approach / demand-pull online one stop services with “No one left behind” as SDGs slogan and digital technologies such as AI,5G and Blockchain.
- This report provides various information and data on both Digital Innovation and Digital Economy as well. These become the key to economic growth and challenges in line with the objectives of Digital Government, which indicates warning signal against digital divide and innovation gap. It might be significant trend that many governments have worked on an early warning system against increasing cybersecurity attacks as well.
- In the middle of the overall ranking, there are many countries which increased or decreased their ranks compared to the ranking in a few years due to competitive edge. Ten main indicators below evaluate the process and achievement of Digital Government ranking in 2022. The 2022 rankings are summarized based on the fruitful results by a harmonized combination of many stakeholders during every year survey, and the team prepares the relevant reports with precious lessons from various international and regional conferences and meetings with international institutions such as APEC, ITU, and OECD as well as receiving the productive comments from experts of IAC member universities, government, and business groups.
- The 2022 rankings also point to significant trends in the usage of digital technologies in government activities. The report shows that there are vital new trends, and they will continue to grow strongly in the coming years.
- On this regard, an analysis for 17 years of the Waseda – IAC Digital Government Rankings Survey 2022 indicates the following 13 highlights of the new trends: these are:
  1. DX Challenges for Digital Government

2. DX and Regulation Reform
  3. Corona measures
  4. Human resources -Hybrid work
  5. Digital Inclusion
  6. Data Driven Evaluation System
  7. Resilient Smart City
  8. Digital Literacy
  9. Silver Innovation
  10. Cyber Security
  11. Digital Twin
  12. AI for Digital Government
  13. Prospect for 5G and Beyond 5G (6G)
- However, although there are lots of fluctuations in the usage of AI and other technologies, many governments in developing countries have not yet made much progress on the activities of the digital government due to COVID-19. A few countries have adopted both AI and IoT to improve the quality of service and productivity of work, most of which are concentrated in developed countries such as Denmark, top of the ranking 2022. Frankly speaking, the reality is that business sectors have speedy advanced in usage of technology and ICT manpower in comparison with government and public sector. Therefore, any government must catch up with them, to avoid the digital gap between public and business sectors.
  - In addition to the above topics of the highlights, there will be six global socio-economic challenges for Digital Government to be solved. These are:
    1. “Digital Innovation with Standardization – Cloud computing, IoT and AI applications”,
    2. “Ageing Society with skyrocketing population ageing”,
    3. “Limited usage of Open Innovation”,
    4. “Digital Divide in global and local communities”,
    5. “Urbanization issues with rapid-rise of Mega city and unbalanced harmonization of urban and rural communities” and
    6. “Lack of Cooperation between Central and Local governments”.
  - As for the UN’s SDGs, the useful utilization of Digital Government might be one of major objectives for stakeholders. On this regard, Digital Government could support the smooth digital transformation (DX) needed for each SDGs sector.
  - This survey is well conducted and edited by Prof. Naoko Iwasaki assisted by Dr. Nguyen Hien of Waseda University with energetic effort under the guidance of Prof. Toshio Obi and the distinguished experts from Waseda University and 9 world-class universities

under the umbrella of the International Academy of CIO in the field. These Institutions as well as experts are :Peking University (China, Prof.Yang), George Mason University (USA, Prof.Auffret), Thammasat University (Thailand, Prof.Sunkpho), Bandung Institute of Technology (Indonesia, Prof.Suhono), RANEPa (Russia, Prof.Ryzhov), University of Turku (Finland, Prof.Dahlberg), Bocconi University (Italy, Prof.Buccoliero), Taiwan e-Governance Research Center (Taiwan, Prof.Liao) and De La Salle University (Philippines, Prof.Magno). Thanks for their precious contributions to the multi-stages of the evaluation and analysis. Also, Appreciations for many professors and research staffs of Waseda University Institute of Digital Government, Tokyo for engagement in 17 years.

- Finally, the team hopes that this report will be able to contribute excellent values globally to all parties concerned. We recognize now that the mankind has unfortunately suffered from the serious COVID-19 pandemic all over the world for almost 3 years, and we are sure that Digital Government can offer effective solutions on well-being/healthy quality of life over corona, post-corona and pandemic issues. It is well noted that this edition is extremely significant in the process of promoting SDGs as well. In addition, we are convinced that the contents of 17th annual ranking report 2022 are well associated with both digital transformation (DX) and innovation.

## B. Overall Data and Statistics

There are 3 tables for 2022 rankings as below:

- ① Overall Digital Government Ranking
- ② Historical trends of ranking 2006-2022 for 17 years
- ③ International comparison on 4 different digital rankings

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### ① Overall Digital Government Ranking

Now, this ranking in 2022 shows important trends in the use of new digital technologies in government activities. The analysis of this report reveals some notable new trends and shows that the digital sector will continue to grow strongly.

Above all, the rise of new technologies is influencing the promotion of digital government in 2022. However, the overall activities of the digital government during the coronavirus pandemic are not progressing as expected. There are several countries that are adopting both AI and IoT to improve the quality of their services and work productivity, but most of them are concentrated in developed countries such as Denmark, which tops the ranking. In order to narrow the digital divide, it is necessary to catch up with the DX level of the top digitally advanced countries.

On this regard, there are six global social, economic and political challenges to be addressed regarding digital government as follows:

- (1) Closing the "Digital Innovation Gap (Cloud, IoT, AI applications)"
- (2) Response to the "Ageing Societies in Japan and Europe, where Ageing Societies are most progressing rapidly",
- (3) Global standardization of "open innovation" that transcends national borders,
- (4) Narrowing the "digital literacy gap in both global and local communities",
- (5) Solving "urban-type social problems brought about by rapidly developing Megacities and economic imbalances between urban and rural areas", and
- (6) "Inadequate cooperation between the central and local governments"

In addition, this report analyzes and discusses the following points.

- (1) The report contains the ranking scores from 64 advanced ICT countries as well as a total of about 380 pages of the country assessment reports.
- (2) Analysis of the Historical Transition of Digital Government based on the past 17 years,
- (3) Highlights of the new trends of digital government and their impact on the economy and society from the perspectives of "Corona", "DX", "GX (Green Transformation)", "Web 3.0 New Technology Innovation", "Personal Information Protection", "Smart City", "Human Resource Development", "Cybersecurity", and "SDGs".

**Table 1 17th Waseda University World Digital Government Overall Ranking 2022**

	Country	Score	22	Thailand	78.0981	44	China	66.2139
1	Denmark	93.8018	23	France	77.1617	45	Brunei	66.1370
2	New Zealand	92.6098	24	Indonesia	75.5854	46	Lithuania	65.8803
3	Canada	91.7759	25	Saudi Arabia	75.3687	47	Romania	65.8198
4	Singapore	91.6292	26	Austria	74.4634	48	Chile	65.6903
5	USA	91.0463	27	Malaysia	73.5467	49	Vietnam	64.6345
6	UK	86.7662	28	Spain	73.3274	50	Uruguay	63.5687
7	Korea	86.5820	29	Belgium	72.7999	51	Peru	62.9441
8	Estonia	85.5827	30	Kazakhstan	72.7647	52	Argentina	62.3563
9	Taiwan	85.3311	31	Hong Kong	72.6450	53	Brazil	61.5775
10	Japan	85.2718	32	Oman	71.6475	54	Kenya	60.7322
11	Germany	83.6440	33	India	71.4932	55	Macau	60.4971
12	Sweden	82.9972	34	South Africa	71.0550	56	Pakistan	59.4226
13	Finland	82.4753	35	Portugal	69.8758	57	Morocco	58.7977
14	Ireland	82.1483	36	Philippines	69.6040	58	Egypt	58.6752
15	Australia	81.7457	37	Russia	69.2390	59	Georgia	58.5943
16	Switzerland	81.1673	38	Turkey	68.9647	60	Bahrain	56.7200
17	Netherlands	81.1172	39	Czech Republic	68.5302	61	Tunisia	55.8085
18	Italy	80.4699				62	Fiji	55.1106
19	United Arab Emirates	80.1409	40	Israel	68.2490	63	Nigeria	53.1105
			41	Mexico	67.9417	64	Costa Rica	45.6868
20	Iceland	79.6673	42	Poland	67.6191			
21	Norway	79.5481	43	Columbia	66.2983			

## ② Historical trends of the Rankings over the past 17 years

The results of 1st Waseda — IAC World Digital Government Ranking Survey was announced in 2005, and since then the history of 17 years is summarized as follows:

The valuable analysis of the Waseda -IAC World Digital Government Ranking Survey over the past 17 years tells the evolutionary transition since the establishment of the digital government in the world. For example, in the beginning, the superiority of digital infrastructure facilities was very important, and consequently countries with strong infrastructure ranked high. Similarly, in the middle term, countries with high application penetration dominated in the top group all at once. After that, there was a lot of interests in the countries that are familiar with new technologies and countries that are strong in cyber security as the fourth generation. The following six new trends in the digital field have been observed in historical transitions:

According to the United Nations survey report, the top 14 countries in the ranking are called “digital advanced countries” group.

- (1) Redefinition and new concept of the shift from e - Government to Digital Government
- (2) Utilization /application of new technologies such as AI, 5G, and IoT to digital government have started
- (3) Newly local growth factors such as the development of smart cities and the expansion of e-municipalities
- (4) Innovative usage of both blockchain and digital twin has begun to contribute to the development of digital government
- (5) Creating the Future 5<sup>th</sup> Generation of Digital Government
- (6) Dramatic expansion of services and applications through one stop service scheme

The so-called top group can be roughly divided into 3 groups as: (1) the Nordic countries such as Denmark and Finland, (2) the United States and Canada in North America, and (3) Singapore and South Korea in Asia.

As the 10<sup>th</sup> rank Japan's strengths include network infrastructure for laying optical fiber networks and the degree of utilization of advanced ICT, but the ranking has been lowered due to the exposure of troubles during the corona disaster.

In addition, the G20 is seriously considering measures to prevent the expansion of the digital gap caused by the financial crisis that has surfaced due to the corona problem in developing countries. On this regard, Waseda University Professor Emeritus Obi, Director of the APEC Digital Government Research Center, is active in this field as co-chair of the T20 Digital Innovation Group, a gathering of global think tanks for the G20 Summit. He suggests to use of university capacity for teaching and training trainers to upgrade digital literacy among ageing population.

**Table 1 History**

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	19/20	2021	2022
1	USA	USA	USA	USA	Singapore	Singapore	Singapore	Singapore	Singapore	USA	Singapore	Singapore	Singapore	Denmark	USA	Denmark	Denmark
2	Canada	Canada	Singapore	Singapore	USA	UK	USA	USA	Finland	Singapore	USA	USA	Denmark	Singapore	Denmark	Singapore	New Zealand
3	Singapore	Singapore	Canada	Canada	Sweden	USA	Sweden	Korea	USA	Korea	Denmark	Denmark	USA	UK	Singapore	UK	Canada
4	Finland	Japan	Japan	Korea	UK	Canada	Korea	Finland	Korea	UK	UK	Korea	Japan	Estonia	UK	USA	Singapore
5	Sweden	Korea	Korea	Japan	Japan	Australia	Finland	Denmark	UK	Japan	Korea	Japan	Estonia	USA	Estonia	Canada	USA
6	Australia	Germany	Australia	HK SAR	Korea	Japan	Japan	Sweden	Japan	Canada	Japan	Estonia	Canada	Korea	Australia	Estonia	UK
7	Japan	Taiwan	Finland	Australia	Canada	Korea	Canada	Australia	Sweden	Estonia	Australia	Canada	New Zealand	Japan	Japan	New Zealand	South Korea
8	HK SAR	Australia	Taiwan	Finland	Taiwan	Germany	Estonia	Japan	Denmark	Finland	Estonia	Australia	Korea	Sweden	Canada	South Korea	Estonia
9	Malaysia	UK	UK	Sweden	Finland	Sweden	Belgium	UK	Taiwan	Australia	Canada	New Zealand	UK	Taiwan	South Korea	Japan	Japan
10	UK	Finland	Sweden	Taiwan	Germany/Italy	Taiwan/Italy	UK/Denmark	Taiwan/Canada	Netherlands	Sweden	Norway	UK/Taiwan	Taiwan	Australia	Sweden	Taiwan	Taiwan

### ③ International comparison of the world's four major digital rankings

The following is to summarize the international comparison of four digital rankings: These are Waseda-IAC, United Nations, IMD (International Institute for Management Development), and WEF (World Economic Forum). For example, when comparing Waseda University and the United Nations, the evaluation benchmarks are different, so the ranking of the results is also different.

Waseda University evaluates the indicators in 10 areas with sub-indices in 36 areas, but the United Nations basically has been used indicators in only 3 areas. Both IMD and WEF do not directly evaluate and analyze digital government in details. They are interested in focusing the target for the fields of digital competitiveness and digital economy and society. From the data of these four major organizations, we can see that the leading nations are competing within the top 15 countries and that there are fluctuations in the rise and fall.

**Table 2 International comparison of the world's four major digital rankings**

	<b>Waseda-IAC</b>	<b>UN</b>	<b>IMD</b>	<b>WEF</b>
<b>1</b>	<b>Denmark</b>	<b>Denmark</b>	<b>Denmark</b>	<b>Singapore</b>
<b>2</b>	<b>New Zealand</b>	<b>Finland</b>	<b>USA</b>	<b>USA</b>
<b>3</b>	<b>Canada</b>	<b>South Korea</b>	<b>Sweden</b>	<b>Hongkong</b>
<b>4</b>	<b>Singapore</b>	<b>New Zealand</b>	<b>Singapore</b>	<b>Netherlands</b>
<b>5</b>	<b>USA</b>	<b>Sweden</b>	<b>Switzerland</b>	<b>Switzerland</b>
<b>6</b>	<b>UK</b>	<b>Iceland</b>	<b>Netherlands</b>	<b>Japan</b>
<b>7</b>	<b>Korea</b>	<b>Australia</b>	<b>Finland</b>	<b>Germany</b>
<b>8</b>	<b>Estonia</b>	<b>Estonia</b>	<b>Korea Rep.</b>	<b>Sweden</b>
<b>9</b>	<b>Taiwan</b>	<b>Netherlands</b>	<b>Hong Kong SAR</b>	<b>UK</b>
<b>10</b>	<b>Japan</b>	<b>USA</b>	<b>Canada</b>	<b>Denmark</b>
<b>11</b>	<b>Germany</b>	<b>UK</b>	<b>Taiwan, China</b>	<b>Finland</b>
<b>12</b>	<b>Sweden</b>	<b>Singapore</b>	<b>Norway</b>	<b>Taiwan</b>
<b>13</b>	<b>Finland</b>	<b>UAE</b>	<b>UAE</b>	<b>South Korea</b>
<b>14</b>	<b>Ireland</b>	<b>Japan</b>	<b>Australia</b>	<b>Canada</b>
<b>15</b>	<b>Australia</b>	<b>Malta</b>	<b>Israel</b>	<b>France</b>

(Source) Waseda-IAC World d-Government Ranking 2022 / UN e-Government Survey 2022 / IMD World Digital Competitiveness Ranking 2022 / WEF Global Competitiveness Index 2020

## C. Top 10 Countries in full scores ranking

**Table 3 Top 10 Countries in full scores ranking**

Rank	Nation
1	Denmark
2	New Zealand
3	Canada
4	Singapore
5	USA
6	UK
7	South Korea
8	Estonia
9	Taiwan
10	Japan

### 1<sup>st</sup> place: Denmark

This time, Denmark ranks first for two consecutive years, 2021 and 2022. Digital government is under the jurisdiction of the Ministry of Finance, which prioritizes administrative and financial reform. Based on that, Denmark's corona countermeasures were outstanding not only in the EU member countries but also in the world. Notably, after the outbreak of COVID, governments quickly increased investment in the healthcare sector, technology and innovation sectors. Centralized digital systems based on a common data security model, standardization of health data, digital registration and personal identification are essential.

In particular, investments in digital health literacy are needed to promote equitable and efficient healthcare with high quality, broad coverage of technology and services, and the use of digitalized health systems by people with low literacy. To make this possible, it is also key to sustaining efforts to facilitate access to health data for local government health workers and enable families to assist through delegated access to health data.

On May 5, 2022, the Danish government announced its latest National Digitalization Strategy for the period 2022-2026, which consists of 61 individual initiatives and 9 specific visions. It shows an important path towards the next stage of digital development and diffusion. The new national strategy consists of 34 specific projects and

enhancements in areas such as critical infrastructure protection. It also aims to further strengthen national cyber security.

## **2<sup>nd</sup> place: New Zealand**

In the 17-year digital government ranking, Japan jumped to second place for the first time. In New Zealand, the government's large investment in DX in the public service sector has steadily paid off. Governments face increasing demand for a fully integrated and comprehensive digitalization of public services, and the COVID-19 pandemic presents an opportunity to accelerate the delivery of digital services. Although it has a small population, it is a country with a high priority for technological development. New Zealand is a pioneer in utilizing government digital innovation, and New Zealand citizens can easily interact with the government using apps and web services.

The government has developed digitalization from scratch and continues to improve it, and it can be said that it is a model country that can be used as a reference for other countries. New Zealand's digital strategy aims to make citizens, businesses, and government agencies more productive, efficient, safe and competitive. This will be achieved by implementing a comprehensive set of policies that promote a favorable environment for digital innovation. The biggest purpose is to share the benefits of DX with all citizens and to make it the best and most resilient economy in the world. It is attracting attention as a digital government model in which the government's rapid DX has succeeded.

## **3<sup>rd</sup> place: Canada**

It can be said that the country has succeeded in digitization in the last few years. Looking at the past rankings, we are making steady progress to 16th in 2018, 8th in 2019/20, 5th in 2021, and 3rd in 2022.

The Canadian government has implemented several initiatives aimed at improving digital government. During that time, there was economic growth and social change in Canada. The Canadian government has invested heavily in digital technology to better serve its citizens. As the COVID-19 pandemic accelerates the global shift to online services and increases the number of employees working from home, emergency benefits and COVID Alert apps can help government workers reach millions early in the epidemic. It was for the rapid digital distribution of essential services for Canadians. The government has expanded its online services and strived to minimize the cost of apps and infrastructure, while focusing on improving services and adding value to its citizens. Shared Services Canada also plays a cross-cutting role, working diligently with government agencies to ensure the timely, effective and secure delivery of critical frontline services. Additionally, the launch of the OneGC

platform is proceeding on schedule, with this one-stop service enabling citizens and businesses to log in once and access all available federal services through a unified portal. increase.

#### **4<sup>th</sup> place: Singapore**

first place several times so far. It was ranked 2nd in 2021, but this year it was ranked 4th. The digitization of Singapore is positioned as the most important issue in the national strategy of the Singapore government. Despite coming in 4th place this time, Singapore is still making great strides in establishing its position as a digital research and development powerhouse in ASEAN and in the world, and its expertise in digital technology is highly valued. Singapore's Smart Nation and Digital Government Group has adopted cutting-edge technology to act swiftly and decisively in the face of the pandemic to keep citizens safe. In the field of digital government research, Singapore's research papers in the fields of AI, quantum and trust technology are the most widely referenced in the world.

In addition, early investments in digital technology and innovation activities have helped create a robust and attractive startup environment in Singapore. Many digital companies are developing in various industries such as e-commerce, digital health, and finance. Some of these companies have achieved unicorn status. In addition, international digital companies such as Google and Salesforce continue to invest heavily in Singapore with the goal of expanding their R&D and engineering operations in Singapore and providing more employment opportunities for local residents.

The corona epidemic has accelerated digitization in all industries, increasing the need for digital platforms, software, hardware, and services. As more service interactions take place online under global supply chains, there is an emphasis on strengthening supply and provenance assurance for products such as food, pharmaceuticals, and components used in technology. increase. Furthermore, through technological developments such as blockchain, Singapore has the potential to play a role as a trusted innovator and value-added intermediary. These technologies are designed to guarantee supply and provenance.

#### **5<sup>th</sup> place: United States**

The United States dropped one place from 4th to 5th last year. US Technology Modernization Fund increased by \$9 billion to bring government information technology and cybersecurity services into a coherent scheme across the board. By automating all previously analog business processes, equipping them with AI, and installing virtual assistants, it is a way for governments to adopt automated systems to enhance services and at the same time reduce the burden on the labor force. The U.S. Department of Housing and Urban Development,

the National Institutes of Health, and the Internal Revenue Service all use robotic process automation (RPA) to meet the growing demand for domestic essential services.

In addition, with the rapid increase in remote work due to the corona crisis, cloud computing has made it easier to shift to working from home by strengthening adaptability. Many parts of the U.S. healthcare system are also digitally operated, allowing people to receive medical advice and diagnoses through telemedicine and teliagnosis, reducing the need to visit clinics and hospitals. 3D printers help accelerate the production of essential medical supplies, as the most effective preventative medicine, vaccine treatment, succeeds and saves lives.

It is said that the implementation of digital government has been shortened by several years due to the corona epidemic. As Industry 4.0 pushes forward, digital payments and identity infrastructure could help address structural issues such as financial exclusion and informality. In developing countries, only half the population of rich countries has access to mobile internet. Developing countries are actively seeking international assistance to meet their growing needs for information and communication technology, and the United States is helping developing countries realize their economic and social potential. increase.

U.S. funding and leadership in the digital infrastructure sector has long-term political and economic implications. There are advantages such as digital financial inclusion aligned with US foreign policy goals. The U.S. government has launched programs to increase the economic stability of the poor, women, and other oppressed groups and to increase women's participation in the labor sector, and the U.S. Agency for International Development has announced that digital We expect that it will reduce the wage gap and contribute to the improvement of the economy and productivity.

## **6<sup>th</sup> place: UK**

Last year, it dropped two places from 4th to 6th. Since the start of the corona pandemic, the UK public sector's commitment to transforming digital services has intensified. Government agencies, local governments, the National Health Service, and other public agencies have long made it a priority to improve citizens' ability to participate in decisions that affect health, safety, and quality of life. British citizens have sought to join their country's Digital Nations and share their experiences and best practices with international partners to maximize the potential of digital services and technology. The core government digital service (GDS) is leading DX in the UK in cooperation with each government agency.

The UK response to COVID-19 shows the enormous potential for digital, data and technology to solve health and social care challenges. Five key challenges facing DX in the UK are hindering the country's economic recovery and expansion. They are. (1) Information as a

catalyst for innovation, (2) New online business models, (3) Construction of a reliable supply network, (4) Complementary AI technologies and possibilities for a wide range of applications, (5) Efficiency and productivity improvements through cloud computing and IoT Improvement.

## **7<sup>th</sup> place: South Korea**

In the most recent rankings, South Korea has promoted from 6th to 9th to 8th to 7th, and although it once dropped to 9th, it has steadily climbed up the ranks. In the rapid DX era, governments need to use digital technology and data strategically in the public sector. Harnessing the advantages of digital technology and data, the public sector is becoming more responsive to citizens' demands, becoming more resilient and more resilient to shocks like the corona pandemic. Competent digital governments are also better positioned to create digital economies and societies to meet the challenges and seize the potential benefits brought about by the digital revolution.

The South Korean government first began implementing e-government plans and related initiatives in the 1990s in response to growing public interest and demand for online public services and public information disclosure. The success of South Korea's e-government is largely due to state involvement and funding of this initiative.

The Korean government aims for openness, transparency, and democracy on the COVID-19 issue, and is rapidly and actively utilizing administrative innovation skills. In June 2021, the Korean government announced a digital government strategy until 2025. It unveiled plans to implement intelligent service design and delivery, data-driven government, and a robust and comprehensive digital infrastructure while reinforcing the weaknesses identified by the DGI. To improve the daily lives of its citizens, governments are working to expand the current digital ecosystem of public data and public services.

In addition, South Korea and the Organization for Economic Co-operation and Development (OECD) will sign a memorandum of understanding on digital government in December 2021, participating in the OECD's global e-leader initiative to support non-member countries in the field of DX in the public sector. We aim to play a more active role.

## **8<sup>th</sup> place: Estonia**

This year's ranking is 8th. It has fallen two places from last year's 6th place. Estonia's digital government, with 99% of public services available online, has inspired many countries' digital strategies. The country's digital government policies, which have been working from early on to ensure the transparency and reliability of the digital government and promote the use of technologies such as AI, have always been a factor in securing high rankings.

Even in the case of corona countermeasures, it can be evaluated that it is rapid considering the total number of cases, hospitalizations and deaths due to the large amount of investment in digital government so far. Political dynamics, rapid policy learning, collaboration with the scientific community, and existing ICT and digital government infrastructure all contributed to the successful response to the crisis.

The identification system used in Estonia is far more modern than any other country in the world, and national IDs are more than just legal photo identification. Granting users digital access to all secure online services, the so-called 'Smart ID' was created in collaboration between SK ID Solutions and Cybernetica. Smart-ID is a new generation of electronic IDs based on apps that are easy to use on intelligent devices while maintaining high security.

### **9<sup>th</sup> place: Taiwan**

Taiwan, which ranked 9th, jumping up one rank from last year. In particular, It received particularly high marks for its completeness of network infrastructure (5th place). digital government strategy promotion measures (9th place), and DX is added (6th place).

On the other hand, compared to last year's ranking, the order of contribution to administrative and financial reform has declined. Two years have passed since the emergence of Corona, but the promotion of digital government under the leadership of Minister Audrey Tan, who has been acclaimed worldwide, continues to be highly evaluated.

In addition, efforts called civic tech, in which citizens use technology to participate in social issues related to government services, are continuing, contributing to open government data. Her efficiency facilitates the full use of digital IDs, including digital signatures between government agencies.

### **10<sup>th</sup> place: Japan**

Japan held on to 10th place for the first year in ranking. On September 1, 2021, the Digital Agency was established in order to solve the issues that have been pointed out as structural issues in Japan, such as vertically divided administration, separation of central and local governments, financial and digital disparities among local governments, and shortages of digital human resources. started. The role of the Digital Agency, which has been established in only about 10 countries in the world, is significant, and policies are being implemented. With the advent of Japan's social issues of declining birthrate, super-aging, and population decline, we are promoting digital transformation with 2040 as the target year. In particular, the promotion of digitization has been reviewed from the perspective of the Local Autonomy Law, such as the digitization of the central government and cooperation between the central and local governments. Several national strategies have been advocated. DX not only reduces

the cost and efficiency of administrative and financial reforms, but also greatly contributes to improving the convenience of people's lives. The top priority of the digital government with Corona is to provide economic revitalization and high-quality administrative services, and to ensure the safety and security of people 's lives.

Digital government should aim for overall optimization, and even in the analysis of 10 benchmarks, it is possible to raise the score not only in the infrastructure field, but also in service quality, security, and new technology utilization. The application rate for My Number Cards, which support the digital government for personal authentication, was 56% as of October, and the issue rate nationwide was 49% as of September, an increase of 11 % from the same period last year. The Minister of Digital Science announced that the current health insurance card will be abolished in principle by the autumn of 2024.

## D. Top 10 Countries in the 10 indicators by 10 sectors

Full names of 10 Indicators above

1. NIP            Network Infrastructure Preparedness (NIP)
2. MO            Management Optimization (MO)
3. OS            Online Services (OS)
4. NPR           National Portal (NPR)
5. GCIO          Government Chief Information Officer (GCIO)
6. EPRO          Digital Government Promotion (EPRO)
7. EPAR          E-Participation (EPAR)
8. OGD          Open Government Data & DX (OGD)
9. CYB          Cybersecurity (CYB)
10. EMG          The emerging technology in Digital government (EMG)

The 17<sup>th</sup> Waseda-IAC World Digital Government Rankings are based on a comprehensive benchmark index analysis invented by Prof. Dr. Toshio Obi, to provide a detailed and accurate assessment of the latest digital government developments in the ICT sector of all target countries (economy). Currently, 10 key indicators below are used to conduct the review for World Digital Government Ranking Survey. The following table shows all 10 indicators and sub-indicators in 36 fields under their umbrella.

**Table 4 Key field evaluation 10 Indicators and sub-36 Indicator list**

10 major survey items	36 Survey sub-items	
Network infrastructure enhancement · NIP (Building and maintenance of public network)	1-1	Internet subscribers
	1-2	Broadband users
	1-3	Digital mobile phone subscribers
Contribution to administrative and financial reforms, optimization of administrative management, MO (effects of EA, etc.)	2-1	Optimization progress
	2-2	Integrated EA model
	2-3	Administrative budget system
Progress of various online applications and services / OS (types and progress of online service activities)	3-1	Electronic bidding system
	3-2	Electronic tax payment
	3-3	Electronic payment / customs clearance

	system
	3-4 eHealth system
	3-5 One-stop service
Convenience of homepage and portal site NPR (Status of National Portal)	4-1 Navigation function 4-2 Two-way dialogue 4-3 interface 4-4 Technical convenience
Government CIO (Chief Information Officer) Activity · GCIO (Authority and human resource development)	5-1 Introduction of CIO 5-2 CIO Authority 5-3 CIO Organization 5-4 CIO Human Resources Development Plan
E-Government Strategy / Promotion Measures / EPRO (Achievement of the plan)	6-1 Legal response 6-2 Effective promotion business 6-3 Support mechanism 6-4 Evaluation mechanism
Enrichment of citizens' administrative participation by ICT · EPAR (Electronic participation of citizens)	7-1 Information sharing mechanism 7-2 Exchange / Discussion 7-3 Participation in decision making
Open Government OGD (Open data) & DX	8-1 Legal response 8-2 Society 8-3 Organization 8-4 Activity
Cyber security / CYB	9-1 Legal response 9-2 Cybercrime measures 9-3 Internet Security Organization
Use of Emerging ICT / EMG	10-1 Cloud utilization 10-2 IoT utilization 10-3 Big data utilization

## 1. Network infrastructure enrichment (NIP)

Table 5 Network infrastructure enrichment (NIP)

	Country	NIP
1	USA	8.0423

2	Netherlands	8.0348
3	Japan	8.0248
4	Iceland	8.0186
5	Taiwan	8.0018
6	Sweden	7.8641
7	South Korea	7.8417
8	New Zealand	7.8359
9	Finland	7.7604
10	France	7.6995

Regarding "network enrichment," three sub-indicators are used to evaluate the digital government. Internet users are an important sub-index for assessing a country's online application services. The development and popularization of wireless broadband, especially 5G, has become mainstream. Infrastructure development has already been developed and applied in many countries. This will be of great help to developing countries in terms of increased high-speed connectivity, evolution of infrastructure over wide bandwidths, and the adoption and progress of digital government strategies, and can reduce the digital divide among developed countries.

This year 2022, USA is the top with a very high digital penetration rate. The infrastructure required for ICT networks and digital governments is well-developed, and it continues to be ranked high in 2022 based upon the interoperability of the system and the large exchange of data between government ministries and agencies. increase. USA has also been focusing on greening from an early stage, and the government has been working with the private sector, focusing on "green IT-GX" solutions to continuously expand digital infrastructure in order to provide a healthier environment for all people. The PPP mechanism has been promoted.

## 2. Contribution to administrative and financial reform, optimization of administrative management (MO)

**Table 6 Contribution to administrative and financial reform, optimization of administrative management (MO)**

	Country	MO
I	Denmark	12
1	Singapore	12
1	USA	12
1	UK	12

5	Switzerland	11.8
6	South Korea	11.6
6	Ireland	11.6
6	Netherlands	11.6
9	Canada	11.2
9	Japan	11.2
9	Sweden	11.2
9	Finland	11.2
9	UAE	11.2
9	Philippines	11.2

Optimization of administrative management is an important indicator of the digital government ranking, which indicates the optimal behavior of the government in the operation and implementation of the digital government. It will be evaluated through the implementation of the project and the strategy for ICT application development. We will apply new technologies that are optimal for promoting online services. Digital policy and system architecture settings are also factors for all governments to consider moving to a digital model. This indicator evaluates the use of ICT to improve government business and internal processes (back offices of each organization). Government management optimization is an important indicator of digital government development as it relates to optimization progress, integrated enterprise architecture (EA), and government management budget systems. Singapore, UK and USA are selected for the first place with a tie score.

### 3. Progress of various online applications and services (OS)

**Table 7 Progress of various online applications and services (OS)**

	Country	OS
1	Switzerland	11.76
2	Singapore	11.4
2	USA	11.4
2	UK	11.4
2	Taiwan	11.4
6	New Zealand	11.28
6	Estonia	11.28
6	Australia	11.28
9	Thailand	11.25
10	Netherland	11.22

Progress in various online applications and services is a key indicator of the development of digital government. The achievements of the digital government include e-services, or products / services provided by the government to citizens, and positions e- services as the interface of the digital government. The growth of a nation as a digital government is measured by the increase in online services and the level of services (information, download forms, transactions, e-payments, etc.). This Digital Government Ranking survey currently evaluates five major online services, including e- procurement, e-tax payments, e- payments, one-stop services, and e- health. These are the basic services of online services. In order to cover and evaluate better online services. In 2022, Switzerland ranks first.

#### 4. Convenience of homepage and portal site (NPR)

**Table 8 Convenience of homepage and portal site (NPR)**

	Country	NPR
1	New Zealand	8
1	Canada	8
1	USA	8
1	UK	8
1	Switzerland	8
6	South Korea	7.8667
7	Singapore	7.7333
7	Estonia	7.7333
7	Sweden	7.7333
7	Finland	7.7333
7	Norway	7.7333

As point of contact for national portal (one-stop service), the government portal would be regarded as all of e- integrated services, this is defined as a place to be able to access through a single gateway. It is also the primary interface for stakeholders to access the government electronically. Through national portals, governments provide users of public services with many benefits by faster and better services from citizens and businesses to the public managers themselves. In the public sector, one-stop service, the most promising concept of service provided in Administration is the most important service. The implementation of the National Portal is included in the digital government strategies in most countries. New Zealand, Canada, USA, UK, and Switzerland together are ahead of the others in first place.

## 5. Government CIO Activity (GCIO)

**Table 9 Government CIO Activity (GCIO)**

	<b>Country</b>	<b>GCIO</b>
<b>1</b>	Canada	10
<b>2</b>	Denmark	9.5455
<b>2</b>	New Zealand	9.5455
<b>4</b>	Singapore	9.3182
<b>5</b>	Norway	9.0909
<b>6</b>	UK	7.9545
<b>7</b>	Estonia	7.7273
<b>7</b>	Ireland	7.7273
<b>9</b>	Taiwan	7.2727
<b>10</b>	USA	7.272

In the "World Digital Government Ranking", the government CIO is introduced as very important index in the evaluation on digital government in each country from the first year of this ranking survey. Government CIOs are expected to balance digital strategy, organizational reform and overall optimization, play an important role in planning and implementation. And in recent years government CIOs have also focused on DX for digital government. Government CIO also activates DX to lead the efforts on digital technology, research, and implement the methodology of the workflow. and GCIOs transform the agility and digital bird's-eye view of digital activities in federal government agencies. This indicator is intended to assess the role of the information technology sector in digital government planning, development and implementation, and to transform DX applications into management models.

This year, Canada gets the highest score. Both Denmark and New Zealand rank in 2nd position. USA drops down to the 10<sup>th</sup>, even though the Federal CIO Council is active, In Japan, the Digital Agency was established in September last year. the name called as Government CIO has been replaced by the Chief Digital Officer. The Chief Digital Officer is a position equivalent to the Administrative Vice-Minister in other central ministries and agencies, assists the "Digital Minister" who supervises the Digital Agency under the Prime Minister, and supervises the overall business of the Digital Agency. Against the background of the authority of the Digital Agency, the Chief Digital Officer is expected to play a role in demonstrating the leadership through comprehensive coordination through join activities with each ministry and local government, and promoting administrative DX by making use of experiences in the private sector.

## 6. Digital Government Strategy and Promotion (EPRO)

**Table 10 Digital Government Strategy and Promotion (EPRO)**

	<b>Country</b>	<b>EPRO</b>
1	Korea	10
2	Estonia	9.8387
3	Singapore	9.6774
4	Denmark	9.0323
4	Canada	9.0323
4	Italy	9.0323
4	UAE	9.0323
8	USA	9.032
9	Taiwan	8.871
9	Indonesia	8.871

This indicator measures government activity towards promoting digital government and distributing e- services to citizens, businesses and other stakeholders. This includes activities related to digital government implementation support, such as legal frameworks and mechanisms (laws, plans, policies, strategies). In short, the government is doing these activities to support the development of e-services and the development of the digital government.

Korea has won the first place due to the success of preventive Corona's digital strategy. Through the media, governments have successfully introduced the promotion of services and utilities that use the internet to provide public services.

## 7. Enrichment of citizens' participation in government through ICT (EPAR)

**Table 11 Enrichment of Citizens' Participation in Government by ICT (EPRA)**

	<b>Country</b>	<b>EPAR</b>
1	Denmark	10
1	New Zealand	10
1	Estonia	10
1	Finland	10
1	Iceland	10
6	Canada	9.75
6	Italy	9.75
6	France	9.75
9	Singapore	9.5

9	USA	9.5
9	South Korea	9.5
9	Germany	9.5
9	Sweden	9.5
9	Australia	9.5

ICT is the administrative tool for citizens in e-participation, to expand the active participation in the digital government operations. In implementing digital projects, business and people can connect, make dialogue with the government, and increase the transparency and consistency of the process. These processes can be about management, service delivery, decision making, and policy making.

Denmark, Finland, Iceland, Estonia, and New Zealand have the highest ratings in their respective methods. In particular, Denmark provides hybrid services that have succeeded in digitizing nearly 100 %, while retaining the administrative services for the people with vulnerable and elderly.

Estonia has already fully fulfilled its role as a leading country for the digital government and is playing various e-participation in the country's digital strategy, such as laying broadband, digital strategy, and attracting business investment. Even with corona measures, there are differences in the participation of citizens in the administration in each country.

## 8. Open Government (OGD) & DX

**Table 12 Open Government (OGD) &DX**

	Country	Score
1	New Zealand	10
2	Denmark	9.6
2	Estonia	9.6
2	UAE	9.6
5	USA	9.5
6	UK	9.4
6	Taiwan	9.4
6	Hong Kong	9.4
9	South Korea	9.2
9	Germany	9.2
9	Netherlands	9.2

Open government/data is a barometer of the openness of specific government data to citizens, businesses, and other ministries. New Zealand is at the top of the ranking. This time UAE has made great strides.

The United Kingdom as the 6<sup>th</sup> rank has earned a high reputation as a digitally advanced country for several years. In UK, the online system of most administrative procedures has already been implemented. Both OECD 's "Digital Government Index (2019) " and World Wide Web Foundation's "open data Barometer (2016)," have become a place, which each government agency WEB site is GOV.

In addition, the National Health Service of the UK medical system has its own website, and the procedure for vaccination reservation / change has been completed on the website for Corona issues. One of the factors behind the success of UK digitization is the collaboration with private businesses through open government/data. DX for digital government is analyzed in each country assessment report.

## 9. Cyber Security (CYB)

**Table 13 Cyber Security (CYB)**

	<b>Country</b>	<b>CYB</b>
<b>1</b>	Denmark	10
<b>1</b>	UK	10
<b>3</b>	USA	9.8
<b>3</b>	Japan	9.8
<b>3</b>	Austria	9.8
<b>6</b>	New Zealand	9.6
<b>6</b>	South Korea	9.6
<b>6</b>	Germany	9.6
<b>6</b>	Sweden	9.6
<b>6</b>	Switzerland	9.6
<b>6</b>	Netherlands	9.6
<b>6</b>	Iceland	9.6
<b>6</b>	Lithuania	9.6

An important issue in promoting digital government is cybersecurity. Sufficient security measures have been taken in Denmark and UK which won the first place in 2022. In addition, Though USA ranks in the 3<sup>rd</sup> position, the latest report of the U.S. Department of State announced that it will create a station in charge of cyberspace and digital policy, and to

the U.S. infrastructure against the ransomware virus. We have set out a policy to strengthen countermeasures against cyber-attacks as the attacks of the United States become more serious. The Cyber Bureau is a center position for “cyber security” that includes, (1) negotiations and deterrence with allies and hostile countries, (2) a "digital policy" that promotes the creation of a reliable communication network, and (3) a "Digital freedom" that protects human rights online. In these three fields, the administration would like to expect future progress in eradicating the rapidly increasing number of cybercrimes.

## 10. Use of Emerging ICT (EMG)

**Table 14 Use of Emerging ICT (EMG)**

	Country	EMG
1	Denmark	7.5
2	Canada	7.25
3	New Zealand	7
4	Singapore	6.5
4	USA	6.5
4	UK	6.5
4	Japan	6.5
8	Belgium	6
9	Germany	5.5
9	Netherlands	5.5

The role of innovation in technology area is to provide effective services to all citizens and businesses using the Internet and communication networks. The development of many new technologies, such as AI and Block Chain, do more than just help people access government services through computers, phones, tablets, and thousands of other devices. Cloud computing helps facilitate the connection between government and citizens. Big data helps governments scale their data to optimize their services. Therefore, the emergence of these technologies always needs the highest priority and should be implemented by the government.

Canada follows in second place. The United States takes in the 4<sup>th</sup> rank, which established an ICT base in Silicon Valley. In addition, international policy adjustments have begun, including standardization of AI, quantum computers, biotechnology, etc. The appointment of a new envoy in charge of emerging technologies will further promote the digitization of the government.

Japan which ranks 4th, could improve the use of cutting-edge technologies such as the advancement of smartness in local public organizations by the spread of digital administrative services utilizing AI and RPA, and the contribution to cost efficiency, work style reform, digital investment, and optimal allocation of human resources.

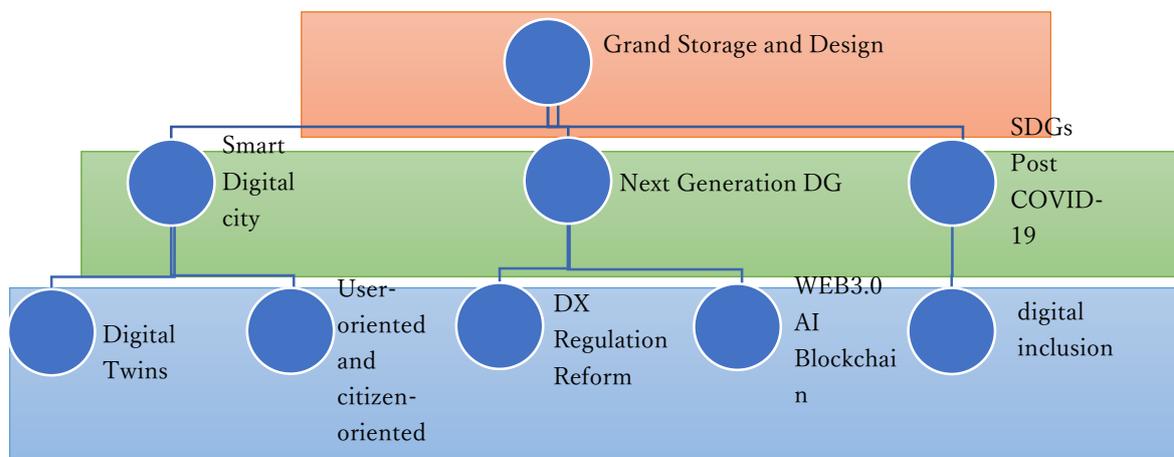
## E. Highlight - New trends of Digital Government

### Topics of Digital Government

1. DX Challenges for Digital Government
2. DX and Regulation Reform
3. Corona Measures
4. Human resources -Hybrid work
5. Digital Inclusion
6. Data Driven Evaluation System
7. Resilient Smart City
8. Digital Literacy
9. Silver Innovation
10. Cyber Security
11. Digital Twin
12. AI for Digital Government
13. Prospect for 5G and Beyond 5G (6G)

### 1. DX Challenges for Digital Government

Figure 1 Framework of DX Strategy



### ① Strategy

Digital government is total optimization. Grand strategy and grand design are required. The e-Government Research Institute has analyzed and evaluated the progress of e-Government over the past 16 years using 10 benchmarks. As more and more countries are strategically promoting digital government, the trend toward e-government is rapidly advancing.

### ② Technology

Technological innovation advances. After COVID-19, digitalization progresses in both developed and developing countries. Shift from defensive digitization for efficiency and cost reduction to offensive digitization using AI. New technologies such as tamper-proof block chains are also starting to be used in digital governments in emerging countries. A shift from architecture to service design can be felt in the top-ranking countries.

### ③ Inclusion

The lack of digital government from the perspective of the people and users denies social inclusion. The goal of social inclusion is to send and receive information to vulnerable people who have digital disparities, such as the elderly, disabled, and foreigners. In addition, although it was a digital government whose main purpose was administrative and financial reform,

### ④ Valuation (E valuation Platform)

While digital government has been promoted for the purpose of administrative and financial reform, the optimal allocation of budgets is being reconsidered according to user needs and the public's point of view. Evaluation based on EBPM, and agile thinking is required as an evaluation index.

## 2. DX and Digital Government

Digital governance is defined as the use of technology to provide government services to the public. The goal of digital governance is to improve the government service delivery methods and enhance citizens' involvement in public services. From that perspective, it stipulates smart cities making advances in data acquisition and digital technologies that have the potential to unlock new, more cost-effective, and productive ways for cities to undertake existing tasks. International standards are best practices established by global experts, which can be used to benchmark the functional and technical performance of smart cities. The smart city is indeed an ambitious concept, but it should be officially recognized by national authorities, international investors, and community organizations to promote societal advancement, technology absorption, and financing of new infrastructure investments. Standards can ensure that technologies deployed in cities are efficient, safe, and well-integrated into the vision and goals of a smart city. This policy brief reviews the evolving standards and technical standards that are important for smart city implementation. Hence,

there is a need for standards to help the regulators and communities in assessing how smart cities function and contribute to strategic goals. The consensus within the smart city community is that so far there is limited use of existing and emerging standards that support smart cities' agenda and that are inclusive of a new digital governance architecture.

The G20 should promote an effective digital governance system to accelerate the transformation. The next generation Digital Government. The next 5th generation Digital Government should be encouraged to implement innovative concepts centered on emerging technologies such as AI, 5G (6G) technologies, IoT, Big Data, blockchains, and digital twins in order to achieve the G20 themes "recover together, recover stronger" and "smart together". It should be fully considered that the convergence of digital society, climate change and aging society will be inevitable post Covid-19. Furthermore, the following new Digital Government for new society is highly recommended.

The 10 indicators by Waseda University-IAC World Digital Government Ranking for 17 years since 2005 is as follows:

- ✧ Network Preparedness/Infrastructure (NIP)
- ✧ Management Optimization/ Efficiency (MO)
- ✧ Online Services / Functioning Applications (OS)
- ✧ National Portal/Homepage (NPR)
- ✧ Government CIO (GCIO)
- ✧ D-Government Promotion (EPRO)
- ✧ E-Participation/Digital Inclusion (EPAR)
- ✧ Open Government (DXOG)
- ✧ Cyber Security (CYB)
- ✧ The use of Emerging ICT (EMG)

We are proposing Digital Transformation (DX) for the next Digital Government model with the following 8 factors in capital as independent indicator:

1. AI Innovative Government
2. Big Data, Blockchain-Digital Twin for Government
3. 5G/6G mobile government
4. Digital Government for SDGs
5. Citizen Centric and Social Inclusion
6. Data driven and Open Innovation
7. Emergency action for crises
8. Global network and Standardization

It will improve citizen's quality of life through infrastructure, applications, and other

means. Governments should heed the digital gap between urban areas and rural areas, and between large companies and SMEs. These disparities became more apparent during the global pandemic. The world is entering an era of further disparity due to the Covid-19 disaster, which shows no signs of equalizing. It will become a major global socio-economic issue.

The governments should create productive harmony between digital government and smart city/villages with all stakeholders. Active participation of civil society should also be encouraged. The biggest challenge for cities is not only how to establish digital government and smart city solutions but also how digital government and smart city can solve basic urban problems. As a result, many cities have adopted smart solutions on urbanization, and sharing experiences between the stakeholders of the governments in different countries are expected to expand solutions for all public sectors. Yet even today there is no substantial universal framework available. On the other hand, there are many governments worldwide that are still struggling to solve basic urban/rural/village problems. Coordination between Digital Government and Smart City There is the need to harmonize disjointed central and local governments' DX and as well as digital capabilities. Also, to address current and future urban issues including aging societies, there must be a renewed focus and reorganization of governance centered to encourage innovative solutions. Harmonization of creating common infrastructures, platforms, and between Digital Government and Smart City as well as their joint activities is extremely important to reduce any duplication of investment for digital infrastructure and accelerate economic growth.

### **Effects on Digital Economy and New Society**

The definition & activities of digital government has changed significantly since it started about 40 years historically. E-Government was established as part of the administrative and financial reform of the US government. In 1992, the Clinton administration came to power in the United States, and about two years later, under the slogan of a paperless society, Vice President Gore took the lead and started working on e-government, the centerpiece of administrative and financial reforms.

In Japan, as part of the administrative and financial reforms, a novel report on e-government was issued, and many IT strategies led to legal revisions. Along with the remarkable development of ICT, e-government related policies have been newly formulated. With the rapid evolution from personal computers to mobile phones and smart phones, broadband environments and wireless speeds have been progressing, and there is a shift to virtualization, decentralization, and cloud computing.

Recently, AI, IoT, big data, and blockchain in major developed countries have been utilized as technologies that form the backbone of digital government, contributing to the

growth of digital government. Since around 2010, social media such as Facebook, Twitter, and SNS have become popular as new interactive means. As citizens' electronic participation is promoted and e-participation is emphasized, the movement of civil society becomes active, and it is recognized as a force that plays a role in digital government.

On the other hand, security vulnerabilities are becoming more serious in many countries and regions, and there is a need to strengthen digital governance. Since the role of ICT has undergone a qualitatively large paradigm shift, in recent years, citizen-oriented digital government has become an important policy subject. Through open innovation, the value of data is regarded as new capital, and an unprecedented digital society is beginning to emerge.

It is essential that digital government, which is the catalyst for administrative and financial reform, contributes to significant cost reduction and administrative DX. Full-scale promotion and deployment of digital government is essential as a basis for economic growth and innovation strategies as well as strengthening international competitiveness. The trend of the world is unfortunately expanding the digital disparity, the central-regional disparity, and the income disparity after the corona. In Emerging countries, the use of AI and blockchain technology and the movement of innovation are conspicuous in reality. Also, the digital divide between the "haves" and "have-nots" is also not shortened. In particular, the gap widens in terms of utilization of advanced technology, digital human resources, and government budget. However, the cooperation between social media and digital government services will advance, and in addition to the usefulness in times of disaster, user-oriented services centered on citizens will also advance.

One of the more advanced digital government strategies is public-private partnership. (PPP) While updating the national strategy, they are working continuously and gradually instilling the importance of digitization to administrative officials over a long period of time. It is also characterized by the establishment of good governance and promoting digitization in society based on the recognition that digitization is of value to both citizens and government officials.

### **3. Corona Measures**

As Singapore ranks No.1 among Asian countries in the Waseda World ranking 2022, several excellent characteristics are introduced:

#### **Promotion of government-led eco-friendly data centers**

Singapore's Economic Development Board (EDB) and Information and Communication Media Development Authority (IMDA) announced the launch of the Data

Center (DC) – Call for Application Exercise (DC-CFA) on 20 July 2022. DC is expected to see a significant increase in demand as an important digital infrastructure for the development of DX and the digital economy.

One of the problems with data centers is their high environmental impact. It is estimated that DC accounts for 3% of the world's electricity consumption. For Singapore, DC accounts for 7% of total electricity. Since the increase in DCs will affect environmental issues such as global warming, Singapore has set a three-year moratorium period from 2019 to suspend the construction of new DCs. For sustainability, the Singapore government indicates a policy to promote the construction of new eco-friendly DCs using the latest technology.

The new DCs are to obtain the Platinum Green Mark certification, to have the PUE of the international power usage efficiency index of 1.3 or less, which is the highest class, to have the highest IT energy efficiency, and to have the best decarbonization. Methodology proposals (renewable energy sustainability goals and innovative energy investment plans) were raised.

The Singapore government will steer in the direction of achieving both the promotion of digitalization and sustainability such as decarbonization. At the same time, it also calls for key data centers and technologies to play a role as regional and international hubs. This is because, while other ASEAN countries are also actively investing in DCs, there is concern that other countries will lose their position due to stricter conditions.

Google opened its third data center in Singapore on August 23rd, 2022. Google's data center investment in Singapore totaled \$850 million. At the same time, Google signed a memorandum of understanding with the Singapore government for the use of AI in administrative services. Cooperate on joint development in the fields of finance and medicine, AI training for government officials, and the establishment of ethics and governance in AI utilization. Google has established a headquarters for Southeast Asia in Singapore, creating 3,000 jobs.

#### ● New construction of data centers in the world

Global internet traffic grew at an average annual rate of 29% from 2017 to 2021, according to research firm Telegeography. Especially in 2019-2020, the early period of the corona crisis, there was a dramatic increase of 46%. According to JETRO, cross-border Internet bandwidth (data flow) increased by about 2.7 times over the four years from 2017 to 2021. New data centers that operate Internet servers and data communication equipment are being constructed around the world.

Currently, nearly 40% of the world's data centers are concentrated in North America. In particular, the United States has an overwhelming advantage, accounting for nearly one-

third of the global market. In addition, countries with large financial cities have a high share of data centers, with the United Kingdom with London, Germany with Frankfurt, and the Netherlands with Amsterdam at the top. A few numbers of data centers are required in Europe due to active Internet communication for financial transactions.

Japan has less than half of Singapore's cross-border data flow and ranks ninth in data center share. Among Japan's partner countries, the United States accounts for 41.1%, China 24.6%, and Singapore 13.4%. The top three countries account for about 80% of Japan's cross-border data flows.

China will start a national data center project in February 2022, building data centers concentrated in the east and extended to in the west, and building networks between data centers.

Southeast Asia is not in the top 10, but it is a battleground where data centers are built in Thailand, Indonesia, Vietnam, Malaysia, Philippines, and Singapore. Cushman & Wakefield, a major US real estate service company, predicts that the DC market in Southeast Asia will grow at an average annual rate of 12.4% until 2024, reaching \$2.4 billion in 2024. The growth rate is higher than North America (6.4%), Europe (11.1%), and the entire Asia-Pacific region including India (12.2%). Singapore currently tops the list, but Indonesia and Malaysia are catching up.

#### Global share of data center

United States	32.9%	Netherlands	3.3%
Germany	5.8%	Australia	3.3%
UK	5.5%	France	3.2%
China	5.3%	Japan	2.5%
Canada	3.9%	Russia	2.0%

Source) JETRO

#### of DC bases in major Southeast Asian countries and DC growth rate in capital cities

Country	Number of DC locations	Capital DC growth rate
Singapore	104	5.1%
Indonesia	64	21.8%
Malaysia	44	12.9%
Philippines	29	14.2%
Vietnam	20	14.5%

Source) Nihon Keizai Shimbun:

The number of DC bases is Cloud scene (as of December 2021) DC average annual growth rate (2020-2024) is estimated by Crashman & Wakefield

### **Singapore Launch of CrowdTaskSG as digital inclusion and e-participation**

On August 12, 2022, the beta version of "CrowdTaskSG", a platform for the government and citizens to share their opinions and feedback, was launched. Available to Singpass account holders. This is a platform to connect the government and the people, and the purpose is for the government to listen to the voices of the citizens and reflect them in policy. For example, if a government agency wanted to know what the public thinks about climate change, it would ask CrowdTaskSG to do a survey and ask users to respond.

Here are four features of CrowdTaskSG. First, it was designed to perform tasks so that it can be enjoyed like an online game. Users will receive virtual coins and experience points for completing tasks such as voting on questions with options and sending feedback on initiatives. As a person accumulates experience points, its rank will increase.

Second, the accumulated virtual coins can be exchanged for incentives. 5000 coins are worth 5 Singapore dollars. Redeem real-world vouchers for tangible benefits. Currently, e-vouchers for NTUC FairPrice, Singapore's largest supermarket chain, are provided.

Third, matching tasks to relevant users. Government agencies can take advantage of targeted allocation capabilities. Elderly people can be matched with tasks related to products for the elderly, and child-rearing households can be matched with tasks for child-rearing households. Fourth, it enables government agencies to engage and pilot the public early in the product and policy-making workflow. In the normal policy process, it takes time and money to search for target people who are suitable for products and measures, conduct sample surveys and test operations, but using CrowdTaskSG saves the trouble of finding target people. Listening to citizens' opinions and reflecting them in policies means that the government and citizens create policies together. Such public comment systems exist in various countries, including Japan, but due to their low level of recognition and difficulty in understanding, effective use is an issue. CrowdTaskSG is a new initiative and GovTech emphasizes that "citizens are really co-creators."

### ● Overview of the DX policy of the Government Technology Agency of Singapore in FY2022

The Government Technology Agency of Singapore announced in June 2022 that the amount of ICT procurement for fiscal 2022 is expected to be 3.8 billion Singapore dollars, the same amount as the previous fiscal year. In fiscal 2021, it increased by 8.6% compared to the previous year, partly due to the impact of the corona crisis. It has spent a total of S\$12.6 billion

over the past four years from FY2018 to FY2021. Of the S\$3.8 billion, S\$2.6 billion, or 70%, will be spent on app development. Projects employing new technologies such as machine learning, sensors, Internet of Things (IoT) and data science are expected to more than double from S\$790 million in FY2021 to S \$2 billion in FY2022.

● Example of project

For specific projects, law enforcement agencies will consider using automatic speech-to-text services. Currently, judicial proceedings, such as court records, are handwritten. The service is a tool to assist transcribers of judicial proceedings.

The Ministry of Education will work with the Government Technology Agency to introduce smart facility management systems in all schools to improve energy and water efficiency. Monitor consumption while collecting data and improve labor productivity through automated management systems. Singapore started using digital textbooks in research schools from 2007. Currently, instead of uniformly deciding whether to use paper or digital, each school principal can choose the medium of textbooks at their discretion.

● Promotion of Cloud First

Since the formulation of the Cloud First Strategy in October 2018, approximately 55% of eligible government systems have been migrated to the Government Commercial Cloud (GCC). The government expects to achieve the target of 70% by fiscal 2023. By deploying apps on the GCC, the government's ICT infrastructure has become more agile and resilient, resulting in an average cost reduction of 30%-40% per system migrated to the cloud. In 2022, They will spend S\$1 billion on projects developed on the cloud.

Joint development projects with industry are expected to account for 27% of the total. The Government Technology Agency promotes joint development with industry. FY2022 is expected to account for 27% of the total project (\$1.04 billion). Approximately 11% in 2020 and 20% in 2021, growing steadily. The content is expected to increase the ratio of streamlining and simplification of the “Singapore government technology stack”, which is a common government platform. And through holding sessions to promote joint development, procurement opportunities for SMEs in FY2022 are expected to reach 80%. It is also effective as a support for small and medium enterprises.

**Corona measures**

**(1) Case study of United States**

Economy comes first, but there are many pains. In the United States, the response to the coronavirus differs from state to state, with Democratic Party-led states having stricter

restrictions, and Republican Party-led states not requiring masks to be worn. Since the Omicron stock has been moving in the direction of coexistence with Corona, the CDC announced on August 11, 2022 that it revised its guidelines to eliminate the need to isolate contacts of infected people and instead recommend wearing high-performance masks. The period is 10 days. For positive people, at the end of December 2021, the conventional 10-day waiting period was changed to a recommendation of at least 5-day isolation. Those who have symptoms but do not have test results would be asked to isolate until results are available.

As of September 7, 2022, 94.8 million people were infected in the United States. Many people have been infected with the Omicron strain in winter, and after that, 100,000 people infected per day and 400 deaths. It seems that the fact the number of infected people does not increase like in Japan due to the infectiousness of the BA.5 strain cannot be said to be a success in infection control. In the United States, many people have been infected with winter Omicron strains. Because many people still have high antibody levels, it is thought that they are unlikely to be infected with the BA.5 strain. In January, the government stopped keeping track of all cases and started distributing test kits free of charge. Many people who are infected do not report, and statistics only reflect the results of hospital tests.

**Table 15 Comparison of both U.S and Japan on Treatment of Infected and Close Contacts**

USA		Japan	
infected person	- Quarantine for at least 5 days	infected person	<ul style="list-style-type: none"> <li>• Reduce the duration of treatment for symptomatic patients from 10 days to 7 days</li> <li>• Asymptomatic people shorten from 7 days to 5 days</li> </ul>
Close contact person	<ul style="list-style-type: none"> <li>• Isolation not required</li> <li>• Inspection 5 days after the last contact</li> </ul> Wearing a high-performance mask for 10 days	Close contact person	<ul style="list-style-type: none"> <li>• In principle, voluntary standby for 5 days from the start of infection control measures</li> <li>• If the antigen qualitative test is negative on the 2nd and 3rd days, it can be canceled from the 3rd day.</li> </ul>

#### **4. Human Resources~ Hybrid work – Telework or full return to the office?**

(1) U.S. companies that have promoted remote work up until now are divided into those that continue to work remotely, those that practice hybrid work, and those that aim to fully return to the office. In the IT industry, there are many IT companies with hybrid work that combines remote office work. Google launched a hybrid work system in April, requiring employees to work three days a week. Both Amazon and Microsoft have also introduced hybrid work. Apple will also ask employees to work three days a week starting in September. Since March, the percentage of people who come to work in the 10 major cities in the United States has remained in the 40% range.

The financial industry is gearing up for a full return to the office. From September, Prudential Financial, BMO Financial Group, Goldman Sachs, etc. will expand the request to come to the office. Arai Financial has also been encouraging people to return to the office. Goldman Sachs has lifted mandatory vaccinations and other barriers to returning to the office. Companies are asking for a complete return to the office from hybrid work, and employees are asking for the continuation of hybrid work.

Studies show that hybrid work reduces turnover and increases job satisfaction. Researchers at Stanford University conducted a six-month randomized controlled trial of 1,612 employees of the online travel agency Trip.com. Employee turnover decreased by 35% for hybrid work, and employees value working from home equivalent to a 4% to 8% wage increase. IT engineers' productivity increased by 8% while working from home.

On the other hand, the return to the office, including hybrid work, also has disadvantages. On August 26, the Los Angeles Public Health Center reported that a total of 307 people were infected at two Google offices that began working in offices, making it the highest number in the private sector. There is also the risk of aggravation and aftereffects due to infection, so there is a dispute over whether to allow remote work for those who do not want to go to work and get infected. When Apple introduced hybrid work in September, there was a signature campaign for flexible work styles. For now, Twitter and Facebook will continue to work remotely for those who want them.

#### **● The problem of aftereffects that cannot be taken lightly**

A Brookings Institution analysis released on August 24 found that 16 million Americans of working age (ages 18-65) are suffering from the aftereffects of COVID-19. And it was estimated that up to 4 million people could not work. Even 3 million people make up 1.8% of the entire US workforce. As of June, the United States has a labor shortage of 10.7 million people, about 3 million more than before the pandemic.

The Brookings Institution estimates that this shortfall of 3 million workers is equivalent to \$168 billion in lost profits annually. If the number of people with sequelae increases by 10% each year, the annual wage loss in 10 years will reach \$5 trillion. Neglecting the problem of aftereffects will continue to expand the impact on the economy in the medium to long term.

## **(2) Case study of Japan – Mortality rate is low, but heavy burden on medical sites and public health centers**

The government currently calls for 10 days of treatment for those with symptoms and 7 days for those with no symptoms, but plans to shorten the period to 7 days for those with symptoms and 5 days for those without symptoms in order to limit the impact on the economy.

In terms of the number of corona deaths, Japan is the lowest in the G7 and 15th out of 19 countries in the G20 excluding the EU (countries with fewer deaths than Japan are South Korea, Australia, Saudi Arabia, and China). Considering Japan's population, this is a fairly low level by world standards. In terms of population ratio, the number of corona deaths in China is about 5,200, and the low mortality rate is overwhelmingly the first place. The populous African countries of Nigeria, Ethiopia and the Democratic Republic of the Congo also have low four-digit deaths. However, the credibility of these countries' statistics is questionable.

### **● Delay of government DX in corona countermeasures**

The failure of DX in corona countermeasures is that the work of the public health center was tight, and the grasp of the total number was virtually broken. Regarding the total number of cases, it was pointed out that the input to the online system "HER-SYS" for submitting the corona outbreak report was a big burden. The government took two measures: First, from September 26th, government limits the target of the notification of outbreaks to the elderly and those with underlying diseases. Even if an outbreak report is not submitted, we will continue to keep track of the total number of infected people and the number of people by age group. There was also a proposal to entrust the decision to local governments, but the transition was made nationwide. In the current HER-SYS, it is not possible to input only the number of people by age group, so government will modify the system before that. On the downside, there is concern that public health centers will have a hard time understanding when people who are not covered by the notification of outbreaks become ill, which may delay response.

Secondly, in the 7th wave of Corona infection, the input items for the outbreak report were greatly reduced. There were 120 at first, but it was gradually reduced to 7 items.

However, even with the 7 items, it is said that input work at the site will continue until late at night in the infection situation of the 7th wave of Corona infection. After the end of the 7th wave, government considers shifting from grasping all the cases to grasping them at fixed points.

### ●DX of public health center work

Regarding the digitization of public health center operations, there is an example of Yokosuka City introducing a new system. At the public health center in Yokosuka, necessary information was retrieved from HER-SYS and put together in a ledger to monitor the health of infected people. Until now, the ledger was created by re-entering data manually while looking at the printed paper. With the new system, the ledger can be created automatically, and the work of creating the ledger, which used to be done by five or six full-time workers, can now be done by one person. As a result, they were able to increase the number of people involved in other tasks such as health observation.

In the world, the world's DX has progressed rapidly due to Corona. According to the “DX International Survey on COVID-19 (May 2020)<sup>1</sup>” conducted by the Waseda University Institute for Digital Government in May 2020, there is a certain degree of difficulty in promoting telecommuting, online education, and online meetings in Indonesia.

Effectiveness has been seen in Singapore, with delivery business, telemedicine by voice and video chat, 24 -hour access to medical data, and expansion of e -shops for purchasing medicines. The Singapore government has released an app called " Trace Together " that notifies people who may have been in close contact while protecting personal information. Considering the timing of the survey, the implementation was only a few months after the corona appeared, so it was a quick response. In Singapore, more thorough tracking management and control were carried out.

In China, the infection risk using movement history was released in an app, and the infection risk was evaluated using a chatbot.

In many countries where COVID-19 occurred, information provision and ICT applications on related digital governments were developed and spread. In addition to these, the media and research organizations in various countries have reported good examples of digital government, such as applying for and paying benefits using the Internet and online

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<sup>1</sup> The APEC “Smart Silver Innovation” project chaired by Waseda University group, and the “Digital Transformation by CIOs to Solve COVID-19” international conference held from April to May,2022 in cooperation with the International Academy of CIO . Investigation. Survey items include COVID19 countermeasures and speed in each country, role of CIO, creation of venture companies, innovation/AI utilization, DX, smart government, etc.

applications. In this way, digitalization has accelerated at once as part of the corona countermeasures in each country.

The IT revolution began in the 1980s, the speed of digitization has been tremendous. Furthermore, it goes without saying that DX has spread around the world with corona. The state of governance that responds to new changes in the social environment by Waseda University survey is changing dramatically. A survey of the progress of digital government in the world also clearly shows that the priority policies and fields of digitalization differ from country to country.

About 40 years since globalization began, and it is still in the process of rule formation and standardization. Governance and Management is an important issue for countries and international organizations to work together to deal with problems. Digital government has become an important strategy that goes beyond the framework of digital government for citizens, and is responsible for the country's basic infrastructure, security, and growth strategy.

## **5. Digital Inclusive, Privacy Protection and Ethics**

Solving social issues in the 17 fields and 169 categories of the UN SDGs is a global concern. Until now, Waseda University Institute of Digital Government has hosted UN SDGs seminars at the UN Headquarters as an international contribution to digital society. On this regard, Japan is the only country that can contribute internationally by realizing the United Nations SDGs 2030 goal of realizing a society where "no one is left behind", and by contributing to the improvement of the quality of government services in the super-aging society that the world is expected to follow.

On the other hand, in promoting digital technology, the digital disparity among those who are weak in information is expanding. With the corona crisis, the risks will become even more obvious, and the polarization will progress. The disparity structure can be expected to become a major global issue in combination with the speed of evolution of the information society. Public-private partnership (PPP) innovation not only reduces administrative costs and increases efficiency, but also greatly contributes to improving the convenience of people's lives. The top priority for digital government in the corona era is to promote a shift to a new lifestyle through powerful and rapid digitalization and administrative DX. It is to protect the security and safety of life. A country with a serious aging population, the need for urgent digitalization, and the strengthening of governance are the keys to building sustainable global governance.

Elimination of the information gap is an urgent issue for social participation of the digitally vulnerable. In Denmark, all citizens have " CPR", which corresponds to Japan's My

Number ID System, "NemID" necessary to log in to the citizen portal, and electronic post office boxes and payment accounts. Furthermore, the Digitalization Agency plays the role of the control tower of digital government, and the central and local governments are working together to promote digitalization. While implementing a nearly 100% paperless digital government law, the government will provide multiple options for those who are digitally vulnerable and encourage them to lead independent lives.

In Estonia, as in Denmark, 80% digital and 20% analog administrative services are provided. Measures for the digitally vulnerable and digital government are truly harmonious. Countries that are building elderly-friendly digital governments are emerging little by little. Governance is also an important issue to focus on as digital utilization is required in society. Looking at the case of personal information protection in Japan, in April 2022, the revised Act on the Protection of Personal Information (hereafter, the revised Act) came into effect. Until now, the legal system has been different for the private sector, administrative agencies, independent administrative agencies, and local governments. A distribution base will be established. According to the guidelines of the amended law, there are (1) mandatory reporting and notification in the event of personal data leakage, (2) obligation to explain when transferring personal data outside of Japan, and (3) expansion of the right of the person to request disclosure, suspension of use, etc., (4) new establishment of personal information and affiliated processing information, and (5) strengthening of penalties. In April, 2022, the Digital Agency and the Secretariat of the Personal Information Protection Commission released information on the main points of contention related to this demonstration project of the amended law in leading local governments, but the use cases of each local government have not yet been standardized. There is a need for common rules that are uniform throughout the country. The revised law is scheduled to come into effect in the spring of 2023, but it will be necessary for the relevant ministries and agencies to show a clear direction before responding to local governments.

It is recommended to understand the handling of the Personal Information Protection Law by all administrative staff in order to ensure that the revised law is well known. The main changes are ①the expansion of the scope of reporting to the Personal Information Protection Commission ②, two-stage reporting of leaks, etc. by the time limit (preliminary report and final report), ③the addition of a prompt notification method from the outsourcer to the outsourcer, and the ④person himself /herself. the obligation to notify the in addition, in order to prevent leaks of specific personal information, PDCA, such as defining, thoroughly implementing, improving, and operating business processes, will be required. In particular, there are many reports of [My Number ID System]leaks. The main reason for this is simple human error, such as erroneous delivery or loss. Even at the International Academy of CIO,

it was pointed out that about 70% of personal information leaks were caused by human error. The J-LIS (Japan Agency for Local Authority Information Systems) also focuses on education and training. There is an urgent need to improve and standardize systems that simplify business processes and use technology to prevent problems.

## **6. Data driven Evaluation System**

For the shortage of digital human resources, existing administrative services will be improved by using technology and data to improve convenience for residents. And AI and robotics will be used to improve operational efficiency and lead to high-quality administrative services. In order to promote the standardization and commonality of local government information systems in the "Digital Government Action Plan" decided by the Cabinet in December 2020, integrated efforts with the national government, which plays a leading role, are required.

Until now, the core competencies of CIOs, which have been key to promoting digital government, have been

- (1) information resource strategy and planning,
- (2) policy and organization,
- (3) information security and information protection,
- (4) process and change management,
- (5) project management, and
- (6) Operations & Evaluation model/method,
- (7) Leadership and management ability,
- (8) New technology,
- (9) EA,
- (10) Digital government and e-commerce,
- (11) Procurement,
- (12) Capital planning and investment evaluation.

We have noted that the prioritized core competencies that are available will change. Currently, the most important point for administrative DX is to oversee the organization to promote DX with leadership and to actively use technology. Furthermore, it will be an important competence to analyze the cost-benefit evaluation based on evidence such as EBPM for investments such as AI and robotics required for DX.

## **7. Resilient Smart city**

The smart city, which was booming before the corona, was temporarily delayed due to the influence of the corona, but now we can see signs of a revival. IMD, a business school

based in Switzerland, publishes a smart city ranking every year. The ranking evaluates each city's infrastructure, services, technology, and other areas from AAA to D. The latest survey results were announced in October 2021, and among the 118 cities surveyed, Singapore was the top-rated city for the third consecutive year. Zurich is 2nd and Oslo is 3rd.

Singapore, which ranks top in the world, the number of elderly people requiring nursing care will double in the last 15 years until 2030. In Singapore, we are working on comprehensive themes such as medical measures, education, energy, communication, and transportation as countermeasures for the aging society. In addition, development of nursing care support robots and personal medical management applications are well developed. And in the field of transportation, development of ITS, automatic driving technology, and wearable terminals that can pay transportation expenses are outstanding.

Smart cities are not limited to developed countries. In Thailand, the government is strategically promoting smart city development based on the future vision while solving the problems of local cities. In August 2021, the Smart City Management and Promotion Committee, chaired by Thailand's Minister of Digital Economy and Society, Chaiwut, announced that it had approved 15 smart city development plans in 14 provinces. With cabinet approval, there will be 30 government-approved smart cities in 23 prefectures. The Digital Economy Promotion Agency (DEPA), which is the contact point for smart cities, estimates that the economic effect of smart cities will be very high, and that it will contribute to the efficiency of the digital industry as well as the public and private sectors.

Vietnam, the state-run Vietnam Post and Telecommunications Group (VNPT) and the People's Committee of Ho Chi Minh City in southern Vietnam agreed in September 2022 to cooperate on DX and smart city construction from 2022 to 2025. The main fields of cooperation are DX in fields such as infrastructure, human resource development, construction of digital government, development of the digital economy, development of the digital society, cyber security, commerce, industry, tourism, transportation, and resources. At the signing ceremony, VNPT Chairman Toh clarified that he would cooperate with the city's DX and smart city construction by 2025 and cooperate with each ward/county in the city and the DX of the cities under direct control. In Vietnam, since August 2019, blockchain has been adopted for the construction of a smart city in Ho Chi Minh City. And the northern Quang Ninh Province has been aiming to establish an environmentally friendly city with the aim of becoming the second Hai Phong. In March 2022, a joint venture under Vietnam's largest IT company FPT invested in Binh Dinh Province, which AI/urban complex facility project was approved. are being maintained.

In the Philippines, Makati City in Metro Manila is becoming a smart city. The smart city business announced in August 2022 is aimed especially at DX for transportation

infrastructure. The targets are the formulation of basic plans, the construction of systems for public transportation, the development of public transportation networks using electric buses, the automatic toll collection system, and human resource development.

As for China, construction began in July 2022 on a large-scale digital smart zone, the China Mobile (Xiong'an) Wisdom City Science and Technology Center, in Xion'an New District, an emerging development area with two hours from Beijing, and has supported the construction of smart cities. This Chinese version of the Silicon Valley concept has various problems in operations.

In this way, smart city construction is progressing all over the world. The huge market size related to smart cities is also noteworthy. According to IDC's Global Market Forecast for Smart Cities and Communities (2022), in 2022, 75% of local governments will increase national budgets to fund digital initiatives, with state-led local planning. It states that progress and conformity with national standards will be strengthened. Furthermore, depending on the size of the city, IoT and security as measures to promote data utilization and counter cyberattacks will be the top investment priority, and that about half of medium-sized cities will be part of environmental measures by 2026.

It is predicted that the digital twin will be used as in other words, many local governments around the world are rapidly turning toward digitalization, and local government DX is also progressing. In the future, the smart city economy will become a huge business due to the fusion of the digital revolution and the aging society.

## **8. Countries that have succeeded in digital literacy**

### **(1) Singapore – Introduction of Digital Ambassador System**

Singapore introduced a digital ambassador system from June 2020 to the end of 2021 to bridge the digital divide. This system consists of digitization support for seniors (Senior Go Digital) and digitization support for Hawkers (Hawkers Go Digital).

For the elderly, government provided one-on-one support for using online meetings, messaging apps, electronic payment apps, etc. It also includes how to use various government digital services and how to use the corona tracking app. Special plans were offered through mobile operators for low-income seniors. 50% of the ambassadors are over 50 years old, and they emphasized support from people of the same generation. According to Douglas Go, director of the Digital Office of the Government Technology Agency, ``We created a place where elderly people who have lost their ability to record can get a psychological sense of security, where they can be taught again even if they have forgotten what they were taught.'' He also created a system that tracks what each elderly person has learned so that they can be taught the same thing over and over again.

As a support measure for hawker shops, we paid a total of S\$1,500 (S\$300 a month for five months) on the condition that there were 20 or more e-payments of S\$1 or more per month. When introducing e-payment, government dispatched a digital ambassador to the store and gave a lecture on how to use it.

In addition to creating 47 permanent bases for digital ambassadors, government also set up temporary counters in supermarkets. To become a digital ambassador, after three days of online training, those who pass the test must go through three months of OJT and be certified as a digital ambassador. Compensation was paid at market prices for equivalent work rather than free.

As a result, 150,000 seniors have acquired digital skills and 11,000 hawker outlets have made electronic payments available. E-payments are now available at 86% of stores in the central shopping district. Because it is a city-state of 5.85 million people, it can be said that they were able to develop detailed services such as one-on-one lectures and payment of ambassador rewards.

The Japanese government has also started to deploy digital promotion committee members nationwide in order to bridge the digital divide, but the digital promotion committee members are treated as volunteers.

**Table 16 Digital Ambassador System**

<b>Senior go digital</b>	<b>Hawkers Go Digital</b>
<b>Target</b>	
<b>Support for 10,000 elderly people Providing Digital Benefits to Seniors</b>	E-payment available at 10,000 stores
<b>Measures</b>	
<ul style="list-style-type: none"> <li>• <b>Digital ambassadors active in 60 communities in Singapore</b></li> <li>• <b>Training of digital skills in a mobile environment</b></li> <li>• <b>Subsidies for telephone and data charges for the poor</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Conditionally pay \$1,500 (\$300/month for 5 months) to hawker shops</b></li> <li>• <b>Implementation of digitization support for each store</b></li> <li>Digital Ambassadors continue to support</li> </ul>
<b>result</b>	
<b>150,000 seniors and over 9,000 low-income seniors acquire digital skills in mobile environments</b>	<ul style="list-style-type: none"> <li>• E-payment available at 11,000 hawker shops</li> <li>• E-payment is now possible at 86% of stores in the central shopping district</li> <li>• 60% of stores have started online sales</li> </ul>

## **(2) Korea – DX progressing due to the corona crisis**

In South Korea, non-face-to-face and non-contact transactions, unmanned stores, and online shopping have rapidly spread due to the corona crisis. Under the strict epidemic prevention policy, non-face-to-face transactions have become a trend in the service industry. In addition to convenience stores, unmanned stores are also being developed at ice cream stores and prepared food stores. In the case of convenience stores, devices such as unmanned stores only open late at night and authentication of credit cards when entering the store for security are seen. In restaurants, fast food shops, cafes, etc., the format of ordering with tablets and information terminals has spread. In South Korea, information terminals for order settlement are called kiosks, and according to the Ministry of Science, Information and Communication, the number of kiosks in 2021 will be 26,578. From 2019, the number of vehicles sold has tripled in two years from 8,587. Chain stores generally have kiosks, and an increasing number of stores do not have people at the checkout counter.

There are three backgrounds to this. First, due to the corona crisis, the country has started to promote non-face-to-face and contactless transactions. In the "Digital Government Innovation Development Plan in the Post-Corona Era" compiled in June 2020 and the "Digital New Deal" in July of the same year, the development of non-face-to-face services and non-face-to-face industries was raised. In response to the spread of this technology, the February 2022 "Strategic Development Policy for the Information Protection Industry" calls for the development of technology that responds to security threats in new services such as non-face-to-face services, virtual spaces, and unmanned stores as non-face-to-face security. raised.

Second, K Quarantine was a strict infection control measure, such as specifying the movement route of infected people and opening it to the public and punishing those who violated self-isolation with imprisonment of up to one year and a fine of up to 10 million won. They boosted the DX of private infection control.

Third, there is the impact of the policy of the Moon Jae-in administration (May 2017 to May 2022) aiming for a minimum wage of 10,000 won. The upward trend of the minimum wage has strengthened, and it was decided that the minimum wage for 2023 will be 9,620 won. It is about double the 4,860 won in 2013 and exceeds the minimum wage in Japan. It became an incentive to actively introduce digital devices and serving robots in order to curb soaring labor costs.

### **Measures set forth in the Korean Digital Inclusion Promotion Plan (June 2020)**

- Implementation of digital basic education at 1,000 resident centers nationwide, libraries, and other facilities closely related to daily life
- Formulation of detailed measures through the ``Expansion Plan for

Software and AI Education for All Citizens"

- Free public Wi-Fi in 41,000 new public spaces by 2022

Developing broadband networks in 1,300 remote areas such as islands

- Provision of digital monitoring services for the vulnerable, etc.

## 9. Silver Innovation for Ageing Society

### (1) Grand Strategy and Design for Wellbeing (happiness)

One of the challenges faced by mankind is how to govern the aging society, which is said to be the most serious global issue. The United Nations report, "Aging World Population: 1950-2050" published in June 2016, already stated, "The population aging facing the world today is unprecedented in human history. It is mentioned that there is

Aging has been regarded as a social issue that has progressed mainly in developed regions. However, in the second half of the 21st century, it will rapidly become a serious problem even in developing regions. China, Singapore, Thailand and other countries have already entered an "aging society," meaning that the proportion of the elderly aged 65 and over in the total population has exceeded 7%. By 2060, about one in five people will be elderly. aging rate to reach 14% from 7% shows that France takes 115 years, Sweden 85 years, the United States 72 years, the United Kingdom 46 years, Germany 40 years, and Japan is 24 years. It is noticed that many Asian countries are aging at a faster rate than Japan, such as South Korea in 18 years, Singapore in 20 years, and China in 23 years. According to the National Bureau of Statistics of China, China's aging rate is already 13.5%, and the number of elderly people is the highest in the world.

Japan's aging rate will reach 29.1% in 2021, and it has been a long time since Japan entered a super-aged society with an aging rate of over 21%. Its position will remain unchanged until approximately 2045. The current state of Japan overlaps with the future state of other countries, which are facing an aging population. Therefore, the digital policies of Japan, the world's number one super-aging society, are of great interest to many countries. As the population ages in many countries, the realization of a "society that no one left behind," which is mentioned in the UN SDGs, is important from the perspective of social inclusion.

#### ● Elderly people left behind

The rapid spread of DX has caused the problem of people who cannot order or shop using information terminals, such as the elderly, being left behind. According to a survey by the Seoul Digital Foundation, 45.8% of people over the age of 55 have used kiosks. Those aged 65 to 74 accounted for 29.3%, less than 30%. Elderly people aged 75 and over cited fast-food restaurants (53.3%), cafes (45.7%), and restaurants (44.4%) as difficult-to-use kiosks.

Korea's measures to bridge the digital divide are based on the Intelligent Information Technology Basic Act and are summarized in the "Digital Inclusion Promotion Plan" compiled by the Information and Communications Strategy Committee in 2020. The plan includes the implementation of digital basic education at public facilities such as libraries and community centers in 1,000 locations, the installation of free public Wi-Fi services, and the provision of digital monitoring services for the vulnerable.

In April 2022, the city of Seoul announced the "Digital Capability Enhancement Promotion Plan," which includes the placement of "digital guides." Digital guides explain how to use digital devices in parks, restaurants, and other places. Based on population data, etc., we will identify places where many elderly people gather and assign 100 digital guides. Compared to the population of Seoul, which is about 9.5 million, the scale is small.

It is predicted that one third of Japanese population will become elderly people in 2040. In Japan, financial situation will become severer. The need for solving social issues such as medical treatment and infrastructure, education and environment, might be top priority. Japan aims at both economic growth and social business solution via "Society 5.0". It is expected that Digital Twin and AI can solve many social subjects.

In Japan, the inside of a constraint of a future manpower and a local government have to continue providing administrative services indispensable to a resident life. It is necessary to create the environment where the administrative staff can concentrate on their own function with AI. A local government is continuing providing resident services, such as medical treatment, welfare, and an infrastructure. And it is maintaining residents' life and regional economy and making it activated.

Ageing population will make a big effect on tax revenues. The expectation for AI is growing as a steppingstone to contribute to improvement in the labor productivity of government. The convergence of both aging and digital societies will be key solution.

## **10. Increasing Cyber security**

E-government under attack by cyber security is in troubles

### (1) Elections and Cyberattacks

Cyber-attack countermeasures in elections are emphasized. Countermeasures against cyberattacks were taken in the midterm elections in the United States and the Conservative Party leadership election in the United Kingdom. A recent example of an election-related cyberattack is the German general election in September 2021. The German government has protested to Russia over cyberattacks on politicians. Phishing emails were sent to many central and local politicians, and personal information was leaked. There is a risk

of manipulating public opinion by hijacking SNS accounts.

Information about cyberattacks in Japan's House of Representatives election last year and this year's House of Councilors election was circulated by media. It is necessary to constantly monitor and respond to cyberattacks targeting government offices, parliaments, and public institutions. In countries with a parliamentary system, examples of cyberattacks include manipulating the ruling party's leadership election and manipulating public opinion through SNS.

September 6, e - Gov and e LTAX have been under cyberattack. The Russian hacker group "Kilnet" has claimed responsibility for the attack and is launching cyberattacks on private companies such as JCB and Tokyo Metro. Although no information leakage has been confirmed at this stage, troubles such as the site becoming unusable occurred.

## (2) UK and USA Elections

Foreign Secretary Liz Truss won the Conservative leadership election on September 5. As the party leadership election draws attention as the election that effectively determines the next prime minister, the Government Communications Headquarters (GCHQ) warned that votes could be tampered with by cyberattacks, delaying the schedule for the run-off election. They have the option of voting by mail or online in the party leadership election. The Conservative Party has said it will allow online ballots to be changed after voting during the election. However, to reduce the risk of tampering, once a security code is used for online voting, it is now deactivated.

This warning is not specific to the hostile country of the cyberattack but is general about the voting process and its vulnerabilities. Ballots were due to be mailed on August 1st, but party members were notified that their ballots would be delayed until August 11th.

During the U.S. midterm elections in November 2022, the Department of Homeland Security Cyber Security and Infrastructure Security Agency (CISA) began distributing free "cybersecurity kits to protect the election" to the electoral community on August 10. It is a tool that protects and detects unauthorized access to voter information and attacks on websites. In addition, on the CISA website, they introduced anti-virus and anti-malware software for each type of attack.

The joint Election Security Group (ESG) of the U.S. Cyber Command and the National Security Agency (NSA) will begin in early 2022 and into the upcoming midterm elections to disrupt and deter foreign adversaries who interfere with voting and counting. ESG points to Russia, China and Iran as potentially trying to sabotage the U.S. voting process and influence voter perceptions. In the 2016 US presidential election, Russian cyberattacks were highlighted. During the 2018 midterm elections, the U.S. Cyber Command and the National

Security Agency (NSA) blocked access to the Internet Research Agency, a Russian company believed to be close to President Putin. It was the first defensive action in a cyberattack for the U.S. Cyber Command, which was created in May 2018.

Private social media will take their own measures against the spread of fake news that influences votes. To help voters get the right information, Twitter will create a dedicated page that summarizes information based on official announcements and will display candidate accounts and tweets immediately. Facebook has announced a policy to ban new political ads from running during the final week of an election campaign. TikTok, which has banned paid political ads since 2019, will step up scrutiny. There have been many cases of candidate camps circumventing regulations and paying influencers to make political claims, and it is said that countermeasures were necessary.

**Table 17 Election infrastructure assets protected by cybersecurity toolkit**

Voter information	Threat actors may attempt to compromise or manipulate electronic ballot books and voter registration databases to cause disruption or delay voting.
website	Threat actors target state and local websites with DDoS, phishing, and ransomware attacks
e-mail	use phishing as a preferred vector to target state and local email systems.
network	Threat actors typically use vectors such as phishing and malware to infiltrate state and local networks that election offices rely on for normal operations.

Source) CISA website

### (3) Cyber security for manipulating public opinion

There are also moves to strengthen influence over other governments by manipulating public opinion in other countries. According to the Japanese Sankei Shimbun, Internet security firm Sola.com announced that five Twitter accounts that spread conspiracy theories related to the attack on former Prime Minister Abe coincided with business hours in St. Petersburg, Russia. Those accounts claim conspiracy theories such as ``The attack on former Prime Minister Abe was self-made," ``Ukraine is a neo-Nazi," and ``Vaccines are part of the population reduction plan," and have 10,000 to 100,000 followers. Climb to the average number of posts per day is high at 30 times. There is a possibility that public opinion is being systematically manipulated by other countries.

Also, on August 20, the Nihon Keizai Shimbun reported, citing a former senior official of the Public Security Intelligence Agency, that in the 2021 Liberal Democratic Party presidential election, many SNS posts that fanned conflict within the party originated in China. The transmission took place between 9:00 am and 5:00 pm Beijing time, confirming the systematic involvement. The aim is to destabilize the party by dividing its supporters, and to lower the public's approval rating by writing extreme comments. The LDP will consider introducing an identity verification system before the next presidential election to prevent foreign nationals from illegally joining the party.

In the English-speaking world, a non-existent corona expert posted a statement defending China on Facebook. Meta announced that it had deleted 524 accounts in December 2021. Most of the access came from China, and employees of a Sichuan-based network and information security company and a state-owned infrastructure company were involved in the incident. While Facebook is generally inaccessible from within China, it is easy for security companies to do so. Also, the face photo is faked using an AI-generated fictitious photo. It is believed that the Chinese government or the Communist Party was systematically involved in activities to fend off criticism of China on English-speaking SNS.

From the standpoint of cybersecurity, we cannot overlook the act of increasing the number of followers and increasing influence through conspiracy theories and developing claims that are advantageous to one's own country, or inciting criticism of that country's regime. Currently, each platform responds by deleting accounts at their discretion. The need for legislation and international cooperation to regulate public opinion manipulation in cyberspace has been repeatedly pointed out, but the reality is that we have yet to come up with an effective solution.

#### (4) Case Study of China Large-scale personal information leak

In July 2022, it was discovered that more than 23TB of personal information for 1 billion people in China had been sold for 10 Bitcoin BTC (approximately 30 million yen). Includes name, address, phone number, national ID, criminal record and medical history. Criminal records include incidents known to police between 2015 and 2019, and there are billions of medical records. Some of the 750,000 data released as samples were confirmed to be genuine. If everything is genuine, it would be the largest personal information breach in history.

The reason for this leak was that the Shanghai National Police stored personal information on Alibaba Cloud without a password, allowing anyone to access it. It has been neglected for at least a year since April 2021. It wasn't that high security was breached and leaked, but that security wasn't working in the first place. CNN reported that Western experts

also knew of its existence.

Although it is not clear why the police even possessed medical history data, China started digital medical insurance cards in November 2019. By scanning the QR code displayed on the smartphone, it is possible to go to the hospital reception and purchase medicine, eliminating the need to carry a health insurance card. It can be used from a dedicated app, Alipay or WeChat Pay.

On July 15 2022, officials summoned executives from Alibaba, which operates a cloud service in which personal information was stored. If the police used it without proper security measures, Alibaba was basically not at fault. However, in recent years, Alibaba has tended to come under pressure from authorities, and it cannot be denied that it will be held accountable. For example, in 2021, Alibaba was fined 18.228 billion yuan (approximately 300 billion yen) for violating the Antimonopoly Act by forcing e-commerce store owners not to open stores for competitors. rice field. Also, in July 2022, Tencent and others were fined for not filing an application for M&A as a violation of the Antimonopoly Act.

In August, it was reported that the information of 48.5 million people registered in the Shanghai city's anti-coronavirus app was leaked. The city of Shanghai has denied that the information was leaked, but Hong Kong newspaper reports said they were able to confirm that some of the leaked information was genuine.

Chinese citizens are not the only victims of information leaks. In September 2020, it was discovered that a state-owned company had collected and published 2.4 million important people in the world. A database that combines public and intelligence information, including bank account and financial transaction information. Taiwanese media reported that the People's Liberation Army was the customer.

The risk of information leakage is inevitable when promoting government DX. However, if sloppy management is discovered or the response to information leaks fails, public distrust will grow, and the public will become uncooperative in providing personal information. Administrative DX can only be achieved with the understanding of the people.

**Table 18 Recent Information Leakage Incidents in China**

September 2020	It was discovered that the state-owned company Zhenhua Zhuo Information Technology Co., Ltd. had collected information on 2.4 million people, including military personnel, high-ranking government officials, and politicians around the world. Financial transaction information is also included.
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July 2022	<p>The sale of the leaked personal information of 1 billion Chinese is discovered.</p> <p>Name, address, phone number, national ID, criminal record, medical history.</p> <p>The source of the leak is the Shanghai National Police.</p>
August 2022	<p>The sale of personal information leaks for 48.5 million people is discovered.</p> <p>The source of the leak is the Shanghai city's anti-coronavirus app.</p> <p>The city of Shanghai denies that "we did not leak information."</p>

## 11. Digital Twin

### (1) Rise of digital twin

"Digital Twin" is a technology that digitizes physical assets, devices, products, environmental information, processes, systems, places, things, things, and people collected from the real world and reproduces 3D images that are both real and false in a virtual space. Based on the enormous amount of data collected, physical simulations that are as close to reality as possible can be performed on a computer, it is an effective means of further improving the manufacturing process and service of products. It is also possible to reduce development time and costs by conducting test operation on the digital twin in advance, for example, when changing a part of the production line. On the other hand, in the "IoT" era where everything is connected to the Internet, it is also possible to detect the deterioration and abnormality of the real thing and reproduce it on the digital twin. It is also possible to devise countermeasures on the computer and provide new solutions to solve problems.

For example, data of all scales such as rooms, buildings, factories, districts, cities, and the whole country can be visualized and interacted with in real time, and from system monitoring and measurement, it can analyze data and simulate scenarios, enabling collaboration and decision-making across regions, optimizing operations and contributing to improving performance. In the future, it will be a solution for creating smart cities and smart states.

According to Gartner, by 2020, the number of connected sensors and endpoints will exceed 20 billion, and digital twins for billions of things will exist. For example, natural disasters, which have been increasing rapidly in recent years, will be incorporated into digital twins. The concept of a digital twin was first proposed in 2002 by Professor Michael Greaves

of the University of Michigan.

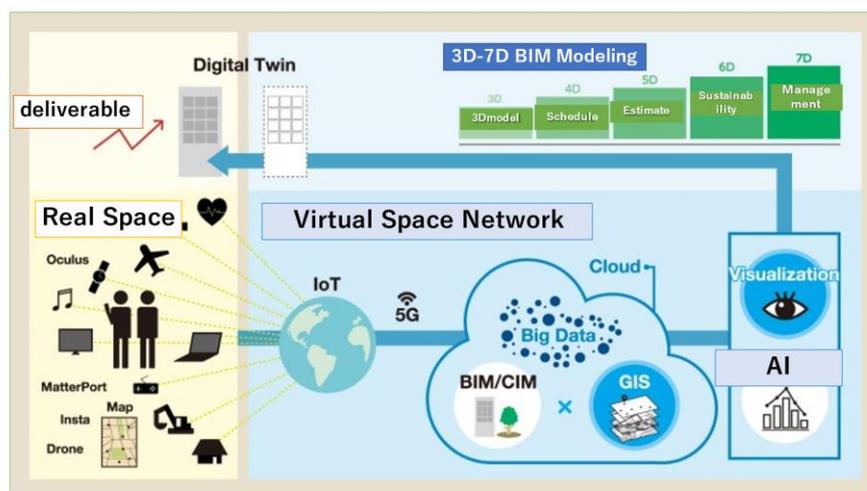
This market will be open to 37.5% in the period until 2025. It will continue to expand at a CAGR (compound annual growth rate) of 8%, and the market size is expected to reach USD 35.8 billion by 2025.

In addition, according to a Deloitte report, the technology is rapidly spreading to a variety of industries, including aerospace, retail, and healthcare, and the report shows that by 2023, the global digital twin market size will be \$16 billion. 750 billion yen), and we expect that the number of introduction cases of technologies (IoT, machine learning, etc.) that support this movement will nearly double in 2020.

The concept of simulating in a digital space using real-world data has existed for a long time, and the concept of digital twin itself is not new. For example, in the field of testing such as heat resistance and impact resistance of products, computer simulations are performed with a tool called CAE (Computer Aided Engineering) to predict the performance and strength of products. It is used to elucidate the cause of failures, and the differences between digital twins and existing technologies are as follows.

- ① Expansion of the scope of application such as visualization of the entire production line and supply chain, and grasping of product usage status
- ② Capable of measurement, analysis, and prediction based on real-time data obtained from IoT, etc.
- ③ Rather than one-way information transmission from the real world to the digital space, it includes the distribution of information from the digital space to the real world.

Figure 2 Digital Twin



[https://www.hcc.co.jp/assets/images/hccclub/digitaltwin/digitaltwin\\_illust\\_hcc.jpg](https://www.hcc.co.jp/assets/images/hccclub/digitaltwin/digitaltwin_illust_hcc.jpg)

## (2) Benefits for countries and industries and companies - Case study of

### Singapore

In Singapore, it has been three years since Dr. Iwasaki of Waseda Institute of Digital Government was appointed as an advisory board member of Nanyang Technological University's ARISE, and the speed of urban planning utilizing advanced technology is tremendous.

Since 2014, Prime Minister Lee Hsien Loong has been promoting "Virtual Singapore" by launching the Smart Nation Initiative. D-Modeling, which visually shows population growth and how cities develop, and simulates the effects of disasters, hours of sunshine, etc. This project is led by the National Research Foundation (NRF), a government agency in Singapore. . The "Digital Twin of the City" serves as the foundation for the development of various infrastructures, and clearly states how to use it to formulate plans for the development of each infrastructure, to consider the installation location of photovoltaic panels, to improve accessibility, to eliminate traffic congestion, and to improve public transportation.

On the Singapore government's website, digital twin videos are also uploaded, and sensor data installed in various places such as in the city, statistical data of public institutions, data collected from smartphone location information, etc. are collected in real time, In Singapore, where Singapore itself is instantaneously copied digitally, with its high population density, active urban development, and traffic congestion and noise during construction becoming social issues, Virtual Singapore is seen as a solution for improving transportation efficiency and improving the efficiency of construction in urban development.

Virtual Singapore is a success story of open innovation in that it encourages collaboration with academia and companies. In the future, when citizens and businesses will also have access to Virtual Singapore, companies will be able to use Virtual Singapore to test driverless cars without placing them on busy roads.

Currently, many industrial IoT solution providers around the world have set up a core base in Asia in Singapore and are creating innovation together with user companies, but what supports innovation in Singapore is It is an ecosystem built mainly by industrial IoT solution providers, etc. that includes hundreds to thousands of startups across a wide range of fields, large companies that actively invest in innovation, educational institutions that nurture innovation talent, angel investors and venture capital that provide funding, and this solidifies the foundation for innovation. It is thought that it may be interacting with government movements such as "Virtual Singapore".

In addition, amid remarkable industrial changes due to technology, the Singapore government has launched a large-scale public-private joint industrial transformation program in order to continue economic growth of 2 ~ 3% a year in the next 10 years. In the five years since 2016, a budget of about 360 billion yen in Japan yen has been injected, accounting for about 80% of Singapore's GDP. By promoting technology in 23 industries, we aim to transform industries from the four perspectives of improving productivity, creating innovation, promoting internationalization, and creating employment.

Furthermore, since around 2010, the Singapore government has set the goal of achieving economic growth by improving labor productivity and has changed its policy of accepting foreigners aggressively until then. Gradually tighten regulations on employment of foreigners to control the influx of foreigners, while at the same time improving labor productivity, The government is making efforts such as aiming to utilize digital technologies such as robots and AI (artificial intelligence).

Virtual Singapore provides four main functions:

1. Virtual Experiments - Virtual Singapore can be used for virtual testbeds or experiments, for example, Virtual Singapore can be used to examine coverage areas of 3G/4G networks, realistically visualize poor coverage areas, and 3D It is possible to highlight areas that can be improved in the city model.
2. Virtual Test Bedding - Virtual Singapore can be used as a testbed platform to validate the provision of services, for example, a 3D model of a new sports hub with semantic information within virtual Singapore can be used to model and simulate crowd dispersion and establish emergency evacuation procedures.
3. Planning and Decision Making – With a rich data environment, Virtual Singapore is A comprehensive, integrated platform for developing analytical applications (e.g. apps) that analyze traffic flow and pedestrian movement patterns. Such applications are useful in discontinuous urban networks, such as parks in Punggol and park connectors.
4. R&D-Virtual Singapore A rich data environment that enables researchers to innovate and develop new technologies and capabilities when made available to the research community with the necessary access rights. 3D Urban models are used by researchers to develop advanced 3D It can provide ample opportunities for developing tools.

#### **Case study of Thailand 4.0**

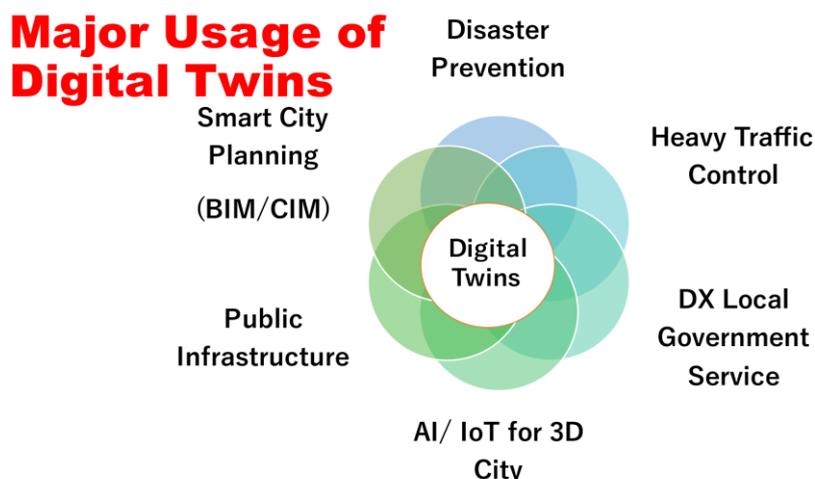
In January 2019, Dr. Obi, Waseda Institute of Digital Government exchanged views with Dr. Sak, the head of Thailand's Digital Government Agency (DGA), through APEC projects, we have been working with CIOs to date. We are collaborating and collaborating

in the fields of human resource development, digital government, aging society and ICT applications, and smart silver innovation.

Since the inauguration of the Prayut administration in 2014, the Prayut administration has been working on national restructuring from a long-term perspective, and the Prayut administration has drawn up a "20-year national strategy" that shows its vision as "Thailand 4. 0". The German industry 4.0 introducing technologies, especially digital technologies, through the attraction of foreign companies, to enhance the industrial structure and join the ranks of developed countries, which has been influenced by 4.0 the government announced a foreign investment policy (investment promotion policy) that includes the largest preferential treatment in history, and named the "Eastern Economic Corridor" as an investment area in eastern Bangkok<sup>3</sup> Provincial governments (Chonburi Province, ChachungSao Province, and Rayong Province) are designated, and plans are presented for intensive infrastructure development.

"Thailand 4. 0" indicates the stage of economic and social development in Thailand and appeals for the need to proceed to the fourth stage of a new industrial structure. The goal of "0" is to narrow down the target industries specifically and join the ranks of developed countries in 20 years. In the past, excluding infrastructure and food, there were many subcontracted industries of foreign-affiliated companies expanding globally, but They are trying to break away from that and create new industries and value on their own. For Japan companies with manufacturing bases in ASEAN and huge factory clusters in Thailand and other countries, the long-term development policies of these countries have important implications.

**Figure 3 Major Usage of Digital Twins**



- **Manufacturing**

Quickly and accurately grasping the entire value chain, including customers, is the source of competitiveness, and in such an environment, "digital manufacturing" initiatives are being promoted to digitize and utilize data as a whole of research and development, production, manufacturing, distribution, and maintenance.

In research and development, product improvement is promoted on a digital twin that simulates the customer's real environment from product operation data, and testing can be performed in an environment close to the real world without preparing large-scale experimental equipment. In production and manufacturing, analyzing production data can lead to quality building up at the development stage and improvement of manufacturing processes. For example, by analyzing data from multiple production facilities, it is possible to visualize bottlenecks in production lines that were individually optimal and to work on Kaizen that is optimal overall. Provision of value-added services such as inventory control based on demand forecasting and failure prevention maintenance using operation data has begun. In digital manufacturing, various changes can be detected from data collected on the value chain related to products. It can be used for quick management decision-making, and with the progress of digitalization, advanced data utilization such as detailed management of product lifecycles, creation of new services for corporate customers, and realization of highly productive smart factories is also expected.

- **Food, Medical, and textile industries**

Digital manufacturing is expected to spread to the manufacturing industry, which has been relatively distant from digitalization, and it is also thought that making it possible for not only large companies but also small and medium-sized enterprises to benefit from digital manufacturing will lead to the future development of the manufacturing industry as a whole.

- **Building /Construction industry**

The benefits of building 3D digital scale models of the entire city or part of it are obvious, especially when measuring everything related to the operation of the urban environment. If a system called installing sensors in municipal trash cans is utilized, it will also contribute to cost reduction, such as collecting garbage when necessary.

City Zenith's Smart World platform, the first vendor to provide software for urban landscapes, is already being used for projects in more than 100 cities, including Chicago and London. Their latest software platform, 5D Smart City, has been adopted for use in developing Amaravati in India, which is an ideal digital twin concept as the physical city has not yet been developed.

- **Examples of Companies**

In this section, we will look at examples of the introduction of digital twins in companies.

① **German Siemens**

It is said that it has been adopted by the factory of the Italian car manufacturer Maserati. At the Hannover Messe 2015 in April 2015, together with Maserati Ghibli, the interaction between real and virtual components was exhibited on the theme of interactive digitization in the manufacturing field

② **GE**

GE uses IoT technology to collect airplane flight data, detailed engine data, dust, and other data, and build a digital twin to realize engine overhaul at an appropriate time and reduce costs. Based on the data sent from the wind farm, in the virtual power plant (digital twin) that imitates each wind farm built virtually, the turbines are individually customized so that the generators operate most efficiently. We are also working to maintain the entire power plant in an optimal state (from <https://www.predix.io/> to 1000).

③ **NTT**

NTT, Intel, and Sony established the Innovative Optical and Wireless Network (IOWN) Global Forum, an international forum aimed at the future of communications. Promote research and development on the following three themes.

1. Photonics-related research and development utilizing advanced photoelectric fusion technology
2. Distributed Computing Research and Development
3. Use cases and best practices for creating a smart world and research and development to make it happen

In the IOWN Conception, he proposed a new concept called "digital twin computing". Since a second society will be created in a virtual space, we will also call on social studies researchers and others to discuss the positioning of intellectual property born in the newly created society and how to organize crimes before starting up. We believe that it is necessary to introduce IOWN in earnest in the 2030s, but if it is a limited service, we expect it to come out soon after the specifications are solidified by 25 years. Services such as digital stadiums that send realistic game footage to different locations are said to be realized quickly. In the 2030s and 40s, quantum communication (which transmits quantum information itself and is said to be extremely secure) may be realized. In quantum communication, all-optical communication

will be indispensable because it transmits the state of light itself. The IOWN concept is a foundation that looks ahead to the quantum communication era. .

#### ④Toshiba+ Mitsui & Co.

Companies conducted demonstration experiments to improve the operational efficiency of thermal power plants in Mexico and used DT to analyze the operation status of power plants to find equipment failure risks at an early stage.

### (3) The Future of Digital Twin

"IoT" technology that connects all kinds of things to the Internet captures the deterioration and abnormalities of the real thing and reproduces it in a virtual space. It is a new initiative to devise countermeasures on a computer and lead to the solution of problems, and it will be possible to verify excellent town building and disaster prevention measures in advance. Until now, digital design through CAD and other means will shift to digital twins in the future, and large-scale urban planning will be possible by creating a virtual world on a computer. Since sensors can be attached to the actual object and ever-changing data can be acquired, it influences widely business use and promotes open innovation. For example, in a building, by preparing a virtual building based on structure, material, weight, etc., the temperature and power consumption of the exterior wall collected by the sensor, the load by people and equipment, etc. are applied to the computer. It is also possible to calculate the impact on buildings with a tin and use it to predict the risk of aging and damage. Since it is also possible to simulate various social issues, its application is wide-ranging.

Of course, not only urban planning but also interiors, measurements, and environments in buildings can be measured instantaneously, and it can be used for all kinds of applications in such business areas.

Whether or not digital twin technology can be utilized depends on how much measurement data can be collected to bring the virtual world on a computer closer to the real thing. When using it for verification of equipment and equipment, it is easy to obtain data through the manufacturing industry Japan focusing on manufacturing. It is necessary to think in such a way that the data that can be disclosed is compatible and the treasure does not become rotten on the other hand, since DT is also capable of acquiring digital data related to national defense as a global business, the spread varies from country to country. It is a new model that will expand explosively as the spread progresses as a solution to solving social issues.

## 12. AI for Digital Government

On this regard, this paper suggests the following recommendation on AI Smarter cities. In Indonesia should promote the roadmap for digitalization and globalization systematically in order to grow into a digital municipality and smarter city that can be the models for local governments around the world. From this point of view, Indonesia will cooperate with innovating AI government in resilient smart cities. The recommendations are as follows:

1. The introduction of advanced technologies such as AI and Digital Twin by CIOs contributes to the new value of e-administrative services. CIOs should increase their chances of learning the core competencies needed for the new AI era. CIOs should create a strategic roadmap and promote the development of advanced digital human resources who can utilize AI in smarter city.
2. In the medical and social security fields, which are regarded as a big spender, there are the costs that can be reduced by using ICT. The investment budget on informatization needs to be reconsidered in the new context of DX.
3. The global booming of upgrading smarter cities by Digital Twin has adopted the perspective of digitalization. And major countries are rapidly digitizing the government services to meet the SDGs
4. They should thoroughly formulate influential local digital government policies by utilizing EBPM and interoperate with various online services.
5. They should create a model for how big data owned by the government can be transferred to the private sector as open data and combined with new businesses. Effective open innovation is needed.
6. Strengthening the digital network and linkage for synergy effect of inter-smarter cities should be prioritized with nation-wise scale.
7. 5<sup>th</sup> generation AI government with 5G must be properly furnished by advanced applications such as Digital Twin via open innovation.
8. Digital Twin in growing smarter city will need proper standard and convergence urgently not only in local, national, but also international platforms.

In Japan, the deployment of AI is increasing steadily in several local governments. We have evaluated local governments which introduced AI. The following are 4 cases analyzed In Chiba city, AI is utilized for the increase in efficiency of paperless (one million population). For example, AI is utilized for calculating an individual inhabitant tax or a corporate residence tax, and the staff's working hours were reduced sharply. About the individual inhabitant tax, the workload of annual about 600 hours was reduced.

In Shiojiri city, Nagano pref. (population of 70,000), when the increase in efficiency

of the childcare function which utilized AI was tackled, the operation was completed in only about 15 seconds. The percentage of correct answers was about 98%. And they could reduce staffs from six to four and have reduced the total number of staffs by 64%.

Saitama City, Saitama Pref. (1.2 million) has introduced AI into the admission procedure for nursery schools. With the optimization logic that created the game theory, the work that used to take 1500 hours can be completed in just a few seconds.

In Uki City, Kumamoto Prefecture, the population is declining year by year. Social issues include a decrease in the working-age population, a labor shortage, and a decrease in tax revenue. When Uki City introduced RPA in government, the number of internal management tasks was reduced by more than 2,700 hours.

With the introduction of AI, it has become possible to perform tasks that required a lot of time and effort in a short time. AI is useful for solving many technical issues that each city has. It is not only to improve operational efficiency and reduce costs, but also to provide better administrative user-oriented services.

### **13. Prospect for 5 G & beyond 5G (6G)**

- Case study of China

The 110 kV Yurakugang Smart Substation located in Zhongxin Tianjin Ecological City, Binhai New District, Tianjin has completed the construction of a holographic model and is taking a step toward the application of "digital twin" technology. Tianjin's first "digital twin" power plant will be completed by the end of this year. Chen Xiaoxian, deputy director of the Substation of the Transport Inspection Department of the Guoyuan Tianjin Binhai Corporation, said, "Our company is pleased to announce that this year, in response to the call for the construction of electric power IoT, the construction of a digital twin substation was developed using the 110 kV Yurakuko Smart Substation as a test target. One of the two substations is a substation with a real substation, and the other exists in a digital/VR world. By using the latter, we monitor and control the operation status of the actual substation in real time, and quickly detect potential failures to immediately repair and prevent dangers."

According to Mr. Chen, the construction of a holographic model using a full panorama scanning vehicle will be the first step in the construction of a "digital twin" substation. In the future, various indicators and data of the substation will be reflected in the VR digital space by various digitization means such as IoT and VR, and finally "reproduction" will be realized. "Digital twin" is not just a simple reproduction, but the application is more important. Since data can be easily obtained, analyzed, and processed through twin substations, difficult problems such as the lack of a unified data platform, the lack of data analysis, and the difficulty of judging equipment risks have been thoroughly solved, and management of the entire

substation and the entire usage period has been realized.

The world's 6G R&D competition begins at exploration Stage. According to the National Development and Reform Commission, Ministry of Education (Province), Ministry of Industry and Information Technology (Ministry) and CAS together with the National Science Foundation Committee on 6G held a ceremony to start technical research and development activities. 6G Declaration of the Inauguration of the Technology R&D Promotion Work Team and the Overall Expert Team The company announced the establishment of a technical R&D promotion activity team and a whole expert team, the former of which consisted of relevant government agencies. The latter is responsible for promoting the implementation of technology research and development activities by a total of universities, scientific research institutes, and companies. Responsible for proposals and technical arguments on the development of technical research and provides consulting and proposals for critical policy decisions. Wang Zhi, Deputy Director of the Ministry of Science and Technology, said, "The world's 6G Technical research is in the exploration stage, The technical route is unclear, Key indicators and applications There is no uniform definition of the scene." 5G Commercialization has already begun in the world. Industry-Recognized Mobile Communications Technology. If you follow the law that there will be generational change year by year, 6G will appear around the year of 2030. Ling Yishi, chief scientist at the China Mobile Research Institute, said, "The generational shift in mobile communication technology is not simply determined by technology. When at this stage I don't know of it be expanded, There is no doubt that the period of the substitution will be shorter. "Professor Wang Xiaofei of the School of Computer Science and Technology, Tianjin University, 「6G Terahertz, Space, Sky, and Ground, Water, Physical layer, Play an active role in particularly core areas such as foundation materials. There is no point in simply increasing the speed."

The performance of the majority of 6 G is improved to 5-100times that of 5G. The maximum transmission speed is 1 Tbps. On the other hand, 0. The net delay of 1 MS is almost imperceptible to mankind. Among the many potential applications of 6G, the application of cross-reality (XR), which combines virtual reality (VR), augmented reality (AR), and mixed reality (MR), is attracting the most attention, and it is said that it is related not only to technology but also to morality and ethics.

According to the Ministry of Industry and Information Technology (Province), at the site of the 5G Forum of the 6th World Internet Congress held in Wuzhen, "There are already about 86,000 5G units in China with about 86,000 5G. Base stations are being built, and 130,000 are expected to be built by the end of the year. Currently, 5G networks are being built in cities such as Beijing, Shanghai, Guangzhou, and Hangzhou, and 18 models of base stations are being built. 5G mobile devices have passed the Internet connection experiment."

smartphone manufacturers such as Huawei, vivo, and ZTE have already announced multiple models of 5G smartphones one after another in China. From 2,000 yuan to 10,000 yuan (1 yuan is about 15.5 yen) or more.

In research and development toward the "post-5G-6G)", "radio wave simulation system" to verify the transmission method and interference of radio waves using a virtual space. It is a technology that creates an environment where many devices communicate wirelessly in cyberspace and explores issues, etc., and the United States and Europe have announced a policy of embarking on research in cooperation. There are plans for improvement in Japan, but there is already a sense of lagging behind. The EU and NSF will focus on the "game changing technology" of wireless communication, post 5 G's cutting-edge research theme is the radio wave simulation system, which applies the technology of "digital twin" that creates real-world equipment and buildings in cyberspace on a computer to the telecommunications field. It is possible to reproduce a city on a computer and verify weather conditions and the attenuation, reflection, diffraction, etc. of radio waves caused by surrounding buildings. There is a battle for leadership due to 5G competition. The need for this system is due to the increase in the number of various wireless communication devices including smartphones, and the post-5 In the G era, there was the spread of autonomous driving and drones, and verification of radio interference in cyberspace where many radios are connected simultaneously at high density is indispensable, and there is a meaning of experimentation with radio wave simulation systems. The construction of a radio wave simulation system is an urgent task for the Japan information and communications industry to make a comeback in the world," said Hideyuki Tokuda, president of the National Institute of Information and Communications Technology. The government will invest about 10 billion yen over four years from fiscal 2020. The plan is to open it to industry and universities and have it useful for the design and development of communication equipment.

## F. Recommendations

The following 21 recommendations are listed as the priorities of the Digital Government in the post-corona era.

1. The History of world digital government has only been around for more than 20 years phenomenon. This report is the culmination of research surveys and analyses in 17 years, and summarizes valuable historical changes obtained from 17 years of time series analysis. It carefully discusses what should be done to foresee the future of digital government. The Team hopes that readers will learn the lessons of history in "technology," which continues to grow rapidly and challenges digital society.
2. In anticipation of a society with the expansion of aging society, the governments should take the initiative in implementing the measures that contribute to reducing fiscal costs and improving the efficiency of public administrative and and improving the efficiency of public and fiscal affairs by promoting public-private partnerships (PPP) and digital innovation by the usage of digital technology.
3. The practical ability to prepare for the next step by making use of the lessons learned in the corona era is the top priority of the digital government. This should be considered by all countries concerned.
4. The National Digital Agency, which aims for overall optimization of public-private cooperation as well as both central and local economic revitalization in line with the objectives of SDGs rather than partial optimization of individual interests.
5. The integration power of the so-called three major advanced technologies of "mobile 5G, AI and TV-8K" will be the cornerstone of digital innovation growth strategy in the post-corona era. The governments need comprehensive roadmap to achieve the power.
6. Information and communication infrastructure, including the optical fiber Broad band, can be said to be the core for the establishment of the "5th-generation digital government" proposed by Prof. Obi, Waseda University and founder of this Ranking survey based on the development of 5G/post-5G (6G) as well as the utilization of AI and blockchain.

7. It is essential to provide seamless one-stop services by eliminating the legal separation of digital government (central) and e-local governments (local). Also, it is recommendable that Administrative and fiscal reforms of both national and local governments, and also elimination of the digital divide among citizens should implement to establish the 5<sup>th</sup> generation of Digital Government.
8. The "shift from e-government to digital government" is an ideal digital society [Society 5.0]. We would like to welcome it as a touchstone for its realization. The International organizations such as ITU, OECD, APEC, UNESCO, and the United Nations Department of Economic and Social Affairs, to which Professor Obi who founded the Waseda University World Digital Government Ranking, has contributed to the index, are making major shifts toward DX and digital innovation. The survey team would like to encourage them to take on the challenge of the future society envisioned in this report without hesitation.
9. In the digital society accelerated by the coronavirus pandemic, both balanced "growth" and "distribution" are essential for small and medium-sized enterprises (SMEs), which account for 80% of employment.
10. It can be said that DX support efforts to address the shortage of digital human resources and funds are the top priority. The governments are urged to establish the national Plan for fostering DX human resource development.
11. Under the combined risks of inflation, yen depreciation, disasters, etc., the governments would like to continue to formulate effective DX policies and strategies. With a sense of urgency toward the implementation of bold measures, it can dispel the sense of stagnation for the future of the people.
12. Realization of "data sovereignty" and reliable DFFT in the digital age for development into a future nation with abundant intellectual property born through innovation, and taking the initiative in formulating international rules is important for national economic security.
13. With the spread of new Internet businesses, including the virtual space "metaverse", a global digital society with the interdependence of the world economy is born. We should build a grand design for a comprehensive strategy for future growth with an eye on 2040.

14. The government improves the quality of life (QoL) of the people and realizes a sustainable well-being society. Also, it reduces administrative expenses by digital innovation as a key factor in administrative and fiscal reform for fiscal reconstruction. Strong leadership is desired to make promises come true.
15. The government should protect the stability, safety, and security of people's lives (3S-Safe, Secure, Stable) by providing speedy economic revitalization and growth strategies and high-quality administrative services.
16. International Summits such as G20, G7 and APEC should present to the global public a firm vision of a "future digital government" for an internationally uncertain and uncertain future.
17. Digital human resource development has produced some results over the past few years, but in the future, it is necessary to develop global digital human resources who can contribute to strengthening international welfare in digital society. Cyber security personnel are required in a multifaceted manner. In addition, the public and private sectors to make efforts to secure and develop comprehensive and diversified human resources. That includes the expansion of educational institutions that actively utilize the online, the acceptance of excellent international human resources from foreign countries, and the improvement of the environment for that purpose.
18. In implementing Smart cities, the construction of a new nation that emphasizes regional cooperation will be the savior of solving many urban problems. The concept of Smart city will be one of the best solutions for healthy urban development.
19. The emergence of the first new society in human history, such as a declining birthrate and a super-aging society, and its solution will be an advanced case study of many countries facing the same social issues, and new global business opportunities can be created.
20. In response to the problems which may slow economic growth, SDGs-related digital society participation such as "skilled immigrants", "AI robots", "retired elderly people", and "women's advancement" that can promote vitality should be urgently implemented.

21. In order to realize the national vision at an early stage, it is essential to enhance the both quality and quantity of human resources who will be responsible for it, in other words, to "invest in people."

## G. Methodology and Contributors

For evaluating digital government development, this ranking survey is based on a group of indicators to evaluate the overall digital government development in a country, ranging from policy development and e-Services implementation to management optimization and digital government promotion. To improve the evaluation of digital government development in a country, from 2010, the ranking added an e-participation indicator. In 2014, both Open Government Data and Cybersecurity were also added to the ranking. In the 2017 Ranking, the research team added “the usage of emerging ICT technologies”. It makes the total ten main indicators for evaluation. And in 2022, in the section of Open Government/Data, Digital Transformation (DX) is added.

Increasing the quality, the assessment used a questionnaire as a tool to obtain some information from respondents who reside in the countries. The respondents are government officers who work for a ministry that concerns digital government and, to some extent, respondents from academia who are knowledgeable in digital government. The score will use the feedback as additional information to mitigate the sample risk, thus, reducing bias during scoring. The following diagram shows the due process of creating the ranking.

### 1. Formulation

The Raw score is normalized to the 0-100 scale score using the following formula.

$$NormScore = \frac{RawScore}{MaxScore} \times 100$$

Raw score is the Score generated by averaging the Score 0, Score 0.5 and Score 1 in 3 levels; Max Score is the maximum score of the sub-indicators.

This will generate the Normalized Score which ranges 0 – 100. Furthermore, the Normalized Score is recalculated by weighted rate. The result is the released score that will be used as the source for arranging the rank.

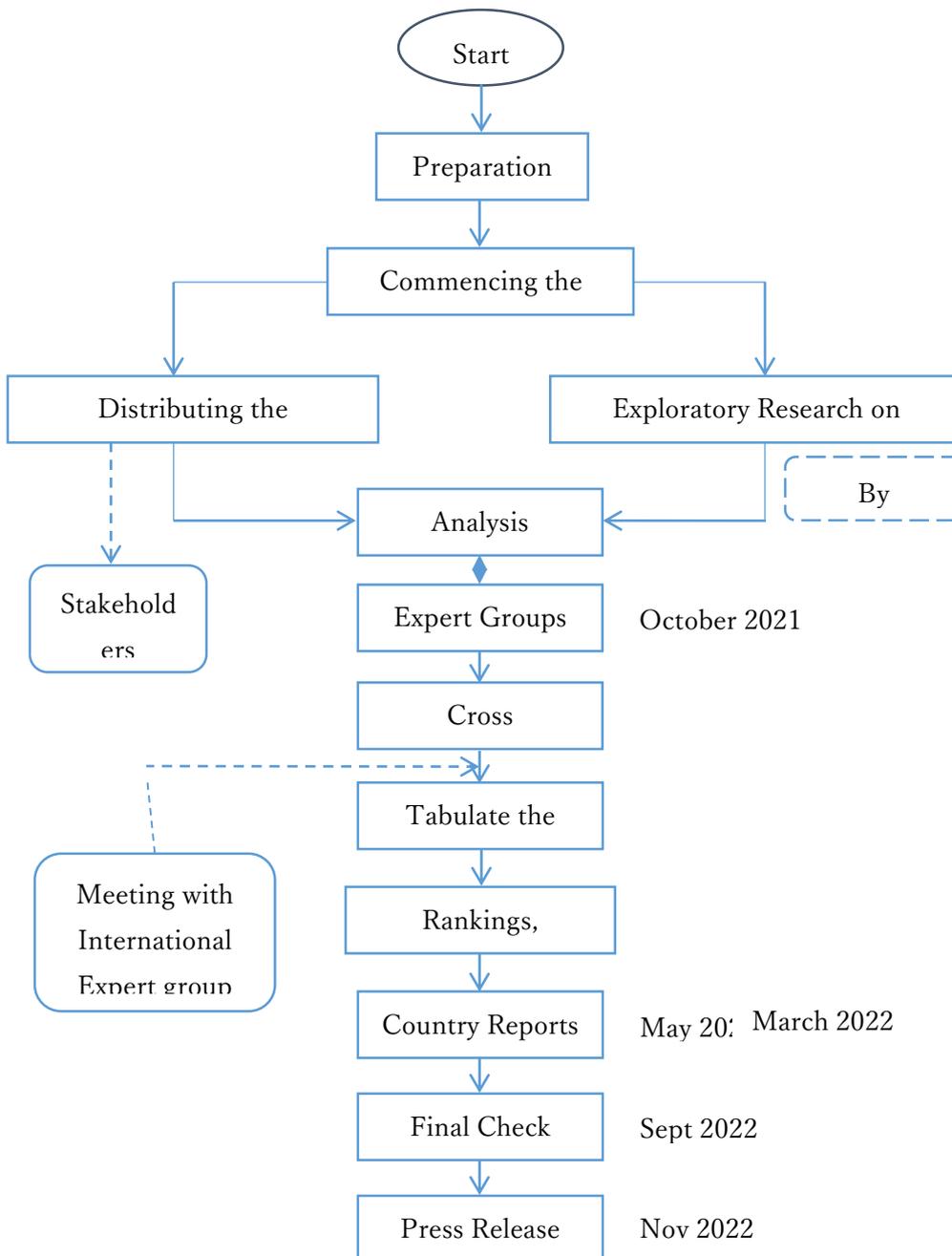
No	Indicators	2022
1	Network Infrastructure Preparedness (NIP)	NormScore x 10%
2	Management Optimization (MO)	NormScore x 12%
3	Online Services (OS)	NormScore x 12%
4	National Portal (NPR)	NormScore x 8%
5	Government Chief Information Officer (GCIO)	NormScore x 10%
6	Digital government Promotion (EPRO)	NormScore x 10%

7	E-Participation (EPAR)	NormScore x 10%
8	Open Government Data (OGD) & DX	NormScore x 10%
9	Cybersecurity (CYB)	NormScore x 10%
10	The emerging technology in Digital government (EMG)	normcore x 8%

**List of Main Indicators**

**1. Processes of Evaluation**

The following process prepares the rankings



## Processes Diagram

Contributors List (● indicate group leader)

### 1. List of Global Experts Group

- Prof. Emeritus Dr. Toshio Obi, Chairman, Institute of Digital government, Waseda University, Japan, Honor President, International Academy of CIO, Director of APEC Digital Government Research Center.
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## H. Annex – 64 Country Assessment Reports

Argentina

### 1. General Information

Area: 2,780,400 km<sup>2</sup>

Population: 45,566,247

Government Type: Federal presidential constitutional republic

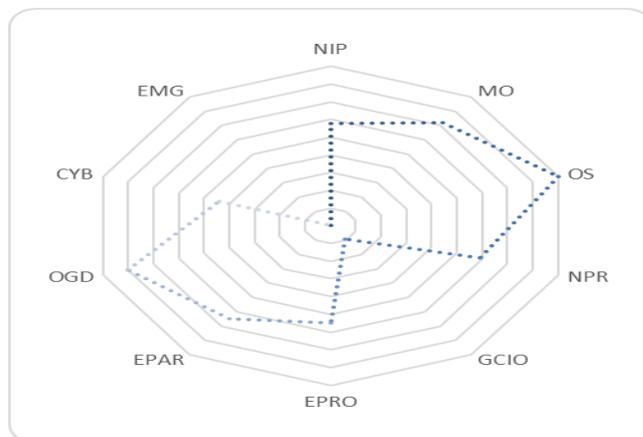
GDP: \$8,549

Internet User: 85.5

Wired (Fixed Broadband User): 21.18

Wireless Broadband User: 68.65

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

The Argentine government is transforming the public sector digitally with an emphasis on available technology. This year Argentina was placed 52<sup>nd</sup> in the Waseda rankings with 62,356 points. The department for technological innovation of the public sector, led by

Micaela Sánchez Malcolm, will no longer be responsible for telecommunications policy – which is now the responsibility of a new division within the office of the chief of staff – and will instead focus solely on the innovation of the public administration. The new departments include administrative innovation, digital services, and information technology.

Recently established, the federal initiative for digital public transformation aims to promote the deployment of digital technologies in the federal government, provincial and local governments, and other public entities. Red Hat has a deal with the department for technical innovation to provide support and consultancy services. Additionally, the organization assisted the department in developing the full container and service system. The department provides provinces and municipalities with digital file management, remote processes, and digital signature guidance and resources. It collaborates with the University of San Martín and private sector businesses. In addition to the digital tools, the government is developing an interface platform to link the new tools with those already in place in the provinces and municipalities.

Following the publication of Disposition No. 06/2021 in the Official Gazette on April 21, 2021, the Vacunación COVID-19 database was established by the Subsecretary of Open Government and Digital Country ("Subsecretaría de Gobierno Abierto y País Digital"), which reports to the Chief of Cabinet of Ministers ("Jefatura de Gabinete de Ministros"). Its goal is to facilitate the prevention of COVID-19 and the mitigation of its health effects by organizing, speeding up, and making the administration of vaccinations approved by the responsible authorities and jurisdictions more effective. The database will be built following the regulations of Law No. 25,326 on the Protection of Personal Data. Users of the Cuid.AR app that schedules an appointment to get any of the licensed COVID-19 vaccinations will have their personal information stored in a database.

### **3.2. New Trends**

Together with all the efforts in the pandemic recovery, the department of technical innovation is constructing a public software repository to provide open-source tools and foster creativity. In the last two years, the number of national registration authorities has expanded by more than 50 percent. In the following months, it is planned to provide a

single digital portal via which consumers can access all government operations. In addition, the objective is to improve the Mi Argentina application, which provides access to all personal paperwork, and to include credentials from other organizations, such as professional bodies.

The department does not maintain the information of the users. Instead, it contacts the databases of the various entities (national register of individuals, automotive registry, etc.) for them to provide the information. Ana Carina Rodriguez, the current national director of digital country and future undersecretary of services and digital country (not yet appointed), explained that most of the application's users are located in the metropolitan area of Buenos Aires and that the intention is to expand its reach nationally. To do this, they will work to include more services and documents.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

In 2022, 85.5 million people in Argentina will access the internet, making the country well prepared regarding its network infrastructure. Eighty-two percent of the municipalities had already selected the most important procedures for beginning digital transformation, and sixty percent were already working on internal and external interoperability. With a rating of 72.1%, technology and connection are the most developed area. Furthermore, 88% of localities had full or almost full 3G coverage, and 86% had access to broadband networks.

Solutions for digital transformation, cloud data center availability, municipal infrastructure, server, and database availability, and AI implementation strategies were all part of the survey questions used to gauge this factor. The area with the most development potential was culture and change management, which showed a rise of 47.9 percent.

##### **4.2. Management Optimization [MO]**

Through Provision 20/2022, the Strategy for the Federal Program for Digital Public Transformation enables the provinces and municipalities to make efficient and extensive use of the technology tools and solutions supplied by the national government for the digitization of administrative procedures. In an effort to enhance Digital Public Transformation, cross-cutting and integrated solutions have been planned, built,

maintained, and managed for the national government, the provinces, and the municipalities during the last two years. Provision 20/2022 is part of the Federal Program for Digital Public Transformation, which was established in April 2022 by the Secretariat for Technological Innovation of the Public Sector, under the direction of Micaela Sánchez Malcolm, to provide assistance and training for the integration of systems of the Digital Signature Infrastructure.

Federal Program for Digital Public Transformation strategy illustrates the following contents:

- Implementing digital technologies for system integration to facilitate public procedures and digital signatures.
- Restructuring administrative processes, generating digital documents, linking digital data, and using a digital signature.
- Digital document management specialists offer an audit, parameterization, training, implementation, and support.
- Implementation and support of open standards by digital document management professionals.
- Encouragement of effective, efficient, and transparent management brings the government closer to the people.
- Loanable computer equipment may be available.
- Communication Coordination

#### **4.3. Online Service [OS]**

Providing efficient, high-quality digital government services in Argentina allowed access to digital government services for more than 9 million residents by 2021 and supported the creation of a digital government site that provides access to more than 1,300 digital government services. Central to the reform was implementing an electronic file system in public administration. From the users' standpoint, the project's most notable accomplishment was the provision of simplified online access to various digital services and administrative procedures. As a reaction to the COVID-19 epidemic, which affected over 7 million residents, they included registration for a digital citizen ID, specialized services for small and medium-sized companies (SMEs), and registration for emergency social protection subsidies.

#### **4.4. National Portal [NPR]**

The government of Argentina administers the website [Argentina.gob.ar](http://Argentina.gob.ar). [Argentina.gob.ar](http://Argentina.gob.ar) is maintained by the Open Government and Digital Country Undersecretariat, which answers to the Secretariat of Public Innovation within the Cabinet of Ministers.

Users may search for national government laws and regulations and policies and programs designed by national state agencies to meet the requirements of its citizens and the individuals accountable for implementing those policies and programs by using the national portal. The administration is looking to strengthen its ties to public agencies to address all complaints that may arise.

#### **4.5. Government CIO [GCIO]**

Argentina's economy has considerable growth potential as the nation begins to recover. Essential CIO traits were taken into account while developing the strategy for the Oficina Nacional de Tecnologías de Información (ONTI). Business innovation and digital innovation management may be best implemented via the tactics of Argentine CIOs. However, there aren't many academic offerings focused on the Chief Information Officer in the Argentine government.

#### **4.6. E-Government Promotion [EPRO]**

In response to these demands, the Argentinian government developed the Open Government Federal Program, a three-part online program that provides principles, tools, and approaches to promote open government. In addition, the program issued a nationwide request for ideas from local governments wishing to execute this strategy via various initiatives in the area. Consistent with Open Government Partnership ideals, this phase is distinguished by the government's commitment to increase public engagement and accountability in delivering local initiatives.

The primary objective is to encourage open government policies by fostering collaborative learning across national, provincial, and local governments. Through its federally inclusive orientation, it promotes the participation of a variety of stakeholders from various backgrounds, enlarging the community of reformers. Local governments, civil society organizations, and citizens benefit from the program's dissemination of the open government approach's foundations in local administrations, provision of concrete

tools for delivering reforms, provision of national technical assistance in different jurisdictions, and invitation of stakeholders to join a national network.

#### **4.7. E-Participation [EPAR]**

In comparison to its neighbors, Argentina has superior levels of human capital (as measured by adult literacy, anticipated and mean years of education, and gross enrollment ratio) and telecommunications infrastructure. Argentina's adult literacy levels are among the world's highest (as measured by access to the Internet, fixed and mobile broadband, and telephone). But when it comes to e-participation (things like the proactive or on-demand broadcast of public sector information, citizen deliberative engagement, and co-creation of policy solutions), as well as digital products, it falls short of what its competitors have to offer (including for instance, the implementation of citizen-centric approaches for public service design and delivery).

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Many participants from provincial and local governments, civil society groups, individuals, and academics have participated in conceptual and methodological courses as part of the Open Government Program. After an open request for ideas to integrate open government concepts into local governments, a jury chose over fifty initiatives from various provinces and municipalities. These programs promote participatory budgeting, digital citizen involvement, open data, civic innovation, and public monitoring. Some of the initiatives co-created with non-governmental actors may qualify for the 'OGP Local track' and get direct assistance from OGP.

The virtual participatory design generated a tremendous learning experience by permitting federal participation on a bigger scale; nevertheless, a return to the area is now required for execution. Cross-level articulation and early engagement have been crucial lessons thus far. The collaborative aspect of the initiative highlighted the lack of consensus around the advantages of open government. This problem was addressed by providing conceptual and methodological training that was not explored throughout the 2019 co-creation process.

Regular monitoring and recording of these activities will provide the jury with feedback for evaluating and recognizing projects with potential outcomes. These will ultimately

shape future editions and assist stakeholders in evaluating their experience in mainstreaming open government concepts in public administration, a lesson that may guide their tactics in other public policy areas.

#### **4.9. Cyber Security [CYB]**

In 2021, Argentine firms spent more than \$60 million on cybersecurity, representing an annual rise of 10 percent. In addition, 85% of Argentine businesses want to invest in cybersecurity during the next four years. Despite the recent expansion of the local cybersecurity sector, this is just the beginning of its maturation. In general, cybersecurity technology adoption lags behind more established industries by two to three years. Banking, energy (oil & gas), telecommunications, manufacturing, retail, and, most recently, the public sector are some of the major industries for cybersecurity investment in Argentina.

The Argentine government will keep investing money in infrastructure and improving the country's implementation of FTTH (Fiber to the Home). ARSAT, which is owned by the government, is still connecting over 1,200 towns in the country to their main fiber network. The Argentine Investment Agency says that the expansion of cell phones and high-speed Internet coverage in Argentina is a \$5 billion investment opportunity. Mobile phone use is high, but coverage isn't the same all over the country and is often poor because there aren't enough cell towers.

#### **4.10. The use of Emerging ICT [EMG]**

National information and communication technology (ICT) initiatives and policies have been developed in recent years in Argentina and other Latin American countries in an effort to construct a school suitable for the digital era. It has been shown via studies conducted in countries like Argentina and Uruguay that ICT initiatives have helped to level the playing field between different socioeconomic groups and promote a sense of social progress. However, the rapid and widespread spread of mobile phones (with a penetration rate of 139% in Argentina) has led to new ICT integration challenges in classrooms, on top of structured integration. Apps like WhatsApp and Instagram have specialized educational functions, but the pre-pandemic school had a contentious relationship with mobile devices, which were managed by certain standards, restricted,

and employed for instructional reasons with variable success. The challenge of syncing rigid educational schedules with the real-time nature of social media is a recurrent issue.

The widespread use of digital technology, together with the institutionalization of ICT integration plans through state laws, is redefining the classroom and has radically transformed everyday life, which is now mediated by one or more displays at all times, everywhere, including in schools. The world is transformed into a never-ending consumerist vortex without a way to turn it off.

Australia

## 1. General Information

Area: 7,692,024 km<sup>2</sup>

Population: 26,177,413

Government Type: federal parliamentary democracy and a Commonwealth realm

GDP: \$51,851

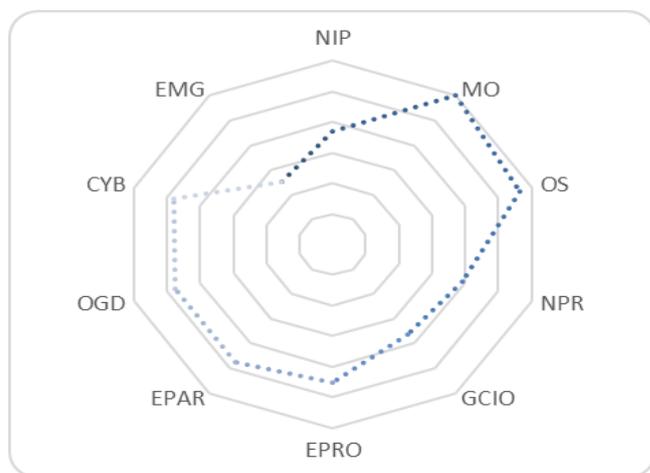
Internet User: 89.6

Wired (Fixed Broadband User): 35.68

Wireless Broadband User: 124.19

## 2. Digital Government Overview in Country

### 2.1. Overall Performance



## 3. Digital Government Development and new trends

### 3.1. The development

Australians can now file their tax returns online, apply for income support, and look at their digital medical records from home or on their phones. In turn, the investment on digital government in many years helps Australian government departments improve their

efficiency, cut costs, improve the accuracy of data collection, and report compliance more accurately.

South Australia's government stated in October 2021 that they would test out a smartphone app that may be used to quarantine people at home. The app uses geolocation and face recognition to ensure users stick to their quarantine protocols at home. As a result of the experiment, it was stated that the app would be tested in additional Australian states. Concerns about deploying such intrusive technology without robust privacy safeguards have been voiced by the tech community, human rights attorneys, and members of civil society. In a joint letter to Australian health ministries, Digital Rights Watch and the Human Rights Law Centre advocated for expanding legal safeguards for the COVIDSafe App to include alternative technology responses to the COVID-19 pandemic.

Along with the Digital Transformation Strategy and developing new ICT projects, the upgrade of the national copper wire telecommunications network has helped Australia's e-government grow. The National Broadband Network replaced a big part of Australia's old network. Even though the NBN didn't change how fast the internet was, it did make it possible for all Australians to connect to the internet and use e-government services. With all the development in digitalization, Australia came in 15<sup>th</sup> position in the Waseda rankings 2022, owning 81,746 points.

### **3.2. New trends**

The Australian Government has a clear vision for the digital future of Australia, including

- The Digital Government Strategy - which accelerates Australia's digital transformation to become one of the world's top three digital governments by 2025.
- The Digital Economy Strategy prioritizes the broader Australian economy and the delivery of reliable and secure digital government services.
- The Australian Data Strategy provides a vision for Australia's data capacity.
- The Secure Cloud and Hosting Strategies

The Digital Government Strategy aligns other government-wide goals to create an environment conducive to digital transformation. The six primary objectives of the

Digital Government Strategy directly assist the implementation of the Digital Economy Strategy and its critical success indicators, such as ensuring that all Australian government services are accessible and secure online. The Australian Data Strategy supports the Digital Government Strategy by laying the groundwork for the Government to maximize the value of data for economic growth and the public good of all Australians. The purpose of the Strategy is to realign our thinking so that we maintain a consistent emphasis on delivering for Australians so that they may use our services whenever and whenever they want. The Strategy will be realized through the execution of agency-based projects, initiatives, and programs. As further government plans are implemented, the Digital Government Strategy will collaborate with them to maximize the digital potential of all Australians.

Now that the global economy is recovering, Australia's capacity to quickly adapt its digital infrastructure in response to changing circumstances will be more critical than ever in restoring the country to its pre-COVID level of prosperity. No one can afford to take digital services for granted, and the Australian government must keep working to expand citizens' access to them. Better investment, tighter security, sound legislation, and expanded data utilization will serve as its bedrock. Australia now has more power in our cell phones than was required to get the first man on the moon, and that number is only expected to rise as technology advances.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Disasters as varied as a pandemic, bushfires, and floods have lately struck Australia. Telecom networks are often impacted by crises and catastrophes, leading to increased traffic and, in extreme circumstances, disruptions in service. Because digital services are so important to Australians' daily lives and economy, the government and private sector should collaborate to assess, address, and prevent threats to network resilience.

As soon as word of the COVID-19 epidemic spread, most fixed and mobile network providers sprang into action. They increased network capacity, optimized network traffic, and activated emergency response measures to keep services up. This meant that

Australia's digital infrastructure could handle a massive load. The thing is, we can't afford to pat ourselves on the back too much.

Natural catastrophes are increasing in occurrence, complexity, and intensity. It is crucial for people to have access to electricity and communication lines in the event of a catastrophe, yet things like fires and floods may knock these out.

#### **4.2. Management Optimization [MO]**

By 2025, Australia is targeting to be one of the world's top three digital governments, benefiting all Australians, and will have the foundations to maintain this position in the future.

The Strategy provides government direction and advice for the APS to use government services to benefit people, businesses, and itself. All government agencies contribute to public benefit development in various ways, including

- Service delivery - these organizations provide specific goods and services. They provide their consumers with separate interactions.
- Innovation and education - These organizations give direction and assistance in advancing innovation and advocating government policies.
- Regulation and enforcement - these authorities impose their will on others. They uphold and enforce rules, regulations, and laws to affect users.

#### **4.3. Online Service [OS]**

All Online Services in Australia have been switched to electronic transactions. AusTender ([www.tenders.gov.au](http://www.tenders.gov.au)) is the principal portal for obtaining business opportunities, annual procurement plans, and contracts with the Australian government. The Australian government aims to replace [australia.gov.au](http://australia.gov.au) accounts, which integrate all government services in one location, with MyGov. By registering for a MyGov account, each person may access several government services, including Medicare, the Australia Taxation Office, a Personal Controlled eHealth Record, and Child Support. The 2.0 edition of MyGov offered more precise information, improved accessibility, and faster response times on mobile devices. Australia placed sixth in the OS category in the 2022 Waseda rankings, with 11.280 points.

#### **4.4. National Portal [NPR]**

Information (content), technology, and functioning are the three factors that make up the National Portal's overall grade. You may visit Australia's national portal at [www.australia.gov.au](http://www.australia.gov.au). It brings together several government agencies' online information resources and services in one spot. According to Google PageSpeed™ Insights, the site's technical performance is satisfactory across all platforms tested, including desktop computers, laptops, tablets, and smartphones. The site also offers a feature that enables users to get changes by email notification and connects with several social networking platforms, including Facebook, Twitter, YouTube, and Flickr. The current accessibility standard for Australia.gov.au is Level A, as defined by the Web Content Accessibility Guidelines 2.0. (WCAG 2.0).

#### **4.5. Government CIO [GCIO]**

With the restructuring of Australia's massive digital government over the last several years, many stories have highlighted innovation and leadership, focused on how chief information officers and other ICT executives responded to the disastrous global COVID-19 outbreak. Collaboration, artificial intelligence and machine learning, data analytics, automation, and robotics technologies are assisting many firms in achieving their strategic objectives this year by enhancing their offerings to internal and external consumers. Diverse industries are experiencing some of the most challenging economic conditions in decades. Despite this, their technology executives have shown genuine leadership and created technical solutions that will aid their companies in addressing future business challenges.

#### **4.6. E-Government Promotion [EPRO]**

As part of its plan to make Australia one of the top three digital governments in the world by 2025, Australia's federal government released an updated digital government strategy. The changes have been in the works for more than a year, and a new 28-page digital government strategy results from public input. As part of the strategy, the government has set three priorities for its services to reach this goal. With these priorities, all government services will be available online, easy to use, and focused on people and businesses.

The new whole-of-government architecture comprises standards, guidelines, products,

and tools that help federal government agencies design digital capabilities, implement technologies, and run them. The architecture would also tell the business world where the federal government wants to go with IT, including the digital capabilities it wants to build in a way that can be used repeatedly. Along with the architecture, there will be a reuse policy and catalog. These are meant to help government agencies understand what new or existing government platforms could be reused.

As part of this new oversight framework, all digital and ICT proposals must also have an assurance plan signed by the Digital Transformation Agency (DTA) and the relevant department. The Minister said that this gives the government an important institutional tool for keeping an eye on high-cost or high-risk digital and ICT-enabled investment proposals.

#### **4.7. E-Participation [EPAR]**

The usage of well-established e-Government channels has increased the rate at which people engage with the government. In Australia, two-thirds of the population has utilized e-Government services for their most recent engagement with the federal government. People in Australia may be encouraged to engage in various activities and interactions with the country's government by using the excellent platform provided by the national site of Australia. People and communities can have an active role in the formulation of policies and services via consultation processes supported by various technologies and approaches.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Open data is probably one of the most significant and 'hot' contributing aspects to the ICT side of the open government movement. Recently, a significant study on open data was made public, and our blog post, "The power of open data," examined the draft version of the report. Open data in action on the National Map, which overlays a vast array of data across a map of Australia, including natural flora and caves, bridges, traffic accidents, and the borders of local councils. The open data component of the open government movement has also received support from state governments. A blog post titled "Open data in Victoria," discussed the recent endorsement of open data by the Victorian Government. In addition, each of the other states in Australia and the ACT has its own

policy regarding open data and dataset repositories.

At the same time, Australia has prepared the Digital Transformation Agenda to streamline the delivery of government services to people to enhance their use of digital technologies. In the Federal Government, this initiative is coordinated and facilitated by the Digital Transformation Agency. What the government plans to do in terms of interacting with and serving its constituents is laid out in detail in the agenda. The program's objective is to streamline the process by which government agencies and departments roll out new programs that enhance online citizens' and users' interactions with the government.

#### **4.9. Cyber Security [CYB]**

The Australian Signals Directorate (ASD) has revealed a new cyber and foreign intelligence center of world-class caliber as the agency prepares to commemorate 75 years of safeguarding Australia against global threats. The new facility, situated in Majura Park in Canberra, intends to expand ASD's capabilities as Australia's premier agency for signals intelligence, cyber security, and offensive cyber operations. It will also provide chances for the next generation of intelligence analysts, cyber operators, technological researchers, and business enablers.

The Minister for Defence remarked that ASD is crucial in preserving and bolstering Australia's security, especially the nation's essential infrastructure. The state-of-the-art facility indicates the Australian government's commitment to protecting and fighting enemies in a rapidly worsening strategic environment. The new location guarantees that ASD's employees can continue innovating and stay one step ahead of Australia's enemies. ASD is a world-class intelligence, offensive cyber, and cyber security organization.

Even the government is attempting to change its operations or manner of operation in the digital age. This indicates that the government will handle, deal with, and store this data using systems or cloud-based technology. This may be a huge concern if security requirements are not adhered to, and the public sector is the most susceptible compared to private organizations. This data loss will be detrimental to society. Government entities are intensely interested in instituting high-level security protection to prevent cyber breaches and assaults. They are attempting to embrace and implement Identity Access Management and Unified Threat Management technologies.

#### **4.10. The use of Emerging ICT [EMG]**

The cloud (cloud computing) is a significant innovation that enables users to manage data and programs through the internet rather than storing them on their computers or network. In a recent blog post, the DTA discusses the advantages the cloud offers the government, including decreased costs, higher productivity, and the delivery of better services.

Becoming citizen-centric is one of the last pillars of the open government movement addressed in the Open Government National Action Plan as part of the promise to revolutionize the delivery of government services digitally.

Open government is the future in Australia, as well as in several other nations across the globe. Transparency, participation/collaboration, and accountability are the guiding principles for policy and action. Salsa Digital has been actively engaged in critical digital components of open government for many years, including open source, open data, utilizing the cloud for delivery, and building citizen-centric digital initiatives.

Austria

## 1. General Information

Area: 83,871 km<sup>2</sup>

Population: 8,939,617

Government Type: Federal parliamentary republic

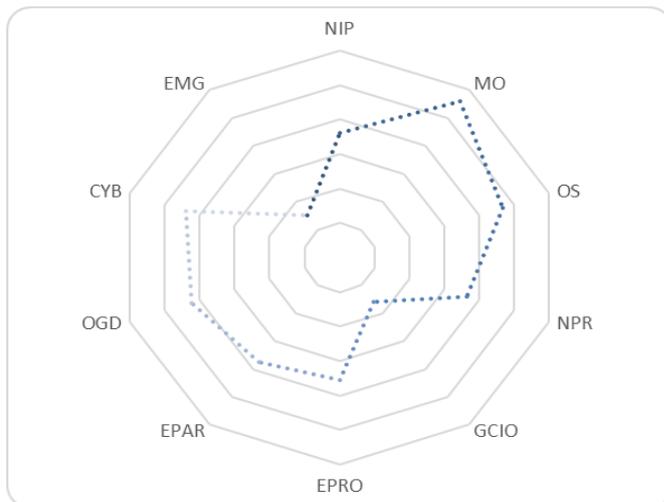
GDP: \$48,426

Internet User: 87.53

Wired (Fixed Broadband User): 28.93

Wireless Broadband User: 107.01

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

With a total score of 74.463, Austria placed 26th in the 2022 Waseda rankings. The Austrian Digital Competence Framework is founded on the European Reference Framework for Digital Competences. The Competency Framework is used to compare and classify digital skills. The Digital Competence Framework for Austria classifies

digital skills into six domains and eight levels. In 2021, a certification system was introduced, followed by its implementation in 2022. The Dig-CERT and DigComp-CERT certifications are a transparent demonstration of digital abilities based on the DigComp 2.2 Acceptable Practices (AT). Courses categorized under the DigComp 2.2 AT framework facilitate the development of digital skills used daily.

The 'Digital Bonus' scheme, with a total budget of EUR 1.5 million, will be started in 2022 and intends to assist individuals in acquiring fundamental digital skills. The curriculum is geared toward people who have trouble navigating the internet or have limited experience dealing with digital issues in their career and personal lives. On the one hand, the program targets education providers and envisions the creation of training offerings based on the DigComp 2.2 AT through the provision of funds of up to 10,000 EUR. On the other hand, persons who have completed DigComp 2.2 AT-based training and earned certificates receive a monetary bonus of EUR 100 per participant. With all the effort raised in innovation and digitalization, the nation has been trying to cover all the losses and influence of the pandemic.

### **3.2. New Trends**

The 'Digital Austria in 2040–2050' vision outlines a digitally responsible society's essential ideals and characteristics. It is the foundation for the entire Digitization Strategy and is based on standards and guiding concepts. The vision emphasizes competitiveness, innovation, prosperity, Climate Protection, health, and cultural heritage and offers the basis for the Austrian Digitization Strategy (Digital Action Plan Austria).

The Federal Minister of Austria launched the Digital Action Plan Austria on June 8, 2020. The action plan, established in collaboration with specialists from the domains of science, economy, and public administration, covers the prerequisites for Austria's successful digital transformation. The Digital Action Plan Austria is a developing strategy to navigate the digital transition successfully. It consists of thematic action plans that address certain priority subjects, the most notable of which are now the data economy and resilience.

## **4. Digital Government by Indicators**

#### **4.1. Network Infrastructure Preparedness [NIP]**

The rollout of 5G in Austria has been put on hold due to the prohibitively expensive lease fees for mobile towers and the absence of legislative incentives. Austria has become a leader in 5G technology. By 2023, Austrian carriers want to have 5G services available along essential routes, and they plan to roll out the technology throughout the country by 2025. In addition, the state has made substantial investments in fiber-optic infrastructure to support its fixed internet service and the 5G network.

#### **4.2. Management Optimization [MO]**

The Federal eGovernment Strategy, under revision with national and regional partners, aims to deploy electronic government services efficiently. This goal is based on the fundamental premise that all businesses and citizens must be able to perform all of the procedures of public administration in a quick, easy, and electronic way and does not require any particular level of technical expertise. To accomplish this objective, the tactics implemented by the Austrian eGovernment sought to encourage the involvement of the federal state, as well as cities and municipalities, and to foster close cooperation between these three levels of government.

Platform Digital Austria, led by the Federal CIO and responsible for developing integrated eGovernment plans, comprises senior leaders from regional and local governments. Thus, the platform's objectives and road maps apply to provincial and municipal governments. These standards are then translated or incorporated into regional and local strategies, which are the responsibility of Lander and municipal governments.

#### **4.3. Online Service [OS]**

The Public Procurement Platform enables public purchasers in Austria and Croatia to send tender notification information online to interested providers. Upon registration, purchasers must input the essential information on a public procurement procedure. A subsequent electronic verification assures the consistency and validity of all data. Following this, purchasers must specify the publication date and medium and upload the delicate materials. Interested suppliers can browse the online database, see and download tender documents, view a buyer's profile, and set automatic search profiles after

registering.

The Federal Procurement Agency's BBG web-based electronic purchasing system enables its customers to manage electronic framework agreements and contracts. The BBG Portal encompasses the complete purchasing procedure, from submitting a purchase request and approving procedures to finalizing the purchase order and sending it to the vendor. It streamlines and accelerates internal operations through flexible, customer-focused electronic workflows. In addition, it enhances the quality of business process documentation for registered users and their respective organizations.

#### **4.4. National Portal [NPR]**

Oesterreich.gv.at is a website that connects to numerous government agencies. As the one-stop eGovernment portal for citizens, it provides information on all interactions with Austrian authorities required in the most common life situations – such as pregnancy, childbirth, marriage, and housing – and permits the electronic completion of sure of these procedures. The portal serves as an interaction between authorities and citizens, focusing on transparency, usability, and information clarity. Accessible 24 hours a day, seven days a week, the portal provides advice on interacting with various agencies in over 200 life scenarios. In addition, many administrative procedures (such as the application for a voter card) can be completed electronically via the oesterreich.gv.at the website.

Until now, the website has been renamed oesterreich.gv.at in addition to being upgraded with the provision of additional services for citizens (such as baby point and relocation). In addition, a chatbot known as Mona and a specialized mobile app was released in March 2019 to improve the service quality of Austria's most popular eGovernment portal for residents.

#### **4.5. Government CIO [GCIO]**

In 2001, the federal government decided to create the position of Chief Information Officer (CIO), to have this individual provide the federal government with strategic and technical help and enhance its eGovernment projects. In addition, the CIO is in charge of Digital Austria and represents the interests of Austrian eGovernment solutions globally in Europe and elsewhere. Consistently, the Chief Information Officer (CIO) provides the Minister Responsible for Digital and Economic Affairs with an update on current actions.

#### **4.6. E-Government Promotion [EPRO]**

The web Accessibility Directive was put into practice by the Austrian Web-Accessibility Act. To make federal websites and mobile applications more accessible for users, particularly for people with disabilities, it establishes the accessibility requirements for those platforms. The Web Accessibility Directive is implemented in each federal State through nine acts in addition to the national level. Federally, the relevant body is the Austrian Research Promotion Agency (FFG), which oversees compliance with accessibility criteria for websites and mobile applications of Austrian public sector entities.

#### **4.7. E-Participation [EPAR]**

Even when utilizing accessible e-government tools, several Austrian enterprises were unprepared for the digital demands of the covid-19 pandemic. Only 25 percent of Austrian businesses offer their products and services online. Most small and medium-sized firms lack knowledge of internet sales, including marketing and cybersecurity. Non-users of online sales channels either believe that their product is incompatible with online sales or choose to disregard the issue.

The Austrian Institute of Economic Research found that while digital public services for citizens continue to be a strength of Austria, corporations still lag. However, the study found that over 90% of Austrian distance selling activity is done online. Even though foreign companies make 54% of distance retail purchases in Austria. Austrian businesses are growing their online offerings and investing in digital capabilities to remain competitive. Public funding is one reason why domestic firms are becoming more competitive online.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The digitization process in Austria is ongoing, with the nation making strides in various digital sectors and launching several noteworthy projects. One of Austria's aims in pursuing more digitization is to position the country among Europe's most advanced digital powers. The country's ultimate goal is to increase its citizens' long-term prosperity, employment opportunities, and quality of life. The constant stream of new technologies influences every aspect of our existence. The Austrian government is making significant

strides toward fully digitizing its citizens' health and education systems. Digital health solutions are an important advancement because they simplify the healthcare system and make it accessible to more people during a pandemic.

Austria made progress toward its aim of open government data with the creation and launch of the Austrian One-Stop Open Government Data. Data.gv.at was established as a central repository for open government data to provide consumers with a single electronic point of contact for finding data rapidly. The potential for open government data to advance social, cultural, scientific, and economic development exists. Because of this, the Austrian government has made it feasible to create new goods and services by reusing data from the non-personal public sector. Open government data may also increase administrative activity openness, business, research, and citizen collaboration, as well as a democracy through growing transparency for organizational activities.

#### **4.9. Cyber Security [CYB]**

Austria approved a new cybersecurity strategy in December 2021, the SCS. For Austria's prosperity and security, it is crucial to increase the nation's digital resilience and ensure cybersecurity across the board in the digital world. Therefore, one of Austria's top concerns and a significant share of cybersecurity is ed problems for the government, corporate community, scientific community, and society at large is cybersecurity. In light of this, the feder planned to revise the Austrian Cybersecurity Strategy and declared cybersecurity and digitalization to be significant domains of activity and political priority in its government agenda for 2020–2024. The goal of SCS 2021 is to build secure cyberspace over the long term using a cross-government strategy to strengthen Austria and the European Union's resilience. The strategy outlines ten goals, numerous actions, and a monitoring system to realize this vision. The first evaluation report's publication is scheduled for the summer of 2022.

#### **4.10. The use of Emerging ICT**

The Austrian Ministerial Council launched the Artificial Intelligence Mission Austria 2030 (AIM AT 2030) on November 23, 2018. AIM AT 2030 is a report by AI professionals on the proper use of artificial intelligence (AI). This includes the optimal exploitation of possibilities and preventing potential unwanted consequences.

On June 10, 2020, the Austrian Cloud (O-Cloud) initiative was initiated. The program seeks to strengthen Austria's resilience and data sovereignty. Austria's OCloud initiative aims to integrate Austrian cloud providers into a synergistic network system, to bolster data sovereignty, enhance transparency and integrity, and process data intelligently. Austria will also participate in the GAIA-X initiative alongside its industry.

Since its inception, Austria has been a member of the European Blockchain Partnership. Austria also participated in the European Blockchain Services Infrastructure (EBSI) and was among the first member states to implement a national EBSI node. Most administrative authorities in Austria are already engaged with blockchain technology and prospective application areas. In numerous domains of the Austrian public administration, blockchain technology is under consideration for implementation. For instance, the Anti-fraud Tax and Customs Office proposes implementing a technology that can interpret cryptocurrency payment processes. To accomplish this, software capable of deconstructing blockchain technology will be built.

Bahrain

## 1. General Information

Area: 765 km<sup>2</sup>

Population: 1,472,233

Government Type: constitutional monarchy

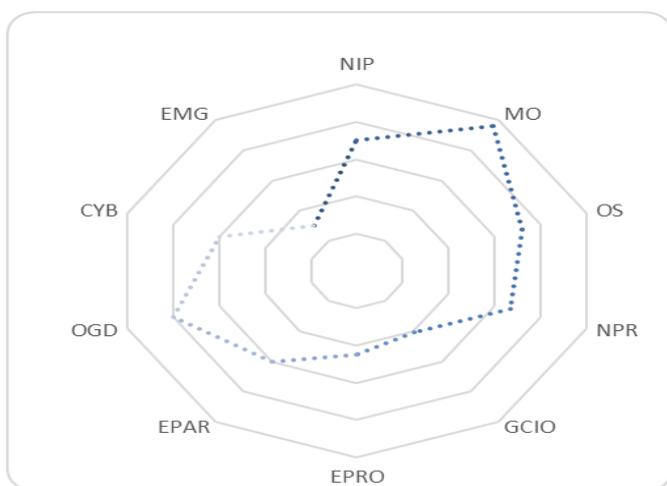
GDP: \$23,585

Internet User: 99.67

Wired (Fixed Broadband User): 8.75

Wireless Broadband User: 109.38

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

With a score of 56.720, Bahrain ranked 60 in the Waseda International digital government rankings for 2022. The Covid-19 pandemic has increased the Kingdom's reliance on its current and developing technology, extending the scope of its national digital transformation programs and electronic services and proving the government is prepared

to deal with conventional calamities and pandemics. The government has quickly recognized the advantages of technology in increasing public access to information and accelerating the delivery of services as the ICT sector has advanced rapidly. This initiated the development of a state-of-the-art National Data Center, the building a trustworthy National Data Network, and the rollout of Smart ID Cards for all residents and citizens.

The administration of Bahrain, which is currently under the sovereignty of the Kingdom, has made a complete transition to digital systems. H.H. Shaikh Mohammed bin Mubarak Al Khalifa, Deputy Prime Minister, is the most prominent of these leaders. He presides over the Supreme Council for Information and Communication Technology (SCICT) and the National ICT Governance Committee (ICTGC). The latter ensures that the Kingdom's strategic digital initiatives are coordinated and carried out.

The government soon started to see the potential benefits that technology may bring individuals regarding their access to data and services. Completing these projects will result in establishing a dependable National Data Network, a cutting-edge National Data Center, and the issuance of Smart ID Cards to all citizens. In order to expedite the creation of an environment suitable for a digital economy, the government has assisted public sector organizations in their digital transformation efforts. This assistance has taken the form of improved digital infrastructure, laws, legislation, and innovative technological solutions.

### **3.2. New Trends**

Movement restrictions and targeted shutdown of businesses and government buildings were urgent responses to the COVID-19 outbreak. Because of this, there was an unexpected increase in the need for web-based services. The government's principal focus has been maintaining service reliability while improving its network and data security to pave the way for remote workplaces, online banking, online education, and online healthcare. A more open, accessible, and effective administration is a priority for the government of Bahrain; hence the country is speeding up the use of advanced and emerging technologies via its Digital Government Strategy 2022. The government's goal is to make services convenient and available for all citizens at any time, from any location, and using any device of their choosing. The government's plans for 2021 and 2022 fall

into one of these categories:

- Promoting a digital economy via investments in digital infrastructure, data, and AI.
- Accelerating government efforts to streamline operations and work together
- Protecting people's constitutional rights and shielding them from online threats via establishing laws and regulations.
- Driving transparency, honesty, and citizen input.
- Promotion of Risk-Taking and Creative Problem Solving

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The government quickly recognized the advantages of technology in increasing access and delivery of information and services to the general population as significant developments were made in information and communications technology (ICT). This resulted in the formation of a National Data Center outfitted with all of the necessary technology, followed by the development of a safe National Data Network and the rollout of Smart ID Cards for citizens and residents.

According to a decision made by the Cabinet in 2005, the Supreme Committee for Information Technology and Communication (SCICT) was established. Its chairman is His Majesty King Hamad's special representative, H.H. Shaikh Mohammed bin Mubarak Al Khalifa. A growing realization of the importance of a coordinated, well-governed eGovernment program across the Kingdom led to this realization. Following the goals of the eGovernment programs, the SICT put into action Cabinet instructions and developed comprehensive strategies and plans to advance the information and communications technology industry across the Kingdom.

##### **4.2. Management Optimization [MO]**

It is the government's intention to use digital technology to enhance the services provided to people, as well as operations, decision-making, and data exchange. The government made the facilitation of a digital workforce, the development of analytical platforms, and the implementation of efficient cyber security measures a top priority. In addition, the government has accelerated the process of creating a favorable environment encouraging

the development of a digital economy by strengthening digital network infrastructure, policies, regulations, and technology platforms and providing assistance to public sector entities. This move was made to encourage the development of a digital economy.

#### **4.3. Online Service [OS]¥**

For Bahrain to reach its objective of being a cashless society by 2030, the government provides several electronic payment options, including eWallets, which make it possible for all financial transactions to be completed promptly and securely. b-wallet, stcPay, Benefit Pay, and Max Wallet are some of the most common forms of electronic wallets used in Bahrain. On the National Port, it is anticipated that electronic wallet methods will be included as one of the official payment options.

In addition to e-Wallets, the government has been implementing the use of digital ID cards in public settings. These cards are used to verify the identity of a person in order to carry out activities such as voting in parliamentary elections, accessing public services and travel documents, and passing through airport security. During the process of renewing their passports, people are given the opportunity to register for their new passports online via the Passport Renewal eService. Online services have provided huge advantages to every person due to the rise of digitization. These benefits include encouraging individuals to use more public services and reducing administrative strain.

#### **4.4. National Portal [NPR]**

To enhance public-private collaboration, the government of Bahrain is updating its Open Data Portal ([www.data.gov.bh](http://www.data.gov.bh)) and electronic participation tool (Tawasul). The Open Data Portal improves Bahrain's reputation by drawing attention to the country's strengths in the business world. Therefore, it will raise business success and growth rates and stimulate local entrepreneurship and innovation. At the same time, the government of Bahrain is pushing for higher-quality data by emphasizing data standards and ownership. Effective cross-government data sharing, clearly defined data ownership and duties, and enhanced data skills and standards have put the government on pace to fulfill its data and AI objectives.

To promote evidence-based decision-making, attract investors, develop a thriving research and innovation sector, and lay the groundwork for artificial intelligence, the

government is also encouraging the use of high-quality data from several sources. The Government places a premium on citizens' and residents' access to information, empowerment, engagement in the development of public service, and citizen involvement in decision-making.

#### **4.5. Government CIO [GCIO]**

A national D-Government Authority, also known as the Information Governance Authority (IGA), has been formed in the Kingdom of Bahrain to function as a GCIO Office (Information and e-Government Authority). The e-Government Authority and the Central Informatics Agency have been merged into a single organization known as the Information and Governance Authority (IGA for short). The responsibilities of the Head of IGA, formerly known as the Head of EGA, are quite similar to those of the GCIO. At the national and ministerial levels, there are formal GCIOs, but there is little evidence of their existence at the official level, and there is little indication that they are even there. Regarding educational options, the University of Bahrain offers a Master's degree program that is particularly tailored toward the role of the GCIO. This program can be found at the Computer Science and Information Technology Department.

#### **4.6. E-Government Promotion [EPRO]**

For the sake of its people, communities, and enterprises, the government of Bahrain has been an early adopter of cutting-edge technology. As it has been in the past, the Kingdom leadership is taking initiatives to advance digital transformation in the public sector, with an emphasis on service-oriented and citizen-centric operating models. The Government of Bahrain has made tremendous strides in the previous decade in understanding and utilizing new digital technologies, in part because of the guidance of the King and other senior officials in the Kingdom.

The National ICT Governance Committee (ICTGC) is responsible for overseeing the coordination and implementation of strategic digital initiatives across the Kingdom, and the Ministerial Committee for Information Technology and Communication (MCICT), chaired by H.E. Minister of Interior Gen. Shaikh Rashid bin Abdulla Al Khalifa, is leading the government's Digital Transformation Journey. The Covid-19 pandemic has increased the Kingdom's reliance on its advanced and developing technology, extending the scope

of national digital transformation programs and electronic services and proving the country's preparedness for natural and man-made calamities and pandemics.

#### **4.7. E-Participation [EPAR]**

The acceleration of digital transformation may be partially attributed to the iGA's work to modernize government service operations and finish national digital transformation plans. Through modern technology and AI, the federal government has aided the public sector, most notably the judicial system, in streamlining processes (AI). Civil and commercial disputes may be filed electronically as part of the judicial system's service.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The government's digital transformation plans center on:

- Creating services that are tailored to the requirements of individual consumers and can be accessed instantly from any gadget
- Using a digitally-enhanced approach, we can ensure that everyone, including those who can't utilize internet services, has access to them
- Having residents and companies submit their information to the government only once
- Making better forecasts and choices via the use of cutting-edge technology and statistical analysis
- Centralizing of public information and its accessibility to the general public:

Open Data lays the groundwork for governments to share data that is readable by machines with the rest of society and makes this possible. Research, the development of innovative solutions, and improved decision-making are just some of how individuals, companies, and government agencies might benefit from access to government data. The Bahrain Open Data Portal enables data collected by the government in various fields to be freely reused, analyzed, and shared while adhering to the personal data privacy laws stipulated in Bahrain's Personal Data Protection legislation.

Big data has been used in Bahrain to finish various projects that require the analysis of massive amounts of data, such as the population census and other administrative records of state institutions, and procedure technology while saving time, effort, and money.

These projects include the completion of the population census. The Monthly Consumer Price Index report summarizes the data collected from various sources and then electronically processed to generate accurate indicators of inflation rates in the Kingdom.

Bahrain's tourism industry's success depends on the online availability of up-to-date and precise government data. This data includes information on the number of tourists arriving in the country, the Bahraini tourist attractions they visit, and hotel and restaurant occupancy rates.

#### **4.9. Cyber Security [CYB]**

Strategically, Bahrain wants to rank in the United Nations (UN) eGovernment Survey's e-Participation index. The Minister further elaborated that the strategy's goals include creating cybersecurity standards, luring large technology firms, and becoming a regional powerhouse for digital innovation. E-transformation, digitizing records, transitioning to e-payments, boosting the use of Artificial Intelligence, and bolstering public-private partnerships are ways the recently unveiled ICT and Digital Economy Strategy might help improve the efficiency of government services.

The strategy's four primary tenets are "digital capability development," "e-governance enhancement," "digital economy support," and "telecommunications infrastructure development." By 2026, the predetermined key performance metrics were intended to have provided sufficient data on the strategy's efficacy. By 2020, Bahrain hopes to have trained at least 20,000 individuals in cybersecurity and automated an extra 200 government functions. The country also plans to grow national employment in the industry by 35%.

#### **4.10. The use of Emerging ICT**

Bahrain is making history as the first Gulf Cooperation Council (GCC) state to develop and promote the use of global mobile network-based IoT connectivity standards. It was also included in a draft of a new working paper proposed by the International Telecommunication Union (ITU) for use with narrowband Internet of Things (IoT) applications. The iGA allots spectrum for use in government initiatives, including smart cities, the Internet of Things, and machine-to-machine connections. Mobile Internet of Things (IoT) and Machine-to-Machine (M2M) services are offered in Bahrain. Adding

5G capability to its wireless and fiber networks improves its accessibility and Internet speed. Several public and commercial organizations in Bahrain make use of this technology.

Businesses that use Blockchain technology enjoy improved openness, safety, traceability, transactional efficiency, speed, and reduced transaction costs. The Economic Development Board and iGA have proposed a national strategy to provide detailed standards for the public and commercial sectors' use of Blockchain technology.

Bahrain was one of the first Gulf Cooperation Council (GCC) nations to undertake a comprehensive digital transformation initiative. Bahrain is leading the way in government IT reform and improvement. Through cutting-edge technology, the government can save money, boost safety, and enhance efficiency, all while providing citizens with first-rate services. This rule requires government agencies to include Cloud Computing into their IT planning and operations following Bahrain's Cloud-First strategy, which lays out a clear road map and criteria for public sector cloud adoption.

Artificial intelligence (AI) has been used to improve government services in Bahrain, and the country as a whole is making great strides in the digital realm thanks to its forward- (AI). The Kingdom is also a source of education and growth opportunities. It was created by Microsoft, Tamkeen (a university in Bahrain), and Tamkeen (a university in Bahrain) to foster originality and imagination in students. This institution focuses on training and educating teachers and students from around Bahrain.

Belgium

## 1. General Information

Area: 30,528 km<sup>2</sup>

Population: 11,655,930

Government Type: Federal parliamentary constitutional monarchy

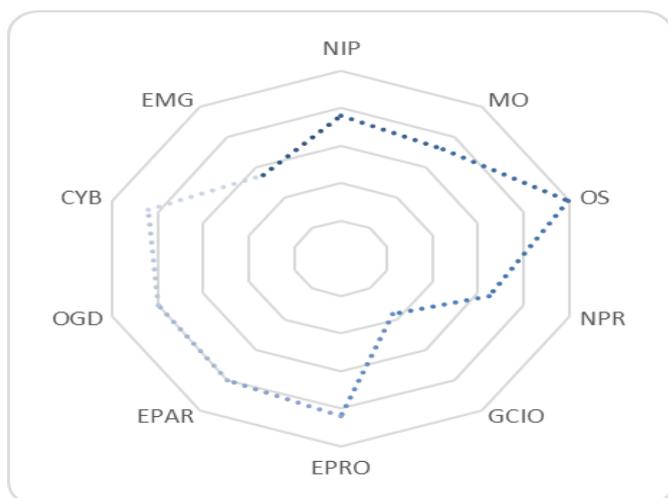
GDP: \$44,736

Internet User: 91.53

Wired (Fixed Broadband User): 40.85

Wireless Broadband User: 89.20

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

In the Waseda rankings for 2022, Belgium finished 29th with 72.8 points. Digital Public Administration LegiIn December of 2021, a draft bill that modernizes Belgium's telecommunications laws and transposes a large portion of the European standards will be passed. In the spirit of creating a "gigabit society," the new set of regulations have as its primary goals the improvement of consumer education, the enhancement of efforts to

combat cybercrime, and the promotion of the construction of 5G networks as well as universal access to high-speed internet.

COVID-19 has brought attention to the value of digital tools in the fight against the pandemic. The Artificial Intelligence for the Common Good Institute was established in the spring of 2021 by the Brussels Region, the Université Libre de Bruxelles (ULB), and the Vrije Universiteit Brussel (VUB) (FARI). Together, the Brussels Regional Informatics Centre (BRIC) and the FARI Research Institute are developing a road map for the future of artificial intelligence research and development in the Brussels Region. The goal is to establish a framework for development, to ensure the coherence of initiatives, and to depend on the exchange of information.

In December of 2021, a bill that would update Belgium's telecommunications laws while also transposing a substantial portion of European regulations was accepted as a draft law. To realize the vision of a "gigabit society," the newly enacted set of rules has as their primary objectives the improvement of consumer education, the intensification of efforts to combat online criminal activity, and the promotion of the expansion of 5G network capabilities as well as universal access to high-speed internet. The document also secures the attainment of the European aim to complete the territory's coverage with 5G and to ensure that all homes have access to an internet connection of at least 100 Mbps using extremely high-capacity networks. Both of these goals are provided by the text.

### **3.2. New Trends**

As a strategy to recover from the pandemic, the nation decided to focus more on innovation and digitalization. The foundation of Belgian eGovernment policies is an authentic-source system, which allows federal public agencies to compile and administer their own databases using information from residents, corporations, and government employees. Other national services that need this information can access these databases, also known as legitimate sources. Requests for data transmission from enterprises and people will be made just once.

The National Registry, which is overseen by the Department of the Interior and is responsible for compiling basic information on all individuals who are citizens of

Belgium; and The Crossroads Bank for Enterprises (CBE): managed by the Department of Economy; the CBE is an integrated business registry that contains all authentic sources of all Belgian enterprises, such as company name, company number, postal and email address, legal form, activities performed within the company, professional skills of the company staff, etc. The CBE is an online database that can be accessed by anyone with internet access.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Digital Belgium, which includes the country's plan for expanding internet access, is a larger policy framework. The national fixed and mobile broadband strategy hopes to fill all the blank spots where high-speed services are still lacking. Belgium encourages a market-driven rollout of high-speed Internet by decreasing prices and easing administrative barriers.

In April of 2021, the government announced a plan to improve fixed and mobile internet across the country, and by the end of the time covered by the plan—2022. It helps move Europe closer to its 2025 goals for gigabit connectivity.

As a first step in making it easier to roll out high-speed services, the proposal calls for mapping the white regions (about 2% of the country). In addition, a dedicated government agency will carry out the strategy and keep tabs on its progress. A Broadband Competence Office will handle all matters about public-private partnerships and the EU Connectivity Toolbox. There are main pillars upon which this strategy rests:

- Establishing a support system for the rollout of fibre and 5G through the website about 5G [www.over5g.be](http://www.over5g.be),
- Establishing a support system for the rollout of fibre and 5G through the website about 5G [www.over5g.be](http://www.over5g.be),

The government is encouraging the deployment of innovative broadband technology by decreasing network providers' administrative hurdles and roll-out costs (fibre, LTE advanced, 5G). For instance, all new and remodeled homes will soon have to be fiber-ready. Belgium must be prepared for the rollout of the Internet of Things by establishing a proactive 5G architecture. The Belgian government has promised to ease the process of

deploying ICT infrastructures and lower associated expenses. The new administration and industry players are reevaluating the plan.

#### **4.2. Management Optimization [MO]**

The second edition of the Digital Wallonia Strategy, which covers 2019–2024, was approved for implementation by the Walloon government on December 6, 2018. The plan outlined a course of action to enable the Walloon area to capitalize on the socioeconomic potential presented by digital transformation. The first edition of Digital Wallonia was published in 2015 and was based on the input of more than one hundred actors and organizations. The second version, Digital Wallonia 2019/2024, is the product of the efforts of the Digital Wallonia Champions. This method is organized on the following five primary goals:

1. The objective is to develop a robust technical industry via a development model that gives Wallonia's digital economy a worldwide scope;
2. The growth of linked commerce depends on the expansion of the digital economy, which aims to make businesses more digitally capable;
3. Connected and intelligent territory: complete high-speed connection in Wallonia is the objective.
4. Open utilities: the objective is to promote transparent and open digital public services;
5. The objective is to improve the digital abilities of the people of Wallonia. As part of the Digital Wallonia Strategy, more than 20 initiatives have been carried out. The development of artificial intelligence is now guided by projects like Digital Wallonia 4 AI (AI). The Digital Wallonia Giga Region specifies the priorities of providing high-speed fixed and mobile networks to all residents and businesses in Wallonia. In contrast, the Digital Wallonia Industry of the Future offers the foundation for the adoption of industry 4.0 by manufacturers in the industrial sectors.

The approach symbolized the Walloon government's declared goal of making Wallonia a connected, bright region where IT firms are acknowledged as leaders and the key to the successful industrial development of the area. 2019 saw the official confirmation of Digital Wallonia as the Wallonian region's digital road plan by the new regional administration. As a result, the political platform of the Walloon administration now completely incorporates the Digital Wallonia Strategy. Additionally, Digital Wallonia

supports the digital goals of the Wallonia Recovery Plan 2021–2024 and the Declaration of Regional Politics 2019–2024.

#### **4.3. Online Service [OS]**

The most recent amendment to the Law on Public Procurement was made by the Law of 7 April 2019, published in the Belgian Monitor on 14 July 2016. The modifications addressed the incorporation of a definition of electronic invoices and the fundamental components of these electronic invoices. The new legislation also ushered in some changes to the provisions of the third chapter of the Law of 17 June 2016 about Concession Contracts.

As a division of BOSA, the Directorate-General for Digital Transformation serves as a technical knowledge hub for eInvoicing and is a critical participant in the intergovernmental effort to advance eInvoicing in Belgium. It serves as the Belgian eInvoicing Event's knowledge partner and official Peppol authority for Belgium. Several tiers of the Belgian government have taken many actions to encourage electronic invoicing. The administrations and public organizations of the Brussels-Capital Region will only accept electronic invoices starting on 1 November 2020 for all public contracts. Mercurius receives and processes all electronic invoices for the Flemish government.

Moreover, the Flemish authorities have established a project team to oversee the implementation of eInvoicing on a local and regional level. The execution of promotional and awareness-raising initiatives for electronic invoicing has been given to the eAdministration and Simplification Unit (eWBS) by Wallonia and the WalloniaBrussels Federation. Walloon and municipal governments are invited to sign up for this service so they may get their bills online by creating an account on the Mercurius platform. Starting on January 1, 2022, invoice processing will be dematerialized thanks to the WBFIN software used in the Walloon public sector.

#### **4.4. National Portal [NPR]**

In November 2002, the Federal Portal was initially made available. Initially, it operated as the federal government's institutional website and an eGovernment portal, offering a solitary and multilingual access point to the federal government's data and services to individuals, companies, and government employees.

In May 2008, a new portal version was introduced after evaluating the whole system. The goal was to make it easier for people to engage with the government and do business. The information is more user-friendly according to the significant life events of both residents and enterprises. It is accessible in Dutch, English, French, and German. In addition to this new user-centered display, a robust search engine enables users to conduct queries both within and outside the site.

Additionally, a significant portion of the new site includes access to all online public services (eServices). Users may focus their search on the subject, target audience, and level of government involved when seeking a certain eService. Many of these eServices must be authenticated using a site token or electronic ID card because they are protected.

#### **4.5. Government CIO [GCIO]**

A specific law or mandate that specifies the CIO job does not exist in Belgium. According to the Waseda assessment, which came in top place in 2009, CIONET was found in Belgium. It is a network of chief technology officers, chief information officers, and chief information officers with operations across Europe. The CIO Forum is a wholly relevant organization to their community as a solely Belgian business interest group. In the Belgian IT scene, a forum for IT executives was created to provide a safe and dependable setting for networking among IT specialists. The website [www.belgium.be](http://www.belgium.be) is a crucial resource that people may use for matters relating to their families, justice, mobility, health, the environment, housing, employment, taxes, education, and the economy.

#### **4.6. E-Government Promotion [EPRO]**

Despite not being a plan, AI4Belgium is a significant initiative that intends to support locally driven AI development throughout the nation. Its objective is to enable individuals and organizations in Belgium to take advantage of AI's prospects while properly aiding the current transformation. AI4Belgium hopes to place Belgium in the European AI scene in this manner. There are seven main goals for the project:

1. Creating a Belgian AI cartography;
2. Supporting policy on ethics, rules, and skills;
3. Co-facilitating the Belgian AI community;

4. Gathering EU funding and connecting EU ecosystems;
5. Proposing specific actions for AI training;
6. Aiding in the industry's adoption of AI technologies; and
7. Promoting new products and services based on AI technologies.

A proposal that will update Belgium's telecom laws and implement a large portion of European regulations was adopted in December 2021. The new set of rules aims to educate consumers better, combat cybercrime, and support the development of 5G and universal access to high-speed internet to build a "gigabit society." Additionally, the article guarantees the accomplishment of the European goal to cover the country with 5G and ensure that every home has access to at least 100 Mbps of internet via extremely high-capacity networks.

#### **4.7. E-Participation [EPAR]**

At the moment, there are no e-participation rules in Belgian law. While it is often advised that young people connect with society and public policy via technology, there are exceptions, such as municipalities that, in 2017 conducted considerable public outreach. On the website's Bataljong page, the required tools and equipment are listed. Applications that may be used for a number of purposes, including online interactions for several uses, are included in the second category of business applications. They are not intended to encourage action directly in e-focus areas.

Although the website is not expressly designed for young people, it does include age-specific information and a wealth of tools to help them get started in the online economy. In Flanders, e-participation was possible, but it is no more.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The regional RRP's and their digital initiatives are influenced by the Digital Transformation of Belgium, broken down into three key components.

1. Resilience in Cyberspace and Cybersecurity
2. Governmental Management
3. New technology, optical-fiber technology, and 5G technology

In Belgium, digital technologies and reforms are applied at the federal level. That implies the government provides more information on its introduction and the feasibility of related projects.

The Smart Flanders Initiative contained the Open Data Charter, which set out 20 principles, including open-by-default and machine-readable data, empowering local governments to support an open data ecosystem. A document was created containing model terms to be used in bids, concessions, and contracts to negotiate agreements with suppliers about (Linked) open data to put the Charter into action. Utilizing these phrases to work toward a more collaborative approach to available data was advised.

The Walloon government's and Wallonia-Brussels Federation's Open Data Decree was approved by the Walloon Parliament. As a result of this proclamation, public administrations will make their data mandate able in digital form so that anybody may readily reuse it, including individuals, businesses, and administrations such as local governments.

#### **4.9. Cyber Security [CYB]**

Draft Legislation Concerning the Establishment of a Security Framework for Information Systems Having General Interest The brand-new Law on the Establishment of a Security Framework for Information Systems was passed on April 7 this year. The European Union Directive 2016/1148 will be implemented at the federal level under Having General Interest (NIS Directive). It is intended to improve the cybersecurity precautions that both public and commercial organizations have taken to provide the community with critical digital services. The new legislation imposes requirements on suppliers of certain vital and digital services for the implementation of technical and organizational security measures to prevent incidents or mitigate the damage caused by them. In addition, it outlines the standards that must be met for security policies to be developed in accordance with ISO/IEC 27001. In the event of an incident, there will be a necessity to report it, there will be a responsibility to conduct an annual audit, and there will be a need to establish a contact point where authorities can be reached.

#### **4.10. The use of Emerging ICT [EMG]**

Artificial Intelligence. Brussels is an online portal that is open to businesspeople,

academics, students, and residents to learn about all of the AI-related activities established in Brussels. The site provides information and pertinent data on several areas in artificial intelligence, such as training, start-up and business assistance, funding possibilities, research centers, and more. The site was developed to meet the requirements of a wide variety of users, and it can locate projects based on the interests of the many stakeholders. The electronic identification card, or eID, issued in Belgium, is a form of identification and a travel document. It has all of the same information that is shown on the country's conventional identity card. It is a smart card with two certificates: one for the authentication process and another for the generation of qualified electronic signatures (eIDAS Regulation). An online identification method is made available by the Belgian eID, which permits the electronic submission of official papers and other linked services. This makes it possible to get access to restricted online services, which in turn makes the use of the internet safer. The national register number, which serves as a unique identity for Belgian nationals, is printed on the electronic identification card and its corresponding microchip. This number is a unique identifier in the electronic identification card's corresponding certificate.

Belgian eID card is used in almost all applications for (qualified) electronic signatures used in the eGovernment sector of the Belgian economy. Multiple levels of security are available on the federal eGovernment Portal, and each depends on the kind of eService being provided. The levels are as follows: (1) no password is required; (2) password is required; (3) password and token is required; (4) eID only; (5) unconnected eID; (6) mobile authorization (time-based one-time password) (TOTP).

Electronic identification cards are only able to be issued to natural individuals. In addition to the traditional functions of an ID card, Kids-ID can grant access to children-only internet chat rooms and a variety of emergency phone numbers in the event the child is in danger. These IDs are available in two distinct flavors: for EU citizens and for people of other countries.

Brazil

### 1. General Information

Area: 8,515,767 km<sup>2</sup>

Population: 215,540,174

Government Type: Federal presidential republic

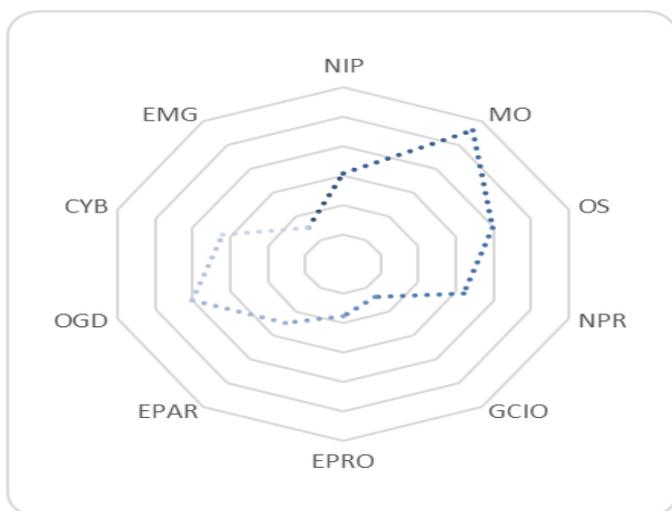
GDP: \$6,728

Internet User: 81.34

Wired (Fixed Broadband User): 17.10

Wireless Broadband User: 89.73

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

According to the 2022 Waseda Rankings of Digital Government, the country ranked 53rd with a total score of 61.577. Several issues confronting global health systems were highlighted by the COVID-19 epidemic, most notably the need for more efficient and secure methods of producing and disseminating health data. On the other hand, this

pandemic scenario has sped up the rollout and testing of health technology. The Brazilian Unified Health System's Department of Informatics prepared for the public emergency brought on by SARS-CoV-2 by developing a contingency plan.

After a long dictatorship era in Brazil, the mid-1980s saw an increase in people's ability to express their citizenship via control and social involvement. Several efforts, such as the 1986 National Health Conference, were implemented after the authoritarian period in Brazil to increase citizen engagement and social control. More than that, Brazil's public administration is both managerial and societal, thanks to a reform of the state's administrative structure.

Increasing social control in Brazil results from the country's progressive openness of public activities and the accessibility of government data in the digital sphere. However, cultural factors, technological incapability, low digital inclusion, and the work required to acquire and comprehend government data all contribute to Brazilian individuals' relatively low level of involvement in social control. However, the Brazilian government is actively promoting and facilitating social control mechanisms like popular councils and public hearings to increase the number of people who feel they have a voice in the country's decision-making processes and strengthen its reputation for democratic accountability.

### **3.2. New Trends**

Due to the COVID-19 issue, several Brazilian businesses shifted their growth strategy to prioritize sustainability and cost reduction. Automation, resilience, and virtual collaboration will be necessary soon. Solutions and services for digital businesses are essential for most businesses considering using innovative tools and procedures. Brazil's businesses were slow to adopt digital supply chain transformation until the epidemic endangered their survival. Due to the rapid growth of online shopping, Brazilian businesses were compelled to actively pursue help with digitally transforming customer service, product development, and supply chains.

As a result, Brazilians have stepped up their advertising and introduced additional services to the market. Service providers are urged to adopt DevOps and other forms of agile development as quickly as possible to address the problem. Although this is the case,

the nation is still in the process of blockchain being a promising new digital tool for business. The integration of Brazil's banking system to provide individuals with financial aid was the country's most significant digitalization endeavor. In a matter of weeks, millions of new records were uploaded to the database. Although traditional brick-and-mortar stores continued to thrive, efforts to expand online shopping made significant gains. And mortar businesses were halted due to the economic crisis.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

In Brazil, over the last three decades, the Courts of Accounts (also known as *Tribunales de Contas*) have progressively implemented computerized systems to automate collecting data from public sector enterprises to carry out a variety of auditing procedures. In general, the automation of data collecting came first in Brazil. However, data processing automation is only getting started in many of the country's courts. The digitization of business processes that are now taking place is made possible by the automation of data collecting. The integration of computer, information, and connection technologies has allowed for enormous, ongoing, and ever-increasing consequences, which is one example of digital transformation. This automation is only one example.

##### **4.2. Management Optimization [MO]**

With the latest revision of its digital strategy, Brazil focuses more on interoperability and consolidation of systems and more engagement with companies that focus on government. The updated order issued by President Jair Bolsonaro on March 16 is aimed at enhancing the quality of services offered to citizens via the Gov. by portal. To facilitate these enhancements, the government recognizes the importance of govtechs.

This year, the government of Brazil will roll out a framework for bringing together government employees who are driving digital transformation with the govtech innovation ecosystem. Within the realm of Gov.br, it is anticipated that the number of open innovation contests to find or create technical solutions for the government would rise by 20%. The announcement earlier this year that individuals would be able to review the quality of digital service supply and establish baseline requirements for online services was followed by news of Brazil's ambitions to speed advances in citizen services

by getting closer to startups.

In 2017, the Brazilian government held a consultation in which they asked for public opinion on nine different aspects of their digital strategy: infrastructure, R&D, digital security, education, international development, data, connected devices, new business models, and digital government. Since then, Brazil's plan has been stepped up, emphasizing connection initiatives and expanding access to digital government services.

#### **4.3. Online Service [OS]**

E-services, such as the country's electronic voting system, tax filing, medical appointment scheduling, and student enrollment in public institutions, have contributed to the rise in popularity of e-gov efforts in Brazil. However, the success of these e-gov projects depends on citizens' willingness and ability to use the information and communication technologies (ICTs) that facilitate communication between the government and citizens. We recognize the presence of state policies in our nation aimed at digital inclusion, which aim to provide access on both an individual and a community level. Policies aimed at facilitating individual access include measures like lowering taxes on the purchase of ICT resources like computers and internet service.

#### **4.4. National Portal [NPR]**

The initiative's goal to promote public access to the Public Administration that the federal government is undertaking is represented by the site gov. br. When planning and developing new features for the Portal, the demands and interests of its users are taken into account. Compared to other government websites, the organizational structure of the Portal is unique. The Portal's most essential characteristic is the service it gives to its users.

#### **4.5. Government CIO [GCIO]**

No one currently serves as Government Chief Information Officer in the Brazilian government (GCIO). The Ministry of Planning, Budget, and Management in Brazil is the equivalent of the Chief Information Officer in the United States, and it is responsible for performing some of these responsibilities.

#### **4.6. E-Government Promotion [EPRO]**

The Brazilian government is actively working to enhance public service delivery by

launching several digital projects. Driver's licenses, voter identification cards, worker identification cards, and electronic versions of the National ID Card and Registry are just a few examples of the recent digital identity projects that have been finished in Brazil. Other examples include identification cards for workers and voters. After developing a services portal that collects information from the majority of federal ministries in Brazil, the delivery of digital services by the Brazilian government has also been significantly improved.

The expectations of Brazilians, together with the technology that Brazilians deployed to connect with those expectations, seem to have resulted in quite favorable results. Individuals now have a more level playing field on which to interact with both the public sector and the internet economy as a direct consequence of the government's legislative and regulatory initiatives. The people, the companies, and the governments all have a part to play in developing a digital world that is linked and unified.

The Brazilian government is beginning the process of digitally reforming the public sector. To satisfy the requirements of digital economies and societies, modern digital technologies are being used to rethink existing services and simplify the operations of businesses. During the transformation process, ensure that the strategy is implemented consistently across the government by eliminating silo-based activities and agency thinking. This will help reduce the amount of unnecessary duplication of infrastructure and data. Alternately, a citizen-driven policy perspective should be included in the model to consider the whole ecosystem of services.

#### **4.7. E-Participation [EPAR]**

Public participation in governmental decision-making is an institutional responsibility that may be carried out by the Government Secretariat, including the President of the Republic. For the phrase "social involvement" to be understood in its broadest sense, direct dialogue between individuals and the government is required. Participa + Brasil is a website developed by the federal government as a direct result of this situation. Its goals are to encourage and strengthen civic participation and boost the degree of transparency in the decision-making processes of the government. Participa+Brazil is an online

platform that supports and verifies the process of social participation by providing modules for disseminating surveys and research and promoting best practices.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

According to the government, this initiative aims to include govtechs, or government technology companies, that provide technology, workflows, and agile solutions to boost innovation and resource efficiency in the public sector in Brazil's digital transformation initiatives. This year, the government of Brazil will launch a framework to connect government workers in charge of digital transformation with the govtech innovation ecosystem. Within the realm of Gov.br, it is anticipated that the number of open innovation contests to find or create technical solutions for the government would rise by 20%.

Open government can be understood as the intensive use of digital technologies to facilitate, encourage, and expand government transparency, the opening, and sharing of public data, access to public information, participation, and social control, which necessitates numerous initiatives by the government and actors outside the public administration, as well as a legal framework for enforcing these principles. Brazil is one of many countries that have adopted this idea. Brazil's Access to Information Law and General Data Protection Law are two examples of laws that aim to improve transparency in government.

One of the technological advancements that helped Brazil's open government idea there is 9,878 data sets made accessible by 193 public institutions. Because of the data published on the site, non-governmental actors were able to build digital tools to promote and ease the monitoring and inspection of public accounts and activities, which may be a factor in creating public value.

#### **4.9. Cyber Security [CYB]**

Institutional support for cybersecurity in Brazil has grown over the last decade. The processes involved were centered on the Federal Public Administration's defense and national security departments. It's a more significant governance process component that includes official and informal cooperation agreements among the many entities that comprise the Brazilian cybersecurity infrastructure. Based on the activities that comprise

this governance ecosystem, this method illuminates alternative pathways for cross-sector cooperation that are often overlooked by a more rigid organizational framework defined by predefined capabilities (cybersecurity, information security, and cyber defense).

Better defining the duties and responsibilities of each sector is the primary obstacle facing multi-stakeholder cybersecurity governance. A lack of apparent agreement and coordination threatens the long-term viability of existing and proposed policies. Recognizing possible areas of shared interest and places for sectors to create trust among themselves is essential for overcoming these obstacles. The increasing threats to the security, stability, and resilience of networks need a more concerted effort to coordinate amongst sectors, all of which are facilitated by the construction of a cohesive framework of cybersecurity governance.

#### **4.10. The use of Emerging ICT [EMG]**

The government has been using substantial ICT resources for some time now to manage better and operate public administration procedures, which has resulted in a broader range of services for people that are both higher quality and more efficient. It has also created technological applications to spread democratic practices in recent years. The phrase "electronic government" is used to refer to initiatives that are based on the usage of ICT and the method in which the government interacts with its people (e-gov). With that in mind, this article's recommended debate is focused on public e-services, which include the use of information and communication technologies for the betterment of services offered to individuals and institutions.

Electronic voting, tax filing, medical appointment scheduling, and student enrollment in public institutions are just a few of the many e-services that have contributed to the rise in popularity of e-gov projects in Brazil. The effectiveness of e-gov programs relies on citizens' familiarity with and willingness to use the information and communication technologies (ICTs) that facilitate communication between the government and the public. Policies aimed at improving individual access include measures like lowering taxes on the purchase of ICT resources like computers and internet connections.

Brunei

### 1. General Information

Area: 5,765 km<sup>2</sup>

Population: 449,002

Government Type: constitutional sultanate

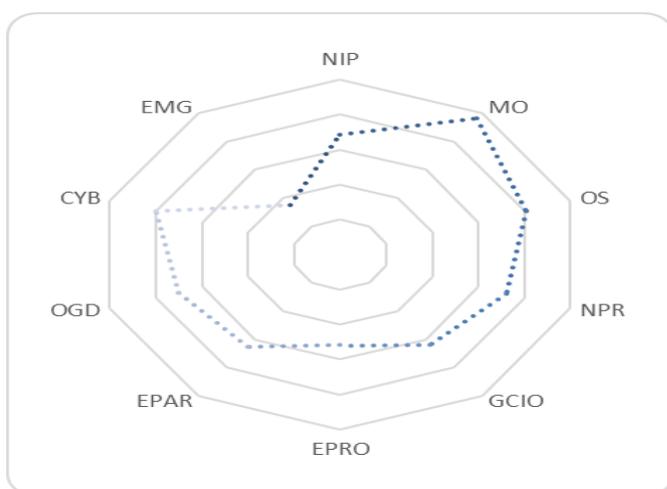
GDP: \$26,733

Internet User: 95.00

Wired (Fixed Broadband User): 16.25

Wireless Broadband User: 120.60

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With a score of 66.137 on Waseda International's digital government rankings for 2022, Brunei placed in the 45th position. Businesses in Brunei Darussalam made it through the pandemic with the help of new technology and received encouragement and assistance in their attempts to mitigate the epidemic. Establishing the BruHealth app as a forum for

public education and information also helped curb the epidemic's spread. As a result of the constraints imposed by the pandemic, virtual meeting platforms have become more important for people working from home during self-isolation and quarantine periods. It's been shown that firms have a lot of room to expand and prosper in the healthcare and support services industries. The Ministry of Health promotes pharmaceutical and medical supply businesses by supporting medical technology and novel healthcare delivery methods.

E-Government National Center is the government agency in charge of Brunei's online administration (EGNC). EGNC provides a broad range of services to government agencies and their personnel. The One Government Network and the One Government Cloud may help government agencies save costs on their IT infrastructure. The EGNC offers OnePass, a trustworthy Digital Identity so that government workers may reap the benefits of online cooperation. To further promote Brunei as a global leader in e-government innovation, the government convened the e-Government Leadership Forum (EGLF). The Prime Minister's Office Deputy Minister presided over the event, highlighting the government's dedication to e-Government reform.

### **3.2. New Trends**

In an era marked by increased economic competition and a gradual return to pre-pandemic levels of prosperity, the government of Brunei acknowledges the importance of devising novel and creative approaches to meeting the demands of the country's citizens and businesses for services that are both convenient and trustworthy. Under the strategic plan for 2009-2014, maintaining a high level of safety will consistently be a high priority. The government has been aware of the crucial relationship between network infrastructure and the surrounding environment. The appropriate precautions will be taken to eliminate potential dangers and recover lost possibilities linked to cyberattacks.

There have been a lot of technical improvements developed to support the growth of the country's economy. The government's use of digitalization increases productivity while simultaneously lowering risk and increasing profit. In this day and age of cutthroat competition and difficult difficulties, the nation has to come together and work together to address all of the problems that are now being faced. The government needs

comprehensive and intensive cooperation and integration from all relevant parties and industries.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

A substantial number of resources have been invested by the government in various projects, including the construction of a national telecom infrastructure through the use of the Kacific-1 satellite, preparation for the deployment of 5G in the public sector, and the establishment of number of portability services.

##### **4.2. Management Optimization [MO]**

Due to the country's heavy investment in digitization, the provision of public services in Brunei has become more accessible, user-friendly, and fruitful for the government and its constituents. The government lived up to its word when it came to satisfying the needs of its citizens. Key Services may be accessed from anywhere, and the government's tax collection is handled digitally. The government also instituted the ID system to make it easier for citizens and companies to use government programs. In addition, the government would have a more manageable picture of its inhabitants and enterprises with this universal identifier, enabling it to anticipate their demands and expectations better. To combat cyber threats and provide a secure and reliable digital platform that can fully use the opportunities presented by the Internet, the National Cyber Security Framework was created. A platform and mechanisms for two-way communication between the government and its stakeholders were established to enhance government services, facilitate the creation of new projects, and address public concerns.

Digital assets have been successfully used and managed to achieve their goals, guaranteeing the efficiency of the government. The government instituted frameworks for coordinating and controlling data creation, archiving, consumption, and processing, including rules, processes, and capabilities. There has been an exponential increase in the volume of data created. With improved data and information lifecycle management, the government may get insight into the health of our business operations and the efficacy of our choices and actions.

##### **4.3. Online Service [OS]**

With the help of IT Central Procurement, the government may legally participate in private markets for consumption and asset leasing. Enterprise software agreements may

reduce the typical six-month procurement cycle for information technology (IT) equipment and services to as few as thirty days. The government engaged in an Enterprise Agreement with Microsoft to acquire Microsoft licenses and related services.

For citizens to access government e-services, the E-Government National Centre has developed the National Authentication Module. Therefore, the government made provisions for e-Darussalam to enter positions of management and public service. The government and enterprises with ties to the government may use this module.

#### **4.4. National Portal [NPR]**

The most convenient method to access online public services in Brunei Darussalam is via the country's national portal, which can be found at [www.gov.bn](http://www.gov.bn). This site is accessible to residents, stakeholders, companies, and visitors. The portal will gather all the centralized data the government has and develop a single authentication procedure. All participants have unrestricted access to the portal at any time, which substantially influences the efficacy of public services provided by the government and the danger of information and process redundancy.

#### **4.5. Government CIO [GCIO]**

The purpose of the e-Government Leadership Forum, which the government of Brunei founded, is to improve the skills of leaders working in e-government development. The Deputy Minister is the one who acts in the role of moderator for the gatherings that take place inside the Prime Minister's Office. The event is open to participation from anyone working in the capacity of Chief Information Officer for a government body. It was only recently disclosed that the Co-Deputy Chairman of the Prime Minister's Office would be assuming the position of Chief Information Officer for the whole e-Government system.

Once every three months, the GCIOs meet together to discuss the many e-Government initiatives and projects, both the ones that were successful and the ones that were not. During the EGLF, we will discuss the findings established during the meeting. The Permanent Secretary acted in the capacity of meeting presider for every CIO Dialog Meeting that took place.

#### **4.6. E-Government Promotion [EPRO]**

Brunei has made remarkable progress in advancing digital services. The government considers the provision of public services the most important way of delivering and publicizing the anticipated profits. E-Government Promotion contributed to the establishment of a relationship between the government and its citizens that is user-friendly, open to scrutiny, and mutually beneficial. Core services are available to all program participants at any time and may be accessed anywhere. Additionally, digitization makes it easier for the government to manage and analyze both money and the results of its activities. The Wawasan 2035 plan has set an ambitious objective for the nation: to significantly improve living standards, build infrastructure that ranks well internationally, and achieve major growth in terms of productivity and investment.

Every public sector in the country has access to the Government Intranet service provided by the E-Government National Center. These services helped agencies and stakeholders save expenses, increase efficiency and effectiveness, and reduce capital expenditures and registration processes when building their IT inputs. All of these benefits came at the expense of fewer overall expenditures.

#### **4.7. E-Participation [EPAR]**

The federal government will purchase the One Government Network to provide a dedicated and highly assured network infrastructure that will link all participants to e-public services and the Internet via the national gateway. The network reestablishes an atmosphere of cooperation in which all members work together and profit from typical pursuits. It is controlled and monitored to ensure that current communication and tools aid authorities by effectively sharing their burden. Establishing the standards for facilities and inputs guarantees that the government would have access to information communication and technology resources that are both efficient and effective—connecting Government Link Company and One Government Network through the Business Partner Link allowed for easier integration with various government departments and authorities. In addition, the National Education Network offered reliable and consistent connectivity to all ICT education systems throughout the country. It is open to government agencies, educational institutions, and Government Link Companies to join this network.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Since the Digital Economy Masterplan, several initiatives and programs have been introduced to further Brunei Darussalam's digital transformation journey. These include establishing a digital data policy and governance framework to regulate the processes involved in digitalization, such as the Personal Data Protection Order and the Cyber Security Order. The Digital Economy Council has recognized three major flagship initiatives as pillars of the national digital economy ecosystem. These three initiatives—Digital Identity, Digital Payment, and the National Information Hub (NIH)—hope to accelerate and facilitate the widespread use of digital tools and systems.

The National Centralized Database was crucial in developing e-government initiatives because it supplied reliable data. It provides information on various topics, including software licensing, backup services, and disaster recovery services, among other things. NCD is seen as reasonably necessary and beneficial because it can decrease costs by pooling resources, reducing maintenance costs, and giving consolidated database information. In addition to this, the use of a Single Database Platform makes it much easier to share data and integrate it. This database management system is accessible to all government departments and agencies.

The National Information Hub uses the capabilities offered by the National Centralized Database system to store personally identifiable information like names, addresses, and identity cards. This tool contributes to the elimination of redundant data as well as errors brought about by human intervention.

#### **4.9. Cyber Security [CYB]**

Two legislative frameworks on cyber security are now being written to improve digital transformation governance. The Cyber Security Order will deal with dangers and incidents related to online security. At the same time, the Personal Data Protection Order will try to preserve the use, collection, and disclosure of personal data in the private sector. To design policies that encourage digital transformation and assure secure cyberspace, the federal government established a new cyber security agency in the previous year.

Enhancing the e-Darussalam government site is something the ministry plans to do to improve the overall delivery of public services. Since its inception in 2012, the website

has provided a total of 132 services, 34 geared toward easing the process of making payments online. In addition to implementing green protocol measures, the government intends to "completely" transition its internal operations to paperless e-office practices to reduce the number of papers generated. During the third quarter of this year, the Ministry of Transport and Info communications will also launch live bus monitoring services under the Public Transport Information System. These services will enable users of public buses to plan their itineraries more effectively.

#### **4.10. The use of Emerging ICT [EMG]**

The plan's new vision of a "Connected Smart Nation" and its mission of "Enhancing Connectivity for Great Socio-Economic Opportunities, Innovation and High Quality of Life" is also in line with the three goals of Brunei Vision 2035, which are to provide a high standard of living, to have a highly educated and skilled labor force, and to have a sustainable and dynamic economy.

The first of the ministry's six guiding strategies is digital transformation, which involves demonstrating efforts toward becoming a "Smart Nation" via digital government, establishing digital society and digital economy platforms, ensuring the long-term viability of the transportation and ICT sectors, introducing smart transportation via electric vehicles, and utilizing Intelligent Transportation System (ITS) pilot programs.

Second, via the Brunei ICT Awards (BICTA), the Ministry of Communications and Information Technology hopes to encourage local and international ICT players to participate actively and innovate.

Thirdly, the ministry will continue to guarantee safety standards in the transportation, information, and communication technology sectors by lowering road mortality rates and maintaining safety and readiness standards and compliance for all agencies under it.

Canada

### 1. General Information

Area: 9,984,670 km<sup>2</sup>

Population: 38,454,327

Government Type: a parliamentary democracy, a federation, and a constitutional monarchy

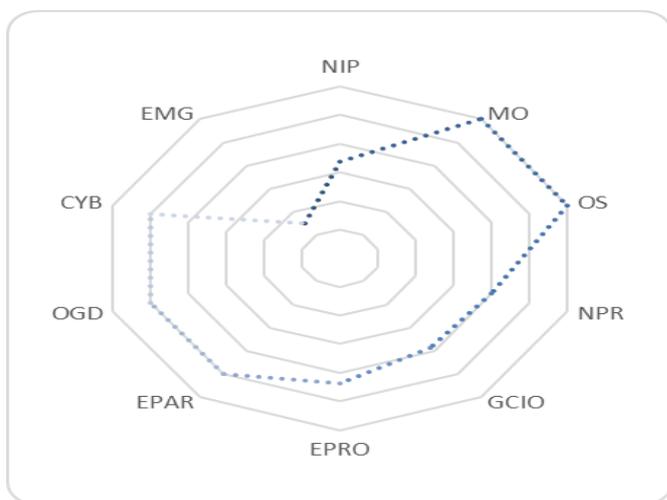
GDP: \$42,789

Internet User: 96.97

Wired (Fixed Broadband User): 41.93

Wireless Broadband User: 72.18

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

There has been a lot of growth and change in Canada in the previous few years. The Canadian government has significantly invested in digital technologies to serve Canadians better. Waseda International's digital government rankings for 2022 placed

Canada in the third position with an overall score of 91.7759. The spread of the COVID-19 pandemic has hastened the worldwide transition to online services and the rise of the telecommuting workforce. Emergency benefits and the COVID Alert app were just two examples of how government workers stepped up at the outset of the epidemic to provide speedy digital delivery of essential services to millions of Canadians. The team at Shared Services Canada works diligently with other government entities to ensure the timely, effective, and secure delivery of vital front-line services.

Digital government, defined here as a more transparent and collaborative government that offers enhanced digital-first, user-centered services and initiatives, is more important as Canada's economy rebounds from the epidemic. Essential improvements to Canada's digital governance, policy suite, and management practices have been implemented since the 2018-2022 DOSP, laying the groundwork for a fully digital government across all departments. The launch of the OneGC platform is on schedule, allowing citizens and companies to log in once and have access to all federal government services available via a unified portal. ca.

### **3.2. New Trends**

According to the Treasury Board Policy on Service and Digital, the Chief Information Officer of Canada is responsible for "approving an annual, forward-looking 3-year enterprise-wide plan that establishes the strategic direction for the integrated management of service, information, data, ICT, and cybersecurity." This duty is met by the Government of Canada's (GC) Digital Operations Strategic Plan (DOSP) for 2021-2024.

This catastrophe is the global spread of the COVID-19 virus, which is being exploited by cybercriminals. Fraud and computer assaults with COVID-19 are on the increase. To acknowledge the progress made, establish governmentwide priorities, and outline critical activities for departments and agencies, the DOSP includes those that support other government organizations through efforts to modernize service delivery, enhance sustainability, and promote digital stewardship, among other things. As a result of these initiatives, government agencies in Canada will be better able to provide digital versions of programs and services to the public. Together with Public Services and Procurement Canada and the Canada School of Public Service, the Digital Government team has

revised the DOSP.

## **4. Digital Government by Indicators**

### **4.1. Network Infrastructure Preparedness [NIP]**

The Canadian Forum for Digital Infrastructure Resilience (CFDIR) is a charitable public-private collaboration based on consensus and action-oriented. Its goal is to improve the resilience of the critical digital infrastructure in Canada, leading to a trusted digital economy for Canadians and a thriving cyber security industry.

CFDIR was founded by Innovation, Science, and Economic Development Canada (ISED), in part to assist in implementing Canada's National Strategy for Critical Infrastructure. According to this policy, the primary federal department for the Information and Communication Technology (ICT) critical infrastructure sector is the Information Systems and Electronic Design (ISED) Department. For the purpose of enhancing the durability of digital infrastructure, CFDIR brings together essential government partners and businesses.

### **4.2. Management Optimization [MO]**

The DOSP 2021–2024 lays a broad vision for the government's service, data, ICT, and cybersecurity integration approach. It lays out the top priorities and the steps needed to take to move things forward. Because of the business's dynamic nature, the government will review this policy annually. The following is the order of importance:

- spending the budget to ensure the government runs on user-friendly, secure, and cutting-edge information technology systems, networks, and infrastructure that can handle the workload of all departments.
- creating and providing services that prioritize users by being accessible, inclusive, secure, and simple to use, and that also protect users' personal information and allow them to choose their preferred language.
- maximizing the public's benefit from GC data and information by fostering data-driven decision-making.
- introducing cutting-edge methods of financing and sourcing to provide more flexible methods of execution

- being ethical and practicing ecologically responsible behavior

#### **4.3. Online Service [OS]**

[My Service Canada Account] is a platform developed by the federal government of Canada to provide all Canadian citizens and permanent residents with the ability to access and modify their personal information online. This includes passports, personal access codes, the status of immigration and citizenship application(s) status, wage earner protection program, pension plan, employment insurance, and long-term care. In addition, various applications, accounts, and other services that may be used for online financial transactions have been made available to the general public. The burden of administrative work may be significantly alleviated with the help of these public services, which is of critical significance while a pandemic is underway.

#### **4.4. National Portal [NPR]**

Canada scored 8 out of a possible 10 points, making it one of the nations with the highest scores in the Waseda rankings 2022 for NPR criterion, indicating a considerable increase in the number of channels built to promote digital advancement. When locating data sources suitable for dissemination, the job's primary emphasis is creating and maintaining a data inventory. The creation of Open.Canada.ca as the national gateway for gathering data from citizens has proven to greatly assist the government in organizing and using the data obtained from various sources. The issue of confidentiality must also be taken into account regarding the data inventory. Datasets that include information that should not be made available to the general public are identified and protected by the agencies responsible for data inventory and information protection.

#### **4.5. Government CIO [GCIO]**

Successful anti-covid measures have been implemented in some nations, including Canada. Nonetheless, the time and energy put into economic recovery were unprecedented, and the pursuit of digital governance is more important than ever. All government administrative processes must be flexible, quick to respond, and dependable if they are to live up to the demands and expectations of the people and enterprises of the country. This calls for overhauling the government's technological management and adjustment methods. The Canadian government has dedicated 2018–2022 to strengthen

the country's digital governance and procedures in preparation for the government-wide digitalization effort. Individuals and businesses can use their login credentials and the gateway Canada.ca thanks to the OneGC platform. The Canadian government has learned a great deal from the CoVID-19 epidemic. It has been working hard to eliminate unnecessary delays in digital integration and technical innovation by the Government Digital Standard.

#### **4.6. E-Government Promotion [EPRO]**

Prime Minister Justin Trudeau recently announced the introduction of the Canada Digital Adoption Program (CDAP) to assist Canadian SMEs in expanding their online presence and upgrading or adopting digital technology. Up to 160,000 small companies will benefit from this investment of \$4 billion over four years, helping to develop excellent middle-class jobs nationwide and providing thousands of young Canadians with employment opportunities.

Canadian small and medium-sized businesses (SMEs) may use the CDAP to evaluate their level of digital preparedness and apply for grants and loans entirely online. They may use the money to take advantage of e-commerce possibilities, modernize or embrace digital technology, and digitalize their processes so that they can remain competitive and satisfy the requirements of their clients in the online marketplace. Businesses may apply for financing via either the Grow Your Business Online or the Boost your Business Technology channels, depending on their size, requirements, and ambitions. As Canada begins to recover from the epidemic, speeding up the digital revolution will help firms here remain competitive, generate new employment, and boost the economy.

#### **4.7. E-Participation [EPAR]**

E-services, online information, and online citizen participation in Canada are structured according to the category rather than by department. This makes them easier to use and more responsive to the requirements of the general public. Both 'Taking Care of Business and 'Citizens First,' developed in Canada, are applied by the government to analyze the success of the services they provide to individuals, families, and businesses. This is done so that the government can determine how effectively its programs meet their objectives. Consequently, instant access to various digital services will be available to everyone. To

assist Canadians in their job that must be done online, the Canadian government provides several different programs, accounts, tools, and services.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The speed and breadth of change in today's digital ecosystem are unparalleled. Rapid technological, digital, and data change is becoming a regular aspect of Canadians' everyday lives, radically altering how people learn, communicate, and do business. The citizens of Canada have come to expect access to any government service through any device at any time. Most residents support sharing individuals' personal data between government agencies to provide better, more timely service. Despite the promise of technical, digital, and data transformation, the general public is worried about how their government utilizes and maintains their personal information and what it does to protect their privacy and security.

Over the last several years, Canada has also established itself as a significant voice in the international community of open government advocates. It joined the Open Government Partnership in 2012 and has been a member since (OGP). This multilateral initiative by 75 member nations and some sub-national government members aims to secure concrete commitments to promote transparency, empower citizens, fight corruption, and harness new technologies to strengthen governance. This will be accomplished in partnership with civil society and the private sector. To date, Canada has disclosed three OGP action plans, each of which outlines the steps that will be taken to open up the government. The creation of a fourth action plan is now underway.

#### **4.9. Cyber Security [CYB]**

Public Safety Canada has just finished a public consultation on the Renewal of the National Strategy for Critical Infrastructure, which complements the Renewal of the National Cyber Security Strategy. The updated National Cybersecurity Strategy will be informed in part by this data as well. The Canadian government's cyber security stakeholders were consulted at Global Affairs' Spring 2022 public consultations. Their insightful criticisms of the proposed International Cyber Security Strategy will be used to improve the updated National Cyber Security Strategy.

Cyber security policies to secure sensitive, regulated, unclassified information and

federal contract information, as well as how stakeholders view cyber security preparedness, were the subject of an RFI published by Public Services and Procurement Canada on buyandsell.gc.ca in January 2022. The US Cybersecurity Maturity Model Certification 2.0 and its expected impact on Canadian businesses are also discussed. Participation is solicited from relevant service providers in defense, security, space, aerospace, cyber security, and other relevant stakeholders (including academic institutions and trade groups). The due date for the RFI was March 4, 2022. To better assist organizations that do business with the Government of Canada and Canadian companies that do business with other jurisdictions in meeting cyber security requirements in contracting, the Government of Canada will use the feedback it receives to make decisions on cyber security requirements, cyber security certification, and other approaches.

#### **4.10. The use of Emerging ICT [EMG]**

Technologies that use artificial intelligence (AI) have the potential to radically transform how the Canadian government communicates with its citizens and delivers services. The people and the government are committed to ensuring that the use of artificial intelligence in government programs and services is guided by clearly defined principles, ethics, and standards. This commitment will help ensure that AI is used responsibly. A public cloud is a commercially available service that has been purchased and evaluated for its level of security for use by a single government agency before being made accessible to the general public. A single organization will share tenancy with other types of users, including commercial businesses, non-profit organizations, and individual users, as stipulated by the requirements of this deployment paradigm. On the other hand, a private cloud is a non-commercial cloud service custom-built for an organization such as the government. According to the design of this deployment, the General Contractor (GC) will be the only tenant that uses the cloud. In some situations, the cloud may be generated and governed solely by resources belonging to the government of Canada. In others, it may be produced and maintained with assistance from the private sector.

The term "Non-Cloud Computer Environment" refers to a computing environment used to host applications that cannot be implemented in a cloud computing environment. The vast majority of the applications currently being considered for the GC may be found in

this particular domain. Open Source Software has been a part of the ecosystem of information technology used by the Canadian government for a significant time. The government has come to depend heavily on Open-Source Software to effectively provide services. It must contribute to other projects and make its source code public under Open Source Licenses to realize its aim of becoming a digital government. The government is dedicated to carrying out these activities in a way that is consistent with fundamental administrative law concepts such as accountability, transparency, legality, and procedural fairness, among other administrative law principles.

Chile

### 1. General Information

Area: 756,102 km<sup>2</sup>

Population: 19,608,983

Government Type: presidential republic

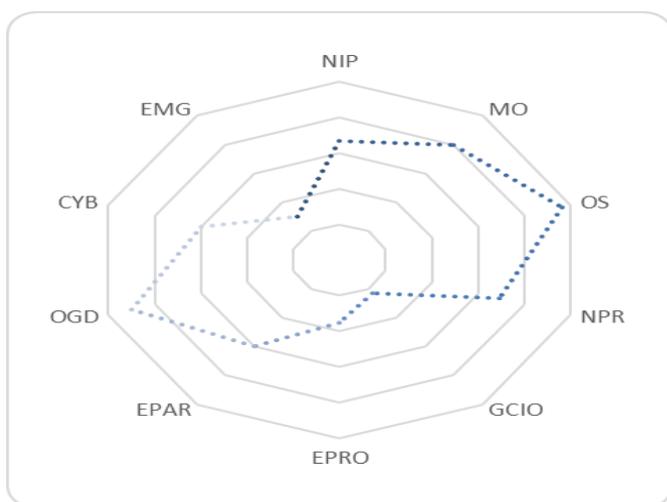
GDP: \$12,880

Internet User: 88.3

Wired (Fixed Broadband User): 19.69

Wireless Broadband User: 101.80

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With a score of 65,690, Chile ranked 48th in the world in the Waseda International Digital Government Rankings for 2022. Chile is one of the few nations working on creating a successful vaccination against coronavirus. Students in the electrical engineering program at the Universidad Católica have also built a prototype ozone generator that may be used

to quickly and effectively disinfect areas like hospitals, clinics, and dental offices. Ozone disinfection may eliminate any leftover coronavirus in a given location. Even though the Chilean textile company Monarch is well-known for its socks and underwear, production was halted at the beginning of March so that more time could be spent developing reusable face masks and aid for people afflicted by the present health crisis. This action was also taken to preserve the Monarch's copper-colored clothing tradition. Exposure of these copper fiber masks to heat and humidity causes the production of copper ions, which kill 99.9% of germs and mold. Due to the severity of the economic and health impacts of the Covid-19 epidemic, the Chilean government has been analyzing some risk reduction strategies.

If rules and barriers to entry were loosened, progress on the communications infrastructure would pick up the pace. Increased productivity might be achieved by implementing policies explicitly geared toward small and medium-sized enterprises (SMEs), such as creating funding mechanisms or specialized programs for adopting digital tools. We also need to enhance the regulatory structure, competitiveness, and climate for innovation. Investment in quality foundational skills, adult and lifelong learning, and highly skilled ICT workers is ongoingly necessary for everybody to reap the benefits of digitalization.

### **3.2. New Trends**

The new government of Sebastian Piera (2018-2022) is making substantial strides toward digital-first public administration, and a public consultation on the government's Digital Transformation Strategy is a crucial aspect of this effort. Both the present state of the economy and the global pandemic had a role in the formulation of the approach. Moreover, a new state-wide digital transformation strategy has been proposed with the recently approved Presidential Instructive on the Administration's digital transformation. It is expected that by 2021, fully all government services will be offered digitally, to reach 100% by 2023.

Another legislation, the State Digital Transformation Act, mandates that electronic forms of government service delivery will be the norm, with paper alternatives available only in exceptional circumstances when digital alternatives cannot be provided. The new

legislation aims to alter the existing legal and regulatory structure for e-government to integrate government operations in the digital realm better. Due to the new administration's initiatives, the government is shifting its attention to shared services and platform-based solutions.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

As the key developments that have occurred as a result of Chile's efforts to prepare for the digitalization of the country, a multi-band 5G spectrum auction was successfully concluded by the regulator; Chile made progress in the development of its ten-satellite National Satellite System; América Móvil gave its approval to a proposal to separate Latin America's towers and passive infrastructure; Telefónica Empresas was hired to complete the nation's National Fibre Optic project, and the regulator contracted for 398 free Wi-Fi zones in various sections of the country. All of these developments occurred in the past month. As a result of the project known as "Connectivity for Education 2030," more than 8,300 educational institutions currently enjoy free access to the internet. Roaming fees have been eliminated across the board in Chile, as well as in Argentina.

##### **4.2. Management Optimization [MO]**

The Organization for Economic Co-operation and Development (OECD) asserts that Chile needs a digital government to prioritize its citizens' requirements above those of its authorities. According to the group, inaction would result in losses for Chile regarding productivity gains, social well-being, the performance of the public sector, and, ultimately, public faith in government. The technical development of a government will go forward with this phase. It is not technology but a strategy that can bring about change. The only way to digitally modernize Chile's public administration is to include all of the country's important players in a series of coordinated activities. This is the only method to accomplish this goal.

To guarantee such cooperation, it is not enough to have strong political leadership; the public sector must clearly understand its place in the digital age. It will be determined whether or not Chile has the strategic institutional frameworks necessary for effective decision-making, investments in ICT, and returns that allow the nation to get the

maximum possible value from digitalization. This study will investigate several distinct topics and contribute to creating potential solutions to the aforementioned challenge. To guarantee such cooperation, strong political leadership is not enough; the public sector must also grasp its role in the digital age and how technology may assist it in accomplishing that purpose.

#### **4.3. Online Service [OS]**

During the "e-government," people worked to bring government services online, automate bureaucratic procedures, and lessen the burden of red tape on regular citizens. These initiatives, often driven by technology, excluded certain users and led to digital-by-default silos rather than consistent, government-wide omnichannel offerings. To guarantee that everyone, including individuals who depend on face-to-face contacts, benefits from digital development, OECD nations are now paying more attention to how services are planned and provided as part of the transition to digital government. To enhance results, efficiency, satisfaction, and well-being, this paper proposes a conceptual model for service design and delivery, which challenges governments to cultivate a design-led culture and assure access to supporting tools and resources. By analyzing the current scenario in Chile using this model, we may provide suggestions for improving the ChileAtiende service delivery network to bring the state closer to residents in a more streamlined, effective, and transparent manner. It offers digital government techniques that provide consistently high-quality service experiences for all users, in all settings, and via all channels by considering the overlap between digital, telephone, and in-person service channels.

#### **4.4. National Portal [NPR]**

Access to the latest government news and papers may be found on the country's main website (<http://www.gob.cl/>). The government maintains social media presence on various platforms, including but not limited to Facebook, Instagram, Twitter, Telegram, and YouTube. Over a hundred million people follow you on Twitter, yet you only have a few thousand subscribers on both Instagram and YouTube. Through its official accounts on several social media platforms, the government has done an excellent job of disseminating information and participating in public conversation. By subscribing to

these accounts, those interested in keeping up with the most recent operations of the government and providing feedback will be able to do so. When English is chosen as the language, the material is presented in English when it should be in another language. Simply clicking on the links, users will be sent to the websites of many other ministries. The general public sees it as a source of information; they do not consider it a service.

#### **4.5. Government CIO [GCIO]**

Chile is currently not participating in any CIO-related activities. The government's Chief Information Officer (CIO) can use various technological tools to enhance existing public services. In addition to enhancing overall productivity, it also helps to foster more collaboration amongst different departments. Many industrialized nations have enacted laws establishing a Chief Information Officer for the government. Over time, they have made considerable strides in improving the quality of their service. It is anticipated that the Chief Information Officer of the Government will play a part in the administration of Chile in the not-too-distant future.

#### **4.6. E-Government Promotion [EPRO]**

The administration of Chile is often regarded as the most dynamic in Latin America and the Caribbean. ChileAtiende, the multichannel method of service delivery used by the Chilean government, can manage up to 67 million interactions annually. Significant gains have been made at the institutional level, the most notable of which is the strengthening of digital government governance. The new government led by Sebastian Piera is making significant strides in transitioning to a digital-first public administration. This includes the passage of a Presidential Instructive on the Administration's Digital Transformation and an ambitious proposal for a Digital Transformation Law<sup>2</sup>. As part of this program, the government plans to deliver eighty percent of its services online by 2021, and the full complement will be available online by 2023.

#### **4.7. E-Participation [EPAR]**

The number of people participating online strongly correlates with the amount of publicly available data that is easily accessible. The government has built social media accounts and made information available on its official websites to make it simpler for citizens to communicate with the government and the government to communicate with the public.

Checking their mobile phones is one way for public members to get information about various topics, including the activities and intentions of the government. In addition, children can voice their ideas and engage in online debates when they go online.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

To aid with the digitization and connectivity of public services, Chile was granted two loans from the IDB totaling US\$400mn in 2021. Loans of US\$100mn based on policy and US\$300mn based on outcomes are part of the operation. As stated in an IDB news release, the former includes two separate yet interconnected procedures. Policy goals include helping people return to work, formalizing their job status, particularly women, and speeding up the public sector's digital transformation and connection. In addition to funding the execution of the digital transformation legislation, the government will also invest in creating and rolling out cross-cutting platforms and other digital tools.

Public institutions are increasingly integrating their digital and available government objectives to maintain coherence in their use of technology as an enabler of open government. This study compares and contrasts the organizations coordinating and leading public government projects in Canada, Denmark, Portugal, and Uruguay. It is common practice in many nations used as an example to establish a centrally located open government unit or task force that works with private industry and non-profits to create and monitor available government programs. This method cuts across several disciplines and is the norm in the nations used as examples. Even if they aren't the ones leading or directing the reference group, many countries nevertheless depend on digital government entities. Eight states served as a reference group to create and launch the Open Government Data Strategy (OGDS). To promote open government in today's society, ICT is essential, as is a coordinated strategy based on identical aims, such as unrestricted access to information and "open by default" standards for government data.

#### **4.9. Cyber Security [CYB]**

COVID-19 has sped up the digital changes in the banking and government sectors, leading to an even more significant dependency on digital infrastructure. Cybersecurity has never been more critical than during the pandemic when protecting mission-critical businesses and government organizations from assaults launched over the internet. In

addition, the national policy details specific objectives and standards meant to promote and safeguard an open, free, secure, and resilient cyberspace. These goals and requirements are specified in the policy. The nation has demonstrated that it is capable of reducing the access gap, increasing awareness about the safe use of information and communication technologies (ICT), and maintaining its position as the leader in technological innovation thanks, among other initiatives, to the Digital Agenda and the Productivity, Innovation, and Growth Agenda.

#### **4.10. The use of Emerging ICT [EMG]**

Chile has made history by announcing what is believed to be one of the first national policies on artificial intelligence. Individuals utilize artificial intelligence (AI) all the time, even in their day-to-day lives, to make decisions about what movies and music to watch and where they want to travel. Blockchain technology was initially used in the energy industry in Chile, making it the first nation in Latin America to do so.

This "Open Energy" platform, which has been modified to incorporate additional public data sources in Chile, was presented with a national innovation award. The award was granted in recognition of the platform's innovative capabilities. However, RENOVA was the governments only publicly declared application in the energy sector before the company's foundation. As the pressure on governments to meet their 2050 climate objectives increases, so does the urgency with which they must address the need to account for low carbon production. Using this technology in various ways, Energy Web spearheads several efforts to monitor renewable energy or credit.

China

## 1. General Information

Area: 9,706,961 km<sup>2</sup>

Population: 1,425,869,634

Government Type: Unitary Marxist–Leninist one-party socialist republic

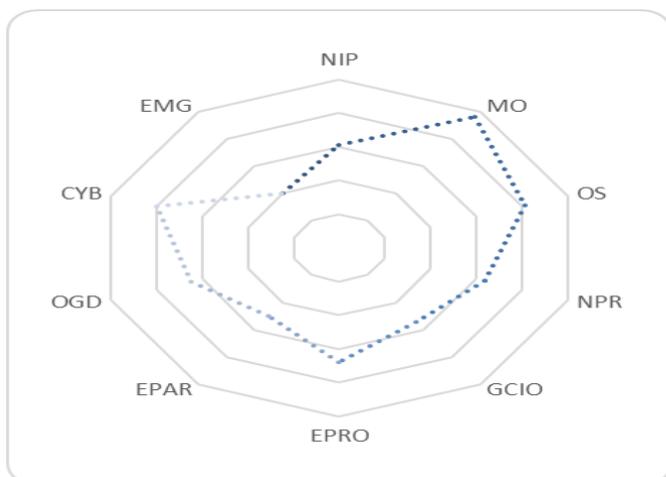
GDP: \$10,423

Internet User: 70.40

Wired (Fixed Broadband User): 33.60

Wireless Broadband User: 94.83

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

With a score of 66,214, China moved to 44th place in the Waseda International Digital Government Rankings for 2022. China's digital monitoring and smart city infrastructure were tested during the Covid-19 crisis, fostering development and innovation across the board, from robots to AI (AI). The government relied on the commercial IT sector to provide data-driven solutions in the battle against the virus, embracing digital

technologies. Some examples include AI and big data-driven platforms and models for healthcare communication, illness prediction, and resource management; movement-tracing applications; face recognition and thermal imaging systems; and more.

The construction of China's digital government has taken several years. The country's adoption of cutting-edge internet technologies and Digital Government programs is increasing in tandem with the rapidity with which it embraces digital transformation. Expanding government activities beyond essential digitization to establishing networks and intelligence to assist its people is made possible by developing and deploying new technologies.

The notion of hastening the building of a digital China was proposed during the 13th National Committee of the Chinese People's Political Consultative Conference as part of the country's 14th Five-Year Plan (2021-25), which establishes a firm course for China's future growth. To speed up the transformation of industrial production, everyday life, and government, we will have to activate the potential of data, promote China's "Internet Plus" policy, and move on with establishing a digital economy, a digital society, and a digital government. Among these are the improvement of public services by making them more user-friendly and technologically advanced, the creation of "smart cities" and "digital villages," the reinforcement of privacy while fostering the sharing of public data, and the promotion of the co-construction and co-use of government-related data.

### **3.2. New Trends**

The worldwide demand for digital tools and services increased dramatically during the epidemic, which boosted China's efforts to market its smart city technology. Many Chinese businesses sold "epidemic prevention and control" tools to local governments in China. These tools included drones, thermal cameras for temperature screening, contact tracking systems, and more. Beyond the current health crisis, these innovations may have far-reaching consequences on international technology markets. China will hasten the development of its digital government to boost government efficiency. The summit concluded that the country should establish a national digital government network to facilitate better information exchange at the local, regional, and intergovernmental levels and to expand the availability and scope of the country's digital public services.

The panel also agreed upon the necessity to promote market regulation digitization and boost digital technology use during big emergencies. A targeted re-lending scheme with a quota of 200 billion yuan (about \$31.3 billion) was approved at the meeting to promote green growth by encouraging the clean and efficient use of coal. The policy supports like tax incentives, special government bonds, and trade-in projects will also be introduced as part of the re-lending program, as was discussed during the conference.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

While Southeast Asia (SEA) is currently in the peak period of the demographic dividend, China is transitioning towards the information and data dividend. More than forty percent of the nation is already served by 5G in China, and the percentage of homes that can get at least one hundred megabits per second by fiber optics is over ninety percent. However, the usage of 5G on a significant scale has just recently begun in a few of Southeast Asian nations. The coverage of 4G mobile networks in Southeast Asia is only slightly more than 50%, while just one-third of homes have access to fiber internet. The percentage of Southeast Asian businesses that are using the cloud is less than twenty percent, which implies that there is a significant opportunity for the monetization of data and the digitization of industries.

##### **4.2. Management Optimization [MO]**

According to the standard, more improvements will be made to the overall design of a digital government consistent with contemporary governance by 2025. By 2035, we should have a digital government that is well-coordinated, efficient, intelligent, and open to all citizens. The guideline lays forth a number of essential tasks and methods, such as improving economic data monitoring and analysis, optimizing digital services to aid firms and the public, and establishing a supportive digital ecosystem, that must be taken to realize these objectives.

The guideline proposes constructing a system of open and shared data resources to improve data management procedures, foster more effective data sharing, and encourage the systematic growth and use of data. The standard emphasizes technological advancement and calls for the complete merger of government administration with digital

technology.

### **4.3. Online Service [OS]**

China's Digital Government has three distinct phases: the information phase, the data phase, and the intelligent phase.

The foundation of the Digital Government is laid in the information phase. Paperless offices, Government Affairs Service Information, System Cloud, and other online services emerged in the 1990s, thanks to the internet's rise and information technology's advances. The problem was that it was a paradigm of service that was one-way and hence ineffective in bringing about transformation. It wasn't precious, to begin with.

This current era is the era of digitalization. There has been a shift in public perception about the importance of the data we gather and how it might be used to better government services due to the proliferation of modern digital infrastructure and technology. There was a simultaneous shift from a passive model of service delivery to one that integrated systems across agencies and administrative tiers in the government's online offerings.

Regarding digital rules, the future belongs to the Intelligent Stage. Digital Governments will be able to effectively evaluate the complicated social environment and capture the requirements of many people and businesses as data technology and intelligent technology continues to develop. We shall witness a shift from social governance to co-governance among all social forces using big data, cloud computing, artificial intelligence, and other technologies combined with the openness of data resources.

#### **4.4. National Portal [NPR]**

The China Government Network, which can be accessed via [www.gov.cn](http://www.gov.cn), is used by the State Council of the People's Republic of China as an all-encompassing platform for publishing government information and providing online services. The official website of the Chinese government has been updated to include new sections such as "State Council," "Premier," "News," "Policy," "Interaction," "Services," "Data," and "National Conditions," among others.

#### **4.5. Government CIO [GCIO]**

In China, the responsibility of chief information officers (CIOs) is typically assigned to the departments in charge of the CIO's job. These various departments fall under the purview of a number of different government agencies, including the Office on Cyberspace Affairs, the Government Office, the e-Government Office, the Information Office of the Development and Reform Commission, and the Industrial and Information Management Department. Each of the central and local governments has a number of departments that are responsible for CIO functions.

The majority of the public sector does not have a GCIO, including the State Administration for Taxation and the General Administration of Customs. The meeting of the Central Leading Group on Cyberspace Affairs was called to order by President Xi Jinping of China on February 27, 2014.

#### **4.6. E-Government Promotion [EPRO]**

In China, IT is given top priority by the government. China's 13th Five-Year Plan, released in 2016, outlined plans to hasten the development of a "Digital China" by using a "Internet Plus" approach. The most recent Five-Year Plan emphasizes boosting the digital and intelligence levels of public service and social governance and bolstering the construction of a digital society and a Digital Government.

Construction of network infrastructures like 5G, new technology infrastructures like cloud computing, and computing infrastructure like data centers are all part of the New Infrastructure movement that is boosting China's digital government growth. As part of the ongoing effort to modernize the country's infrastructure, the major emphasis since

2020 has been creating a digital government, with New Infrastructure expanding into other sectors occurring more gradually. Thus, the degree of growth of China's Digital Government will be profoundly impacted by the progress of China's New Infrastructure.

#### **4.7. E-Participation [EPAR]**

E-participation in China is still a limited means of involving Chinese citizens as critical stakeholders in developing information and communications technology in China, even though it has significantly expanded in recent years. Blogs and other types of online engagement in China's e-Government will not provide regular netizens with the same weight in the decision-making process on the country's policies.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

With the 14th Five-Year Plan and the post-epidemic period as a backdrop, the Chinese government needs a new digital transformation strategy to produce more agile, adaptable, and scalable goods and services. Artificial intelligence (AI), the future of intelligence (FoI), the future of work technologies, and other research subjects combining China government features and new technology are important elements of this program. Additionally, Open Data China focuses on three areas: open governance of digital rights, commercial models for openness, and governance of vital digital resources (such as data). We ran a number of projects from 2015 to 2018, but Shanghai Open Data Apps (SODA) was the longest-running and most well-known. It started as a competition for local open data and has now developed into a blueprint for how to run an open data ecosystem in a community setting.

From a governmental and legal standpoint, China has prioritized open data as part of its big data industry's forward momentum, increasing the number of open data portals from three in 2014 to over one hundred fifty by 2021. The groundwork for a nationwide site has been laid, and it is now time for its debut. The country has enacted regulations mandating data sharing for all publicly sponsored research. Despite the optimistic picture, however, certain dangers may still exist. For instance, discussions on how to profit from publicly available data pose a potential risk to the open data movement. In addition, China's unique structure divides government data into non-open data, non-conditional open data (the usual open data), and conditional open data, which comprises several types

of data access. The potential for new obstacles to arise in China's pursuit of truly open data due to this framework's radical departure from the original notion of open data is high.

#### **4.9. Cyber Security [CYB]**

The Ministry of Business and Information Technology in China estimated that the country's cybersecurity industry will reach 250 billion yuan (about US\$40 billion) by 2023, thanks to increasing expenditure in telecommunications and other vital areas. Telecommunications and other fast-growing businesses like the Internet of Things and the manufacturing of intelligent cars will get a disproportionate share of the security budget increase. The income of China's online security service industry has more than quadrupled due to the success of the cloud, remote control, and other innovative services. Additionally, Shanghai uses digital networks to enhance municipal administration and strengthen cybersecurity. In today's digital age, people need to increase their consciousness of the need for cybersecurity. These gatherings educate the public on how to distinguish between reality and fiction on the internet, spot and avoid online fraud and keep their private data safe. The official Shanghai data use policy will include ten chapters and 91 lines of text, including a dedicated chapter for data security. Due to the new strategy, Shanghai can now coordinate its various departments' many public data resources. The policy will assist the city in enhancing digital management and stimulate innovation by verifying "data rights" and how to utilize them.

Threats to governments, economies, cultures, societies, defenses, security, and the legitimate rights and interests of individuals are increasing as the cybersecurity situation worsens daily. The economic security of China is in jeopardy due to cyberattacks. The whole economy and society rely heavily on networks and information systems. If they are attacked and destroyed, or if big security events occur, they will have terrible results and seriously undermine national economic security and the public interest.

To achieve its strategic goal of developing a strong cyber power, China will use the national security perspective as a compass to guide its careful planning of internal and foreign security growth. China is eager to work with all nations to improve diplomatic ties, broaden consensus, increase collaboration, speed up the reform of the global internet

governance system, and ensure the safety and prosperity of cyberspace for everyone. China would support reforming the global Internet governance system and work to improve international cyberspace communication and cooperation based on mutual respect and trust. China would also actively engage in global and regional organizations to foster cybersecurity cooperation and deepen bilateral and multilateral exchanges on the topic.

#### **4.10. The use of Emerging ICT [EMG]**

The Chinese government is now constructing the world's most comprehensive cyberspace and ICT regulatory framework. Beijing has moved swiftly to build a legislative and regulatory framework covering cybersecurity, the digital economy, and online media content, all under one aegis, in response to the government's inability to keep up with the fast pace of technological development.

Strategies, legislation, measures, rules, and standards intertwine under China's ICT governance framework. Data protection, CI, encryption, online content, and the development of China's information and communications technology sector are all addressed in these documents. China's cybersecurity legislation, the focus of most attention, is part of a larger strategy. Most laws and plans have been finalized, but many accompanying measures and standards are still in the planning stages. As parties within the Chinese bureaucracy continue to discuss implementation scope, it is important to keep an eye on pending standards, such as those pertaining to data flows, personal information, and CI.

The work in Beijing is already more extensive than in the United States and Europe. The U.S., for example, has no national-level data protection posture and has failed to develop a coherent policy for cyberspace outside the military realm. For its part, the European Union's General Data Protection Regulation (GDPR) is not directly coupled with more far-reaching national security and social stability aims.

Colombia

## 1. General Information

Area: 1,141,748 km<sup>2</sup>

Population: 51,913,498

Government Type: Unitary presidential constitutional republic

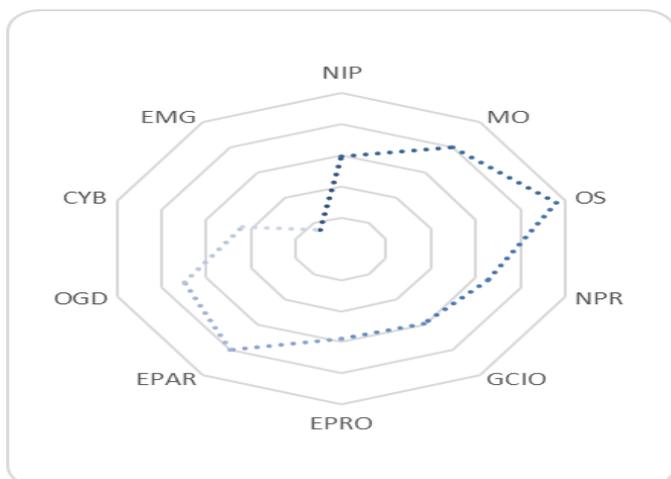
GDP: \$5,213

Internet User: 769.79

Wired (Fixed Broadband User): 15.26

Wireless Broadband User: 61.82

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

With a score of 66.298, Colombia placed 43rd in the world in the Waseda International Digital Government Rankings 2022. Because of the epidemic's effects, Colombia's GDP contracted by 6.8 percent in 2017, making it the worst year for economic growth since 1975. As a result, the country is placing its hopes on increased productivity by digital transformation. The central bank anticipates that the GDP will increase by 5.2% this year,

which is in line with the most recent projections made by the IMF, which are 5.1% growth in 2021 and 3.6% growth in 2022.

It is necessary to have efforts that are focused and well-located to help employees in the use of technologies. It was reported that there were gaps in the usage of digital platforms by instructors working in Colombian public schools during the epidemic. Olga Luca Acosta, the person in charge of the UN's Eclac office in Bogotá, recommended that the public sector play a more prominent role in helping the private sector while maintaining budgetary sustainability. The importance of international collaboration and finance cannot be overstated, particularly concerning the enhancement of productivity made possible by new technology.

### **3.2. New Trends**

The Colombian media industry has a history of cozy relationships with the country's political and economic elite. Though their impact seems to move online, new actors and social media alter consumer patterns. Though interest in reading and watching the news about the epidemic skyrocketed as individuals sought out information, the current economic downturn has prevented this rise in interest from translating into increased advertising revenue.

About 90% of Colombians use their phones to read the latest headlines. Digital native media outlets like El Paciente Colombiano, Conversemos de Salud, and La Silla Vaca have capitalized on this shift to give in-depth coverage of medical and scientific developments in Colombian society. In contrast, several broad-based news outlets failed to report COVID-19 because they lacked sufficient numbers of trained reporters. Public concerns were bad, but the politicization of problems, in general, was far worse.

Users on social media have voiced their fear that misinformation is being spread concerning COVID-19 and vaccinations. They've taken measures to combat the spread of disinformation with the support of established media outlets. To correct the record, some radio stations ran an advertisement dubbed "Vera, the Voice of Truth" (which embodies the social responsibility of traditional radio stations). Compromises with local internet media like La Silla Vaca and Colombiacheck aided in spreading false information about the outbreak. Facebook and the World Health Organization (WHO) agreed to have official

Ministry of Health information on COVID-19 linked in Colombian users' news feeds to reduce the spread of fake news.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Colombia has been working to overcome several obstacles to reach broad Internet usage. The digital ecosystem may face various challenges, including its infrastructure, services, applications, and consumers.

People do not believe the Internet has any practical use. According to the findings of several surveys, one of the primary reasons why members of the general public and smaller businesses do not utilize the Internet is that they do not consider it beneficial or essential. This viewpoint might be explained by the dearth of specialized and helpful apps and material aimed at the general public and smaller businesses.

##### **4.2. Management Optimization [MO]**

The ICT ministry has highlighted a multi-million dollar strategy to assist people and businesses in updating existing business models and developing new income streams via technology to stimulate economic growth. For example, the Vende Digital initiative is part of a larger package of policies and programs (some of which were initiated by previous administrations) to assist micro, small, and medium-sized firms in transitioning to digital sales channels.

According to Rueda, the government has already launched 24 centers to help enterprises undergo digital transformation in collaboration with regional business groups. The source also referenced another program included in the "bundle," which included issuing credit lines for working capital by SMEs at preferential interest rates without the requirement for guarantees. Bancoldex and the National Guaranty Fund have contributed to this initiative.

The agreement also includes the US\$24mn Misión TIC 2022 software developer training program. One hundred thousand people from Colombia will get coding education next year. According to the official, 54,000 Colombians begin training this month at partner colleges after the initiative was ramped up from a test phase in 2020.

##### **4.3. Online Service [OS]**

To facilitate electronic payments from bank accounts, Colombians have been working on an online payment system for the last decade, which has been incorporated into government and commercial websites. This case study was based on interviews with ACH Colombia's administration, stakeholders, and PSE users. The Better Than Cash Alliance case studies provide several instances of the invaluable role that individuals and businesses play as funders.

The National Coffee Growers Federation of Colombia saved roughly \$15.5 million over seven years by switching from cash to payment cards. Significant savings were realized due to paying coffee farmers using credit cards rather than cash. It was also an opportunity to promote financial inclusion, a particularly challenging goal in rural areas. There has never been any investigation of this scope on B2B interactions in rural areas. As part of their study, Federación and banks conducted focus groups and in-depth interviews with coffee farmers.

#### **4.4. National Portal [NPR]**

The major objective of GOV.CO is to streamline and centralize the delivery of procedures, services, participatory activities, and information about institutions. The ability to quickly adapt to changing conditions while focusing on the end-user's requirements is essential to the success of GOV.CO. In the past, residents had to go through more than 8,000 websites to access the many procedures, services, information, and involvement activities. GOV.CO is a public service available to all Colombians and foreigners who interact with the government and those who wish to influence the development of policies and programs that improve their quality of life. Those who wish to interact with the government can visit the website.

#### **4.5. Government CIO [GCIO]**

According to Colombia's Minister of Information Technology and Communications (MICITC), the country's deputy minister of information technology serves as the top information officer for the government. No more information is available about the Chief Information Officer of the Government.

#### **4.6. E-Government Promotion [EPRO]**

Insufficient digitization and interoperability across institutions have been cited by Colombia's National Planning Department as a major barrier to the country's digital transformation. Superintendence of Industry and Commerce ("SIC") published External Circular No. 04 of 2019 in response to these challenges, outlining guidelines to protect personal data while promoting digitization and interoperability of public entities and individuals exercising public functions to prioritize the use of information technologies for the benefit of the general interest.

The following legal framework is included in these Circular recommendations; we find it useful since it focuses on the priority of using new technology. This law includes pertinent provisions such as a restriction on changing information after it has been entered in a patient's medical history, even if the change is an update to remedy a mistake. Accordingly, and to meet the requirements of the relevant rules, it may be necessary to use certain technical instruments to provide a greater degree of security for the integrity of the information.

#### **4.7. E-Participation [EPAR]**

Urna de Cristal, often known as Crystal Urn, is the government's official website in Colombia, which may be accessed at <http://www.urnadecristal.gov.co/>. This website provides access to a range of government agencies in Colombia and information on current themes and possibilities for individuals to participate in their government. Citizens are strongly urged to participate with the government through social media and this website, both of which provide them with the opportunity to do so.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Even though Colombia has made some significant steps in recent years to encourage digital transformation, more needs to be done to guarantee that the potential and advantages of digitalization are spread across the economy and all sectors of society. Going Digital in Colombia analyzes the state of digital adoption and readiness in the nation, then provides a plan for establishing a comprehensive digital policy framework. As part of a larger National Digital Strategy for Colombia, it recommends various policies to improve connectivity, boost the adoption and use of digital technologies, foster digital innovation, develop skills and the labor market for the digital economy, and seize new

growth opportunities about digital transformation.

The release of publicly held government information is essential for achieving social and economic goals. Over the last several years, Open Data Portal in Colombia has seen a significant rise in the number of datasets available to users and a considerable improvement in the simplicity with which users access those datasets. Despite this, the most significant benefit Colombia can reap from its investments in projects that encourage the reuse of OGD is the growth of data journalism in Tamalemeque and hackathons hosted by the Digital Public Innovation Center. Both of these initiatives have already been shown to be successful. It is essential to contact potential consumers of open data to understand the criteria they utilize. To achieve the best possible results in terms of economics, society, and governance, the policies of any institution need to include the aforementioned examples. Open data users are not only those the government does not employ; they are the producers and consumers of the data made available to the general public. In light of the circumstances, this is quite important. Open data is such a fantastic resource that the public sector has to formulate a plan for using it since it is so important.

#### **4.9. Cyber Security [CYB]**

Modifications are being made to the legislation governing the privacy of personal information in Colombia. The government has often emphasized modernizing and strengthening data security regulations. It is anticipated that many regulatory hurdles facing the digital economy will be lowered while still providing for people's safety. Colombia's data security system continues to use the DataBase Registry even though it has been decommissioned in the European Union. As a result, the country's rules on the transfer and transportation of data are unlike any others on the globe. The purpose of laws is to maintain the status quo while simultaneously protecting the rights of citizens.

In addition, legal changes are being implemented in Colombia. When the government first released its cyber security strategy for government agencies in 2016, it paved the ground for establishing a centralized reporting mechanism for cyber attacks. Nonetheless, the existing setup is inadequate. National efforts to improve citizens' knowledge of cybersecurity and familiarity with digital tools are being coordinated by the government, businesses, and the creation of a register of essential infrastructure. Data protection and compliance standards have also developed over time.

Colombia has developed a robust regulatory system to protect its banking sector from cybercrime. Financial institutions in Colombia are governed by "Circular 005" released by the Financial Superintendence at the start of 2019. Standards for cloud computing services and cloud security have been set by the Ministry of Information and Communication Technologies, calling for limits and unique creativity.

#### **4.10. The use of Emerging ICT [EMG]**

While Colombia's software and services industry has grown into a significant nearshoring hub, the country's ICT hardware sector remains tiny, and the market is dependent on imports. In 2021, as global vaccine efforts reduce uncertainty and boost foreign demand, Fitch Solutions expects the ICT market to rise by 12 percent, led by corporate and consumer mood. As a result, the software and services industry will benefit from increased private sector investment expenditures. Many software companies in Colombia are aiming for growth on a regional scale. Finance software, computer graphics software, and mobile and online application development are local software companies' strong suits. The Colombian legislature approved the ICT Sector Modernization Law on July 25, 2019. (Law 1978 of 2019). The purpose of this law is to close the digital divide in Colombia. Its goal is to stimulate the information and communications technology market by encouraging established and up-and-coming businesses to create ground-breaking initiatives related to ICT services, broadening their reach and making them more accessible to everyone.

Costa Rica

## 1. General Information

Area: 51,100 km<sup>2</sup>

Population: 5,180,829

Government Type: democratic republic

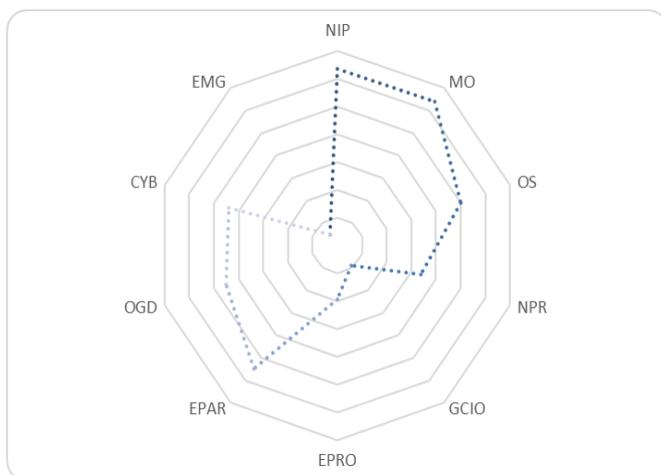
GDP: \$11,995

Internet User: 80.53

Wired (Fixed Broadband User): 19.49

Wireless Broadband User: 91.12

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Overall, Costa Rica scored 45,687 on the Waseda International Digital Government Rankings 2022, placing it 64th. The COVID-19 pandemic exposed the need for easier access to government services via digital channels in the wake of a public health, social, and economic disaster. In an age when avoiding large crowds was paramount, digital governance was crucial for state institutions to be open and functioning to react to the

requirements of residents. Costa Rica has long been a pioneer in Central America in the domains of information and communications technology (ICT) and the environment; nevertheless, it does not have a well-developed public policy in this area. On the other hand, private initiatives in the country are working to advocate for and promote environmentally friendly information technologies. One such initiative is called "Smart and Green Costa Rica," hosted by the Costa Rican Chamber of Information and Communication Technologies.

Costa Rica, with its steady workforce and practically fossil fuel-free power, has been preparing for the future of employment in digital technology for more than a decade.

The government has committed to constructing technological clusters specializing in various fields, such as technical assistance, software creation, maintenance of legacy systems, cloud computing, and cyber security. The technology companies of Costa Rica have also shown their ability to do research and development in the fields of content creation, engineering and design, and embedded software.

### **3.2. New Trends**

The COVID-19 pandemic exposed the need for easier access to government services via digital channels in the wake of a public health, social, and economic disaster. Services' digitization capabilities and digital inclusion are crucial for future-proofing public institutions against catastrophes. For this reason, several nations in the area have embarked on large-scale programs to modernize their governance processes and services via information technology. The government of Costa Rica is striving to become digital and open the country up to the benefits of Industry 4.0 in sectors like agriculture and tourism. It also establishes a timeline for deploying 5G wireless networks to aid the government's digital transformation. The central American government strives to improve digital accountability and governance in response to cyber-attacks.

To improve digital governance, "Pura Vida Digital" will create a centralized online catalog of citizen services, a unified national patient record for the healthcare system, and a nationwide "intelligent" transportation network that accepts electronic payments. For this plan to work, everyone must have access to digital IDs with biometric features, and existing ID-checking technologies must be compatible. The government will apply the

ideas of Industry 4.0 to vital industries like agriculture and tourism by developing digital agricultural production maps and entrepreneurial clusters.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

In the recent decade, Costa Rica has achieved progress in digital inclusion. The E-Government Index's performance, which measures the desire and ability of national administrations to employ information and communications technology (ICT), has improved. The nation continues to lag behind inaccessible government data regulations, scoring lower than the averages for the area and the Organization for Economic Cooperation and Development (OECD) in the OURdata Index.

##### **4.2. Management Optimization [MO]**

The first phase of creating the national telecoms development plan for 2022-2027 was finished at the end of June with involvement from the government, corporate sector, academic community, and civil society. As Deputy Sector Minister Teodoro Willink had previously explained to BNAmericas, the idea was presented to the public on the national holiday dedicated to the telecommunications industry.

##### **4.3. Online Service [OS]**

For the first pillar of the OECD Recommendation, which deals with the Constitution, digitally enabled openness evaluates the government's use of digital technology to increase transparency, engagement, and inclusivity. Improved openness, accessibility, and transparency in government procedures are among the goals of the Constitution's digital technologies. Transparency and public access to information are guaranteed under Costa Rica's robust democrConstitutionn. A new legislative and regulatory framework for transparency and public access to information is now under discussion.

The Presidency Ministry is responsible for leading the National Commission on Open Government, which monitors government openness. Subcommissions within the National Commission focus on support systems, participation, training, transparency, or territorial collaboration. Increasing ease of access is essential in light of the widespread nature of digital service providers. The authorities are trying to learn more about the open

data ecosystem's producers and users to serve everyone involved better.

It is more difficult for people to access and use public services and data and for governments to react to citizens' demands holistically and integrate them when they are treated as separate entities. To overcome this obstacle, OECD developed centralized government services based on life events rather than government structure.

#### **4.4. National Portal [NPR]**

The government of Costa Rica has kept an open data site with many resources available. However, the adoption of open government data is hindered by the absence of necessary norms and legal frameworks. Among other things, this explains why the NPR indicator for the nation remained placed last out of 64 on the list. Since many businesses do not see the benefit of sharing data, the public sector, in particular, needs to learn more about the topic. The amount of public datasets is low, and the number of organizations offering datasets is around average compared to OECD nations, as the Open Government Data website reported. So the nation has a poor record of providing open government data.

The government's new data policy is up for comment. It creates a national open government data policy framework, a method for selecting datasets for publishing, release rules, and means for engaging and assuring effective engagement by the data consumer community in executing open data policy.

#### **4.5. Government CIO [GCIO]**

Since 2009, Alicia Avendao Rivera has been serving as the Director of Digital Government in Costa Rica, the job that most closely corresponds to the duties of the Chief Information Officer in the United States. Projects, Technology, and Digital Inclusion are the three divisions that fall under the Director's purview as responsibilities of the Digital Government. They are responsible for delivering reports to the Minister of the Digital Government.

#### **4.6. E-Government Promotion [EPRO]**

Costa Rica is in the process of formulating an information and communications technology (ICT) and environmental strategy that three pillars will support. The major objective is to advance research via collaborative efforts with academic community

members. The second endeavor is a program for increasing one's ability, and it is being carried out in partnership with the National Learning Institute, also referred to as INA. Thirdly, the MICITT, the MINAE, municipalities, and other stakeholders educate the general public and customers about the use of technology and its potential to enhance its environmental performance.

A culture of sustainable development has also been formed in Costa Rica thanks to the country's laws, economic practices, and citizens' actions. One strategy that has been used in recent years is the creation of voluntary programs to assist businesses and organizations in improving their environmental performance. These programs are intended to be used in conjunction with other methods.

#### **4.7. E-Participation [EPAR]**

The democratic institutions of Costa Rica encourage citizen engagement through the fundamental principles outlined in the Constitution. These aims may be strengthened by establishing a legislative framework that regulates public participation in policymaking. In Costa Rica, significant advancements have been made in law, service design, and service delivery. The importance of national efforts cannot be overstated. The National Commission for Open Government is now working on new laws on urban renewal in addition to the decrees on information freedom and open government data that were recently passed.

The Ministry of Economy, Industry, and Commerce (MEIC) is now leading major national programs to integrate user input into service design and delivery. This is part of the Ministry's efforts to simplify administrative processes. Including users and other stakeholders in the most important administrative duties is crucial to provide more user-centered and user-driven services. In addition to that, several programs encourage the reuse of data to reinvent public services. Innumerable municipalities, for instance, have established participatory budgeting systems, made data on public assistance available to stimulate the development of new public services, and made it possible to provide input on municipal operations online.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Businesses need adaptable partner ecosystems to thrive in the new normal, particularly in

Industry 4.0. In addition to helping with the skills shortage, achieving organizational objectives, and speeding up the digital transition, internationalization is an excellent strategy. Now more than ever, it's crucial to make the most of the benefits offered by digital technology. Expertise, creativity, a resilient attitude, and strategic connections outside the headquarters or in a new location are necessary to enable this comprehensive shift. Some of the most critical factors in achieving the transformation agenda include having access to a talent pool that can drive the organization's vision and purpose, having competitive prices, making it simple to conduct business, and having cutting-edge technological capabilities. Costa Rica is becoming well-recognized as a center for technological innovation. There are already over three hundred firms providing cutting-edge IT services, fifty Fortune 500 businesses with established offices, and four hundred technology startups proving Costa Rica's economic worth.

It is essential to strengthening public institutions' institutional ability and legitimacy by forming pro-transparency coalitions among members of civil society, the commercial sector, and local governments. It is possible for Costa Rica, via the use of Open Data projects, to raise the level of citizen involvement in the public arena, which would result in a considerable improvement in the delivery of services by the government.

At this time, Costa Rica is in the process of transitioning from Open Government to Open Data. This is made possible by the active engagement of the Judicial and Legislative departments and local authorities. Participation from every societal level, including the individual, is required if this shift is set in motion successfully.

#### **4.9. Cyber Security [CYB]**

The Ministry of Information and Communication Technology (MICITT) of Costa Rica, in partnership with Amazon, Trend Micro, Inc., and Venable, oversees three initiatives to increase the number of qualified cybersecurity professionals in the area. The Ministry of Science, Innovation, Technology, and Telecommunications (MICITT) of Costa Rica plans to carry out three separate initiatives. All to assist businesses and improve their cybersecurity measures.

Concerning this matter at the national level, the Ministry of "Current ransomware assaults are far more sophisticated than those of the past. In the first few months of this year, we saw a rise in the prevalence of ransomware families, with many of them using a RaaS

(Ransomware as a Service) model and resorting to triple extortion in order to monetize their assaults." He also said that all sizes of businesses are fair game. The release of three cybersecurity tools to public and private enterprises was officially announced on August 12. These tools will develop and strengthen IT professionals' knowledge and abilities, making the nation more prepared to deal with cyberattacks.

#### **4.10. The use of Emerging ICT [EMG]**

Artificial Intelligence (AI) is a game-changer because of its very nature. Costa Rica seems better prepared for the possibilities presented by AI than its neighbors. Because of this, Costa Rica will fall behind in providing the next generation of services. As a result of Intel's decision to spend \$800 million in the area in 1997 and build the continent's giant microprocessor plant there, the city of San José, Costa Rica, with a population of over five million, has been widely recognized as Central America's technological core. This has not slowed down at all.

Internet of Things (IoT) and artificial intelligence (AI) networking and monitoring firm GBT Technologies of Costa Rica has launched nationwide testing of its product. Healthcare counseling, engineering design, consumer assistance, and financial analytics are a few of this method's potential domains of use.

The effectiveness of data-driven operations may be improved by connecting more devices to the Internet via the IoT. To participate in event-driven, self-managing logistics, commonplace objects may now send and receive data and process and store it. The IoT may provide helpful information that will inspire new theories and approaches to old problems. There has been a notable improvement in efficiency and customer satisfaction in the logistics industry because of the proliferation of IoT devices and data. Thanks to rising interest and investment, sensors and IoT systems are more attractive to logistics companies. Smaller and cheaper Internet of Things devices is becoming more accessible as technology advances. The gathering of unprecedented data is a direct outcome of developing novel sensor placement methods using sensors no bigger than a millimeter.

Czech Republic

## 1. General Information

Area: 78,865 km<sup>2</sup>

Population: 10,493,986

Government Type: parliamentary democracy

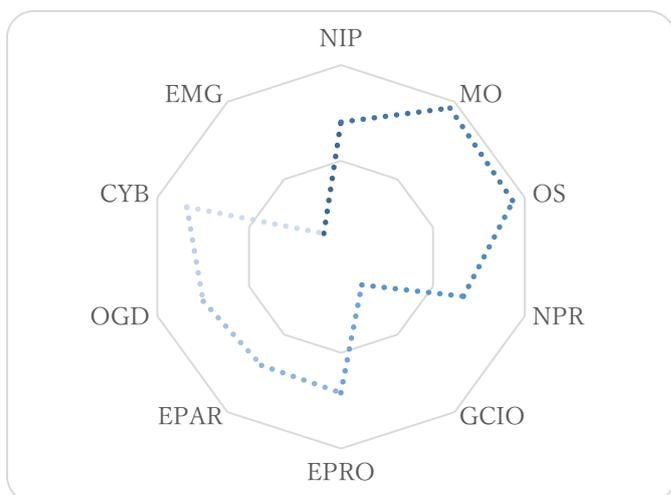
GDP: \$23,379

Internet User: 81.34

Wired (Fixed Broadband User): 35.91

Wireless Broadband User: 94.40

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

In 2022, Czech was ranked 39th in the Waseda ranking, with an overall score of 68,530. The COVID-19 epidemic has hastened the transition to digital services in the Czech Republic, as elsewhere. Most government agencies are now using cutting-edge technology tools to streamline their operations. Certain government agencies dispersed

state help to companies that had lost money during the COVID-19 outbreak utilizing their online platforms. To better educate company owners about government assistance programs and recent policy changes, the Ministry of Industry and Trade has established an information chatbot and increased the number of electronic forms accessible on the businessinfo.cz website. Due to a lack of PPE in the healthcare industry, the Czech government launched the website "We are linking the Czech Republic" (spojujemecsko.cz) to facilitate communication between public and private entities and the submission of bids for the supply of PPE.

Following the pledges made in the Berlin Declaration on Digital Society and Value-Based Digital Government, the Czech Republic continues to implement digital government initiatives during 2022 as part of its Digital Czech Republic government program. In its policy statement, the new government led by Petr Fiala reaffirmed digitization as a national priority and outlined critical initiatives for the coming period. These key initiatives include finalizing the Act on the Right to Digital Services, creating a central coordination team to support the digital transformation of central and local administrations, and accelerating digital skills development and capacity building. The goals of the digital transformation activities will be to improve digital government services, increase transparency, strengthen cybersecurity, improve connectivity, and build new networks.

### **3.2. New Trends**

The COVID-19 pandemic severely taxed health and human service (HHS) professionals. However, it also sped up the introduction of digital solutions, which have reaped many advantages for service users and providers. Both the administration of public services and the administration of public services themselves are decentralized in the Czech Republic. As a result, regional and municipal authorities are responsible for creating eGovernment policies and strategies within their respective realms of competence, while the National eGovernment Strategy defines a common approach. In addition, the National Association of Regions and the Union of Towns and Municipalities collaborate to establish complementary strategies and encourage their members to share and learn from the best practices.

The Internet of Things (IoT) is a component of the national Smart City and Industry 4.0 plans, implemented by the Digital Czech Republic program through several projects. Through Government Resolution No. 441 /2021, the Smart City Strategy was authorized for implementation. Beginning in 2023, the Ministry of Regional Development will begin presenting an annual status report to the Government on the significant milestones of the implementation plan for the strategy. To account for the advancements that have been made, the Smart City approach has to be revised no later than 2026. The Smart Cities Working Group's meeting minutes may be found on the website devoted explicitly to the group.

One of the top concerns of the country is working on expanding and improving access to public information. The Open Data Initiative is one of the primary focuses of the Czech Republic 2030 Initiative, which establishes a strategic framework for the country's long-term growth and ranks it as one of its essential goals. The National Open Data Coordinator is responsible for organizing several events in 2022 to promote further and assist the deployment of data-based digital governance.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Both the management of public services and the administration of public services in and of themselves are decentralized in the Czech Republic. In addition to offering the people in their respective regions their digital services, 14 provinces and 6,258 municipalities use the infrastructure and service provided by the eGovernment located in the central government. Consequently, regional and municipal authorities are responsible for formulating policies and initiatives related to eGovernment within their particular areas of expertise. On the other hand, the National eGovernment Plan is in charge of determining a standard strategy for use across the board.

##### **4.2. Management Optimization [MO]**

This digital overhaul effort is a foundation for the complete computerization of government operations. The initiative focuses on the state's information and communication technology (ICT) infrastructure and digital administration, as well as the digital economy and society within the framework of a single digital market (the Czech

Republic in Digital Europe). Annual revisions are made to the program's implementation plans. Among the priority, projects are Base registries 2.0, the modernization of the public administration portal and its transactional component, the Citizen's Portal, the generational technological change of the Czech POINT system, and the further interconnection of public registries and databases known as the interconnected data pool. The Integrated Regional and Operational Program will co-finance the eGovernment development for 2021-2027. The Digital Czech Republic Strategy is in complete accordance with the Innovation Strategy of the Czech Republic for 2019-2030, which has a greater reach. In the context of the COVID-19 pandemic and the development of the National Recovery Plan, practical digital projects are considered a crucial element of future resilience and competitiveness. National digital goals include database-driven digital governance, digital skills, cybersecurity, and innovations centered on people. Political leaders are aware of the complexity of digital transformation and the necessity for a well-coordinated strategy to handle the benefits and problems that come with it. Teams of government specialists, business representatives, and other stakeholders collaborate closely to define the best plan for achieving the desired goals. Negotiations and active communication are moving toward the purposes outlined in the Czech Republic's 2019–2030 Innovation Strategy. By 2030, the Strategy wants to make the Czech Republic one of Europe's most inventive nations. The Strategy includes eight additional strategic pillars in addition to the initiatives focusing on digital government and services, including funding and evaluation of R&D, polytechnic education, a favorable national environment for start-ups and spinoffs, innovation and research centers, wise investment, intellectual property protection, a suitable environment for mobility and construction, and intelligent marketing.

#### **4.3. Online Service [OS]**

The National Identity Authority (NIA) offers an electronic identity based on a person's name, password, and a code sent via SMS, as well as the Mobile eGovernment Key application, which uses a QR code. Czech citizens can also identify themselves using electronic identification methods when accessing digital government services. They may also utilize the eID methods made available by private eID providers, such as the Bank ID of several accredited banks. Citizens may activate their Data Mailbox service, which

can be done online using any of the eID mentioned earlier methods, to fully benefit from the advantages of safe online engagement with the government. Here you may see the country's certified eID service providers list. This page publishes the most recent list of internet service providers.

The website for the national electronic identity and authentication hub is called the National Identity Authority (NIA) Portal. It offers details on how to create a digital identity guaranteed by the State and have access to personalized and secure digital government services. The Portal also thoroughly describes the procedures involved, offers all required paperwork, and gives instructions to promote transparency and foster confidence in digital services.

The Czech Republic created many electronic identification methods so that people would have more choices when identifying themselves online. These methods may be used to access digital government services from the Citizen's Portal and sectoral websites. The various eID options that are currently accessible include those offered by the government, such as the chip-based citizen identity card (eObanka), the NIA ID (name, password, and SMS), the digital mailbox ID service, and the services provided by private eID providers linked to the National Identity Authority (the National Point for Identification and Authentication - NIA), such as some Bank ID providers. The National identification program under eIDAS includes both the mojeID and the Mobile eGovernment Key. The Digital Constitution is implemented to support the Bank ID's entry into Czech legislation (Act on the Right to Digital Services).

#### **4.4. National Portal [NPR]**

Access to all electronically provided information and services from all government departments is available via the Public Administration Portal in a single window. The transactional portion of the Portal, the Citizen's Portal, requires digital identification to access several fully automated digital services, including extracts from State base registries, information on citizens' public administration submissions, and a personal archive of public administration documents. The Portal provides ePrescriptions and digital services from the Czech Social Security Administration, Financial Administration, Cadastre, and Trade Licensing Register. Using government digital services requires several login methods.

Citizens and employers working with the Czech Social Security Administration have access to the data stored in the administrative databases, may submit requests online, and can get responses electronically. Various user groups may access different online services. Online access to paid sick days during a person's professional career, information about health insurance payments for self-employed individuals, and online calculations of retirement pensions based on completed insurance periods are a few services provided to individuals.

#### **4.5. Government CIO [GCIO]**

Concerns about the electronic administration of government are within the purview of the Ministry of the Interior, which makes that ministry accountable for addressing such problems. A sub-department of the Department of Information and Communication Technologies manages the Department of the e-authority Government. This department is under the jurisdiction of the Department of Information and Communication Technologies. The nomination of a Chief Information Officer (CIO), who is responsible for the administration of that function for that ministry, is accountable for the collection of information and communications technology (ICT) for each church.

#### **4.6. E-Government Promotion [EPRO]**

The newly appointed Deputy Prime Minister for Digitalization, Mr. Ivan Barto, presented his vision of potential changes in the governance of the digital public administration in March 2022 to ensure the implementation of the National Recovery and Resilience Plan, in particular its chapter on the digital transition, as well as to address issues with the digital government effectively. These adjustments will make it easier to adopt a whole-of-government strategy for digital transformation, utilize resources more effectively across administrations, and introduce new ideas into the public sector. The adoption of governance reforms will influence central administrative bodies' established procedures, positions, and duties. A broad commitment from stakeholders is required, as well as laws to support it. By 2023, according to the Deputy Prime Minister, they will be put into practice.

The Government Office's EU Applied Policies Department manages programs related to

artificial intelligence and the European Data Economy. The Department is also responsible for organizing the European Digital Agenda inside the state apparatus. The Department organizes national perspectives on projects and related subjects to promote the Digital Single Market. Public dialogues in this area are the responsibility of the Department.

#### **4.7. E-Participation [EPAR]**

Four goals are outlined in the Czech Republic's Government Resolution No. 680/2014 on the development of public administration: implementing a process management approach to public administration; increasing service accessibility through eGovernment tools; increasing the effectiveness of public administration at the regional and local levels; and continuing to develop the skills of public servants.

A new model for public administration development, Client-Oriented Public Administration 2030, has been developed to account for the next period. The Strategic Framework for Public Administration Development 2014-2020 only covered 2014 to 2020. The critical goals of the program do not include eGovernment procedures or satisfaction in the eGovernment plan. The two investigations, nevertheless, support one another. Increased administrative efficiency is a goal of the Public Administration Concerned with Citizen Happiness and Administrative Efficiency, which also aims to improve public satisfaction with the government and its services. The approach includes several measures, such as better public outreach, a focus on evidence-based decision-making, and increased encouragement of innovation. In 2020, the government implemented its 2030 vision for client-oriented public administration.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The Czech government has strongly advocated for the country's economic and social transition into the digital age. Its policies align with the European Union's most prominent technological programs, especially the Digital Decade's goals. To get there, it has to raise the number of businesses that use cutting-edge digital methods. More IT professionals need to be educated so digital government services can be used seamlessly across borders. To improve public services, the government must adopt private sector best practices. In that way, it can tap into the digitization potential of its society and create an effective e-

government system.

With the concept of linked data pools for the public administration, many Digital Czech Republic Programme projects will concentrate on the National Open Data Catalogue and further integrating public databases in 2022. Implementing Regulation (EU) 2018/1724, creating a single digital gateway, and the national Act on the Right to Digital Services served as one of the primary impetuses for these activities. The National Open Data Coordinator team has released a brand-new, obligatory open standard for the code lists. Furthermore, starting in February 2022, all governmental entities must disclose their digital noticeboards in available data format. The National Open Data Catalogue site offers the open government standard for bulletin boards, and administrators may utilize testing software to guarantee interoperability.

#### **4.9. Cyber Security [CYB]**

The approach to cybersecurity taken by the Czech Republic is based on efficient cross-border and national collaboration between all relevant parties. The ecosystem of domestic cybersecurity is defined in the National Cybersecurity Strategy for the years 2021–2025. In November 2020, the National Cybersecurity Agency (NKIB) submitted its plan for approval, and the government gave its blessing. The Cybersecurity Strategy specializes in protecting the public sector and the digital society by conducting coordinated risk studies regularly. The outcomes of these analyses help to identify the required countermeasures. The digital infrastructure was established to ensure the interoperability of technology utilized in various public administration sectors. The adoption of unified channels for information that provide safe data transfer is supported in the Czech Republic. One of the guiding principles of national cybersecurity is to ensure that the digital infrastructure is resilient in all circumstances and that there are backup plans in place in case the State administration cannot provide services digitally.

The national cybersecurity plan for the health sector considers important strategic papers in the cybersecurity area, the federal government ICT policy under the Digital Czech Republic project, the national eHealth strategy, and the EU Cybersecurity strategy for the Digital Decade. Two additional recent initiatives provide central government support to healthcare providers in the area of cybersecurity: in 2020, experts from the NKIB, the National Agency for Information Technologies, and the Ministry of the Interior published

the Minimum Security Standard for organizations whose operations are not regulated by the Cybersecurity Act. Based on the existing circumstances, the NKIB and the Ministry of Health developed a guideline for healthcare providers in February 2022 to mitigate two particular cyber dangers.

#### **4.10. The use of Emerging ICT [EMG]**

Adopted in 2019, the National Artificial Intelligence Strategy establishes the conditions for coordinated activities related to human-centered innovations and AI technology by assessing the current state of affairs, establishing key objectives, and identifying the ministries and agencies responsible for implementing the Strategy. National AI Observatory and Forum was formed to identify legislative hurdles, provide suggestions on overcoming them, and set ethical and legal norms for AI research, development, and application. The AI Observatory and Forum offers a venue for proper public consultations and promotes the nation's participation in EU-wide issues.

Cooperation amongst diverse stakeholders, including government officials, academics, and the commercial sector, is also essential for effectively executing the National AI Strategy. The Ministry of Industry and Trade is responsible for coordinating the implementation of the AI Strategy, which is being carried out through the national AI Committee. In September 2021, AI Committee members examined the status of the EU draft legislation on AI, the Digital Europe initiative, and the digital innovation ecosystem, including European digital innovation centers and AI TEFs.

In 2018, a Memorandum of Cooperation on Blockchain was signed with the Czech Republic. As a result, numerous governmental and non-governmental platforms implemented awareness-raising activities to comprehend better the potential advantages of using distributed ledger technology in the public sector. The latest research by the Blockchain Republic Institute examines ideas for Czech legislative reforms necessary to harness the commercial potential of blockchain, particularly in the realm of international commerce.

Denmark

## 1. General Information

Area: 43,094 km<sup>2</sup>

Population: 5,882,261

Government Type: Unitary parliamentary constitutional monarchy

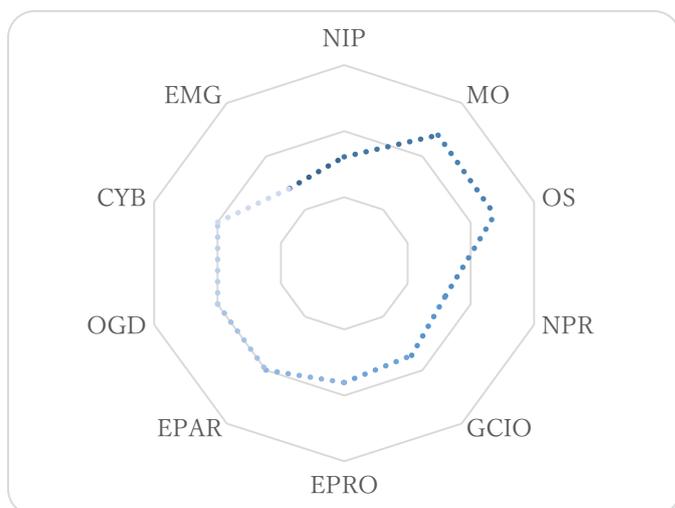
GDP: \$60,535

Internet User: 96.55

Wired (Fixed Broadband User): 44.72

Wireless Broadband User: 138.67

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

By removing all remaining Covid requirements, Denmark became the first EU member state to allow its citizens to leave the house without worrying about needing to wear protective gear or carry a QR code. This follows on the heels of Denmark's pioneering work in introducing a digital corona pass. The road back to normalcy has been built by a comprehensive and publicly managed digital service infrastructure that benefits

individuals in Denmark and Danish enterprises and contributes to the general well-being of Danish society. Regarding the degree to which nations have digitized their public sectors, Denmark keeps one of the highest rankings in the world. They have a great degree of openness and a lot of engagement with the public sector in Denmark, which plays a very significant part in all people's lives. There also exists a lot of connection with the public sector. Users can get unhindered and secure access to more than one hundred specific public services and, in addition to that, a variety of private services with only one digital key. This makes it simple for individuals to carry out various tasks, such as enrolling their children in school or signing up for private banking services to pay their expenses.

The digital key, known as "NemID," or "EasyID" in English, is one of the fundamental components of Denmark's digital infrastructure. This key makes it easy for residents to access various services offered online. When investigating how Denmark has become one of the most digitalized nations in the world, one of the essential factors to consider is the digital key in and of itself, as well as the collaboration between the public and the private sectors. She believes that the trust between people and their government is the most critical factor in the success of an endeavor. Consequently, Denmark earns 93.80 points and a spot in the top Waseda rankings for 2022.

### **3.2. New Trends**

After the COVID outbreak, the government increased its investment in the healthcare sector, particularly in technology and innovation.

- Health care professionals, especially those working in Danish Primary Health Care (PHC), access to health data across care levels is critical for enhancing workflow and treatment pathways.

- Common data security models and standardization of health data, as well as mandatory digital registration and a centralized digital system of personal identification, are essential. Key to maintaining PHC's proximity to its target population is providing users (both patients and providers) with a single point of entry for accessing health records and learning about available medical options.

- Supporting the Portal and related service providers in creating user-friendly solutions is

a side effect of maintaining regular interaction with people.

- Investment in digital health literacy is necessary for digital technologies and services to catalyze high-quality, far-reaching, equitable, and efficient health care. To enable those with less digital literacy to use the benefits of digitalized healthcare systems, it is essential to increase access to health data for municipal healthcare employees and to continue efforts to empower families to aid through delegated access rights to health data.

The government unveiled its updated national digitalization strategy for 2022–2026 on May 5, 2022. The strategy, which comprises 61 individual initiatives and nine particular visions, lays out the significant trajectories for the next stage of Denmark's digital development.

The former national strategy covering 2018–2021, which the government launched on December 15, 2021, was replaced with a new strategy for 2022–2024. The new national strategy, which consists of 34 concrete projects and enhanced responsibilities in areas like, for example, critical infrastructure protection, enhances national cyber and information security in society.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The Danish government has streamlined, expedited, and safeguarded the country's publicly available digital services. The establishment of digital infrastructure is now in progress. Consumers and companies now have access to a diverse selection of digital services due to improvements made to the underlying infrastructure. Electronic identification, often known as eID, digital post, and the citizen website known as borger.dk are some of the main components of the infrastructure. In recent years, user journeys and individualized surveys have become increasingly important components of these systems. As the infrastructure expands, there is an increasing need for ongoing coordination of data transmission, data security, and registry foundations.

##### **4.2. Management Optimization [MO]**

The aims and initiatives for the digital transformation of Danish industry and commerce are included in the Strategy for Denmark's Digital Growth. More specifically, the plan

comprises 38 projects, allotting a total of EUR 112 million from 2018 to 2025 to promote the digital transformation of small and medium-sized firms. The plan calls for an annual investment of EUR 10 million. A few of the strategy's key initiatives are: improving SMEs' digital capabilities, creating a digital hub for more robust digital growth, promoting digital literacy among all people, using data to drive trade and industry growth, implementing agile regulation in these sectors, and enhancing corporate cybersecurity.

A strategy for ICT management in central government was unveiled to enhance the operational administration of ICT systems. The 13 initiatives that make up the framework for improved ICT system management address topics including the need for adherence to the ICT system portfolio management model used by the central government and the National ICT Council's periodic examination of each ministry's ICT system management. The initiatives also deal with the growth of intergovernmental network activities among leaders and staff members working with digitalization and developing the technical and professional competencies and skills necessary to manage ICT.

#### **4.3. Online Service [OS]**

The Procurement Portal provides public and commercial suppliers with information and resources to deliver tendering services. The Portal encourages collaboration between businesses and the public sector to promote shared services. Several regional and municipal governments exploit unregulated markets. Simpler eTendering solutions systems have been made up by the state-owned National Procurement Ltd.

#### **4.4. National Portal [NPR]**

The Citizen Portal, which was first introduced in January 2007, provides people with a single point of access to online data and eServices made available by the public sector, independently of the public authority. National, regional, and municipal governments support a common infrastructure called the portal. An English-language sub-site for foreign citizens is also available on the Citizen Portal. The Citizen Portal gives residents access to Digital Post as well as general, location-specific (such as by area or municipality), personal information, data, and eServices (more details on Digital Post below). Additionally, some "self-service" options are available via the Citizen Portal, enabling people to effectively and efficiently handle their contacts with the public sector.

A single sign-on solution allows individuals to receive and use information and services from several agencies without logging in again.

More than 2000 self-service options are available on the site. The portal received 70.7 million visitors in 2021. The Citizen Site provides a user-friendly design, content personalization, borger.dk content syndication, and flexibility for authorities to add region-specific material. According to the most current user survey, 92% of users are happy and "extremely pleased" with the Citizen Portal, and 91% feel comfortable. Because of all the work and money put into NPR, Denmark was able to secure the number one spot in the Waseda rankings for 2022 with 8,000 points.

#### **4.5. Government CIO [GCIO]**

This year, Denmark came in 2nd place in GCIO criteria, with an overall score of 9.55. Information on Chief Information Officers at lower levels of government is not available to the general public. The Chief Information Officer (CIO) position is not explicitly designated within the cabinet. On the other hand, members of the Steering Committee for Joint-Government Cooperation (STS) come from various levels of government. It performs the function of a clearinghouse for e-government initiatives in the public sector. The committee's findings are made available to the public every two years. Currently, the role of the Chief Information Officer in the government is not governed by any particular legislation.

#### **4.6. E-Government Promotion [EPRO]**

The goal of the Danish government's appointment of the first World's Digital Ambassador in 2017 was to increase Denmark's access to, relationships with, and influence over major global tech businesses. The Danish government unveiled the Strategy for Denmark's Tech Diplomacy 2021–2023 in February 2021. It is based on three guiding principles:

- Responsibility is essential, and the tech sector must fulfill its social obligations and compete on an even playing field;
- Democracy must be the foundation of governance, including in the digital age. Global digital management should be based on democratic principles and human rights.

- Security should be a top priority, with technology supporting it. A flagship initiative called the "Tech for Democracy Initiative" has also started. It ignited a multi-stakeholder campaign to defend and advance democratic principles in an age of rapid technological advancement. It has resulted in an international conference with influential figures from the tech sector, civic society, and government.

#### **4.7. E-Participation [EPAR]**

Web portals run by the Danish government show a thorough knowledge of involvement, particularly when numerous stakeholders are involved—interactive use of internet resources and services designed to improve social connection. For instance, the public website ([borger.dk](http://borger.dk)) acts as a national discussion and voting platform, enabling residents from diverse backgrounds to participate. It also encourages the use of blog hosting services. Anyone from anywhere in the world may join the Danish way of life by commenting on the country.

ROSTRA is a website where anyone may express their opinions, engage in public discourse, and exchange ideas. The Danish National Information Technology and Telecommunications Agency created a website for citizens. It establishes a nationwide "debate and voting gateway" that enables people, organizations, politicians, and other entities to participate in discussions and votes specific to certain governmental levels, issues, etc. It may facilitate debate and voting at the municipal, state, and federal levels.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Denmark is one of the world's most digital societies today, which has seen a radical digital transition since the turn of the century. Most Danes and Danish businesses now interact with the government through digital means. They do everything from registering their children for public daycare, getting their blood tested, setting up their businesses, and making payments safely and securely online. This advancement in digital technology has helped us address some of the most pressing social issues of our day. Two new initiatives, built on this solid foundation, provide a path for Denmark's digital future. Digital inclusion and digital service design are crucial to a smooth transition to the digital era. Therefore, digital governance should prioritize accountability and ethics while

streamlining the public sector to serve residents better.

The Danish government created a fourth National Action Plan (2019–2021) The former national plan covering 2018–2021, which the government published on December 15, 2021, was replaced with a new strategy for 2022–2024. As part of the Open Government Partnership, an international collaboration with seven initiatives from various Danish public sector departments to enhance public sector transparency and trust, particularly in the area of digitalization. The Open Data Directive 2019/1024 of 20 June 2019 was implemented by the Act amending the Law on the Reuse of Public Sector Information on May 10, 2021. This directive is a recast of the previous directives on the re-use of public sector information known as Directive 37/2013/EU and Directive 2003/98/EC.

#### **4.9. Cyber Security [CYB]**

The new national plan started in 2022, among other things, increases societal critical infrastructure protection requirements while strengthening national cyber and information security via 34 targeted activities. The initiatives are designed to increase security through the following methods: (16 initiatives), increased level of competencies and management responsibilities (6 initiatives), strengthened public-private cooperation (7 initiatives), and active international engagement in the fight against cyber threats (5 initiatives).

The Agency for Digital Government, the Centre for Cyber Security, and a representative from the private sector serve as co-chairs of a newly formed national Cybersecurity Council comprised of public and private sector representatives. It will guide the government throughout its new mandate, which runs from 2022 to 2024, on improving other cyber and information security in Denmark in light of the rollout of the new national strategy.

The new national strategy seeks to address the severe threats posed by cyberespionage and cybercrime by raising the bar for industry efforts and commitments made about the nation's critical infrastructure and cross-sectoral initiatives. The strategy also emphasizes enhancing cyber and information security for people, organizations, and governments.

#### **4.10. The use of Emerging ICT [EMG]**

Artificial intelligence is the focus of recent Danish initiatives in emerging technologies. Aiming to further research and create AI-based solutions, the National Strategy for

Artificial Intelligence encourages the responsible use of AI in both the public and commercial sectors. The plan also seeks to advance the use of AI in four major sectors: healthcare, energy and utilities, agriculture, and transportation. A solid foundation for AI; more and better data, strong capabilities and new knowledge; and increased investment in AI are among the four focal areas covered by the strategy's 20 initiatives. As a result of the country's extensive EMG-related investments, Denmark placed No.1 in the Waseda rankings for 2022, scoring 7.50 total points.

The publication of six ethical guiding principles for using AI to improve access to public data and creating standard Danish language resources to facilitate and speed the development of language-technology solutions in Danish are noteworthy projects. Denmark additionally created an investment fund (2019–2022) in conjunction with the plan to assist in testing AI in the public sector. The fund now supports 40 flagship projects to test AI in healthcare, climate change, social issues, and jobs.

Egypt

## 1. General Information

Area: 1,002,450 km<sup>2</sup>

Population: 110,990,103

Government Type: Unitary semi-presidential republic

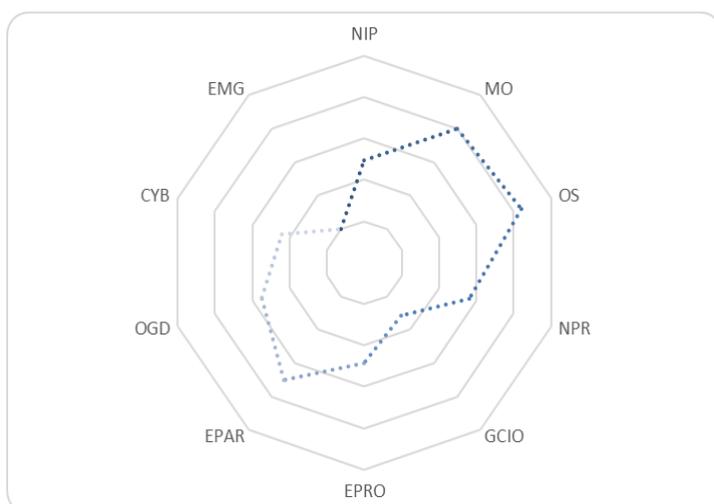
GDP: \$3,280

Internet User: 71.91

Wired (Fixed Broadband User): 9.14

Wireless Broadband User: 64.76

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

According to the 2022 Waseda International Digital Government Rankings, Egypt ranked 58th with a total score of 58,675. There are three pillars to the Egyptian Ministry of Communication and Information Technology's Digital Egypt initiative: digital transformation, fostering innovation, and digital skills and employment. Egypt has ramped up its efforts in response to the outbreak and its associated concerns. According to Egypt's budget plan data, the country boosted public investment allocations for the ICT

sector by an unprecedented 300 percent in FY 2021/22 to speed up the digital revolution. Digital Future was established by the Federation of Egyptian Chambers of Commerce in partnership with the Ministry of Public Business Sector, Microsoft, and Fiber Misr Systems. The project aims to help Egypt's medium and small-sized businesses (SMEs) navigate the digital transition in the middle of the crisis.

The appearance of the Covid-19 virus has expedited Egypt's plan for its digital transformation. There have been considerable increases in both the peak times of internet use and the total amount of data sent. Mobile Number Portability is a service that would enable mobile phone users to keep their current phone numbers while switching carriers (MNP). Even if the consumer changes their network provider, this may still be accomplished. Therefore, productivity and competitiveness will continue to increase over time. The Ministry of Communications and Information Technology has an insatiable appetite for new information and is always looking for better ways to conduct its operations. Anybody may see requests for proposals by visiting the websites of the governing organizations to whom they are submitted. Bidding is open and competitive among interested parties in this procurement process. Technical and economic merits, among others, are considered in the decision-making process.

### **3.2. New Trends**

To facilitate the improvement of the nation's information and communications technology (ICT) industry, the Ministry of Communications and Information Technology (MCIT) was founded in 1999. The mission of MCIT is to realize the digital economy by using the many ICT instruments to guarantee economic growth, personal liberty, and social justice for everyone. Its mission is to facilitate the growth of a knowledge-based society and a robust digital economy, both dependent on equitable and affordable access to information, digital rights, and the growth of a nationally competitive and innovative information and communications technology (ICT) industry.

The new Egypt will have an economy that is competitive, well-balanced, and diverse; it will be reliant on innovation and knowledge, and it will be founded on justice, social integrity, and participation. It will be characterized by an ecological partnership system that is balanced and diverse, utilizing the genius of place and people to accomplish

sustainable development and enhance the living quality of Egyptians.

The strategy for sustainable development has three different aspects: the economic component, which focuses on economic growth, and the transparency and efficiency of governmental institutions, energy, and knowledge. In the environmental dimension, the primary areas of concentration are the environment and urban growth. At the same time, the social component emphasizes social justice, cultural diversity, health, education and training, and post-COVID recovery.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

In addition to the statistics, Egypt has reached several significant milestones up to the beginning of the year 2021. Already in service was the SEA-ME-WE 5 cable, which had the effect of doubling the capacity of the global Internet; it was anticipated that fiber would replace 95 percent of the copper infrastructure by the end of 2020. Telecom Egypt and Liquid Telecom have agreed to quicken the speed of constructing fiber optic networks in North African countries. Also, the offer to purchase most of Vodafone Egypt's equity came from Saudi Telecom. Implementing a \$2 billion infrastructure project was made possible due to an agreement between Orange Egypt, Vodafone Egypt, and Telecom Egypt. The establishment of a 5G network in Egypt was made possible thanks to the collaboration between Telecom Egypt and Nokia, which resulted in Telecom Egypt hiring Nokia to develop the network.

##### **4.2. Management Optimization [MO]**

The Egyptian government's Ministry of Communications and Information Technology (MCIT) is working hard to create a "Digital Egypt" in which technology is widely used and accepted. By enhancing the work environment, providing assistance for the decision-making process, and finding answers to critical societal concerns, MCIT hopes to boost the performance of ministries and other government agencies while also increasing the quality and efficiency of services.

The insights on Egypt's Digital Strategy are as follow:

- Improve citizens' quality of life by enhancing their living circumstances and delivering numerous electronic services via all digital and non-digital channels
- To make the government more efficient and effective, it has to be transformed into a digitally linked government by integrating digital systems and enhancing work inside the state's administrative machinery.
- Foster e-governance and the principles of openness, accountability, and supervision in all facets of business via collaboration and communication between educational institutions, businesses, and other sectors of society.

#### **4.3. Online Service [OS]**

The objective of the unified card system is to facilitate the provision of services and financial aid to persons who are eligible for such assistance. The purpose of linking each card to a bank account or an account held by Egypt Post is to expand the financial inclusion opportunities available to the country's 28 million inhabitants dependent on government services.

The Egyptian Government's Ministry of Health and Ministry of Communications have agreed to collaborate on automating Egypt's national health insurance system. According to the sources consulted, the new method would first consider the geographic distribution of the population and the initial places to implement the new health insurance legislation. As part of the collaborative agreement, the government gave unified smart cards to all its people, including their medical information. After receiving a report from the Health Committee about the legislation, Parliament passed the comprehensive health insurance bill proposed by the government.

#### **4.4. National Portal [NPR]**

The University Enrollment Project, which can be found at [tansik.egypt.gov.eg](http://tansik.egypt.gov.eg), was awarded the 2009 Public Service Award for Preventing and Combating Corruption in the Public Sector. Because of this approach, the university no longer requires 400,000 students to send in their documentation to the enrollment office. This resulted in a significant reduction in the amount of time, effort, and money that was spent on hand delivery to enrolling offices. The project considerably streamlined the procedure by making it possible to automate the submission, review, and follow-up of university

choices. As a result, the project reduced costs and improved operational efficacy.

In addition, the website [www.etenders.gov.eg](http://www.etenders.gov.eg) was awarded the UNPAN Public Service Award in 2011 in Preventing and Combating Corruption in the Public Sector. The Government Services Authority of the Ministry of Finance worked with our team to develop this website.

#### **4.5. Government CIO [GCIO]**

Yasser Elkady was appointed Minister of Communications and Information Technology in Sherif Ismail's cabinet on September 19, 2015. He has more than 25 years of experience working in the information technology and telecommunications industries, with a particular focus on strategic planning, technological integration, and the growth of companies. The American Society for Information Technology and Telecommunications is one of the organizations that Elkady is a member of (ASITT).

Even if Egypt's legislative structure does not make it possible to establish chief information officers or other posts of comparable prominence, the Egyptian public administration does so on national and local levels.

#### **4.6. E-Government Promotion [EPRO]**

The Egyptian government has unveiled new initiatives to advance society's digital transformation and enhance the digital government services available to Egyptian residents by Egypt Vision 2030. New infrastructure and information systems will be developed in public universities, technical institutes, research centers, and university hospitals, according to an announcement by the Ministry of Higher Education and Scientific Research (MoHESR), which stated that the project would cost 465 billion United States dollars. This includes computerized examinations, electronic learning systems, automated university hospitals, and a site specifically for overseas students. In addition, the Ministry of Justice (MoJ) announced that it would work with Microsoft and Link Development on a project to improve its Economic Courts (EC). As a result of this collaboration, a digital justice platform will be developed to ensure that justice is accessible to all. This platform will use Microsoft Dynamics 365 to automate and integrate end-to-end judicial processes and services, such as filing legal cases, assignment of cases, scheduling cases, managing cases, and other similar activities. An integrated

online portal allows people, attorneys, and other parties involved in a legal case to register, file new cases, track the status of cases, arrange appointments, receive judges' rulings, make electronic payments, and do various other tasks.

#### **4.7. E-Participation [EPAR]**

As a result of the new globalization era's advances, Egypt's government has successfully made the change. For Egypt to fulfill its obligations under international treaties, its government must perform at a level on par with those of other governments worldwide. The most cutting-edge technology is being made accessible and integrated into the government's e-government project to ease the changeover.

A new framework for government procurement, enterprise resource planning (ERP), and efficient resource allocation will be implemented to help down government spending. Executives are provided with timely and reliable data, which aids decision-making and allows for constant monitoring of development programs.

E-payment standards and the law controlling their use in online transactions have just been made public. And the government hopes that all citizens and enterprises will use the nation's vital public facilities. There is a clear divide among IT experts on whether or not they want to work for the government to implement the incentive program. The federal government established and continues to manage national databases, developed new software, and augmented existing infrastructure.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Egypt can benefit from digital transformation in many ways, including creating new opportunities for individuals and businesses, promoting inclusive development and growth, and modernizing critical economic sectors like finance, retail, healthcare, agriculture, and manufacturing. For digital transformation to become a platform for equality rather than division, it must be backed by the necessary technology infrastructure, human capital, and the proper legal, regulatory, and other enabling contexts.

Recently, as part of a more comprehensive growth plan, the Egyptian government has

placed a greater emphasis on anti-corruption activities. The objective of the business sector is to make use of the possibilities offered by information technology to provide government agencies with corporate indications and reports that will aid them in the battle against corruption. The successful deployment of a data warehouse outfitted with analytical tools for identifying criminality among various government institutions will expose irregularities that need further investigation. This will ensure that the aim is met. Despite this, there are still many opportunities for the government to increase data openness while achieving its goals more expediently.

#### **4.9. Cyber Security [CYB]**

Egypt has made significant progress in its digital transformation during the last several years. It is clear that the nation is making strides toward its goal of automating different areas, including government, finance, and the energy industry. The Egyptian government sees technological advancement as the next great challenge. Reflecting this, Egypt's Vision 2030 lays out the long-term goal of creating a "Digital Egypt" on the backs of three pillars: digital transformation, digital skills and jobs, and digital innovation, all of which would benefit greatly from a culture that prioritizes cybersecurity and is cognizant of the risks associated with the internet.

Future Data Center is an example of Egypt's commitment to developing its technology sector, demonstrating the country's progress toward its aim. These gatherings assist in bringing together and promoting the adoption of new technologies in the nation, as well as inspire and develop the local talent pool for the future. The number of meetings we had at FDC and the enthusiasm shown for our Incident Response Games, a competition in which participants solved an incident response case based on a real-world scenario, convinced me that cybersecurity is one of the country's highest priorities as it works to create Digital Egypt. In the digital realm, this will spur Egyptian creativity.

#### **4.10. The use of Emerging ICT [EMG]**

As part of its ICT 2030 plan, the Egyptian government invests in and implements various capacity-building and training programs, digital government service changes, and infrastructure enhancements. Capacity-building, electronics design and production, and technology parks are all areas that will need to be prioritized to increase the ICT sector's

positive impact on Egypt's economic development, as outlined in the plan. The strategy also includes a goal to digitize essential public services in three key areas: healthcare, education, and government.

“Our Future is Digital” is a program run by Egypt's Ministry of Communication and IT (MCIT) to educate and prepare one hundred thousand young Egyptians with in-demand ICT skills, including web design, data analysis, and digital marketing.

Estonia

## 1. General Information

Area: 45,227 km<sup>2</sup>

Population: 1,326,062

Government Type: Unitary parliamentary republic

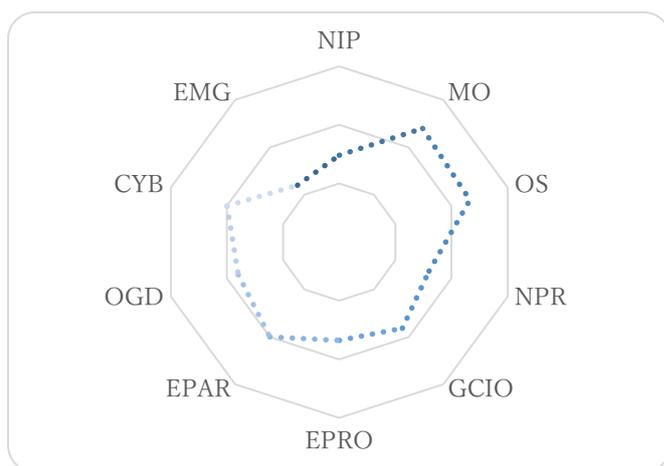
GDP: \$23,095

Internet User: 89.06

Wired (Fixed Broadband User): 31.33

Wireless Broadband User: 165.06

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

This year, the Waseda rankings placed Estonia in eighth place, with a total score of 85.583. This achievement was made possible by Estonia's significant investment in digital governance. When considering the total number of cases, hospitalizations, and fatalities, Estonia has handled the corona-crisis successfully. Political dynamics, rapid policy learning, collaboration with the scientific community, and the preexisting ICT and e-government infrastructure all contributed to the successful handling of the crisis.

The Estonian people are pioneers because they have created an environment that is

productive, safe, and open to the public. This saves both time and money. E-Estonia extends an invitation for you to continue down the digital path. The first section provides an introduction to and a demonstration of the fundamental processes involved in digitizing a society. It also provides an overview of the most significant difficulties and policies and a knowledge of the infrastructure, e-solutions, and services. The identification card system used in Estonia is by far the most modern of any country in the world. The obligatory national card in Estonia serves as much more than a legal picture ID; it also grants users digital access to all of Estonia's secure online services. The so-called "Smart ID" was created via a collaborative effort between SK ID Solutions and Cybernetical. The Smart-ID is a new generation of electronic identification based on an app and is meant to be used easily on intelligent devices while maintaining a high degree of security.

Economic success, digital transformation of its public sector, and fast development and persistence of social inequality in Estonia are three unique elements of Estonia's transition to free-market capitalism and liberal democracy. Indeed, Estonia is now among Europe's most unequal countries. A neoliberal policy mix opened markets and enabled globalization to play out its drama on a home stage, generating winners and losers, which may explain economic success and rising social inequality. Despite this, Estonia's digital strategy has been an enormous success. This extremely neoliberal policy environment provides a fascinating backdrop for examining the country's public sector's leadership in the digital transition.

### **3.2. New Trends**

Today, Estonia takes great pride in its status as a "digital state." And it is especially pleased with itself for taking a realistic view of digital transformation. During the Corona crisis, the Estonian government often hosts a hackathon. The new digital strategy for 2030 that Estonia has developed will serve as the foundation for future digital advances in the nation. It will include lofty goals for the digital sphere, with a significant emphasis placed on connectivity, digital public services, and safety and security online.

The concept of a "digital citizen," who has access to public and private services through a digital platform that guarantees the interoperability of disparate and decentralized

information systems, is key to Estonia's digital transformation. This is based on a theory known as the "hiding hand," which is the opposite of the "invisible hand" popularized by free-market advocates. Both the establishment of several overlapping small networks to boost early success and create momentum and the acceptance of a culture of risk-taking and daring ideas by politicians and policy-makers were crucial. These trends strengthened one another, facilitating the quick spread of novel approaches.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Adopting broadband Internet access is vital in the fixed and mobile realms. Overall, Estonia's fixed Very High Capacity Network (VHCN) connection is rather good. At the same time, more resources are required in the country's most remote regions to bring them up to speed.

The Estonian government is behind in offering 5G commercial services since the spectrum resources needed to run 5G networks have not yet been assigned. By 2025, Estonia hopes to have a 5G connection in all major cities and along key transportation routes. The Gigabit Society has not been achieved in Estonia. Adopting its digital plan for 2030 and allocating the 5G "pioneer" bands promptly is crucial.

##### **4.2. Management Optimization [MO]**

The Estonian government is now updating its ICT strategy across many sectors and coordinating this effort nationally. In particular, the Ministry of Education and Research, the Ministry of Finance and its Information Technology Centre, the Ministry of Environment, the Ministry of the Interior, the Ministry of Social Affairs and its Health and Welfare Information Systems Centre, the Ministry of the Interior and its Information Technology (IT) and Development Cen, and the Ministry of the Interior are all represented in the coordination of their respective ICT strategies.

In October 2021, Estonia passed a new Development Plan for the Estonian Digital Society 2030, directed by the Ministry of Economic Affairs and Communications. The previous Estonian strategy for developing the Information Society by 2020 has been carried over into this one. The purpose of the new plan is to lay forth a long-term strategy for fostering the growth of Estonia's digital society.

### **4.3. Online Service [OS]**

The Waseda Rankings 2022 for OS criterion put Estonia in 8th place, with a total score of 11.28. Estonia implemented national eID cards, which were supposed to serve as the primary form of identification for all public and private activities. The electronic identity card may be used to register a company, validate financial transactions, acquire access to medical data, and as a legitimate EU travel document. The card's microprocessor integrated circuit allows for secure authentication and digital signatures to be used with public and private web services. In addition to the owner's name and PIN, sensitive data files, digital signing certificates, and PIN-protected private keys may be stored here.

Identity cards may be used as a form of authentication for mobile phone users in Estonia. For digital signatures, a mobile app will do the job. It may also be used to sign and verify papers digitally. Smart-ID saves consumers the trouble of carrying around their phones' worth of credentials. The smartID may sign documents and authenticate users when connecting to eServices. They have the same legal force and effect as handwritten signatures and are recognized and honored anywhere in the European Union.

### **4.4. National Portal [NPR]**

The Estonian eGovernment Portal went online to continue the eCitizen initiative that was started in 2002. The passage of time has resulted in some improvements being made to it. The portal offers a consolidated site for accessing the numerous state-run services accessible to people, companies, and government organizations, and it provides a safe online environment in which to do official business. The information and eServices made accessible on the Portal will be categorized differently for corporations, government personnel, and private residents. Within the environment of the State Portal, users can verify their identities using electronic identification cards issued by the Estonian government, submit applications and forms to local governments, digitally sign documents, set up email accounts with the @eesti.ee domain, and subscribe to alerts sent to their mobile devices. The Portal also provides users with a connection to more than 20 national databases, enabling users to access a wide variety of additional registration services without leaving the Portal itself.

Since June 2014, every website belonging to a government ministry has had the same

design. This has made it much simpler for users to find the information they require, and it has also provided users with an accurate representation of the government's goals, programs, and initiatives. Citizens are now able to access information from the government, the government office, and eleven other ministries via a centralized internet hub that was recently established. In addition, the websites of other government agencies are readily accessible from inside each government portal site.

#### **4.5. Government CIO [GCIO]**

The State Information System Office under the Ministry of Economic Affairs and Communications is responsible for constructing Estonia's information society. The role of the Government Chief Information Officer (CIO) is to advocate IT-related projects for a more open and transparent society, and to design related laws. To be more specific, the Government CIO's office coordinates all of the state's administrative information systems-related IT policies and strategies, including but not limited to budgets, legislation, projects, audits, standards, procurement processes, and international cooperation (IS). The Chief Information Officer oversees a staff of six people who focus on digital service excellence, legal and financial matters, ICT skills, cybersecurity policy, and international affairs.

The critical factor in administering the government's ICT and information society activities is the Department of State Information Systems (RISO), recently renamed the Office of the Government CIO. In addition to overseeing the state's information policy and sustainable energy efforts, RISO is also in charge of enforcing and developing the necessary IT standards.

#### **4.6. E-Government Promotion [EPRO]**

The minister believes that the brand-new Digital Agenda 2030, which was only just approved, will serve as the foundation for further digital advances. It establishes goals and an action plan for maintaining what has been built in e-Estonia so far and, at the same time, further developing the Estonian economy, state, and society with the assistance of new digital technologies. E-Estonia is an acronym for the Estonian Information and Communication Technology Agency.

Estonia is continuing to work on several significant initiatives to consolidate its position

as the global leader in digitalizing public services. The most recent epidemic has allowed the nation to establish itself as a leader in this field on the international stage. It is anticipated that Estonia's position as a European and worldwide leader in digitalizing its public services will be strengthened further due to the new cybersecurity strategy.

The already highly digitalized Estonian public administration will be even more upgraded shortly, according to proposals announced by Estonia. The administration and other public services will see an increased emphasis on digitalization thanks to almost half (47%) of the initiatives supporting Estonia's digital transformation strategy. A total budget of 97.43 million Euros will be allocated for these initiatives.

#### **4.7. E-Participation [EPAR]**

Using a management and development information system, the Estonian Information System Authority intends to offer the general public the highest level of humanly possible service. In addition, the Authority is responsible for monitoring the growth of state information systems, coordinating projects, and participating in international initiatives. In addition, RIA conducts research on the legislative process to determine the requirements for management information systems.

The Estonian government established the Rural Municipality Portal to foster more openness and engagement from the general public. This company operates on an open-source platform for material administration, and its foundation is an original idea. The designed plan contains a predetermined website architecture suitable for local governments, administrative site management capabilities, and built-in interaction with public registries.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The Estonian Parliament passed the Principles of the Estonian Information Policy in 1998, which have served as the foundation for the growth of Estonia's e-Government ever since. That's how the government started its digital transformation, to improve the quality and timeliness with which it provides public services. The Estonian government made two crucial technological decisions—ensuring a safe data interchange environment and nationwide digital mobile phone network coverage—that facilitated this digital transition and are known as interoperability enablers. Initially, there was the decision to establish a

digital persona (ID-card). This ID-card was mandated to identify persons in the digital realm, with the belief that this would be the connecting factor between the digital and physical worlds.

Additionally, Estonia made advancements in open data in 2021, raising its score by 24 percentage points compared to 2019. This substantial improvement results from public data being made accessible to a greater audience on an increasing basis. At the beginning of 2021, the Estonian Open Data Portal hosted nearly 800 datasets from more than 100 authors. These datasets covered various topics, including agriculture, education, energy, health, governance, and transportation. After then, university researchers, start-up enterprises, and established businesses are all free to utilize these datasets to create new services or improve upon existing ones. In addition, the Estonian authorities significantly improved the availability of information across borders.

#### **4.9. Cyber Security [CYB]**

Estonia's national ID card system is the most sophisticated in the world. The national card is more than just a picture ID; it grants users access to Estonia's private online services. SK ID Solutions and Cybernetica created the Smart ID. Intelligent ID is the next generation of electronic identification for use on smartphones.

The Information System Authority (RIA) is responsible for managing security incidents in Estonian computer networks, organizing activities related to information security, and coordinating the development and administration of information systems to guarantee the interoperability of the state's information system. The Ministry of Economic Affairs and Communications houses the Information System Authority in terms of government structure.

Estonia's CybExer Technologies, the winner of a prestigious NATO award, specializes in cyber defense and training. Its training systems are widely recognized as among the most advanced in the world. The platforms are essential for carrying out many cybersecurity training and exercises for ordinary users, technical responders, and the highest levels of strategic leadership. CybExer's primary offering is the design, implementation, and maintenance of cutting-edge cyber ranges. Ultimately, it provides a risk-free setting where human, technological, and organizational cyber security capabilities may be evaluated, analyzed, and refined.

#### **4.10. The use of Emerging ICT [EMG]**

Cloud computing was tested in Estonia, resulting in the successful completion of a pilot project known as the "Estonian Government Cloud." It has been shown that cloud computing can successfully support IT applications in the public sector and that expanding cloud computing deployments should be seriously considered. Meanwhile, the government is researching cloud computing in the public sector to better understand the types of data stored in the cloud and the necessary cloud services. To satisfy these requirements, Estonia is attempting to develop its government cloud.

Creating more high-paying employment is a primary objective of eGovernment. The country's goal is to develop a comprehensive strategy for using AI in government. It is the goal of the National 94 Strategy to streamline administrative processes in the public sector to improve the quality of policymaking. The Estonian Unemployment Insurance Fund might utilize AI to pair job-seekers with open positions. The amended Estonian Digital Agenda 2020 also pushed for the development of pilot projects for the state information system and critical components using cutting-edge technologies, including artificial intelligence (AI), blockchain, and the Internet of Things (IoT). The Estonian Parliament has just installed a new AI system called HANS (Human Assistance for Legislators and Employees).

Fiji

## 1. General Information

Area: 18,272 km<sup>2</sup>

Population: 929,766

Government Type: Unitary parliamentary representative democratic republic

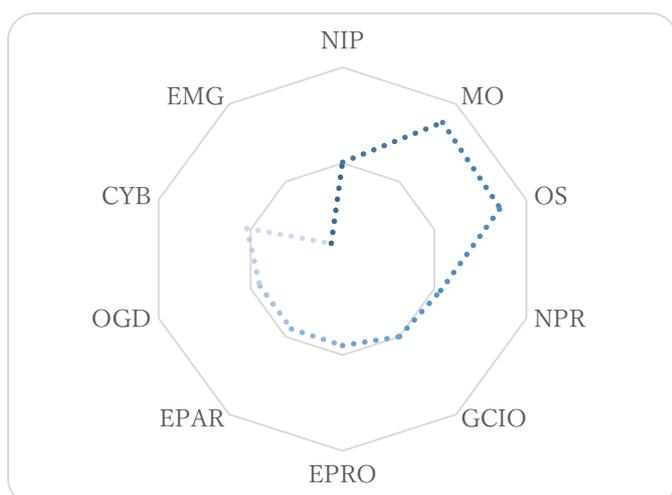
GDP: \$4,920

Internet User: 68.9

Wired (Fixed Broadband User): 2.57

Wireless Broadband User: 78.44

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

In 2022, the digital government rankings conducted by Waseda International put Fiji in the 62nd position with an overall score of 55,111. Fiji has been able to contain COVID-19 by closing its borders and efficient case management. With Australia's help, Fiji could better coordinate and organize its response to the COVID-19 outbreak, acquire medical and personal protective equipment, and redeploy expertise to COVID-19 response taskforces. The health care system in Fiji is nonetheless susceptible to an epidemic, as it is in other nations. Current health issues, especially NCDs, would lead to comorbidities

that make complicated situations even more difficult. The poor, women and people with disabilities are already at a higher risk when normal health and disability service delivery is interrupted. As a direct response to the emergency, contact reduction policies have hastened the transition to the digital delivery of essential governmental services. The government of Fiji has made educational resources, such as radio and the "Walesi" program, accessible to pupils across the nation, regardless of their location or access to technology.

The United Nations Development Programme (UNDP) Pacific Office in Fiji has signed an agreement with the Fiji Competition and Consumer Commission (FCCC) to aid in the improvement and expansion of the FCCC's online platforms, as well as the creation of a specialized mobile application that provides users with access to pricing, market information, and complaint filing mechanisms. Additionally, the UN Development Programme (UNDP) is funding the creation of a mobile application (the App) that customers and retailers can download onto tablets and e-kiosks that it is providing. It's compatible with these gadgets and will operate without any problems. Self-guided legal and rights data on business requirements, up-to-date access to the Fiji Universal Price List, consumer rights and responsibilities, and information on landlord and tenant legislation are just a few examples of what you may expect to find in this App.

### **3.2. New Trends**

In an area that depends mainly on tourism, these outbreaks have added to the strain placed on government resources by the pandemic's economic effects. It is essential to continue providing accessible, equal, and high-quality education to everyone who wants it. Consequently, a larger pool of highly skilled individuals will be open to working globally. Investments will also be made in both new and existing school buildings, as well as in educational technology, online education, and the professional development of teachers. Better teacher-to-student ratios and continued professional development for current educators mutually support raising educational standards for all students.

All of Fiji will be digitally linked thanks to high-speed internet networks and broadband connections. Digital infrastructure will be improved thanks to financial investments, and productivity and service provision will be boosted by introducing cutting-edge new

technology. The use of information and communication technologies will lead to job growth, greater productivity, and improved living standards.

The government has plans to increase the number of telecentres and construct new ones all around the nation. People will generally get a higher level of fluency with digital tools. All Fijians would benefit from this increased connection, especially those living in remote or rural locations and those seeking employment in IT support services. These adjustments will bring new avenues of investment and development while encouraging increased commercial activity. Priorities in 2022 include establishing a regulatory framework for credit unions and moneylenders, expanding access to insurance, expanding the capital market, and increasing financial literacy and inclusiveness.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The percentage of people who use mobile phones and the internet is greatest in Fiji, making it one of the Pacific Islands with the most modern communications infrastructure. It is the market to keep an eye on for the expansion of both LTE and 5G. Digicel Fiji and Vodafone Fiji, the country's two primary mobile service providers, have extended their investments in LTE and LTE-A technologies, which currently make up most mobile connections. Mobile network operators are getting ready for the next growth sector in the mobile data industry, concentrating their efforts on areas with a high population density. In addition, network operators are looking towards 5G and constructing their networks to be compatible with it.

##### **4.2. Management Optimization [MO]**

The digitalFIJI plan aims to create a digital economy in Fiji worth \$1 billion (around US\$500 million) by the year 2030, which would be comparable to the scale of the country's tourist sector at that time. The benefits of going digital are starting to sink in for Fiji. An important part of the DigitalFIJI plan is fortifying the digital underpinnings to bring systemic improvements. To combat the rising prevalence of chronic illnesses, the Ministry of Health and Medical Services collaborated with the University of the South Pacific to create the My Kana app for smartphones.

There is a wide range of creative uses of technology in Fiji to address urgent development issues during normal times, in the aftermath of disasters, and the face of climate calamities. Drones are being used in Vanuatu to enhance the delivery of immunizations to children on outlying islands, a move that can significantly reduce both the expense and difficulty of delivering these medicines. No reason this technology can't be scaled to meet the needs of people in the hundreds of island nations that make up the Blue Pacific, which accounts for around 15% of Earth's total land area. As a result of using LiDAR technology, Tuvalu can keep a closer eye on rising sea levels and make more informed decisions about how to adapt to a changing environment. To rescue the world, you must first preserve Tuvalu. You've reached the front lines, man. Digital technologies must serve as both catalysts and facilitators of change.

#### **4.3. Online Service [OS]**

As part of a wider effort to digitize civil documents in the nation, Fiji has digitized its Births, Deaths, and Marriages Registry, Companies Registry, and Titles, Deeds, and Partnerships Register. E-profiles provide users access to these services and data on taxes and superannuation that may now be found on the internet.

MyFeedback is a smartphone app developed by DigitalFIJI that enables citizens to provide rapid feedback to the government. In addition, online services are available for submitting birth certificates and registering businesses.

The Ministry of Economy manages the electronic procurement platform TenderLink. By hooking up to Wales (a state-owned corporation) by aerial or satellite, citizens of Fiji may view digital television programming for free. The federal government has a wide range of useful online resources.

#### **4.4. National Portal [NPR]**

The Fiji National Provident Fund (FNPF) is responsible for collecting all mandatory employer payments for retirement funds for Fijians working in the country. The employee contributes 8%, while the employer contributes 18%. The FNPF requires employers to submit reports every month. In the past, these monthly contribution schedules, often known as CSs, were handed out manually to members. The FNPF faced several difficulties while using this strategy. Donations may be made online via the Employer

Online Portal, which also handles distribution. The CS may be submitted by employers online, which adjusts member accounts immediately. Thanks to the employer portal, members also benefit from increased contribution compliance, increased staff efficiency, and improved data integrity.

#### **4.5. Government CIO [GCIO]**

The Chief Information Officer (CIO) role has been assigned to the Ministry of Information. This organization comprises a Chief Information Officer Council, which is accountable for the agency-level execution of the eGovernment Master Plan. It directly reports on all matters about eGovernment to the eGovernment Steering Committee. Members of the CIO Council come from various backgrounds, including government, business, and the academic world. On the other hand, a few more prerequisites need to be fulfilled before the federal government can fully implement the CIO idea.

#### **4.6. E-Government Promotion [EPRO]**

Since most technological advancements have originated in the private sector, governments are often criticized for falling behind in the digital realm. In addition, governments should be the ones to drive and use technology wherever possible. These efforts span the gamut from guiding the shift to environmentally friendly shipping to constructing national ID systems to providing service packages to expanding access to financial services, particularly for women. Governments in the SIDS cannot afford to do anything.

Using our SIDS's tiny size as a testbed and incubator, we can spearhead the introduction of cutting-edge innovations. More readily than in bigger nations, governments may give fiscal and other possibilities to attract global financial and tech corporations. Governments may encourage innovation by providing financial incentives, and they should cooperate with businesses to create regulations that are both innovative and beneficial to citizens.

Because of this latter reason, governments must guarantee that the advantages of the digital transition far exceed the potential dangers. It is the government's responsibility to ensure their residents' safety, prevent and punish cybercrimes, and guarantee the privacy of individual's personal information and intellectual property. These things need the

development of novel governmental and non-governmental competencies and capabilities. But they will also spur economic growth and a slew of new possibilities. There is a significant responsibility for governments and civil society at large to help individuals acquire digital literacy from a young age, ensuring they have access to inexpensive devices and Internet services and fostering a culture of digital literacy. I am optimistic that the UNDP will be able to collaborate with the Pacific States on this initiative.

#### **4.7. E-Participation [EPAR]**

Data may be entered into a system for a variety of purposes, including communication, education, banking, health, online shopping, and national identification, to name a few. A digital identity cannot exist without the holder possessing a mobile phone, social media, or email account. The collection and storage of personal information in databases are required to fulfill educational objectives. Creating a digital identity requires all of these components to work together.

"Internet banking" refers to various services, such as bank accounts and credit cards, online shopping, mortgage loans, hire purchase agreements, and NPF accounts. Even in public institutions, patient medical records must be stored in the cloud. Card readers allow passengers to buy electronic tickets for the riding bus. Voter identification cards, birth certificates, and the FijiCare app, which allows for the monitoring of contacts during the COVID-19 pandemic, all contribute to realizing a digital Fiji.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

As a result of the digital transformation focused on the end-user, Fijians will be able to more easily participate in ethical market behavior as both consumers and company owners. This will help promote a culture of compliance in Fiji and keep national markets stable. The Australian government and the United Nations Development Programme provide funding for the transition of digital systems (UNDP). To mitigate the effects of the COVID-19 pandemic as soon as possible, the United Nations Development Programme (UNDP) Pacific Office in Fiji has been assisting the Fiji Competition and Consumer Commission (FCCC) in enforcing laws that safeguard consumers from price gouging, businesses from hoarding, tenants from rent increases and evictions, and the supply of essential goods from fluctuating.

The website of the official government of Fiji includes, among other things, information on the country's many departments and ministries, as well as news briefs and press releases. It is a conduit for exchanging electronic health records and tendering documents, but it does not include publicly accessible government data.

#### **4.9. Cyber Security [CYB]**

A cyberattack is now being dealt with by the Fijian government's Information Technology and Communications Department. Cybersecurity experts employed by the government collaborate closely with their counterparts in the private sector to swiftly diagnose and remedy any issues that may arise. Following the dissemination of suggestions throughout the government to ensure the continued integrity of the network, a temporary outage occurred in the countrywide network, which included GovNet. The ITC Department is working to improve the network's security standards step by step. Government services may be unavailable for many days as the situation returns to normal.

Evidence gathered throughout the investigation indicates that the offending server was not associated with the ITC Department. In the following days, we hope the findings of the ongoing forensic study will provide light on the magnitude of the event. The amount of cyber-based threats and their level of sophistication are growing globally. There has been a rise in attacks against countries and corporations worldwide, including the United Kingdom, the United States, Australia, and Singapore. T's cyber security architecture was developed using the best practices from across the globe to respond quickly to prior cyber attacks. Based on the findings of the study, the cybersecurity measures will be modified so that they can continue to stay one step ahead of any future cyber-attacks.

#### **4.10. The use of Emerging ICT [EMG]**

Applied artificial intelligence is a term that refers to the process of reproducing human intellect using computers. These computers are programmed to mimic human activities such as learning and problem-solving. The use of computers powered by artificial intelligence (AI) is essential in the twenty-first century, and these machines have considerably influenced academics, politicians, and inventors. As a result of its development, artificial intelligence has had both a short-term and a long-term impact on various businesses. To name just a few of these, we have promoted global production,

equality, and the protection of the environment. On the other hand, the purportedly foreseeable consequences of artificial intelligence on individuals are both excellent and detrimental to their well-being.

Finland

## 1. General Information

Area: 338,424 km<sup>2</sup>

Population: 5,540,745

Government Type: Unitary parliamentary republic

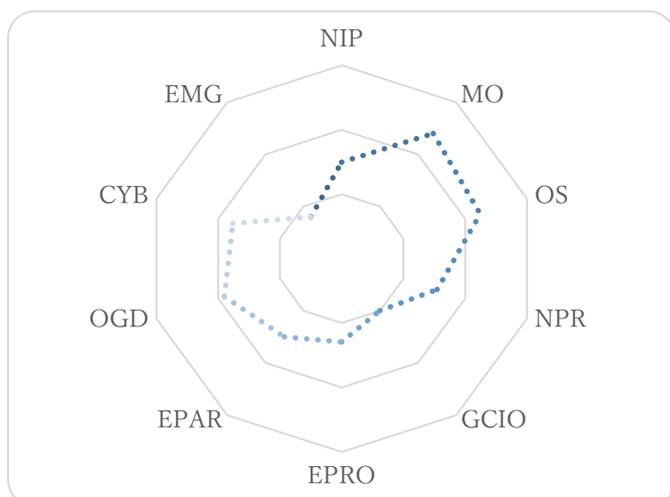
GDP: \$49,022

Internet User: 92.17

Wired (Fixed Broadband User): 33.32

Wireless Broadband User: 155.76

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Finland is the 13<sup>th</sup> position in the Waseda International digital government rankings 2022 with an full score of 82.475. Finland's digital government is at the forefront in Europe. It is also among the best in the world at what it does. The Finnish government has a long history of using information technology. In 1958, the S.S.I. and Postbank were the first government agencies to use computer technology. In 1965, the government established a central computer facility. Since then, there has been a steady stream of policies and

initiatives to optimize IT use in government and administrative work.

The Covid-19 epidemic underscored the importance of data for public service delivery and government organizations' need to undergo digital transformation. Finland ranks well in several global and EU-wide evaluations relating to digital transformation. Due to its positive effects on economic development, new business formation, social well-being, and job creation, the digitalization of industry and society has risen to the top of the agenda in this region. Finnish government agencies use AI and other cutting-edge technology to modernize support services and enhance citizen satisfaction. The Government acknowledges that digital delivery of public services would be prioritized moving forward. The federal government and private companies have begun joint initiatives to help those without access to digital resources. The Government often works with groups outside their industry.

By developing ecosystems that revolve around the milestones in people's lives and the cycles of enterprises, the government is speeding up the creation of superior services. Public and private entities are both part of these ecosystems. Furthermore, the government is developing new forms of cross-sectoral service delivery emphasizing the needs of international residents and businesses in Finland. Government agencies in Finland have earned the confidence of their constituents by consistently delivering high-quality, unbiased, and on-time services. The government has faith in its people and its enterprises. Finland's government is notably free of corruption.

### **3.2. New Trends**

Finland's goal is to become a digital technology powerhouse and assist domestic businesses in optimizing the digital economy to boost their worldwide competitiveness. This is why the Real-Time Economy initiative was formed. The Finnish Patent and Registration Office, which promotes and supports new ideas around Finland, is in charge of the initiative's implementation. Electronic voting and other participation services have increased the voices heard in Finnish decision-making due to the proliferation of digital technologies at all levels of society. Health care, education, security, land surveying, and social services in Finland have all been improved to be more open, transparent, efficient, and inclusive. The Finnish government is always looking for ways to improve its services

while keeping prices down.

Digital, structured data and processing are used in every transaction as part of the post-pandemic recovery. All services in a digital economy exist online and may share data. A continuous electronic feed of the company's business data is sent in real-time, with quick notification to the appropriate authorities. Businesses may save both time and money by using automated data processing. Companies now recognize the strategic value of data and actively seek to acquire it. Government workers can provide more significant assistance thanks to business data. This work is part of a more considerable effort to promote digitization and the real-time economy at the national level in Finland. The coronavirus pandemic has raised awareness of how well-prepared people are to make technological adjustments.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

With 7.7 points, Finland is placed in the 7th position in the Waseda rankings in 2022, regarding NIP criteria. The authorities in Finland are in favor of a competition-driven, fiber-based network rollout. This rollout would also be aided by public money for places that are not currently being covered and guidance for local municipalities on how to establish broadband networks. In regions with insufficient financial incentives for businesses to develop high-speed networks, Finland is helping to subsidize the installation of fiber networks. The Digital infrastructure plan 2018 supports the European Gigabit Society goals 2025, establishes objectives for developing digital infrastructure in Finland by 2025 and strategies for accomplishing these objectives, and is published in Finland.

The Finnish Recovery and Resilience Plan (RRP) plans to spend fifty million Euros on infrastructure projects. It contains an investment assistance plan to improve the quality and availability of high-speed connectivity networks in regions where the market processes do not deliver such connections in the appropriate quantities. Broadband service providers will get financial assistance in the form of grants. The high-speed Internet connections provided by this program will each have a capacity of at least 100 megabits per second.

##### **4.2. Management Optimization [MO]**

With the publication of the Digital infrastructure plan in October 2018, the Ministry of Transport and Communications established goals for the growth of Finland's digital infrastructure by 2025 and strategies for accomplishing those goals. Each home in the United States should have a connection speed of at least 100 Mbps by 2025. The bandwidth might be increased to 1 Gbps if given a chance. Streamlining regulations on the location of telecommunications cables will allow for more cost-effective development of optical fiber networks. In tandem with the creation of the Highways Act, the method for obtaining permits for cable installation will be worked out.

As stated in the Programme of Prime Minister Sanna Marin, digitalization is one of the most important objectives of the current administration. According to the plan, by 2023, the public sector is expected to provide digital services to individuals and businesses. Open government data, establishing and maintaining digital identities, and developing cyber security skills are all necessities for furthering the digitization of the public and commercial sectors. The AuroraAI national artificial intelligence project was launched to improve the interaction between individuals and the services provided.

#### **4.3. Online Service [OS]**

Precautions for a Risk-Free Work Environment The only employment service in Finland is in Finland. Visitors may utilize the platform to look for employment or further their careers. The Finnish Digital Agency manages digital credentials and identities in Finland. Finns may use a PIN with electronic identification to protect their privacy online (eID). The Finnish Digital Agency is the only government agency in the world that can help you maintain a secure digital identity. The national eID system in Finland received a high score in the IDAS. In Finland, eIDAS High is only supported by the Finnish Digital Agency's eID cards. The Finnish Digital Agency has successfully bargained with government ministries concerning banking and mobile certificate services.

Public critical infrastructure (PKI) is integrated into the Population Register Centre's certificate system and public, organizational, and server certificates to authenticate individuals, corporations, and servers. Internet service providers must respect people's right to personal data privacy and security. FINdID keeps track of the client's name, initials, and unique customer ID number. In addition to detecting emails, it can also scramble them. This device also allows for electronic signatures and may be connected

to your official identification. The certificate protects electronic exchanges. Electronic signatures have the same legal force as a handwritten signature. A digital agency card is given to each person.

Hansel eProcurement is a government-owned company dedicated to providing innovative eProcurement solutions. Its online procurement service provides a comprehensive and up-to-date public bid database. You need to use active public bids to get this database. The alert system is run via an eInvoicing platform. Users can receive an initial email notification and follow-up.

#### **4.4. National Portal [NPR]**

Companies and individuals from Finland may include their available public services and information channels in the Suomi.in Service Catalog. A service that may be accessed online Suomi.fi is a resource for planning corporate functions. The Suomi.fi Service Catalog is a government and business-maintained online directory that details Finland's public services and broadcasting outlets. Private and external organizations may change the Service Catalog to reflect current offerings. Authorization Upon Submission to Suomi.fi (EA) Suomi.fi Myregister compiles information from a wide variety of public databases; Suomi.fi Electronic messages, decisions, and conversations between the government, the people, and businesses may travel securely via Messages. Su Access to official records is made possible through affirmative action, which benefits individuals and companies. Navigating to and from public service locations is a breeze using Suomi.fi Maps. You may utilize Suomi.fi Payments with a wide variety of eServices are very user-friendly.

Paikkatietoikkuna is a government-run portal for all things geographical in Finland. It's based on free, public software, and users may see hundreds of map layers covering themes like geography, land use, and more. On a need-to-know basis, the site is used by individuals, companies, and government organizations.

#### **4.5. Government CIO [GCIO]**

After August 1, 2021, and ending on July 31, 2026, Jarkko Levasma (MSc) will serve as the Minister of Finance's Head of Government Information. The CIO of each government department or agency may have a different official title and responsibility set than their

counterparts in other departments. There is no legal need for a Chief Information Officer in each government ministry or agency; the institution's policies and practices fill the CIO role.

Changes are being made to the CIO's mandate and responsibility, especially at the ministerial level. Before, they were in charge of your company's IT infrastructure. The CIO's role is less hands-on and more strategic these days since the Government ICT Center Valtori provides infrastructure services. The new hire's key responsibilities will be formulating and managing an information and communications technology (ICT) strategy and an information and cybersecurity plan.

#### **4.6. E-Government Promotion [EPRO]**

The Next Generation Virve 2.0 will allow authorities and other parties to communicate and work together in the future. By 2022, service quality may have improved as more media (video, photos, and data) are sent to users across broadband networks. Finland and Estonia intend to upgrade their X-Road 7 data exchange in 2020-21. Organizational responsibility for this site rests with the Nordic Institute for Interoperability Solutions (NIIS).

Shared values, long-term security, and sustainable prosperity are the pillars of the Fourth Finnish Open Government Action Plan (2019-2023). Plans of action will be based on the long-term aims and objectives established in the Open Government Strategy. Because of this, a Transparency Register may be found, which has several benefits. These promises will be assessed both during and after the strategy's execution.

#### **4.7. E-Participation [EPAR]**

Demokratia.fi, the information portal for the Finnish government, compiles material from various websites, including news items, that is essential to democratic decision-making. People are given assistance in finding more meaningful ways to participate, and the site also makes it simpler for the government to be open and involved with its citizens. Lausuntopalvelu.fi is a website that promotes the eDemocracy online services provided by the Ministry of Justice. Some of these services are kansalaisaloite.fi, nuortenideatinsteadParliamente.fi, otakantaa.fi, and Parliamentvelu.fi. Demokratia.fi offers links to websites run by public authorities that give information on ongoing

initiatives or developments, including the website's own. In addition to that, it offers information that is currently current about politics and administration. On this website, you may find connections to many government agencies and groups that provide their services to the general public.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Growth, entrepreneurship, job creation, and societal well-being are all facilitated by the digital revolution of industries and society. Accelerating the creation of new solutions to local economic and social concerns, as well as the Sustainable Development Goals, is made possible via digital transformation. Several studies evaluating the progress of nations toward digital transformation have placed Finland among the top nations. Finland's business sector has an international outlook. It has a strong focus on international trade and is led by companies providing digital services and other high-tech products, many of which use open data and other "next generation" business models.

The value of an item, such as knowledge, increases as it is disseminated and used. The government is responsible for a wealth of data storage and retrieval facilities. Improved decision-making, accelerated administrative actions, and more transparency are just some of the benefits that may accrue from measures taken to promote access to and use of information resources, which can raise the value of this kind of intellectual capital. Data created or managed by a public agency is open if it is freely accessible in a machine-readable format. It may be used, modified, and distributed by anyone, including commercial ones. The European Data Portal receives metadata on publicly available datasets through the Avoindata.fi service. Together, the Suomi.fi service and the API catalog are created and maintained by the Digital and Population Data Services Agency.

The government is keen on fostering an atmosphere of transparency and decision-making informed by expert information. As part of digitalizing administration and services, the emphasis of efforts will move from gathering information to using it as public information resources become more accessible. Finland actively collaborates with foreign entities via networks to promote open data. Opportunities for international data sharing arise from the widespread use of similar procedures and organizational frameworks. For instance, Finland has taken part in the pan-European Share-PSI project, and the project's best

practices for open data have been included in the Avoindata.fi service's available data guide. Surveys conducted in other countries have likewise shown that Finland has made significant strides in removing barriers to information access. Both Finland's standing and its development are closely tracked.

#### **4.9. Cyber Security [CYB]**

Risk management, continuity management and preparation, cyber security, information security, and data protection are all included in the digital security framework in the Government Resolution on digital security in public administration from 8 April 2020. According to the Haukka implementation strategy, progress on digital security in government agencies will be made between 2020 and 2023. Data security, data privacy, discoverability, and usability are all aspects of digital services that must be considered by government agencies when they develop and update their offerings to comply with the Act on the Provision of Digital Services. Information security rules for government agencies are detailed in the Act on Information Management in Public Administration.

#### **4.10. The use of Emerging ICT [EMG]**

Following the Act on the Provision of Shared Government Information and Communications Technology Services, it is the responsibility of the Ministry of Finance to guide and direct the provision of shared government information and communications technology services, as well as the quality of these services, as well as ensure the interoperability of these services and ensure that they comply with enterprise architecture. Concerning the provision of shared services, the Ministry of Finance is also responsible for providing administrative and strategic direction and advising on the contingency planning, preparation, and security of information and communication technology (ICT).

According to the Act on the Operation of the Government Security Network, it is the responsibility of the Ministry of Finance to provide administrative, strategic, and economic guidance and supervision of the operations of the security network, as well as advice and management of ICT contingency planning, preparedness, and security regarding the operations of the network. In addition, the Ministry of Finance is responsible for providing guidance and supervision of the ICT security regarding the network's operations. The Advisory Committee on Security Network Operations,

established by the Government, lends assistance to the advisory role performed by the Ministry. On the government security network website, you may get more details on the activities of the security network (TUVE).

France

## 1. General Information

Area: 551,695 km<sup>2</sup>

Population: 64,659,344

Government Type: Unitary semi-presidential constitutional republic

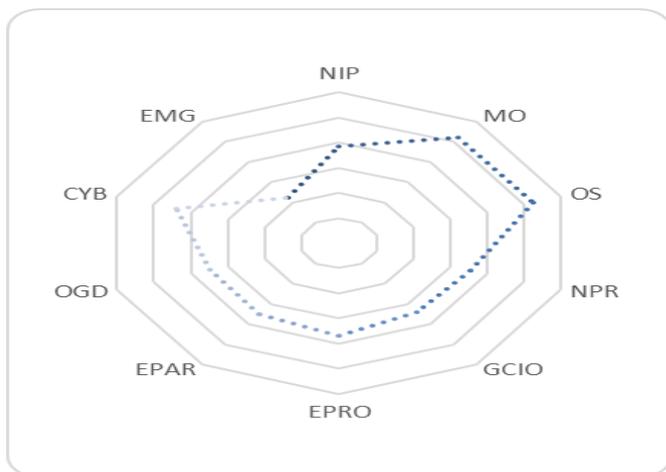
GDP: \$40,571

Internet User: 84.8

Wired (Fixed Broadband User): 46.92

Wireless Broadband User: 99.26

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

France placed at number 23 in the world in the 2022 Waseda International Digital Government Rankings, with an overall score of 77.162. France's rapid and successful reaction to the COVID-19 problem ensured that the country's economy, workforce, and households all survived the health crisis relatively unscathed. The epidemic has also shown a lack of digital technology adoption among smaller and medium-sized businesses.

E-government, also known as digital government, is the use of modern technology in administrative settings to improve the quality of government by facilitating more accessible access to public services and streamlining administrative processes. Because its residents can complete practically all of their official functions online, Estonia is a pioneer state in this sector. Edouard Philippe, a former Prime Minister of France, said in 2017, "the Estonian reality is the French ambition in terms of e-administration by 2022." As a result, he initiated a program to rethink the paradigm of public action in France that was given the name "Public Action 2022."

In a nation with a long legacy of bureaucracy, the stakes of modernizing the public service are high enough to disrupt the convoluted and inflexible processes already in place to move toward a more modernized and responsive government. The beginning of the 21st century marked the beginning of the French plan for the state's digital transformation. As a result, one of the first major shifts in the industry occurred in the year 2000 with the launch of the website [service-public.fr](http://service-public.fr). This platform gave users the ability to get access to online resources that assisted them in the execution of their administrative operations.

### **3.2. New Trends**

Many large-scale digital technologies were put out at an unprecedented rate due to the worldwide pandemic, laying the groundwork for future digital administration. France wants to spend an extra EUR 1.8 billion on the research, development, and deployment of critical digital technologies (including cybersecurity, quantum processing, and cloud computing) to encourage innovation and broader use of these fields by EU goals. France will also participate in two international public-private innovation hubs (IPCEIs) focusing on microelectronics, communications, and cloud and edge computing.

The computerization of educational and training systems will accelerate in the next few years. Hybrid education should be available to 1.4 million college students by 2022 and 45,000 K-12 classrooms with state-of-the-art digital equipment. Support for students and employees to participate in digital skills training programs is an element of the investment in skills. The government program France Num France, which aims to help 200,000 SMEs transition to the digital age, will be implemented.

## **4. Digital Government by Indicators**

#### **4.1. Network Infrastructure Preparedness [NIP]**

The French government and people have achieved significant progress in terms of their investments along the route toward digital transformation in France. The ARCEP is in charge of executing activities and disseminating press releases to facilitate the transition from copper to fiber infrastructure. A service supplied by SpaceX will make it possible for people living in France to connect to the internet. In addition, Orange Concessions is in charge of managing the development of fiber optic networks, and they do this with the assistance of municipal governments. In order to generate revenue for the rollout of 5G, Iliad is selling a portion of the land that comprises its French tower. Notably, the PSTN's decommission will start in 2023, and authorities have given the go-ahead for 5G testing in the 26GHz spectrum.-

#### **4.2. Management Optimization [MO]**

As part of his commitment to modernizing the French government, Prime Minister Édouard Philippe introduced a program called Public Action 2022. The project's primary goals are the provision of public services, the maintenance of a healthy workforce, and the administration of finances. In October 2018, a meeting of an Inter-ministerial Committee on Public Transformation was held to develop a National Strategy for the Transformation of Public Action. Using the metrics outlined in the plan, one can monitor and report on the program's progress. As a result, individuals in France will be able to monitor developments over time. Reforms can only be successful if they match the needs of the people, and complete transparency of all expenditures is an unmistakable indicator of successful change.

#### **4.3. Online Service [OS]**

On the websites of some French government departments, such as [impots.gouv.fr](https://impots.gouv.fr) (which deals with taxes), [AMELI](https://ameli.fr) (which deals with social security), [La Poste](https://laposte.fr) (which deals with the mail), and [MobileConnect et moi](https://mobileconnect.etmoi.fr), the FranceConnect logo may be found. On the login pages for FranceConnect, the FranceConnect logo has been shown. Customers may make all their online acquisitions using [Impots.gouv.fr](https://impots.gouv.fr) now that the website has updated its connection mechanism.

Under the PayFiP brand, the General Directorate of Public Finance (DGFIP) has offered

public institutions and consumers improved, secure, and up-to-date online payment services since the previous year. PayFiP was developed so that municipal and other public sector invoices may be paid using bank deposits.

#### **4.4. National Portal [NPR]**

The Interministerial Directorate has set up an application programming interface (API) gateway for Digital Affairs (DINUM). When developing a new strategy or a teleservice, administrations usually employ many APIs derived from various sources. For the purpose of easing the burden placed on data providers during the authorization process, DINUM has developed a one-of-a-kind application known as "Signup." Providers may simply market their application programming interfaces (APIs) using the catalog. In France, efforts are currently being made to both centralize personal data that is held by administrations (such as the National Family Allowance Fund or the Directorate General of Public Finance) and to assist administrative service providers (administrative departments and cities, among other entities) in developing more effective online procedures.

The Interministerial Directorate is currently developing the FranceConnect Platform for Digital Affairs. To deliver online public services, suppliers of public services need to do nothing more than maintain a single account and a single point of contact. The current user accounts will be connected as part of FranceConnect rather than brand new public identity providers being established due to FranceConnect.

#### **4.5. Government CIO [GCIO]**

Several well-established agencies, such as the Council for the Modernization of Public Policies (CMPP) and the Directorate-General for State Modernization, are responsible for formulating and coordinating the various policies and activities related to e-government (DGME). It is the responsibility of the council and directorates to monitor the e-Government responsibilities of their relevant industry and departments. The Interdepartmental Agency for Digital Projects (Direction interministérielle du numérique and the system of information and communication of the State) is the organization that serves in all three capacities; it is the Chief Information Officer of the Government, the Chief Digital Officer of the Government, and a member of the Cabinet's

Data Management Committee. All of these roles report directly to the Government's Chief Information Officer.

#### **4.6. E-Government Promotion [EPRO]**

The application of digital technology is now an essential part of France's foreign policy and public action. This is true whether one is concerned with the performance of the French economy in the context of global competition or with maintaining global conditions of stability, security, and power.

These shifts bring with them the possibility of a digital domain that is unregulated, harmful, and closed; hence, France has come to establish the guiding principles for digital technology that it hopes will be successful everywhere around the globe. To accomplish this goal, France has to promote a model that is true to the country's core principles.

This approach opposes the present tendencies of compartmentalization, control of networks, and instability we see in the world. In addition, this model does not resemble the model supported by prominent American and Chinese technology firms. Instead, this model seeks to provide more excellent protection for individuals by ensuring that fundamental rights are respected, supporting the principle of loyalty, and defending fair competition and taxation.

#### **4.7. E-Participation [EPAR]**

The inter-ministerial network of the government makes it easier for data to be shared between and within the many ministries. This critical component of the ongoing effort to bring the state's information system and, by extension, public action in France into the 21st century makes data transfers within the eGovernment simpler and more reliable. As the French army prepares to deploy, they have set a target of 14,000 sites by 2022, and as of January 1, 2020, they have already connected more than 13,000. By the year 2022, the Network will have additional capabilities, allowing for safer browsing of websites on the internet.

Since November 2007, government members could discuss and exchange information considered to be top secret thanks to the Secure Interministerial Intranet for Governmental Synergies. The responsibility of defending the nation's digital infrastructure from acts of

cybercrime and other forms of attack falls on the shoulders of the National Agency for System and Network Security. The European Union's agencies, institutions, and member states were able to engage in digital communication thanks to the Trans European Services for Telematics Between Administration (TESTA) program.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The French State Secretary for Digital initiated the French National Plan for Digital Inclusion as a strategic move. Its goal is to help France build a digital society that is both secure and respectful of individual privacy and agency. A primary goal of the strategy is to get at least one-third of the French population online during the next decade. The Agency predicts that this will result in 4.52 million more people in France having access to basic digital skills. Within the scope of the 2030 objectives proposed by the European Commission's Digital Decade, the French National Plan for Digital Inclusion is launching actions to help 80 percent of European residents acquire fundamental digital skills over the next decade.

The regulation that governs the repurposing of public sector information for purposes other than commercial enterprise encourages the reuse of publicly available data. Because of this rule, information of a more general nature may now be accessed and reused flexibly. The administrations of both the state and the municipalities might stand to benefit from this approach. There is an exception created for digitalized cultural finance made available online when a government agency is required to give up its resources to allow open access. [data.gouv.fr](http://data.gouv.fr) is the address of the open data site that the French government maintains. The website provides access to data produced by governments, businesses, people, and not-for-profit organizations. On the website [data.gouv.fr](http://data.gouv.fr), anybody is permitted to submit a dataset, make comments, or publish reuse.

DINU has been researching the usability and overall user experience of Romania's 250 public services that are used the most often since June of this year. Prioritizing the product roadmap for those services and working with other government agencies is one of the most important tasks associated with this project. According to DINUM, the only concept used to evaluate the quality of the user experience is responsiveness. Other factors that are considered include user joy, speed, and performance. The data is updated as open data

once every three months, making it accessible to anybody who visits the site.

#### **4.9. Cyber Security [CYB]**

In order to improve France's international standing in this field and develop an "ecosystem" better able to detect and counter-attacks, the French government has mandated a bolstering of digital security based on several key goals. These include the development of innovative sovereign cybersecurity solutions and the strengthening of links between the various players. Several plans have been set to be accomplished by 2025 in the cybersecurity industry in France. These include a 20% increase in patents via R&D initiatives, a turnover of €25 billion, and the creation of three "unicorns" in the industry.

With their innovative spirit and high level of expertise, French cybersecurity companies have been challenged by international competitors with more extensive R&D and marketing budgets and a dearth of qualified personnel. These recent announcements signal a real opportunity for all players in the French cybersecurity industry. They also provide a chance for all French businesses, government agencies, and municipalities to improve their security by using tried and accurate French solutions with verified robustness and source code auditing. Stormshield will be among the companies represented at the next French Cyber Campus. The strategy serves as a stark reminder that our responsibility extends well beyond the security of digital assets; it also safeguards real-world property, people, and organizations. Recent assaults have shown that IT and OT have evolved into vital parts that must be protected to the highest standards possible from an economic, social, technical, and human perspective.

However, the European Union is also making plans to combat cybercrime and increase cyber-resilience so that all EU individuals, companies, and governments may use secure digital services and solutions. French solutions that have undergone certification and qualification are entirely legitimate under the new European Union-wide certification system. Stormshield is also involved in developing these new certification requirements as part of the ENISA working group.

#### **4.10. The use of Emerging ICT [EMG]**

The fundamental aspects of the National AI Research Strategy have been made public.

By the end of 2022, an amount equal to 665 million euros will be invested in the approach. The research lays the groundwork for advancements in artificial intelligence (AI). France's mathematical and computational institutions have propelled the nation to the forefront of international competition in this discipline.

Since the National Strategy for Artificial Intelligence publication, there have been two requests for expressions of interest made by the Interministerial Directorate for Digital Affairs (DINUM) and the Interministerial Directorate for Public Transformation (DITP). Both of these organizations are intergovernmental. A panel of impartial judges selected the most promising propositions submitted by different administrations, including the national and state governments and non-profit organizations. The next ten months were spent by the AI Lab financed by DINUM and DITP doing evaluations and development work on the ideas that had been chosen.

Georgia

## 1. General Information

Area: 69,700 km<sup>2</sup>

Population: 3,740,234

Government Type: Unitary parliamentary constitutional republic

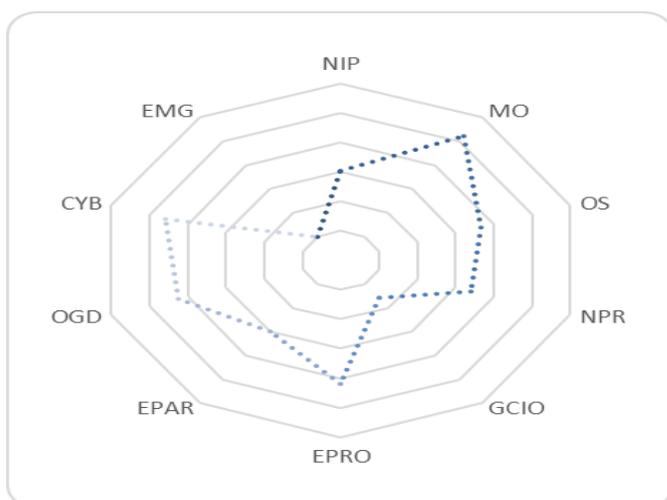
GDP: \$4,232

Internet User: 72.53

Wired (Fixed Broadband User): 24.37

Wireless Broadband User: 81.60

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

According to the Waseda rankings in 2022, Georgia is 59th with a total score of 58,594. Georgia has taken measures in recent years to expand its digital economy. Various outside specialists have questioned Georgia's coronavirus case, test, death, and vaccine tallies since the beginning of the epidemic. The state's data practices have been criticized.

Adopted last year, the "National Broadband Development Strategy (NBDS) 2020-2025" sets lofty ambitions for the information and communication technology (ICT) industry. To implement the NBDS, Georgia has launched the Log-in Georgia Project, which intends to expand rural access to high-speed internet. The project involves training and capacity-building initiatives to boost community networks and the rollout of 5G technology. The government has invested more than 15 million lari (about USD 4.7 million) directly in over 200 internationally scalable start-ups in fintech, AI, virtual reality, ed tech, agri-tech, and biotech. In addition, Georgia got crucial technical help for a national online safety assessment and advise on accelerating digital transformation by fostering ICT-centric innovation.

The administration is investigating ways to attract investment in digital corridors and data centers, which may make Georgia the digital hub of the South Caucasus area and a gateway between the European Union and Asia. Georgia aims to simplify innovation, foster start-ups, improve digital skills, and encourage ICT and entrepreneurial education careers by refining regulatory frameworks. Access to capital is essential, particularly for high-risk enterprises such as startups. Recent changes combine state-run initiatives with matching funds to foster the growth of venture capital. In addition, methods are being implemented to transform R&D (research and development) into active commercialization and tech transfer, bringing applied science, intellectual capital, and technology into the marketplace.

### **3.2. New Trends**

The increased momentum of GovTech at COVID-19 might lead to cost savings, more transparency, and other digital economy advancements. The results of this evaluation might be used to inform the creation of a comprehensive strategy for implementing GovTech throughout the government in advance of the anticipated adoption of a new digital strategy by the Government by the end of 2021. An integrated approach to digital platforms, including using AI in areas like tax administration, is one of the plan's primary goals. Other objectives include better policy coordination and user-centricity.

The state of Georgia has made substantial GovTech advancements in the areas of centralized digital platform development and the fortification of both digital and physical

services and enablers. These advances may provide residents and businesses with superior services that are both swifter and more adaptable. Some promising future reforms are:

- Increasing the reach of a successful GovTech strategy throughout the whole government.
- Implementing a Mobile ID and electronic archive solution bolsters the existing GovTech infrastructure's emphasis on digital identification and digital records.
- Investing in the continued development of virtual digital platforms and services, with tax administration as a priority.
- Increasing game-changing technologies like AI/ML/big data in government agencies facilitates fact-based policymaking.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

In 2021, Georgia exerted a substantial amount of work toward the creation of input for the long-term digitalization of the nation. Several of them include the following: the fixed-broadband sector would continue its transition from copper to fiber, and MVNOs would be able to begin establishing services starting in February 2021.

##### **4.2. Management Optimization [MO]**

- Technology-based solutions for improving government service: To serve customers better, a multi-channel strategy for service delivery has been created. On the one hand, Georgia came up with the idea of Public Service Halls to improve individuals' and companies' access to government-run services. In this architecture, many departments share a common front end and provide various services to the public. Additional digital channels for e-services have been built by several government entities, such as the taxpayer portal by the State Revenue Administration and the procurement portal by the State Procurement Agency.
- Contributing to the foundational policies of the government: All essential electronic PFM systems, including those for budgeting, treasury, and associated sectors, are in place and running well, putting the PFM plan for 2018–2021 into effect. The Georgian Government Gateway data exchange infrastructure was established as a result of a unified strategy for digital investments. The

government has set up a cloud computing infrastructure to aid both public and commercial organizations. Numerous infrastructural systems, such as document management and human resource management systems, are used by the government for its digital platforms. Digital signature infrastructure (certificate authority, e-ID Card) was also established to lessen the possibility of manipulating official document flows, lessen the possibility of corruption, and boost public faith in the government.

- Making participation in government the norm: As part of the Open Government Partnership (OGP) action plan, Georgia launched a new open data portal called [data.gov.ge](http://data.gov.ge) to boost government accountability, encourage public participation in government, and inspire the creation of citizen-led projects and businesses. The non-governmental organization Institute for Development of Freedom of Information has created an online petition mechanism.
- Facilitators of Government Use of Technology: Legal changes were a critical facilitator of GovTech. The Personal Data Protection Law, Electronic Document and Digital Signature Law, the Unified State Registry of Information, and the Criminal Code, which includes provisions for cybercrime, e-procurement legislation, etc., all contribute to Georgia's comprehensive legal framework, but none of these laws serve as an overarching digital governance law.

#### **4.3. Online Service [OS]**

The Unified Electronic Services Portal [My.gov.ge](http://My.gov.ge) is one of Georgia's most frequented governmental websites, ranking first among Georgian internet resources. The key to this achievement is that [my.gov.ge](http://my.gov.ge) gives much-needed access to electronic services for residents and companies, from applying for IDs and passports to establishing a new company or a property title.

The government created the Unified Portal of Electronic Services in 2012 as an innovative instrument for service delivery and e-governance. In recent years, public demand for this one-stop-shop marketplace, where all services are only a click away, has been steadily expanding due mostly to Georgia's systematic reforms of public services and the growing number of Internet users in both urban and rural regions. However, when Georgia announced a pandemic lockdown, forcing the public and commercial sectors to get online,

my.gov.ge became a viable option for thousands more residents and companies.

#### **4.4. National Portal [NPR]**

The national portal data (DATA.GOV.GE) may be used, reused, linked to, and redistributed at no cost, regardless of whether the usage is commercial or noncommercial. The portal's primary goals are to encourage creative uses of this data and to encourage businesses to develop new service offerings.

#### **4.5. Government CIO [GCIO]**

There is no Chief Information Officer inside the Georgian government. An information and communications technology policy are currently being formulated inside the Ministry of Economic Development by the Telecommunications and Information Technology Department. The Ministry's strategic plan does not emphasize the expansion of industrial

#### **4.6. E-Government Promotion [EPRO]**

The pandemic has sped up the process of digital transformation all over the globe, reducing the amount of time required for digitization from years to months. This phenomenon was first seen in Georgia. However, in addition to the apparent advantages, this swift and often impromptu process generates new difficulties and shows gaps that need to be addressed as the globe rises from the crisis. Inadequate access to technological solutions exists in many countries, and these nations are working hard to close the gap. This includes the state of Georgia, where the percentage of people with internet access ranges from 40 to 70 percent on average and may be as low as 15 percent in some rural regions.

Cybersecurity, public education, and data protection are also areas that will require more effective solutions in the near future. This is especially true given that Georgia is currently updating its national Law on Information Security and introducing new strategies for protecting personal data. As a result of the fact that so many nations have already started down comparable roads, there is a massive chance to profit from a worldwide sharing of expertise in "digital disruption." Georgia has much to gain and contribute to this regard in the form of a track record of e-governance success stories that other nations may try to mimic.

#### **4.7. E-Participation [EPAR]**

According to the evaluation findings, Georgia has successfully integrated digital solutions into the delivery of services, supported innovation and technology across the economy, expanded digital platforms and services, internet access, and the developed of digital skills. An end-to-end customer experience for vital services such as online tax filing and company registration has been made possible thanks to a multichannel service delivery method based on a vast network of physical one-stop shops and a government site with over 700 fully transactional services.

As part of its strategy to reform public administration, Georgia has also made significant progress in creating digital platforms and solutions for use at the state's administrative hub. These include a system for electronic public financial management, electronic procurement, a government Cloud, digital signature infrastructure, and data exchange infrastructure, all of which allows the interchange of data between the commercial and public sectors.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Recently, Georgia has shifted its attention to decentralizing service production and delivery at the regional and municipal levels. It leads the world and the area in business friendliness and cyber security, performing above average on all regional and income-based metrics. A Digital Transformation Strategy for Georgia 2021–2025 is a priority for the state's administration. The project's primary objective is to create a plan for the digital transformation of public sector service production and delivery in Georgia and Georgian society over the course of 36 months. This project will use a new Strategy that builds on previous efforts and achieved results. Following its completion, the created plan will serve as the guiding direction for the Government of Georgia's digital transformation over the following years.

The Open Data is crucial to open government procedures and modern e-government models. By publishing open data (data that can be freely accessed, used, and reused) owned by government institutions in open formats, the Open Data Portal paves the way for businesses, non-governmental organizations, and government agencies to use the data without restriction, develop applications and e-services that make use of the data and reap

the resulting economic benefits. The primary goal of Georgia's efforts to make public information and open data available has been accountability and openness. In addition to this crucial goal, open data now serves as a foundation for private-sector innovation, public-sector productivity gains, and national economic development. Therefore, it is crucial to transform the current portal, which primarily serves as a navigation web page for various links to the government pages, into a genuine open data portal where open data are available in a manner consistent with the open data web pages of the United Kingdom and the United States.

#### **4.9. Cyber Security [CYB]**

The success that Georgia has had in developing innovative and user-friendly methods of service delivery is evidence that digital tools can provide solutions to many of the problems that citizens, businesses, and government employees face. These solutions ensure that services can be provided whenever and wherever required. However, the proliferation of digital technologies carries increased hazards to the privacy of data and personal information.

The United Nations Development Program (UNDP) and the United Kingdom's Department for Digital Economy (PSDA) collaborated to help Georgia better safeguard electronic data by analyzing possible cyber risks and strengthening Georgia's preventative measures. In addition, the PSDA is working on defining data collecting and management standards that will eventually be applied to all of Georgia's public entities. In addition, the Digital Governance Agency (DGA) launched an educational website with support from the United Nations Development Programme (UNDP), Sweden, and the United Kingdom (UK). This website provides civil servants, university teachers, and students access to online training courses in cyber and information security, cyber-hygiene, risk management, and information security audit.

#### **4.10. The use of Emerging ICT [EMG]**

Artificial intelligence's rise to prominence has significantly impacted trading in today's market. The use of artificial intelligence has led to the execution of repetitive tasks in a manner that is more effective. Artificial intelligence (AI) has given rise to a new manner of doing business that is distinct from the tried-and-true procedures of the past. Finding

the best AI companies to work with is becoming more difficult as the demand for AI increases and the industry becomes more saturated with competitors.

The "internet of things," sometimes known as IoT, has spurred a digital revolution. The competition in the market for IoT-related products and services is intense. GoodFirms recommend that one should take the initiative and lead from the front. IoT companies that offer complete solutions to their clientele are among the most successful in the industry. Georgia's most successful internet of things firms are evaluated based on various factors, including quality, reliability, and capabilities.

Germany

## 1. General Information

Area: 357,114 km<sup>2</sup>

Population: 83,341,424

Government Type: federal republic

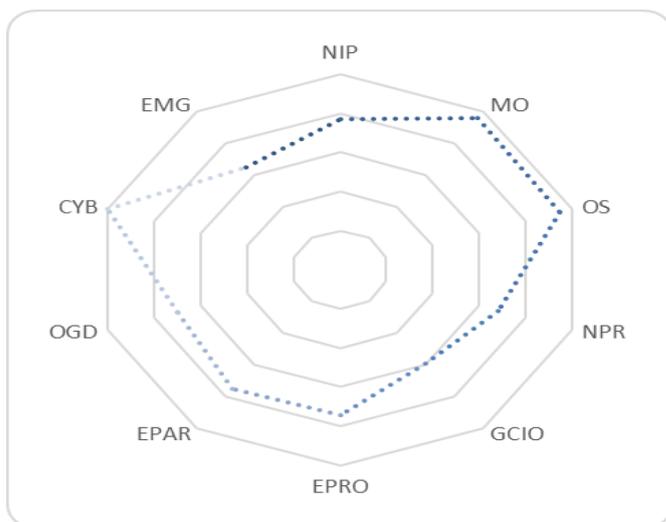
GDP: \$46,100

Internet User: 89.81

Wired (Fixed Broadband User): 43.22

Wireless Broadband User: 90.69

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

The Waseda International digital government rankings put Germany in 11th position in 2022, scoring 83.644. Because of the Covid-19 incident, local governments have been pushed to speed up their digitization activities. The German government's push to digitize and de-bureaucratize public services are only one piece of a more significant, decades-long reform effort. The BMWK's Digital Agenda details economic and innovation policies in Germany (Federal Ministry for Economic Affairs and Climate Action). It focuses on topics such as digital infrastructure, digital economy, digital workplaces,

innovative public administration, societal digital environments, digital education, research, science, culture, and media, as well as security, protection, and confidence in the corporate and societal sectors.

Cybersecurity, the German economy's digitalization, and the country's broadband network extension are all stated goals of the policy. The effects of the EU Digital Single Market, the GDPR, the E-privacy Regulation on ICT firms, and recent legislative changes in cybersecurity all present obstacles. The U.S. Commercial Service stays abreast of these changes and collaborates with organizations like the BMWK, Bitkom (Association for Information Technology), BDI (Federation of German Industries), GTAI (German Trade and Investment), and AmCham (American Chamber of Commerce) to identify business opportunities and raise policy concerns.

### **3.2. New Trends**

The development of digital skills and the promotion of the use of new technologies to boost Germany's digitalization processes are described as the priorities of the German Government in the project known as Digital Strategy 2025. The plan is founded on ten fundamental pillars for digitalization, one of which is a pillar that focuses on the introduction of digital education and continues to do so throughout a person's life at all stages.

## **4. Digital Government by Indicators**

### **4.1. Network Infrastructure Preparedness [NIP]**

The federal states support Germany's broadband expansion through various mechanisms and financial resources. Presently used methods include:

- Support for expanding networks to provide high-speed broadband to unserved regions is provided through a federal government initiative called Förderprogramm für Breitbandausbau. Extending a minimum of 1 Gbps connectivity to underserved sections of the country, thanks to government funding. Each project may get up to EUR 30 million in government financing.
- It is feasible to combine with other financial initiatives, for instance, from the federal states, to cover the remaining co-financing. Breitband-Ausschreibungen

provides an overview of the financing procedures that are now underway and have been completed in several Bundesländer.

#### **4.2. Management Optimization [MO]**

Here are some of the most important goals that fall under the umbrella of "Digital education:"

- By 2025, students everywhere will have been exposed to the fundamentals of computer programming, algorithmic thinking, and other areas of information science. To this end, it is necessary to mandate relevant subjects in K-12 curricula and provide educators with ongoing professional development opportunities.
- Germany's educational system will have one of the most advanced digital infrastructures worldwide by 2025.
- It is expected that by the year 2025, the workplace will be the primary location for learning about cutting-edge IT.
- Essential course materials should be made accessible online by 2025 at all publicly funded educational institutions. These objectives can only be met by promoting education in and for the digital world at all levels by 2025, from K-12 through higher education and beyond.
- A 10-year plan for digital infrastructure in Germany was approved in 2016. By combining historical competitive advantages with cutting-edge technology, cutting-edge methods, and targeted support programs, the German economy will be better equipped to face new challenges and maintain its position as a global leader in quality and innovation for years to come, as outlined in the Strategy.

#### **4.3. Online Service [OS]**

With an expected 1,124 million workers in 2022, Germany has one of the biggest ICT marketplaces in the world. The country has 95,808 IT enterprises (software and hardware as of 2019, source: Statista). The demand for American goods and services is high in every market. Market share leaders include Microsoft, Apple, Dell, Adobe, IBM, Oracle, and SAP. In addition, the market is full of specialist SMEs. In 2022, the IT-Services industry accounted for USD 45.3 billion in revenue, the IT-Hardware sector accounted for USD 34.9 billion, and the software sector accounted for USD 34.1 billion. The IT

industry's overall revenue is projected to reach USD 114.3 billion in 2021, up from USD 76.4 billion in 2007. There has been consistent expansion throughout the last several years. Income is forecast to increase from 102.6 billion EUR in 2021 to 108.6 billion EUR in 2022.

Due to the prominence of numerous major ICT trade exhibitions held in Germany, the country is an excellent platform for American businesses to connect with international partners and customers. Exhibitors from the United States have successfully attracted international customers at trade shows, including Hannover Messe, IFA Berlin, IT-SA, Gamescom, and Embedded World.

#### **4.4. National Portal [NPR]**

All three tiers of government in Germany worked together to create a unified online system. This system was built with the help of a web of federal and state government administrative sites. Government e-services are just as easy to use and secure as consumer accounts in online commerce. The portal network enhances existing methods of cost-cutting and time efficiency. In 2018, the German federal government launched a new website that provides access to federal government eGovernment services with a national service account. These eGovernment services are easier and faster to find on the web since users no longer need to know which federal jurisdiction is responsible for the proper procedure.

#### **4.5. Government CIO [GCIO]**

When the Government IT-Steering Strategy went into effect on January 1, 2008, a whole new federal agency was born. According to the decision made by the Cabinet, the Commissioner is responsible for developing federal eGovernment and IT security policy, developing national IT architecture and standards, and managing the federal government's core IT infrastructure. Each federal agency now has a Chief Information Officer (CIO). The CIO Conference consists of all of the federal government's IT executives and is in charge of establishing policies and legislation pertaining to federal IT. They are in charge of organizing national and state-level eGovernment efforts and chairing the CIO Conference.

#### **4.6. E-Government Promotion [EPRO]**

Almost a year after the new administration was elected, on August 31, the federal government of Germany is expected to approve the country's long-awaited digital strategy during a cabinet meeting. Industry stakeholders have recently voiced their displeasure with the strategy's ambiguity and the lengthy delay in its disclosure. This one is far more precise and thorough than previous drafts, declaring that "Germany needs a broad digital awakening."

The strategy reiterates the importance of three key leverage points as the foundation for future digital projects: the availability of high-speed data and terabit networks, the introduction of secure electronic identities, and the adoption of uniform standards and frameworks for interoperability and scalability. The revised draft also defines the primary digital policy initiatives that each ministry should pursue. There is a set of outcomes to be reached by 2025 for each project, such as digital administration, mobility, defense, and climate protection. In the past, concerns about the absence of a specific timeline were raised.

The digital ministry has promised further information on how they plan to keep tabs on the progress of these detailed initiatives. The digital strategy should serve as a baseline for digital-related matters, but its objectives should be refined and, if feasible, made more stringent over time. Another stated goal is for Germany to go up from its thirteenth position on the Digital Economy and Society Index (DESI), the European indicator that assesses the digital performance of EU member states.

#### **4.7. E-Participation [EPAR]**

It was established in the 1990s when the German federal government and parliament relocated to Berlin from Bonn. While the IVBB did allow access to the IVBB intranet until July 2006, the Federal Intranet took its place in that role as of that month. The German government's internal network. The ultimate goal is to construct a unified federal government system. The Federal Networks have replaced the IVBV and the Federal Administration's Information Network (Netze des Bundes - NdB). The IVBB design yields an IP-based network with a firewall, strong data encryption, and persistent monitoring of connected users and newly established connections. The intranet portal provides access to various resources, including a travel management system, a

people/government organization search engine, and a document/information database.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The transition to the digital era has officially begun. Rapid technological advancement is altering how we learn new things, interact with one another, and spend our money. The Ministry of Economic Affairs encourages this growth by enacting pro-business economic policies and giving specific aid to selected businesses. In addition to inspiring new goods and services, digitalization is also shaking up long-established ideas about how markets function. Advanced infrastructure is essential for a fully digital society. To fully realize the social and economic benefits of the internet, we need to implement up-to-date, fair, and accessible regulations regarding digitalization. To guarantee that consumers and businesses may reap the advantages of technological advancements and that financing is available for new inventions, the Federal Ministry for Economic Affairs and Climate Action has enacted several significant internet policy initiatives and regulatory measures. The German government recognizes the importance of accessible data in fostering a culture of innovation. This necessitates vastly enhancing the quality and quantity of administrative data and making it accessible as open data to benefit a functioning democracy and contemporary society. The Open Data Strategy also aspires to be a program that encourages corporations, universities, and the general public to increase their open data output. The Open Data Strategy lays out its plans for Germany and various additional concerns in four distinct sections. Opportunities and advantages of open data, the situation of open data in Germany, and a set of initiatives to make Germany a leader in open data are all on the table.

The government should take an active part in creating more accessible databases of information. Federal agencies have access to a vast data pool due to the significant volumes of data of many types they gather as part of their legal mandates. To ensure that this data set is helpful for more than just the organization that collected it, it should be made freely available to as many people as possible within the current legal framework. This includes individuals, organizations, businesses, academic institutions, social initiatives, and government agencies.

#### **4.9. Cyber Security [CYB]**

The Cybersecurity Strategy prioritizes four sectors for implementation: society, private enterprise, government, and EU/international affairs. There are 44 distinct goals designed to be achieved by focusing on these strategies. With these specific goals in mind, we are pioneering new territory:

The Federal Office for Information Security will join the Federal Criminal Police Office (BKA) and the Federal Office for the Protection of the Constitution as pillars of the integrated federal cyber security architecture, coordinating efforts between federal and state agencies to combat cybercrime.

By bolstering our ability to control our data, our approach ensures that the digital revolution of our nation can occur in a secure environment. Germany can boost its digital economy by investing in critical technologies and connecting with relevant researchers. Security measures will be included from the beginning of critical and developing enabling technologies. Germany's 2016 Cyber Security Strategy has been updated to the 2021 Cyber Security Strategy. Principles, focus areas, and overarching goals are laid out to provide a road map for the Federal Government's long-term approach to cyber security.

#### **4.10. The use of Emerging ICT [EMG]**

German policymakers place a premium on ICT development. BMWK's Digital Agenda serves as a road map for the German government's grand strategy for stimulating the economy and fostering technology innovation. Security, safety, and confidence for the community as a whole and for enterprises individually are all prioritized, as are aspects of the digital environment in society, such as infrastructure, the economy, workplaces, public administration, education, research, science, culture, and media.

Cybersecurity, the internet of things (IoT), big data, health information technology (IT), cloud computing, enterprise resource planning (ERP), data centers, smart social business platforms, integrated systems, virtual and augmented reality (VR/AR), and digital factories are some of the key segments and topics of interest.

Hong Kong

## 1. General Information

Area: 1,104 km<sup>2</sup>

Population: 7,488,774

Government Type: limited democracy

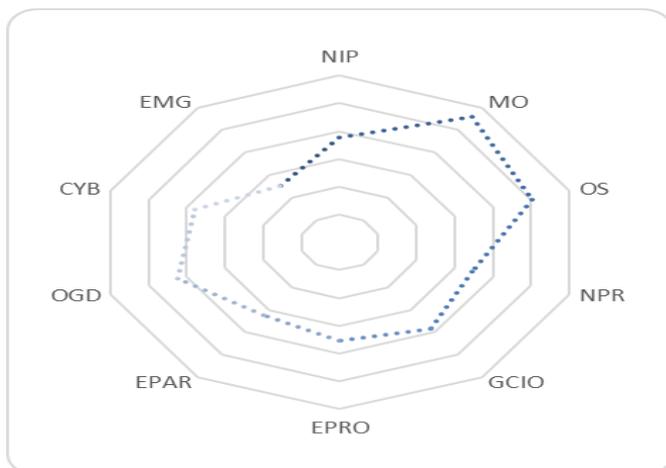
GDP: \$46,052

Internet User: 92.41

Wired (Fixed Broadband User): 3849

Wireless Broadband User: 135.23

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

In 2022, Hong Kong was ranked 31st in the Waseda International digital government rankings, with 72.645. Hong Kong's COVID-19 pandemic firewall was broken at the beginning of 2022. For months, there were no more than a handful of instances in the broader community, but by the end of January, hundreds of new cases were being discovered weekly. When authorities saw how quickly COVID-19 spread, they instituted

strict lockdowns and a massive testing campaign. Authorities in Hong Kong, China, were prepared to act swiftly and flexibly in the face of a public health emergency. Because of this, OGCIO was responsible for creating technological solutions to the infection control and prevention problem. One of its priorities was ensuring that tourists going to Hong Kong, China, had enough time at home to complete the required 14-day quarantine. It is necessary to provide a mechanism to keep people in their homes throughout a quarantine without breaking any privacy laws. The StayHomeSafe app employs geofencing technology, ideal for usage inside, and mobile phone technology to identify signatures. Engineers refrain from spying on individuals to respect their privacy.

For the Hospital Authority, an ineffective face shield was modeled in 3D by students at Hong Kong Polytechnic University (PolyU). The Hospital Authority commissioned a reusable eye visor, which Queen Elizabeth Hospital manufactured. Popular location-sharing applications such as WhatsApp and WeChat were utilized to activate the surveillance system after the quarantine. Staff and volunteers also made surprise house visits and spot-check video calls to ensure everything was running well.

### **3.2. New Trends**

Even while technology has made it simpler to work remotely, businesses still have a responsibility to continue cultivating a vibrant culture of remote work. There has been a notable increase in people using virtual workplaces at work. Shortly, business owners will have to choose where they place themselves between virtual and physical offices on the spectrum. Increasing numbers of individuals are realizing that the merging of the material and digital worlds has blurred industry borders and connected value chains and posed a challenge to the conventional model of the value creation process. They believe that it is vital to undertake initiatives such as digital transformation, cyber threat mitigation, and providing a consistent customer experience. There is a possibility that the corporation may benefit from each of them based on their strengths.

## **4. Digital Government by Indicators**

### **4.1. Network Infrastructure Preparedness [NIP]**

Hong Kong has become the communications center of Asia. Many high-quality, cutting-edge services are available at affordable prices. The private sector in Hong Kong supplies

local carrier services, fixed broadband services, and mobile services. Maintaining a fair playing field in the market is a priority for the Government of Hong Kong Special Administrative Region (the Government).

The government of Hong Kong has made fostering the deployment of 5G networks one of its top telecommunications policy priorities. 5G services provide many new opportunities for innovation and the Internet of Things, bringing Hong Kong closer to its smart city ambition. The Office of the Communications Authority (OFCA) has introduced the Subsidy Scheme for Encouraging Early Deployment of 5G to promote the rapid spread of 5G services.

Home fixed broadband penetration in Hong Kong is above 95%, making it one of the world's most sophisticated fixed broadband network infrastructures. So that everyone in the New Territories and the outlying islands may use fast, reliable internet, the government has initiated a subsidy program to bring fiber-based networks to an additional 235 settlements.

#### **4.2. Management Optimization [MO]**

The government's Chief Information Officer is tasked with developing and putting into practice the organization's information technology policy. Through the use of cloud computing and other recent technological advancements, the OGCI is assisting government business units in planning and implementing IT-enabled transformation initiatives in a way that is more flexible, cost-effective, and coordinated than was feasible before.

#### **4.3. Online Service [OS]**

Hong Kong founded the Hong Kong Science and Technological Parks Corporation as a one-stop shop for businesses and organizations in the city's technology sector. Industries related to medicine and electronics, as well as ICT, chemistry, and mechanics, are given special attention. The Hong Kong Science Park is an important information and technology hub in the city, occupying a 22-hectare property in Pak Shek Kok. It is being built next to the Science Park to lease out its adaptable design and associated facilities to the Science Park's tenants and incubators, as well as the companies' and incubators' employees, mainland researchers, and international visitors.

#### **4.4. National Portal [NPR]**

MyGovHK was launched in 2010 and provided access to various government databases and online services. A significant update was made to the Hong Kong government's website towards the end of 2019 to make it easier to use. To encourage individuals and companies to create innovative applications using existing data, the government publishes open data in digital formats as part of the PSI site, such as a map presenting many datasets on a single map.

#### **4.5. Government CIO [GCIO]**

The Office of the Government Chief Information Officer (OGCIO) is responsible for managing all government IT operations, allowing the federal government to promote ICT improvements in the local community actively. The Office of the Chief Information Officer (OCIO) in Hong Kong has five primary objectives. These goals include providing efficient and secure eGovernment services to Hong Kong citizens; cultivating Hong Kong's ICT talent; enhancing the competence of Hong Kong's ICT industry; and transforming Hong Kong into a world-class smart city by promoting top-tier data centers, cloud computing services, big data, and cyber security awareness.

#### **4.6. E-Government Promotion [EPRO]**

The government is committed to maximizing IT's potential for the good of the people of Hong Kong and strengthening the city's standing as a global hub for digital innovation. The Government Backbone Network connects all bureaus and departments to encourage using standard applications and services such as the Government Communication Network, the Central Cyber Government Office, and central Internet services, all of which have undergone extensive redesigns to serve the public better. The Government has issued methodology, standards, and guidelines to boost productivity and promote product and service quality in order to support the adoption of joined-up e-Government services.

#### **4.7. E-Participation [EPAR]**

There has to be an ICT outreach program for the elderly so that individuals who are institutionalized and "hidden," as well as those who get daycare and home care services, may gain knowledge about how ICT can improve their quality of life and encourage

healthy aging. Seniors who can utilize basic information and communication technologies in their daily life. A web-based learning platform was launched in October 2019 to help the elderly make the most of the benefits of digital technology in their everyday life. The Hong Kong Internet Registry Corporation (HKIRC) is a non-governmental agency responsible for managing and overseeing registration.HK domain names (ccTLD). The Office of the Government Chief Information Officer (OGCIO) launched the Web/Mobile App Accessibility Campaign as part of a multi-pronged strategy that includes government leadership, raising awareness, publishing guidelines and tips, cultivating expertise, and implementing recognition schemes to encourage the use of accessibility design.

#### **4.8. Digital transformation [DX] and Open Government Data [OGD]**

The COVID-19 epidemic has highlighted the need for digital transformation in bolstering long-term economic resilience, but Hong Kong faces various impediments to this shift. According to a recent assessment, an estimated 8.4 percent of Hong Kong's workforce deficit in 2030 might be attributable to a lack of technological expertise. Because of the current epidemic, it is critical that these obstacles be removed. As a result of the epidemic, the digital revolution has been effectively fast-tracked for five years. There is a window of opportunity here for Hong Kong to catch the next digital wave. If the economy is to recover quickly and remain strong in the post-pandemic era, it will need to undergo a digital makeover.

To achieve economies of scale and economic efficiency and to manage government data center operations in a more environmentally friendly manner, the Office of the Chief Information Officer (OGCIO) is creating a government data center complex that will integrate numerous existing federal data centers.

#### **4.9. Cyber Security [CYB]**

As part of its mission to strengthen national cyber defenses, the Office of the Chief Information Officer (OGCIO) has instituted stringent management practices, a comprehensive framework of information security legislation and protocols, and regular audits. Multiple layers of security secure the government's digital holdings. A dedicated government computer emergency response team has been established by the Office of the Government Chief Information Officer (OGCIO) to handle information security incidents

in a timely and unified manner across government agencies. The OGCIO's goal is to increase public and business-sector understanding of cyber security using some means, including the Cyber Security Information Portal ([www.cybersecurity.hk](http://www.cybersecurity.hk)), seminars, competitions, and visits to local schools. The OGCIO is leading a public-private collaboration dubbed Cybersec Infohub, sponsored by TechConnect (Block Vote) under the ITB, to improve Hong Kong's overall resilience to cyber threats. Cybersec Infohub encourages trustworthy cross-industry cyber security cooperation and information exchange.

#### **4.10. The use of Emerging ICT [EMG]**

The Hong Kong Cyberport Management Company Limited is in charge of directing all of the operations that take place inside the port. Within the complex known as Cyberport, information technology companies and businesses connected to it are of a high level. Through the years, Cyberport has assisted a number of new firms in their early stages of development by furnishing them with various financial and professional resources. In addition to its technical infrastructure, Cyberport provides students of information and communications technology (ICT) with internships and incubator programs. It also encourages collaboration and cooperation among companies working in the ICT sector.

The e-sports competition facilities at the Cyberport Arcade were also available to the general public. In addition to that, a program for the facilitation of e-sports was initiated. The construction of Cyberport 5, anticipated to be finished in 2024, has been allocated a total of \$5.5 billion in funding.

Iceland

## 1. General Information

Area: 103,000 km<sup>2</sup>

Population: 372,899

Government Type: constitutional republic

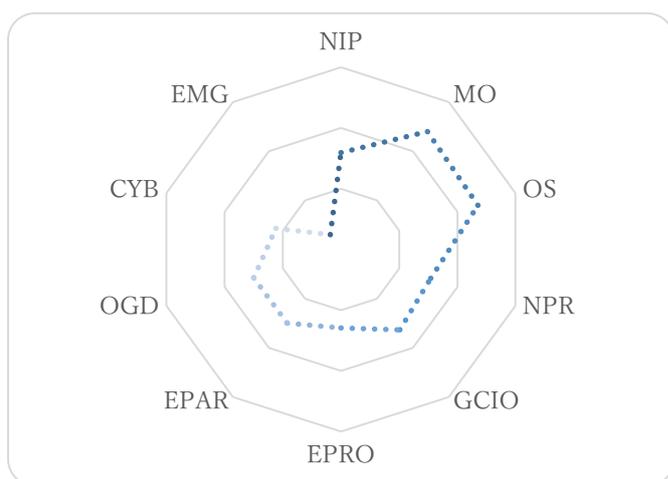
GDP: \$57,992

Internet User: 99.00

Wired (Fixed Broadband User): 41.56

Wireless Broadband User: 122.85

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

With a total score of 79.667, Iceland ranked 20th in the world in the 2022 Waseda International Digital Government Rankings. Most nations and municipalities are pursuing digital government policies, many with novel measures, like the COVID-19 epidemic forcing lockdowns; nonetheless, many people still do not have access to internet services. When it comes to high-speed internet access, Iceland is already at the top of the list. People in Iceland have never experienced buffering when watching a video on YouTube. Citizens not only have access to almost all government services in Iceland through the

internet, but they can also express concerns and ideas, which are then passed to the proper authorities for consideration.

Aside from enhancing the general efficiency of government, digitalization also democratizes it and creates a system of self-governing in which every person is actively engaged. This means we have one of the most open and effective governments in history.

Iceland's shift to open-source technologies was more straightforward than most other nations. E-government portals, tax collection and payments, mandatory voter registration, and other essential public service websites now provide the vast majority of these functions. Healthcare-related government websites, for example, have been updated to run on open-source software. Undeniable that this has improved many people's lives, who can get the better, more relevant information they need more quickly and easily online and do so without spending a fortune or a lot of time on it.

### **3.2. New Trends**

Over the last several years, Digital Iceland has been at the forefront of this transition by assisting Icelandic institutions as they go down this path. Putting money into digital initiatives has already shown monetarily positive returns and improved public service. Because of its responsiveness and positive social effect, Iceland has been an inspiring model for countries worldwide. This skill sets may be seen as a robust crisis management strategy. Constant and transparent dialogue between the public and private sectors is a prime example.

Because using digital services may make procedures more accessible for everyone involved, the government of Iceland is working toward making this the principal method of communication between its agencies and the Icelandic people. Digital Iceland, run by the Ministry of Finance and Economic Affairs, coordinates the efforts of all other ministries and government agencies toward achieving these objectives.

## **4. Digital Government by Indicators**

### **4.1. Network Infrastructure Preparedness [NIP]**

Iceland was ranked fourth in the NIP criteria this year, with an overall score of 8,019. In

January of 2022, 340.9 thousand people in Iceland used the internet. At the beginning of 2022, 99.0 percent of Iceland's entire population was connected to the internet, making Iceland's internet penetration rate the highest globally.<sup>5</sup> According to research by Kepios, the number of people using the internet in Iceland grew by 2,054 between 2021 and 2022. These user numbers suggest that 3,444 persons in Iceland did not use the internet at the beginning of the year 2022, which means that 1.0 percent of the population stayed offline at the beginning of the year. For context, these figures are presented here. However, since COVID-19-related concerns are still affecting studies into internet use, the actual number of internet users may be more significant than what is indicated by these reported data. At the beginning of 2022, the number of people in Iceland who used social media was comparable to 96.2 percent of the entire population. However, it is crucial to remember that the number of people who use social media may not reflect unique persons.

#### **4.2. Management Optimization [MO]**

Increased efforts should be made to improve Iceland's innovative capacity. ICT-related patents and trademarks, as well as technology exports. This may be attributable to the preponderance of small and medium-sized enterprises (SMEs), who are less inclined to innovate than their bigger counterparts, and the substantial role that the tourist industry plays in the Icelandic economy, despite its relatively low technical intensity. An increasingly digitalized world calls for a diverse economy and reliable performance, which may be facilitated by bolstering innovation, particularly ICT-enabled (digital) innovation.

Building on their successes, Iceland will need to provide strong support for commercial R&D going ahead. Making the most of technological advancements is crucial. The high and medium digital intensity industries contribute less GDP growth than the OECD average. By helping to discover and capitalize on innovation niches, adopting cutting-edge technology is crucial for Iceland. Therefore, it is necessary to enhance the enabling framework conditions for innovation in the private sector is necessary. The public sector has an opportunity to have a positive social effect via the further development of digital governance. Achieving more innovation and maintaining competitiveness in the digital age depends on the availability of suitable talents. Enhancing communication between the research community and the business world is essential for maximizing the impact of

scientific findings. Knowledge sharing would improve much more with a stronger foundation of international collaboration in research. The government's innovation policy already addresses many of these problems, but reform efforts must be maintained.

#### **4.3. Online Service [OS]**

By using its national eID infrastructure, Iceland helps further the Nordic-Baltic cooperation project (NOBID). The NOBID project's stated goal is to allow residents and enterprises in the Nordic-Baltic area to utilize their national electronic identification cards to access digital services without being limited by national borders (eIDs). The project's overarching goal is to define interoperability standards at the national level and across the Nordic and Baltic countries by identifying and addressing any underlying technological or legal hurdles.

Numerous government agencies in Sweden and Norway utilize the Swedish eProcurement platform TendSign. From the eNotice through the eAward, this system facilitates the use of electronic procurement. The Central Public Procurement agency of Iceland, Ríkiskaup, has implemented XML-based eOrdering for all government agencies in the country. Ríkiskaup is mulling on using this tech on a smaller scale.

Located inside the Ministry of Finance and Economic Affairs, the Financial Management Authority (FJS) is an autonomous body responsible for managing public funds. The organization is responsible for financial administration and reporting. As stated by the group, the FJS has been designated as a PEPPOL Authority and has signed contracts with three service providers (PA). Using the IcePro Icelandic Committee on Trade Procedures and eCommerce, the FJS collaborates with the SA Confederation of Icelandic Enterprise. EDI (Electronic Data Interchange), ebXML (Electronic Business eXchange), and other standardized electronic commerce technologies are discussed and debated at IcePro, a forum for government agencies, corporations, and people interested in improving commerce and trade processes.

#### **4.4. National Portal [NPR]**

The portal provides citizens and businesses with access to data from every government agency in Iceland. Each branch of government may access and share data over the Internet. Island.is is the main hub for government-run online resources. More specifically, it

references the online presence of all Icelandic government agencies that provide digital services. Detailed descriptions of all available services may be found in individual boxes on the site's front page. Customers may find the services they need more quickly and easily thanks to many explicit search choices beyond the standard the search bar sets. Its user-friendly interface provides quick access to public digital services and digital forms that can be filled out online.

The site also provides a toolkit of resources that any government agency may use. The three main categories are centralized authentication methods, digital document delivery, and digital document dissemination. The Icelandic government has created a one-of-a-kind webpage called MyPages, where citizens may access digital papers and public data about themselves. All public-facing organizations access a central inbox where all outgoing e-mail is processed. Users may sign in to their MyPages and digital mailboxes using either a username and password or another authentication mechanism.

#### **4.5. Government CIO [GCIO]**

Because Iceland does not have a specific position for a head of information technology, the Ministry of the Interior oversees the overall development of information technology throughout the nation. Following her appointment as Minister of the Interior, Nordal Lof now leads the development of the nation's information and communications technology (ICT) infrastructure and e-services.

#### **4.6. E-Government Promotion [EPRO]**

Multiple shocks from the outside world have recently been experienced by Iceland, which highlights the need for continuing efforts to diversify the country's economy. Enhancing competitiveness, encouraging innovative practices, and streamlining the process of reallocating resources should be the primary goals of this endeavor. It is possible to increase efficiency and stimulate development by relaxing the laws that govern businesses and reducing the restrictions placed on new businesses and young companies. There is room to expand the digital penetration in production processes and boost the innovation potential of the economy, which may be accomplished in some ways, including encouraging investment in R&D and making it easier for small businesses to access financial resources. It is encouraging to see that investment in R&D is now on the rise.

For innovation to be supported, efforts must be made to enhance educational results continually and solve skill mismatches in the job market.

#### **4.7. E-Participation [EPAR]**

In 2022, Iceland's EPAR scored 10.000, which put the nation in the top position in the EPAR. The government approved the Information Act in the spring of 2012, and started being enforced on the first of the following year. It is of the utmost importance to safeguard fundamental liberties such as the right to knowledge and the freedom of speech, as well as the capacity of the general people and the media to serve as a check and balance on the government's authority. This legislation applies to all actions carried out by the federal government and to any private firms that fall within the federal government's purview. Since Act 140/2012, the scope of the Information Act has been restricted to municipalities with a population of one thousand people or less.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Citizens in the current day have access to a wide variety of upgraded digital experiences provided by private players. For governments to attract the skilled workers they need to keep their digital government engine humming, it is essential that their leaders step up their digital government transformation efforts. Over the last several years, Digital Iceland has spearheaded this change by bolstering the efforts of Icelandic organizations. Putting money into digital has paid off monetarily and improved government services. The Icelandic government is committed to expanding the use of digital services as the principal channel for interacting with the Icelandic public. This is the mission of Digital Iceland, a government-wide initiative run by the Ministry of Finance and Economic Affairs.

In terms of the availability of open data, Iceland is lagging farther and further behind the rest of the world. In this particular arena, Iceland has not, as of yet, created an official plan. There is a marginal source on data consumption and the value produced by the OPingogn.is Service Portal. Meanwhile, it is essential to emphasize that Iceland does not now face any legal challenges regarding the distribution of open data for its implementation. A data exchange layer, which will be known as Straumurinn (X-Road), and an API gateway service portal, which will be known as Data Pool, will be built to

facilitate the interchange of data and simplify it for consumers and enterprises to communicate with one another. The national plan for generating open government data will focus on the government's activities in this domain.

#### **4.9. Cyber Security [CYB]**

In June, with backing from the NIS, the Icelandic Parliament approved Cyber Security Act No. 78/2019. This new legislation, which takes effect on September 1, 2020, revises a law passed in Iceland in 2015 regarding cyber security. For the new Cyber Security Strategy and Action Plan to be effective, the Cyber Security Council intended to have a legal basis. The first Icelandic cyber security policy was presented to the government and parliament in 2015. The strategy's time frame is 2015–2026. Both the policy and its supporting action plan were assigned to the Cyber Security Council (CSC). The government officials and ministers who deal with cyber security have formed a new entity. It's a great resource for teamwork and knowledge sharing.

To further promote collaboration between private and governmental sectors, the initiative also established a Cyber Security Forum. New regulations provide more constraints on cyber security, communication, postal, and registration Iceland programs. The government wanted to develop a strategy for defending its digital infrastructure. The current cyber security plan, which will be replaced by this one, will be in effect from 2019 until 2033. A similar resolution with accompanying time constraints was approved in Parliament. A Cyber Security Council was formed to oversee how the strategy and action plan were put into practice. In order to solve cyber problems, several different departments and agencies must work together. When it comes to teamwork and sharing knowledge, this curriculum is unparalleled. The Cyber Security Forum was formed as a third organization to facilitate communication and collaboration between government and private organizations in the area of cyber security.

#### **4.10. The use of Emerging ICT [EMG]**

According to the findings of the analysis, Iceland is in an advantageous position to cope with the development and deployment of artificial intelligence. Based on the status report, the government has to adopt a policy for artificial intelligence that takes into account the human rights and freedoms of the population while furthering the economic interests of

the country. In order for the government to provide the greatest possible service to the American people, it should adhere to the following principles: In addition to adhering to social principles such as human rights and democracy, the development and use of artificial intelligence should also assure fairness and openness in communication and decision-making. This should be done while maintaining adherence to these values. It is anticipated of inspectors that as part of their duties, they would monitor the functioning of systems that integrate artificial intelligence in order to preserve accountability and trustworthiness. This is absolutely necessary for the creation, operation, and management of systems of this kind.

India

## 1. General Information

Area: 3,287,590 km<sup>2</sup>

Population: 1,417,173,173

Government Type: Federal parliamentary constitutional republic

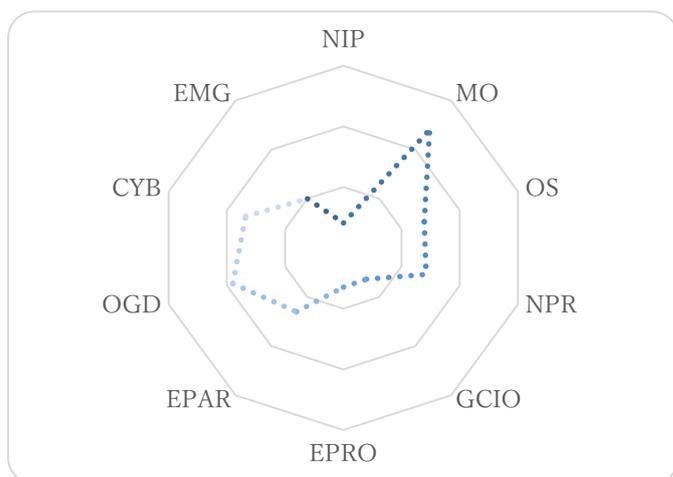
GDP: \$1,882

Internet User: 43.00

Wired (Fixed Broadband User): 1.66

Wireless Broadband User: 52.54

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

With a total score of 71,493, India scored 33 on the nations rated by Waseda in 2022. To propel them to the forefront of the eGovernment movement, the governments of the globe are undergoing significant upheaval at an accelerated rate. Covid-19 has caused a genuine schism between countries and their citizens. Nonetheless, the need to link e-government services has only become more precise as residents, and government workers remain at

home. India plans to expand its use of networked digital services. The Indian government is also making the transition to an electronic government at present. The Indian government has initiated a project known as Digital India. This umbrella initiative not only contributes to the transformation of the e-government but also focuses on changing people's lives and growing the nation in an all-inclusive manner.

The idea of Digital India is cutting-edge since it provides a unified vision and a comprehensive plan of action. It accomplishes this goal by centralizing several departments and ongoing and upcoming initiatives monitored and influenced by the government. This article's objective is to provide a comprehensive analysis of this flagship effort so that the reader may understand the transformation this program has brought about in e-government. The primary differences that may be seen between traditional and online governance forms are this essay's primary emphasis. In addition, it highlights the initiatives that have been made to transform the government of India into an electronic one as part of the Digital India Program.

### **3.2. New Trends**

Investments in the IT sector have expanded due to the government's encouragement of rapid digitization. The government of India made many proclamations in their most recent Union Budget for 2022–23 that would significantly advance the state of digitalization in India. The Reserve Bank of India, the country's central bank, will soon issue India's Digital Currency, joining the country's ongoing digitization in the banking, higher education, and healthcare sectors. The government has also said it would give data centers the infrastructure status, elevating their importance in developing the digital economy.

Under many consequences of COVID, India will significantly emphasize coordinating government programs across departments. Because of this, dealing with the government would be much less cumbersome. For a youngster diagnosed with learning difficulties, the child's medical information would be shared with the education ministry. Then the schools will be better prepared to provide extra support in class. It is possible to connect citizens seeking job assistance with other government benefits, such as medical coverage.

India is taking pains to ensure that when public services go online, citizens can still easily access them. It's possible that plenty of individuals lack the expertise required to use

online services effectively. To address this problem, India is developing voice-based technology that will allow its residents to access all government services. They may just ask for what they need rather than fumbling with menus and buttons.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Because of its enormous population, India will need to make far more investments in the infrastructure network before it can complete its digital transformation. The figures don't tell the whole story, but India has made significant progress in the years leading up to the beginning of 2021. India has made further efforts to bring the delayed 5G spectrum auction to a successful conclusion. BSNL carried out the 5G experiments in collaboration with Ciena, and at the same time, the undersea cable that connects the mainland to the Andaman and Nicobar Islands was constructed.

##### **4.2. Management Optimization [MO]**

In recent years, several state and federal authorities have implemented electronic government. There have been a lot of different initiatives done to improve accessibility as well as the delivery of public services. Computerizing government agencies is only one component of the newly implemented citizen-centricity, service orientation, and transparency that are part of the Indian e-Government. While formulating the nation's modern, forward-thinking e-government strategy, an earlier attempt at electronic government was investigated. Accelerating the deployment of e-government should be done logically, directed by a shared vision and design on all three levels (national, state, and municipal). Interoperability may be made feasible by implementing standards thanks to the assistance provided by the infrastructure, and citizens will have a unified vision of their government.

Numerous distinct e-government initiatives are taking place around the country, but the NeGP brings them all together under a single overarching goal and objective. Because of this plan, a comprehensive infrastructure for the whole state is now being developed, and a significant number of documents are undergoing digitization to make the internet more user-friendly and reliable for everyone. The primary objective of the NeGP is to broaden people's access to the many services provided by the government.

### **4.3. Online Service [OS]**

Multiple online systems and platforms have been developed in India, contributing to the country's reputation as a leader in technical innovation. People in India may use MyGov.in to get their voices heard on government and policy matters. It also helps people become involved in government and politics.

The Indian government developed UMANG (Unified Mobile Application for New-age Governance) for mobile platforms such as Android, iOS, Windows, and USSD (feature phones). Additionally, assistance with tax avoidance and enrollment in the Aadhaar database is offered. Users may now digitally sign documents with the use of the Aadhaar e-Sign framework.

The e-Hospital platform enables patients to do anything from check in and pay their bills to check their test results and blood supply. Live to track government employees' whereabouts.

Users may utilize the Digital Locker to save sensitive papers like their PAN cards, passports, mark sheets, and diplomas safely accessible from anywhere in the world. The Digital Locker allows citizens to access official documents safely. The use of Aadhaar's authentication services is included, with the ultimate goal of reducing the need for paper documents by promoting electronic document exchange across government agencies.

To connect rural India to Digital India, the Indian government mandated that Gmail, Office, and Rediff create regional language email accounts. Companies that supply email services have responded favorably and are taking similar actions. Indian company Data Xgen Technologies Pvt Ltd launched DATAMAIL, the first free global multilingual email service. Data XGen Technologies plans to provide multilingual email support in 22 different tongues.

### **4.4. National Portal [NPR]**

NIC, a significant Indian government ICT body, working under the Ministry of Electronics and Information Technology, created, built, and hosts the Official Portal of the Government of India, india.gov.in (the national portal of India). The Portal was developed as a Mission Mode Project to implement the National E-Government Plan.

With this Portal, Indian people and other interested parties would have a centralized location to access government data and services. This website was created as a comprehensive resource for learning about India. The present portal is metadata-driven and linked to other Indian government portals and websites with the most recent data. The National Portal Secretariat includes a Content Management Team in charge of the portal's information. In the future, we want to regularly update this Portal's content range, aesthetic, and technological components.

#### **4.5. Government CIO [GCIO]**

An essential element of India's Ministry of Communication and Information, the Department of Electronics and Information Technology (DEITY) has been at the forefront of sponsoring and directing the country's digital government initiatives. Since the leader of DEITY is responsible for duties that are typically assigned to a country's CIO (Chief Information Officer), this hub is also known as a "Government Chief Information Officer" (GCIO) center. CIO Academy is an extension of the CIO development programs offered by Srinji Raju Centre for Information Technology and Networked Economy (SRITNE) and the Indian School of Business (ISB), both of which operate in tandem with the Indian CIO Association.

#### **4.6. E-Government Promotion [EPRO]**

In recent years, many local administrations and federal agencies have moved toward e-Government deployment. Several initiatives have been to improve the accessibility and availability of public services. E-Government in India encompasses more than just the digitalization of government agencies; it also prioritizes service to the public and promotes openness. The country's forward-thinking e-Government strategy was developed by studying previous e-Government efforts. A deliberate approach driven by a clear vision and plan has been adopted to expedite the implementation of e-Government across various government agencies at the national, state, and municipal levels. This idea can save costs by sharing essential and auxiliary resources, promoting interoperability via the adoption of standards, and giving citizens a more holistic picture of their government's actions.

All e-Government initiatives in the nation will be working toward the same goals thanks

to the National e-Governance Plan (NeGP). As a consequence of this plan, a statewide infrastructure is being built, and many documents are digitized so that everyone in the state can access fast reliable internet. The New Essential Government Performance Plan's end purpose is to improve citizens' access to government services.

Several legislative initiatives and projects have been implemented to improve the e-core Government and its supporting infrastructure. The National e-Government Service Delivery Gateway (NSDG), the State e-Government Service Delivery Gateways, and the Mobile e-Government Service Delivery Gateway (MEGSDG) are the main pillars of the foundational infrastructure. Metadata standards, interoperability, business design, and data security are vital to support components. The G-I cloud will use cloud computing.

#### **4.7. E-Participation [EPAR]**

Indian society and culture have been considered "high-tech adopters" since the early 1990s, when both the government and the general public began using ICT to further their respective missions and improve their daily lives. Members of Congress keep up a webpage so they may communicate with voters. However, the overall quality of e-Participation in India has decreased due to the lack of a site devoted to eliciting public opinion. India scores well because it has a GCIO and an organization and engages in development efforts.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

India's digital transformation is a testament to PM Modi's visionary leadership and dedication to harnessing technology to achieve equitable development and change. Digital India's mission statement, "Power to Empower," is being fully realized. The fact that Digital India has been so successful over the last eight years is further evidence of the vital role it will play in India's continued progress. There are complex data to back up the claims of digital transformation after eight years of digital governance. India presently has over 80 crore internet users, 133 crore Aadhaar cards, and 4G, and is rapidly progressing toward 5G. In addition, its data rates are among the cheapest in the globe. The progress India has made is thanks to Prime Minister Modi's plan, which he outlined during the July 1, 2015, launch of Digital India.

The Open Government Data Platform in India makes it easier for more people to access

and use data that is held by the government, therefore maximizing the data's potential to contribute to the country's progress. The program is an element of Pillar 6 of the Open Source Stack that Digital India has developed. The Open Government Data Platform in India was a joint project between the governments of India and the United States. In addition, the Open Government Data Platform India has been turned into a product, and its source code has been made freely available for usage in other countries. The total effect may be obtained by going to the external website called "GitHub," which loads into a new tab or window. The Open Government Data Platform in India gives several government entities the ability to publish their data catalogs on the front end of the website, pending clearance via a workflow process.

#### **4.9. Cyber Security [CYB]**

As part of new cybersecurity guidelines suggested by CERT-In, VPN, cloud, and other IT service providers would be forced to gather their clients' personal information and activity logs and send them to Indian authorities upon demand. To comply with the regulations, organizations operating inside India must enable ICT system logging and maintain data for at least 180 days. It is CERT-prerogative In's to seek and examine such documents in the event of a cybersecurity incident. Unintentionally, legislation mandating extensive logging will result in a massive honeypot of sensitive data from all businesses using or interacting with the Internet or digital computer systems. Threat actors, criminal organizations, or even hostility from other countries might easily breach them.

To ensure that all ICT systems operate correctly, they must be synced with official government time servers. Besides running contrary to accepted procedures for syncing to multiple time sources, this raises the prospect of a disastrous breakdown. Cybersecurity laws have been created to lower cybercrime rates, but they have done nothing to increase internet, government, business, or consumer security so far. Network operators and service providers may be reluctant to report incidents if they believe CERT-In is also acting in law enforcement or regulatory. In addition, the cost of complying with these requirements will be disproportionately high for startups and smaller enterprises in India's burgeoning IT industry. India is in danger of losing its position as a worldwide leader in the ICT sector and stifling its digital economy's growth due to the directives' extraterritorial impact on service providers and intermediaries. Insufficient clarity and

scope in cybersecurity regulations endanger the reliability of the Internet as a whole. Furthermore, the security of the whole Indian internet community would be compromised if these new rules were implemented.

#### **4.10. The use of Emerging ICT [EMG]**

India hopes to prove itself as a leading AI powerhouse that other countries may turn to for assistance. The progress India makes in artificial intelligence will help advance the field worldwide. Protections for citizens' private information are now being written into law in India. To ensure the development of a trustworthy artificially intelligent supercomputer, legislation is being advocated. A data-rich and data-driven society will benefit the Indian people and reduce corporate expenses.

Technology has been used by Digital India and the Smart Cities Mission to provide a wide range of intelligent services to the people of India. Technologies such as the Internet of Things (IoT), cloud computing, and artificial intelligence enable smart transportation, infrastructure, energy, communications, and lighting. All levels of government, as well as private businesses and individuals, may save money and time by using these solutions. The Internet of Things (IoT) is becoming more important in many commercial and industrial settings. Electrical grids, vehicles, cities, and factory floors will all be interconnected. The Internet of Things India conference will center on mobile IoT infrastructure.

Indonesia

## 1. General Information

Area: 1,904,569 km<sup>2</sup>

Population: 275,501,339

Government Type: Unitary presidential constitutional republic

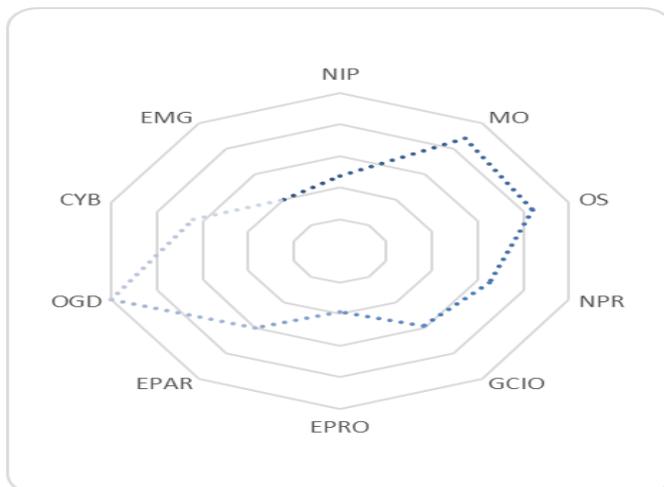
GDP: \$3,847

Internet User: 53.73

Wired (Fixed Broadband User): 4.29

Wireless Broadband User: 104.19

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

With a score of 75.585 on the 2022 Waseda International Digital Government Index, Indonesia ranked 24th overall. The quality of Indonesia's public services has advanced thanks to Indonesia's efforts noticeably. The country's score on the World Bank's ease of doing business index improved from 129th to 73rd out of 190 nations, indicating that it

has developed a more productive environment for doing business. During this time, the government started transitioning its conventional services into what is now known as e-government services, which use technology to provide public services. One such instance is the Manajemen Integrasi Informasi dan Pertukaran (MANTRA) data-sharing system, which has enabled online access to public services for the general populace.

The pandemic has prompted a rapid shift toward economic digitization in Indonesia. More people from more backgrounds will access better economic opportunities as the pace of digitization in the economy quickens. The tremendous growth in digital technology usage, however, necessitates a more unified and comprehensive governmental response on a global scale. According to the Ministry of Communication and Informatics, the acceleration of digital transformation in Indonesia may be pushed via four primary areas: digital infrastructure, digital government, digital economy, and digital society. These four sectors are listed in the following order: These four industries can assist Indonesia, which has the potential to record the most significant and quickest growth in the internet economy in Southeast Asia.

### **3.2. New Trends**

When it comes to the functioning of an economy, the services provided by the government are necessary. Effective public services can stimulate economic expansion by fostering the rise of other industries. Suppose the government of Indonesia wants to realize its goal of elevating the country's economy to the fifth-to-7-strongest on the global stage by the year 2045. It must devote significant attention to enhancing the nation's public service standards.

Data inconsistencies arise when government organizations construct their databases independently of one another, with just a few communication points between them. One such instance is the difference in reported COVID-19 instances between the federal government and the states. The government's ability to make data-driven choices is hindered by the lack of trustworthiness in the data it has at its disposal. The government and people of Indonesia stand to gain much from adopting e-government while also resolving some of the most pressing problems in the public sector. By easing data sharing, allowing efficient digital services across government agencies, and speeding up the

creation of companies that can utilize the shared database to generate last-mile digital services, a national digital platform may hasten a country's digital transition. Meanwhile, the government may use the information provided by many sectors to develop a holistic picture of society and craft more effective policies.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Construction of the SATRIA-I multifunction satellite with a capacity of 150 Gbps began in 2021, with satellite and rocket components being built in France and the United States and 11 earth stations being constructed in Indonesia to accommodate the growing demand for satellite capacity. Meanwhile, the Ministry and its cellular operator partners have begun building Base Transceiver Stations (BTS) in 12,548 rural areas without current access to 4G. The Ministry's BLU BAKTI has built 9,113 BTS in the 3T region, while private cellular providers have built 3,435.

The Ministry's continued focus on ensuring the high quality of Indonesia's telecommunications services complements the country's massive investment in digital infrastructure. In light of this, the Ministry has finished building a Telecommunication Monitoring Center that will track public complaints about service outages in real-time and quantify QoS and QoE. Inside 514 provinces/urban areas. The Ministry will carry out the initiatives outlined in the Digital Indonesia Roadmap to further expand the country's telecommunications infrastructure. The Ministry's main emphasis in 2022 will be on bringing the development of the backbone layer up to the very last mile.

Limited finance, particularly for growth in the 3T area, is one of the many obstacles to building digital infrastructure identified by the 2022 development study (underdeveloped, outermost, and underdeveloped). Consequently, the Ministry achieved a breakthrough thanks to a novel blended finance plan.

##### **4.2. Management Optimization [MO]**

In light of this digital potential, the nation has devised the Indonesia Digital Roadmap 2021-2024 to accelerate digital transformation in line with a direction from the government. The Human Resources Research and Development branch of the Ministry of Human Resources is working to encourage people with digital potential in different

locations to pursue possibilities.

Regarding infrastructure development, the ministry has constructed the Palapa Ring, which spans 12,229 kilometers and links 57 districts in Indonesia. In 2023, the Ministry of Communications and Information Technology will launch the Indonesia Raya Satellite, also known as SATRIA 1, with a capacity of 150 Gbps; SATRIA 2, with a total of 300 Gbps; and SATRIA 3, with an ability of 500 Gbps, to provide public services with access to high-speed internet via Wi-Fi. Through the Telecommunication and Information Accessibility Agency, they will also build 7,904 Base Transceiver Stations (BTS) in villages located within 3T areas, which are defined as being "outermost," "remote," and "underdeveloped" (BAKTI).

#### **4.3. Online Service [OS]**

Credit card usage is shallow in Indonesia despite the widespread use of alternative forms of digital payment. GoPAY led the electronic wallet market share, followed by Ovo, Dana, and LinkAja. The most common uses of electronic wallets are for payments in online transportation, online food and beverage, and offline food and drink. These days, it's common practice to provide monetarily or point rewards for participation in promotions.

Tokopedia is the most widely used online marketplace in Indonesia because it facilitates the rapid setup and management of digital shops for individuals and businesses. More importantly, Shopee is a significant player in the industry, especially in countries where "mobile first" is the standard. For the most part, it functions as a mobile-friendly, multi-vendor online store that offers the standard web shopping experience.

In addition to Shopee, Bukalapak also serves as an e-commerce hub where buyers and sellers may interact in the global marketplace. The safety and comfort of its customers' financial transactions are of paramount importance to Bukalapak, and the company puts a premium on the speed and reliability of online trading.

#### **4.4. National Portal [NPR]**

The website the Indonesian government officially sanctions is the National Portal of the Republic of Indonesia (Indonesia.go.id). A broad overview of the nation is presented, as well as information on the leaders of the government, the legislative and regulatory

agencies, announcements of new initiatives, public service announcements, and news and statistics. Support is only provided for the Indonesian language.

#### **4.5. Government CIO [GCIO]**

In Indonesia, the chief information officer (CIO) position is filled by someone appointed due to a presidential mandate. CIOs of the government work together with CIOs of other ministries and enterprises, as well as other C-level executives in the field of information technology, to guarantee the success of national digital projects. According to a presidential mandate that Indonesian President Joko Widodo gave, all government agencies are required to recruit a Chief Information Officer (CIO) in order to manage the implementation of technological agendas across several administrations.

To ensure that digital projects are carried out nationally, government chief information officers work with other chief information officers, businesses, and ministries. The goal of the presidential decree was to bring together disparate technological systems used by various ministries and government entities. To implement the brand-new e-governance system at the national level, it is required that all government institutions collaborate and use the same electronic services.

#### **4.6. E-Government Promotion [EPRO]**

Both on the ground and in space, the Indonesian Ministry of Communications and Informatics has been ramping up its efforts to construct a sizeable information and communication technology infrastructure in Indonesia. Providers of information and communications technology infrastructure enhance Indonesia's territorial integrity to the point where ICT infrastructure becomes a societal requirement. This is the case because ICT infrastructure providers are a means by which ICT infrastructure becomes a societal requirement. Technological advancements make accessing information and communication networks no longer prestigious or exclusive.

#### **4.7. E-Participation [EPAR]**

The factors the nation has taken into account have led to the development of e-government applications compatible with mobile devices like smartphones and tablets. Apps that enable users to engage in the digital world despite the absence of crucial infrastructure are often well received by the younger generation. It is normal practice for

governmental authorities to have a website and allow residents to communicate with them via the site. In Indonesia, residents can lodge complaints against government officials using e-participation sites such as [lapor.go.id](http://lapor.go.id). The Presidential Task Force, which is linked to all branches of the government, is responsible for maintaining this website.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The digital transformation of the whole country of Indonesia is now the real economic growth of the country. The growth of a nation's digital sector is intrinsically tied to the strength of its economy, and the two interact in a virtuous cycle of innovation that feeds and reinforces itself. The regulatory framework is the ultimate driver of the digital and economic growth cycle; thus, familiarity with it is essential. A nation's economic success is in part determined by the extent to which its citizens use digital services and procedures. Consequently, the health of a country's financial system and investment climate directly results from its economic success, which in turn affects the digital ecosystem. The purpose and function of the regulatory framework should be to foster the development of such a positive feedback loop.

In Indonesian politics, the National Action Plan (NAP), which outlines the country's plan for implementing open government, is critical. Ministries, agencies, and groups within civil society have committed to providing financial resources to the National Action Plan (CSOs). In order to ensure that all of the commitments are kept, specific benchmarks have been developed for each participant. The Open Government Indonesia National Action Plan works toward the goal of "Clean, Effective, and Reliable Government Management" by fostering political stability and upgrading public services simultaneously. This is essential to the nation's sustained economic growth. Additionally, the plan is an integral component of the government's efforts to push the global agenda, including the Sustainable Development Goals (SDGs).

As a direct reaction to the spread of the COVID-19 virus across Indonesia, the Open Government Indonesia National Action Plan was developed. Since then, attention has been directed to post-epidemic COVID-19 and strategies for accelerating Indonesia's recovery. Several strategic objectives, such as improving public services, lowering levels of corruption, promoting budgetary transparency, increasing access to justice, and supporting public policies sensitive to gender issues, will also be easier to achieve.

#### **4.9. Cyber Security [CYB]**

Recent developments in Indonesian policy demonstrate a rising understanding of the vulnerability of crucial national infrastructure to cyberattacks and the need for comprehensive regulatory and legislative responses. It's possible that the security services of Australia can assist Indonesia in improving its cyber security foundation.

The Indonesian president, Joko Widodo, issued an executive order on April 13 to strengthen the National Cyber and Crypto Agency, also known as the "State Cyber and Signal Agency," abbreviated as BSSN. This order was made in response to a cyber-attack on April 13. According to Presidential Decree 28/2021, BSSN is directly answerable to the president. This provides extra opportunities for flexibility and influence outside of the typical ministerial structure. The efficacy and efficiency of the BSSN and the norms controlling "national security, sovereignty, and data protection" would be strengthened. After the BSSN order, three additional decrees will be published: one on the country's national cybersecurity plan for 2020–24, one on dealing with cyber crises at home, and one on the significance of critical information infrastructure throughout the country. All of these decrees will be published simultaneously. These instructions will be used by Indonesia to enhance the country's geopolitical and economic competitiveness as well as develop, secure, and deploy cyberspace to accomplish national objectives.

#### **4.10. The use of Emerging ICT [EMG]**

The industry of digital innovation in Indonesia is seeing significant expansion. Indonesia is the world's fourth most populated nation, with a total population of 264.2 million people. The "digital economy" is anticipated to create an annual revenue of US\$133 billion by 2025 when Internet penetration reaches 64.8 percent. Smartphones are the most popular platform, with 96 percent of those who use the internet owning at least one.

As the nation with the most internet users and the biggest economy in ASEAN, Indonesia boasts one of the region's most diversified and broad start-up ecosystems. This is attributed to the country's 215 million online users. According to Google and Temasek's projections, Indonesia's "internet economy" is predicted to reach US\$130 billion by 2025, having grown at an annualized pace of 49 percent since 2015. In 2019, it is estimated to be worth US\$40 billion. By 2025, it is projected to reach US\$130 billion. This is close to 45 percent of the expected total for ASEAN.

Entrepreneurial spirit is essential in today's rapidly expanding "digital economies" areas, such as e-commerce, digital health, banking, and education technology. Additionally, it is a driving element for modernization in conventional banking, telecommunications, agriculture, logistics, retail, natural resource management, and public service delivery. This was made feasible with the assistance of a diverse assortment of accelerator and incubator programs, co-working spaces, and venture capitalists.

Ireland

## 1. General Information

Area: 70,273 km<sup>2</sup>

Population: 5,023,109

Government Type: Parliamentary Democracy

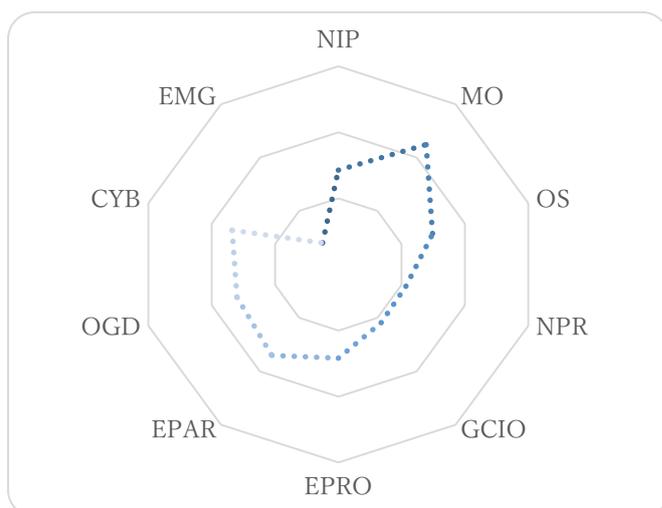
GDP: \$84,718

Internet User: 92.00

Wired (Fixed Broadband User): 30.71

Wireless Broadband User: 103.82

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

In a brand-new phase of technological advancement for Ireland to recover from the epidemic, it was necessary for the country to put much greater effort into incorporating technology into its economic and social life. It is believed that improved digital governance will be the trigger that will pull Ireland out of its downward spiral. The government took steps to reduce the gap in digital skills and develop an education and training system to facilitate the adult acquisition of digital skills. In addition, the

government has made significant expenditures on the digital transformation of the country's workforce. All labor force members must achieve certain levels of expertise and knowledge before they may find employment. After this comes the objective, which is to produce technology that citizens have created to live up to the standards of the next period.

Immigration and company registration procedures have both been simplified and given more resources to conform to international norms. The government standardized its policies and programs across departments to foster the growth of its infrastructure and public service provision. They collaborate with the European Commission to develop practical and legal initiatives in the data management and artificial intelligence sectors, pushing for open global data flows. Waseda International's digital government rankings for 2022 placed Ireland 14th, with a total score of 82.148. This position was achieved despite all of Ireland's efforts.

### **3.2. New Trends**

The Irish government has developed an 18-step roadmap with eighteen significant initiatives to advance the five pillars of its Public Service ICT Strategy. The eighteen projects have all been tailored to make the most of modern advancements in their respective professions. Examples of such initiatives include the building of the Gov.ie website, the passing of legislation, the establishment of a Government Private Cloud, and the launch of an ICT Apprenticeship program. The government is working to broaden MyGovID's user base and improve the service's functionality. One such method is authentication using a mobile device. They hope that by combining their private cloud with public cloud services, they can reap both benefits while keeping prices down. They want to concentrate on open data in the future as well.

Due to the epidemic and the country's economic recovery, Ireland has adopted strategic objectives. Accelerating change and innovation is adopting new business models, digital transformation, and a low-carbon economy. The primary goal of the government is to increase the number of business customers that adopt and transform their operations with the help of digital technology. By emphasizing remote work, marketing, capacity support, and communication, they want to aid customers in their understanding of digitalization.

Ireland is working on a multi-year plan to digitize its economy. It is providing input into developing national policies to increase its customer base's digital competence and hasten its digital transformation. Partnerships between the United States and its regions will be supported, particularly in research and innovation. Optimizing cutting-edge production processes and advanced technology can help firms cut their carbon footprint.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The following are some of the significant advancements that have been made in the digital government of Ireland:

- National Broadband Ireland is working to strengthen the broadband network available across Ireland.
- Trials of Starlink's satellite broadband service have begun, and the eir network can now provide 5G connectivity to 57 percent of the country's population.
- The government has compelled eir to open its fiber networks to other carriers; Vodafone is expanding the availability of its NB-IoT and 5G services in several additional cities.
- SIRO's Gigabit Hub Initiative is attracting an increasing number of customers.

##### **4.2. Management Optimization [MO]**

Developing an eHealth strategy is what Ireland has been doing to prove that its healthcare delivery system and its citizens benefit from using eHealth. Examples are electronic prescriptions, online referrals and scheduling, Telehealth, and the generation of summary patient data. The Health Service Executive published the Knowledge and Information Strategy, a document promoting eHealth's benefits in Ireland. The objective of the Strategy is to provide comprehensive care focused on the individual, is risk-free, and excels in quality. This plan, which expands upon Ireland's eHealth Vision, is meant to meet the population's needs in every medical location and along every possible patient pathway. In addition, this Strategy details how the organization's knowledge and information will be modified to address future delivery issues and advance the Vision and objectives of the HSE Corporate Plan.

The government of Ireland has unveiled its Action Plan, a set of measures designed to attract and retain top-tier ICT professionals in the country. The strategy proposes several

steps to boost the country's supply performance to maintain Ireland's status as a global center for top-tier IT talent. This is a collaborative effort of government, industry, and educational and training systems.

The duties of local governments are carried out following LGA initiatives and national policy. To help cities and towns succeed, the state funds the Housing, Planning, Community, and Local Government Department, the Local Government Management Agency (LGMA). Within the scope of its authority, the LGMA promotes the efficient and economic rollout of municipal services and programs. The Office of the Government Chief Information Officer (OGCIO) creates and manages a suite of applications used by the government. The Public Service ICT Strategy advocated for a unified software suite across government agencies to save costs. Ireland's 11.600 MO score is sixth in the 2022 Waseda rankings, where it currently sits.

#### **4.3. Online Service [OS]**

Government agencies and other approved users use the Personal Public Service Number (PPSN) to provide safe access to essential government services. Organizations, including the Health Service Executive, the Revenue Commissioners, and the Department of Employment Affairs and Social Protection, utilize PPSNs (HSE). Vaccinating children, obtaining public health services (such as medical cards and a payment system for prescription prescriptions), obtaining financial aid (such as reductions in mortgage interest), securing housing subsidies, and taking driving theory and license examinations all need a PPSN. No matter how you access government services—in-person, over the phone, or online—the Public Service Card (PSC) ensures your privacy is protected.

Online passport applications and renewals are now available to citizens of Ireland. As the name implies, the service is always on hand. Ireland citizens are now free to travel across the European Union, the Economic Area, and Switzerland. The application process is open to any Irish citizen older than 18. Citizens may submit your application through their website or mobile app. New Irish passport holders may now renew their passports online.

#### **4.4. National Portal [NPR]**

The government domain serves as a central hub for all accessible government services online, making it easy for citizens to find what they need. By reporting on government

activities as news, the Irish Government News Service Portal provides a glimpse into how things work behind the scenes. The site's primary goal is to give balanced reporting on a broad range of topics. This means that the Portal provides a central location for those interested in government problems to get up to date quickly and easily. RSS streams and departmental websites connect to all government press releases. In addition, the Portal's 'Issues' area provides relevant, timely resources. The GIS, GPO, and IT all worked together to produce it.

The Citizens Information Board is the government agency responsible for distributing Citizens' Information. The topics covered on the site are legal protections in the workplace, purchasing property, moving abroad, and furthering education. The issues are organized into 14 groups that map the main phases of a person's life. Details are bolstered by case studies, supporting paperwork, and downloadable forms from various organizations.

#### **4.5. Government CIO [GCIO]**

The Chief Information Officer of the Irish Government, often known as the GCIO, is to develop and carry out a unified information technology strategy for the government that will guarantee the use of technology across all of its departments and agencies. At the second level of the organization, the Health Service Executive (HSE) established the Office of the Chief Information Officer (OCIO) with the mission of supervising the implementation of the eHealth Ireland Strategy and ensuring that advancements in technology contribute to the improvement of medical care.

#### **4.6. E-Government Promotion [EPRO]**

In terms of lifestyle, economic practices, and consumer habits, Covid-19 has brought about profound changes. This might be the fundamental impetus that government agencies need to spur creativity. Many industries that fought digitization in the past are now dependent on it. As the nation moves towards the digital economy, consumer and institutional preparedness are considered separately. Most Malaysian customers are prepared since they are already online through mobile devices; by 2024, the number of smartphone users in Malaysia is expected to exceed 33 million.

There has been significant progress in recent years, but there are still substantial obstacles to digital adoption. These include a lack of digital literacy and a general perception that

it is difficult. We anticipate this would hasten local capacities in adopting digitalization via the Prime Minister's National Digital Economy and 4IR Council.

Essential elements that governments should consider in their digital journey to guarantee the capacity to serve effectively, grow affordably, and react quickly are as follows:

#### 1 Expanding the digital infrastructure

In light of the different movement restriction orders, people are expected to stay indoors and complete their daily responsibilities, including school and work. The government is struggling to keep up with the soaring demand for digital services and brand new services not previously available due to the increasing number of firms that must function remotely. This has necessitated a massive expansion of their digital capabilities, and they have responded to the many threats they face by using a pair of digital strategies. The government of Malaysia has implemented several programs—including the Strategic Programme to Empower the People and Economy (Pemerksa) and different stimulus packages—to boost economic recovery and growth. With US\$242.5 million allocated in the 2021 Budget for Cybersecurity, IoT and Connectivity, Digital Workforce Development, and SME Digital Transformation, Malaysia is well on its way to becoming a fully digital nation.

#### 2. Making use of cloud-based services

Using cloud computing is critical for maintaining operations. Due to its inherent scalability, the cloud offers cost savings and adaptation with relative ease. Recognizing this, the government intends to set the pace for the expansion of the cloud industry by implementing a cloud-first policy throughout the public sector and contracting with cloud service providers and managed service providers to increase Malaysia's competence in this area. Microsoft, Google, Amazon, and Telekom Malaysia have all been granted conditional clearance to construct and operate hyper-scale data centers and cloud services in Malaysia as part of the MyDigital initiative's plan.

#### 3. Making government employees more comfortable with technology

Investments in IT infrastructure may speed up the government's digital effort, but this alone won't be enough to keep things moving forward. The development of a technologically literate workforce is of equal importance. As the epidemic spread, it brought into sharp focus the necessity for a public sector staff that is both tech-savvy and

digitally literate. Their respective governments should drive efforts to improve people's familiarity with technology. Last year, Huawei Malaysia introduced the Huawei Asean Academy, a specialized training module to develop digital talent, in collaboration with the Ministry of Communications and Multimedia. The academy's ICT training programs and courses are aimed at government agencies, industry experts, and college students, giving the nation a well-rounded boost to its ICT ecosystem and digital economy.

#### 4. Spending money on improving people's ability to interact with one another

Expanding digital solutions and encouraging the virtualization of services can only be beneficial if they are accessible to the general public. Therefore, governments must invest in public infrastructure that increases access to digital solutions, particularly for underserved communities.

#### **4.7. E-Participation [EPAR]**

Ireland is uniquely attuned to the political repercussions of shifting patterns of information and communication. Since its independence, Ireland's politics have been characterized by a lack of administrative transparency and accountability, coupled with a strong heritage of informal social and political engagement. It was believed that citizens did not get state advantages because it was their legal right to do so, but rather because powerful and kind rulers awarded them as personal favors in exchange for the citizens' political support. There are a number of hypothesized contributors to the rise and persistence of political clientelism. Exclusive in nature, clientelist informal networks encourage private individuals to exploit public services for their own benefit.

The political system in Ireland has evolved as a result of the proliferation of information and communication technologies, which have affected the ways in which individuals engage with the state's administrative structure. The use of informal and ad hoc methods may also increase citizens' involvement in government. New technologies have already shown that the administrative system is more fair than was previously imagined. People have seen that they can apply for and get benefits to which they are legally entitled, and that doing so may have a positive impact on their lives. The next phase is to increase public engagement, either as individuals or in ad hoc organizations, via the expansion of this technological connection between citizen and state.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

To stimulate and allow digital change throughout the Irish economy and society, Ireland has developed a national digital strategy called "Harnessing Digital - The Digital Ireland Framework." It focuses on four main areas: digitizing public services, digitalizing government operations, and the digital transformation of businesses. The plan has lofty goals for the digital transformation of Irish firms by 2030, including SMEs and large corporations widespread use of cloud computing, AI, and big data. Key productive industries such as construction, advanced manufacturing, agriculture, healthcare, transportation, and fintech are highlighted. Maintaining a focus on growing Ireland's vibrant startup scene is essential.

Governments may become more open, encourage innovation, and offer data infrastructure to assist economic development with the aid of available data. The data it generates may prove that public funds are being used effectively and policies are being carried out. The 48 Hour Hackathon on "Unleashing the Power of Open Data for Innovation," hosted by the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU), gave high school students and adults a chance to utilize open data to create solutions to societal challenges.

An open database that anyone can access, use, and share, the Sinar project is working to increase citizens' access to vital civic information such as legislative processes, parliamentary data, and MP statistics. The creation of the Asian Open Data Alliance has opened up new possibilities for cross-border cooperation in disseminating and using open data in the Asia-Pacific area.

#### **4.9. Cyber Security [CYB]**

The National Cyber Security Centre (NCSC) has administered day-to-day operations as the department's operational arm for information security. Members of the NCSC are selected from the national or federal Computer Security Incident Response Team in each state (CSIRT-IE). The purpose of the project is to lessen the risks associated with the infrastructure and services of the internet to provide a reliable, trustworthy, and stable online environment in which people and companies may engage in social and economic activities. Protecting vital digital assets and the infrastructure that depends on them may be aided by working with other government agencies, critical businesses like energy and

telecommunications, and foreign partners.

#### **4.10. The use of Emerging ICT [EMG]**

The government revealed its new Research Priority Areas for 2018–2023. Ireland promises to review critical areas monthly and update or alter them as necessary to ensure they remain relevant. Ireland has to be ready to make the most of global opportunities today and in the future by adapting to the global trends and challenges that affect the global economy and its position. The focus and fundamental ideas have shifted somewhat since 2012 to account for new realities.

Ireland launched the European Blockchain Partnership to provide a unified framework for blockchain services throughout Europe (EBSI). Ireland was an active member of the Partnership's Self-Sovereign Identity case use workgroup and its other policy, technical, and use case workgroups. As well to the Organization for Economic Cooperation and Development, Ireland is also a member of the Blockchain International Association for Confidence Applications (INABTA). Ireland has decided to join the government consultative board of INABTA, furthering the discussion of blockchain technology worldwide. Public and private sectors in Ireland's blockchain industry have joined together to form Blockchain Ireland.

For compliance with the EU Social Security Coordination Regulations, Member States must set up a centralized network for the electronic transfer of relevant data. The system's goal is to streamline claiming benefits following European Union rules. The EESSI Access Point is up and functioning in Ireland at this time. The Disruptive Technology Innovation Fund (DTIF) will invest €500 million in disruptive technology R&D, marketing, and deployment as part of Project Ireland 2040. Smart and sustainable food production and processing, as well as high-tech manufacturing, are both essential.

Israel

### 1. General Information

Area: 20,770 km<sup>2</sup>

Population: 9,038,309

Government Type: parliamentary democracy

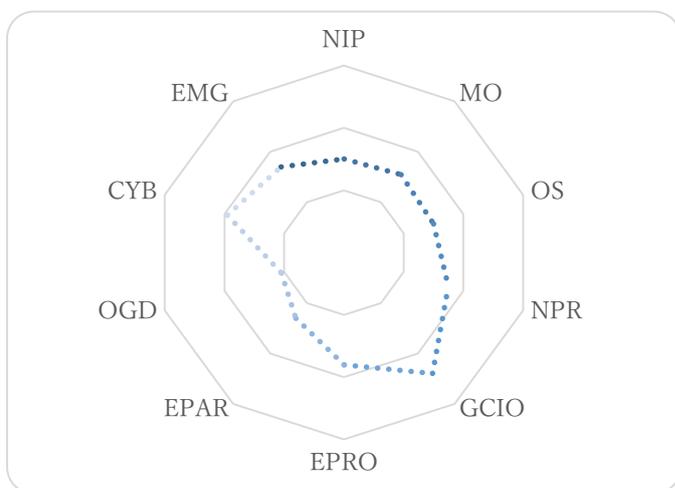
GDP: \$45,042

Internet User: 90.13

Wired (Fixed Broadband User): 30.06

Wireless Broadband User: 121.31

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With an aggregate score of 68.249, Israel landed in the 40th spot in the Waseda rankings for 2022. In 2013, Israel's government realized they needed to create a comprehensive national digital strategy. The epidemic has accelerated the development of digital services in Israel and paved the way for drastic changes to establish corporate identifiers

and eliminate regulatory roadblocks. That same year, the Israeli government passed a resolution creating the "Digital Israel National Initiative," whose goal is to develop and implement a comprehensive national strategy for using information and communication technologies. In a strategic socio-economic evaluation compiled and submitted to the government, the National Economic Council identified "Digital Israel" as one of six significant concerns the State should address.

The government also agreed to create the Digital Israel Bureau (hereafter "the Bureau"), which functions under the Ministry for Social Equality, to coordinate and integrate government activities to achieve the National Initiative and its aims. The government has tasked the Bureau with, among other things, formulating a National Digital Program and assisting with the creation of digital initiatives at the departmental, interdepartmental, and cross-government levels, all of which are essential to the successful implementation of the National Initiative.

Israel, known as the "Start-up Nation," is prepared to take advantage of the opportunities presented by the information technology revolution. Because of its dynamic population and propensity to quickly accept new technologies and services, Israel has become a global leader in the high-tech industry in recent decades, thanks in large part to the benefits of digitization. For Israel to maintain its current level of preeminence over the long term, significant resources must be committed to this cause.

The benefits and opportunities of the Digital Age have not yet permeated all sectors of Israeli society and the economy, despite the country's innovative spirit and cutting-edge technology. In addition, the degree to which the percolation occurred varied between demographic subsets. Widespread inequality and a widening "Digital Divide" exist in Israeli society, with the former benefiting from and the latter often being left out of the advantages of technological progress. The Ministry for Social Equality has identified digital technologies as a fundamental way of resolving these inequalities and taking action to close gaps between demographic groups, erase the "distance" between periphery and center, and further equal opportunity.

### **3.2. New Trends**

Key concepts behind "Digital Israel" include:

1. Customers come first: digital services should be built with people's needs in mind.
2. The ability to quickly adapt to new information and conditions, as shown by initial research and the systematic, step-by-step approach of an integrative process that involves performance, enhancement, measurement, and alterations.
3. Information sources management, including decision-making informed by data and making data and analysis publicly available to foster confidence in government and encourage participation from the public while keeping data secure.
4. digital inclusion or ensuring that all individuals have the same chances to reap the benefits of digitalization by providing universal access to services and minimizing digital literacy disparities.
5. "digital as default"; that is, creating government services as end-to-end digital services that are standardized and easy to use.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

According to the annual Digital Quality of Life Index 2022, Israel placed number one in digital well-being among 117 nations globally. This is even though Israel's mobile internet is among the most expensive in the world, and its quality and infrastructure are both lacking. According to the report from 2022, mobile internet service in Israel is the cheapest in the world. According to the index, Israelis may get 1GB of mobile internet for 5 seconds of labor each month, which is 58 times less expensive than in the US. Compared to the worldwide average of six hours of delivery, the cost of broadband internet was higher but still manageable at 19 minutes of work.

In the other areas, Israel's performance was inconsistent. The quality of the internet in Israel has declined to 21st rank, from 11th in 2021, as measured by the reliability and speed of mobile and broadband connections. While progress has been slow, the Ministry of Communications said this summer that 70 percent of Israeli homes should have access to high-speed internet by the end of the year, thanks to the country's efforts to build out high-speed internet infrastructure utilizing fiber optic connections. Download rates of many gigabits per second are possible with fiber optic networks, which employ light

signals sent via hollow cables rather than electricity along copper wires. At now, rates may be measured in tens of megabits per second.

#### **4.2. Management Optimization [MO]**

To maximize the benefits of digitization and hasten the expansion of the economy, the following three strategic objectives have been established:

1. Foster the growth of information-based companies and industries, as well as digital sectors and businesses, and stimulate information-based innovation. In addition, firms in Israel need to enhance their online activities to improve their competitiveness, open up new prospective customers, and provide new prospects for development.
2. Develop the labor market in a digital age by concentrating on aligning digital skills in the education system, the academy, and the labor force to the needs of the labor market, increasing the use of online professional training, expanding employment opportunities in a digital age by removing distance obstacles, and exercise experienced personnel in the fields of digitalization and information and communications technology (ICT).
3. Encourage an atmosphere conducive to digital work and support the construction of necessary infrastructure (such as high-speed broadband and optical fibers).

#### **4.3. Online Service [OS]**

As for Online Services, the regulations governing electronic signatures, data transmission, and anti-spam are still in place to guarantee the integrity and safety of using Digital Government apps. An array of government services, from tax and payment processing online to form downloads and driver's license applications, are now conveniently accessible via [www.gov.il](http://www.gov.il), a new one-stop government website. Even if there is a central hub for government information, citizens still have to wade through a sea of links to get what they need. Pages of the error have been shown when transfers between the portal and the relevant department or between English and Hebrew sites have not been optimized. Some apps need users to download forms and email, or snail mail them to the proper authorities; hence no fully optimized online transaction experience has been established.

#### **4.4. National Portal [NPR]**

In response to a decision by the Ministerial Committee, the website [gov.il/data](http://gov.il/data) has been

redesigned to provide the general public with reliable and approved information by the Israeli government. The report offers open-source access to the datasets maintained by the government, allowing users to construct apps and systems according to their whims. The Government Information and Communications Technology Authority has launched a new consolidated website, gov.il, based on the open code of the British government's website, gov.uk. The purpose of creating the website was to facilitate the public's quick and straightforward access to all of the information and services provided by the government. The website's design has been applied to the services that are used the most often.

#### **4.5. Government CIO [GCIO]**

Before she was appointed the country's first national chief information officer, Ms. Carmela Avner served as a director in the Ministry of Finance. Since Avner's resignation, the news outlets published in the English language have not mentioned a successor. Although there is little to no focus placed on CIO in the school system of the nation at this time, positions in this field, as well as panels and forums dedicated to CIO topics, are still available in the private sector.

#### **4.6. E-Government Promotion [EPRO]**

One of the most important things governments can do to encourage digital transformation is to provide the necessary infrastructure. There are four distinct functions of government:

1. Spending on digital infrastructure: Having reliable internet is as essential as having roads or electricity, which has far-reaching social and economic consequences. There is a need for government involvement in the planning, supervision, and, to a lesser extent, funding of infrastructure improvements in smaller and more remote cities due to market failures and lack of resources. Participation on this scale would ensure that all Israelis easily access high-quality infrastructure. In the long run, it's more important to prioritize actual usage than the availability of infrastructure, such as by setting affordable rates for all population segments. Israel's government and corporate sector have identified the rapid expansion of optical fiber coverage, developing a G5 cellular network, and introducing a cloud services system as their key goals.

2. The digitization of public services: Secure communication and information exchange,

as well as users' confidence, is crucial to successfully implementing a comprehensive digital government system. In this phase, we must: Completely digitize all government departments. Business registration, product import licenses, national insurance, and other regulatory processes are some examples of red tape that have been streamlined thanks to the digitalization of business regulation. Market and implementation assistance for digitalizing payments in the private sector, including digital signatures, digital permission from banks, and more.

3. Fostering a norm of data-driven decision-making in the public sector by removing roadblocks, fixing market failures, cutting bureaucracy, and regulating less. When it comes to bureaucracy and regulations, the government should take action to eliminate any extra roadblocks that might lead to market failures. Data sharing, digital signatures, digital identity, and other information security and privacy-related challenges need revised legislation.

4. Fostering competence in digital tools: Increasing digital literacy across the board, but especially in traditionally underserved communities, including the Arab world, the Orthodox Jewish community, and the elderly.

#### **4.7. E-Participation [EPAR]**

As the cornerstones of open government, free speech and participation from the general public are encouraged across the board in all government entities in Israel. The government has the goal of increasing citizen participation in decision-making and plans to do this by continuing to broaden access to data from the public sector. Consequently, the contact information for Israel's ministries is now available on the official website of the Knesset, which may be found at [www.knesset.gov.il](http://www.knesset.gov.il). The official websites of Israel's Prime Minister Benjamin Netanyahu and President Reuven Rivlin provide links to the leaders' respective social media platforms, such as Twitter and Facebook. However, there is neither a standard nor an institution to evaluate the level of public satisfaction with the District Government's services.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

A national strategy for digital development is necessary since digital transformation is a key mechanism for generating higher productivity and faster growth. In order to identify

whether or not the increased investment was successful, the plan would provide measurable targets and investment measurements, as well as defined priorities for implementing the various phases based on their influence on growth. The framework that would promote and propel the execution of digital development processes is a government plan that is systematic and laid out in terms of objectives, budget, and examples of success, as well as an executive-legislative plan advocating orderly, coordinated legislation efforts concerning the selected subjects.

Thanks to the Internet, people from all walks of life may communicate with one another in ways never before possible. The principles of open government, including transparency, accountability, and citizen involvement, provide the basis for a generative democracy. Several government agencies developed a strategy to digitally transform the most successful public-private service hubs and cutting-edge technology. Israel is one of more than 70 countries that are members of the International Open Government Cooperation, cooperation between governments and civil society organizations.

The Open Government Partnership's goals have the backing of the Government ICT Authority, which supports initiatives to further those goals. Government agencies shall promote public access to government databases and strengthen public engagement in decision-making. It collaborates with the Accountant General's Office and other government departments to establish an open-source software development policy. The government will provide resources, including portals with current government information and public engagement platforms.

#### **4.9. Cyber Security [CYB]**

Regarding cybersecurity, Israel is where it all begins and ends for the world. Following a year of record financing in 2021, Israeli cybersecurity was expected to become a go-to resource for businesses and governments throughout the globe. After a string of high-profile incidents in recent years, cybersecurity has gained widespread attention throughout the world; this trend shows no signs of abating in 2022.

San Francisco, Greater Washington, DC, and Israel stand out as the world's three most significant hubs for cybersecurity innovation. Israel's standing as a "start-up country" is reflected in the fact that it ranks second among these clusters in terms of venture capital

financing (\$4 bn) and proportion of the top 150 creative cybersecurity enterprises.

The dedication of the Israeli government to cybersecurity has put Israeli cyber enterprises in a better position for continued revenue growth than their counterparts in the United States, Japan, and the United Kingdom, as seen in the accompanying figure. Strength was added to Israel's cybersecurity sector because of the impressive growth it saw in 2021. The industry will continue consolidating and expanding upon these gains during 2022. While a new wave of unicorns raises record amounts of money and gets to work in 2021, long-standing Israeli companies are scrambling to adapt to the latest market conditions that year.

#### **4.10. The use of Emerging ICT [EMG]**

The government of Israel has set a goal of being one of the top five nations in AI research and development. The government will use the planned budget range of \$300-\$600 million to achieve this end. A group of experts from academia, business, and the government was formed to investigate this idea further. However, Israel maintains its position as the industry's leader in talent and AI companies, with an ecosystem that includes more than 1500 businesses.

A large percentage of companies in the ICT sector are software centric. The United States is Israel's leading software, IT equipment, and IT services source. Internet use in Israel has increased 400% over the last decade, and the country has become an essential participant in the IT, software, and e-commerce industries. Israeli software is ubiquitous worldwide in the business, consumer, and technology sectors. The next IT revolution is cloud computing; over a hundred Israeli software companies are already working in this space.

The Ministry of Communications prioritized investment in communication systems. The Ministry approved the fiber optic infrastructure strategy in June 2021. Increasing fiber-optic infrastructure in economically poor areas is a priority for the Ministry of Communications, which has pushed for subsidizing such an expansion. Mobile chipsets, modems, data center gear, and Internet of Things devices are some of the components Americans may begin contributing to the 5G ecosystem right now. Additionally, the network will allow for "smart cities," enhanced transportation, digital healthcare, and

higher industrial production and manufacturing levels.

Italy

## 1. General Information

Area: 301,336 km<sup>2</sup>

Population: 59,037,474

Government Type: Unitary parliamentary  
constitutional republic

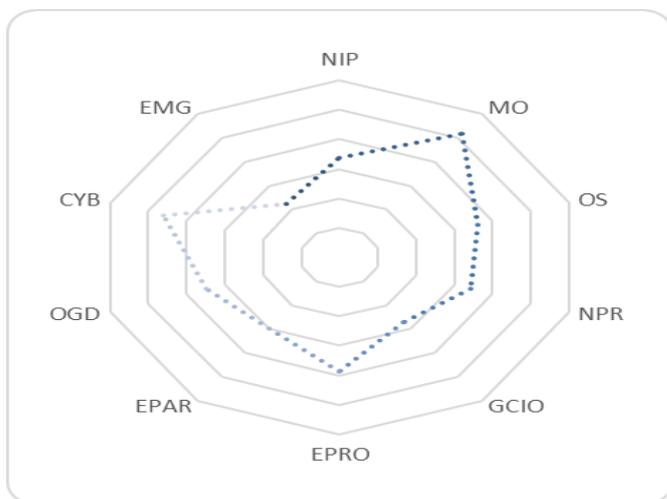
GDP: \$32,031

Internet User: 70.48

Wired (Fixed Broadband User): 29.98

Wireless Broadband User: 93.17

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Italia finished 18th place in the Waseda ranking in 2022 with a total score of 80.47. The digitization of public services and infrastructure is bolstered by initiatives encouraging the growth of individuals' digital abilities and ensuring that digital literacy is widespread

and comprehensive. It is anticipated that more conventional expenditures will be made on educational programs, platforms, and infrastructure that will encompass the whole of the educational patterns of residents. In addition to these initiatives, the Digital Civil Service, a youth volunteering program, and the Digital Facilitation Services will enable three million people to gain fundamental digital skills, closing the digital skills gap.

With almost a thousand deaths attributed to COVID-19, Italy is Europe's worst-impacted nation. Italy's Ministry of Technological Innovation and Digitization (MID) and the country's digital agency (AGID) have collaborated to launch a website detailing the various efforts made by operators, companies, and associations across the country to lessen the impact of the coronavirus emergency on ordinary Italians. On the government's Digital Solidarity portal, citizens may join up to get complimentary digital newspapers, faster internet, and access to e-learning platforms, while businesses can sign up to deliver these benefits to the public at no cost. Italy has begun a campaign to encourage internet firms and publishers to provide free services to let people work and study from home or to aid and enrich citizen life during confinement when the country's population of 60 million is under lockdown.

### **3.2. New Trends**

A revised version of the Italia Digitale 2026 plan was published in 2021, after a new government election and the Minister for Technological Innovation and Digital Transition position. The success of the MITD Strategy Italia Digitale 2026 depends on two intervention areas outlined in the National Recovery and Resilience Plan (NRRP) under the heading "Mission 1: Digitalization, Innovation, Competitiveness, Culture, and Tourism." These intervention areas are as follows:

- Networks Capable of Extreme Speeds
- Transformation of the Public Service Sector Into the Digital Age.

The two initiatives include eight projects, and the budget for Italia Digitale 2026 is 13.45 billion euros.

The Department for Digital Transformation and AgID released an updated version of the Three-Year Plan for ICT in Public Administration in October 2021. (2021-2023). The new plan is a crucial tool to promote digital transformation in the nation, especially when

considering the digitalization of public administration, as it represents the logical progression of the previous three plans. The fourth strategy will concentrate on carrying out the recommendations made in the prior three while keeping an eye on the outcomes that have been attained so far. The revised plan also introduces a few fresh ideas on the National Recovery and Resilience Plan (PNRR) and the oversight of the digital transformation goals for the public sector at all levels. The plan has three main goals: creating a digital society where digital services prioritize people and businesses, promoting ethical and inclusive development, and spreading new digital technologies throughout the productive Italian ecosystem while encouraging standardization, innovation, and experimentation in the delivery of public services.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The digital investment guarantees that all Public Administration systems, databases, and applications are maintained in highly dependable and quality-controlled data centers. The investment will either construct a state-of-the-art national hybrid infrastructure based on cloud technology or certify alternative secure and scalable public clouds, after which public administration datasets and applications will be migrated. The objective is to improve the safety, dependability, efficiency, and processing of data centers in Italy.

##### **4.2. Management Optimization [MO]**

The Three-Year Plan for ICT in the Public Administration was developed by the Digital Growth Strategy to focus public sector ICT investments following governmental policies and in line with European aims and programs. The proposed paradigm for management and usage is systematic, distributed, and shared, and it may be used with the most cutting-edge digital technology. The management style would be dynamic and evolutionary, with transparent governance of the different levels of public administration as its foundation. The three pillars of innovative technologies, agile management, and a good and functional governance model work in harmony and balance to ensure that the nation is better able to capitalize on new technologies while giving its citizens an advantage in terms of accessibility and the enhancement of current digital services.

The plan's execution is coordinated by the AgID, which is also responsible for assisting regional and municipal public administration authorities. The Italian government adopted the three-year 2019–2021 plan for information technology in the public sector in March 2019. Initiatives to hasten the shift to digital government and local entities were included in the plan, along with tools to enable individuals and organizations to have a more active role in driving innovation.

#### **4.3. Online Service [OS]**

The design and connectivity of administrative databases, which help individuals and businesses save time and money, are the foundation of digitalization in public administration. The usage of digital identity and digital domicile will increase as databases in public agencies become fully interoperable. The National Digital Data Platform (PDND) will enable the creation of a singular "digital profile" that adheres to the OnceOnly-principle and will ensure the interoperability of public sector information through a central catalog of Application Programming Interfaces (APIs) shared across central and local administrations.

The released APIs (eServices) will be available for authorized and verified usage by public and private organizations by EU privacy legislation. These eServices will make it possible to harmonize service methods prioritized by the Single Digital Gateway Directive with those of other EU nations. The National Data Catalogue for Semantic Interoperability (NDC) [schema.gov.it](http://schema.gov.it) will facilitate the eServices' semantic and syntactic interoperability.

#### **4.4. National Portal [NPR]**

The Italian National Registry of the Resident Population is known as ANPR (Anagrafe nazionale della popolazione residente). A national database called the National Registry of the Resident Population was created to compile demographic information on all Italian citizens, including those who live abroad (registered with the AIRE). All Italian municipalities were successfully migrated into the Italian National Register Office for the Resident Population by January 2022. All residents of one of the 7,904 municipalities in Italy, as well as all Italian nationals living abroad who are registered with AIRE (Anagrafe Italiana Residenti all'Estero), have free access to the ANPR portal where they can check

and verify their personal information and obtain self-certifications and certificates. Additionally, beginning in February 2022, citizens will have direct access to the ANPR site to amend their residence status.

As stipulated in Article 60 of the Digital Administration Code (Codice dell'Amministrazione Digitale), the National Registry Programme (Programma Anagrafi) will connect all significant national database registries and other pertinent databases beginning in 2022, in particular: the National Registry of Resident Population (Anagrafe Nazionale Della Popolazione Residente), the Revenue Agency (Agenzia Delle Entrate), and the National Institute for Social Security (Istituto Nazionale di Previdenza SocialeINPS). Upon user consent, every public administration will be permitted to reuse or exchange information and documents that people have previously provided through machine-to-machine communication. A suitable environment is created by integrating databases and services to guarantee a successful cycle of data quality management and to put the Once-Only concept into practice.

#### **4.5. Government CIO [GCIO]**

No information about the Chief Information Officer and General Counsel posts. In Italy, the position of chief information officer is not subject to any specific regulations or norms. The main body oversees Digital Italy, AGID, which operates outside the Prime Minister's Office. The AGID team assists and advises several Italian public sector entities and the Italian government. The Director of AGID makes a brief mention of the GCIO function somewhere in his remarks.

#### **4.6. E-Government Promotion [EPRO]**

By allocating 5 million EUR for two years, beginning in 2020 and ending in 2021, Law No. 160/2019 intends to provide further assistance to the Italian Digital Agenda. In addition, the legislation offers a new function for the Department of the Presidency of the Council of Ministers in identifying, promoting, and administering initiatives associated with innovative technologies and digital transformation. The bill also envisions the creation of a platform for digital alerts as its final provision. Every single entity that is part of the public administration must utilize this platform.

In addition, Article 1 of the Law stipulates the appointment of a Minister for

Technological Innovation and Digital Transformation, to whom the President of the Council of Ministers will delegate the responsibility of promoting the utilization of technology among private companies, private citizens, and public administrations.

The DTD was established to assist the Prime Minister in promoting and coordinating initiatives within the government to create a consistent strategy for the digital transformation and modernization of the country via the use of digital technologies. September 2019 marked the beginning of operations for the department. The DTD is committed to contributing to the ongoing modernization of Italy's public administration. The department actively supports various reform efforts to improve the public administration's effectiveness and efficiency. The DTD's responsibilities include, among other things, the coordination of many stakeholders from the government and the public administration to manage present and future digital programs in an integrated way using an agile methodology and an approach that prioritizes open data.

#### **4.7. E-Participation [EPAR]**

In February 2020, the 2025 National Innovation Plan was introduced. It promoted public services, digital infrastructure, and cooperation between the public and commercial sectors. The project aims to stimulate high-tech businesses, such as robotics, smart mobility, artificial intelligence, and cybersecurity, and find solutions to all of the issues associated with humans brought up by the fourth industrial revolution.

Interoperability between public and information systems throughout the EU was supposed to be achieved with the assistance of the Agency for Digital Italy. The complete integration of Europe guarantees the technological coherence of public information systems designed to be helpful to individuals and businesses. Additionally, the Agency works to encourage Italian participation in initiatives related to national and European digital agendas. The new measurements of open government culture, corruption prevention, simplification, digital services, digital citizenship, and skills reflect the available government processes' maturity while enhancing action convergence and resource optimization.

The projects Soldipubblici, OpenCoesione, ItaliaSicura, and Opencantieri are bolstered and expanded upon in the context of the third Action Plan, which aims to increase the openness of the government's investments. In addition, local governments contribute to

the battle against corruption and digital rights protection.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The Minister of Technological Innovation and Digital Transition relies on the Department for Digital Transformation to promote and coordinate government initiatives toward developing a coherent strategy for the digital transformation and modernization of the country using digital technology. It carries out the Minister's instructions in this area and ensures that digital transformation programs are coordinated and carried out.

Italy announced the publication of its Fourth Open Government Partnership Action Plan in June 2019. The plan, which extends from 2019 to 2021, has as its primary objective the modification of how individuals interact with the government. The goal is the result of laborious coordination efforts carried out by representatives from all relevant institutions and members of the civil society on ten different topical areas: Open data; transparency; a register of beneficial owners; support for participation; regulating access of stakeholders to decision-makers in public administration; a culture of open government; prevention of corruption; simplification; digital services; and digital citizenship and skills.

The plan provides new measures on consultation policies, the register of beneficial owners, and restrictions on stakeholders, demonstrating that opening procedures are now mature. The tightest areas of open government are open data, transparency, digital skills, and services. Compared to the action plans that came before it, the Fourth Action Plan has two significant advancements that guarantee better commitment from all parties involved. First, participation of the Open Government Forum was an essential component since it allowed public administration entities and civil society organizations to debate and reach a consensus on the goals that are to be accomplished by the year 2021. Second, the final text reduced the number of acts to be carried out exclusively by one administration and increased the number of actions to be carried out jointly by more than one administration. Because of this, a more effective convergence of the activities and optimizing the resources were made possible.

#### **4.9. Cyber Security [CYB]**

Decree No. 82 of the 14th of June 2021 established the National Agency for Cybersecurity

(Agenzia per la cybersicurezza nazionale). The Agency is responsible for protecting the national interest in cybersecurity, including preserving the good in cyber-defense. In addition, the Agency has complete control over its finances, as well as its budget, regulatory framework, administrative structure, organizational structure, and accounting practices. <https://www.acn.gov.it/>

The Inter-ministerial Committee on Cybersecurity was established by Decree No. 82 on June 14, 2021. Its full name is the Comitato interministeriale per la cybersicurezza. It provides advice, makes policy proposals, and deliberates on those policies, all to preserve the nation's security in the digital sphere.

Cloud Strategy The DTD, in collaboration with the National Agency for Cybersecurity 2021, published the Italian Cloud Strategy (Cloud Italia) in September 2021. This document outlines the steps public administrations, including local administrations, must take to transition to the cloud. By 2026, the goal is to have 75% of Italy's public administrations whole to the cloud. By encouraging the use of data processing infrastructures that are safe, efficient, sustainable, and dependable, the plan intends to address a problem that has persisted for a long time inside the Italian public administration. Determining whether the cloud delivery mode—public, hybrid, or private—is best suited to reduce the risks associated with the various kinds of public data and services is the central tenet of the strategy.

#### **4.10. The use of Emerging ICT [EMG]**

The Italian government released its Strategic Program on Artificial Intelligence for 2022-2024 in November 2021. The Ministry of Education, University and Research, the Ministry of Economic Development, and the Ministry of Technological Innovation and Digital Transition worked productively to develop the plan. The strategy is the consequence of this harmonic partnership. The National Plan for Recovery and Resilience in Italy is the source of the funding for this approach (PNRR). It is hoped that this will significantly advance Italy's AI strategy, which will be accomplished by capitalizing on the primary advantages the national environment offers while simultaneously concentrating on the most urgent requirements for development. In this sense, the project identifies six objectives, eleven key sectors to remove investments from, and three areas

of intervention that describe how the nation plans to fulfill the six objectives of this strategy.

Italy's Department of Digital Transformation and Agency for National Cybersecurity collaborated to publish the country's Cloud Strategy in September of 2021. This paper describes the strategic program, the implementation, and the oversight of cloud technology within the public administration.

Japan

### 1. General Information

Area: 377,930 km<sup>2</sup>

Population: 123,800,230

Government Type: Unitary parliamentary constitutional monarchy

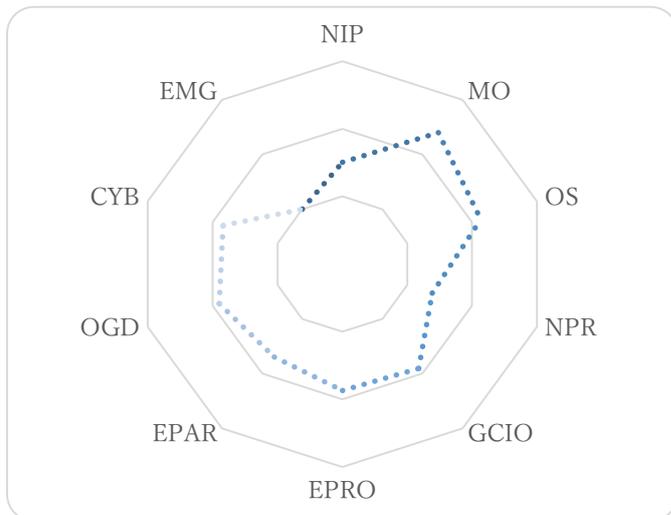
GDP: \$40,662

Internet User: 90.22

Wired (Fixed Broadband User): 34.79

Wireless Broadband User: 202.25

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

Japan ranks the 10th position in the 2022 Waseda International digital government rankings with a total of 85,272 points. Many nations' efforts to combat the epidemic depend critically on technological advancements. Technology in Japan has always been a liability rather than an asset. Experts from Japan's Ministry of Health and Welfare's

COVID-19 reaction team struggled to obtain timely and reliable data on factors, including the number of confirmed cases and available hospital beds. It took a lot of man-hours and materials to manually enter data and verify numbers with local officials over the phone. Due to its older population, Japan has some difficulty to handle the COVID-19 situation in comparison with many of its Western counterparts. Namely, Japan could not handle the epidemic well because it did not utilize data and technology effectively.

One of the advantages would be an enhanced analysis of extensive data, which may assist in determining the efficacy of specific programs. More widespread use of the technology would enable the government to offer services more swiftly while reducing associated costs. In addition, plans will be developed to improve telemedicine and distance education, which fall within the Ministries of Health and Education purview.

### **3.2. New Trends**

Japan has to restructure the country after COVID through significant actions or concentrated efforts by key industries or stakeholders to reform operations, capitalize on new trends, and integrate digital technology throughout the value chain. There are four main ideas driving these changes as follows:

- Software developers, data engineers, data scientists, machine learning engineers, product managers, agile coaches, designers, and other emerging professions are the primary targets of a daring strategy to more than treble the bench of digital talent. The team's hardware expertise is also becoming more robust.
- Almost half of Japan's GDP comes from just four industries: industrial and automotive manufacturing, wholesale and retail; healthcare and financial services; and tourism. Digital penetration indicators, such as the number of digital-manufacturing lighthouse factories or the percentage of e-commerce penetration, are all in the single digits for all these industries. More than a hundred validated use cases of cloud computing, machine learning, deep learning, e-commerce, the Internet of Things (IoT), 5G, cybersecurity, and other technologies can scale up their value chains, leading to revenue growth and cost savings.
- The term "digital government" refers to the government's long-term plan to improve infrastructure, including internet access, data security, and cloud

computing, so that a new generation of apps may be developed. This massive shift necessitates the rollout of digital applications in the public sector to digitize the services it provides to citizens and businesses, doing away with time-consuming processes that previously necessitated in-person meetings, paper, seals, faxing, and other anachronistic means of communication.

- Japan boasts more than half of the world's oldest created enterprises, and many of them are struggling economically due to stagnating sales and profits. Renewal of the country's economy is desperately needed. To fulfill this rejuvenation mission, the start-up ecosystem must adjust its present inward and hardware concentration to instead aggressively target global consumer issues with the software. Start-ups, entrepreneurs, and talent require reforms to improve conditions and allow for faster growth.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Japan got a NIP score of 8.0 in 2022, which put it in third place in the NIP's Waseda rankings. A change in tax policy is included in Japan's digitalization plan in order to support the deployment of 5G networks in rural areas. By March 2022, it is anticipated that NTT DoCoMo's 5G service will be accessible to 55 percent of the population, and by 2023, the corporation will have full control over the network. In the fixed broadband market, the transition to FTTP is continuing even as DSL is being phased out.

The Artificial Intelligence (AI) plan, which was first created in 2017 and modified in 2021, explains the next ambitions and goals regarding the domestic development of AI-based solutions. This strategy pertains to the main field of AI. The strategy calls for implementing programs to develop solutions for five unmanned aerial vehicles (UAVs), also known as drones. These measures include supporting the formation of an artificial intelligence research and development network, promoting education and the development of digital talents, and implementing programs to develop solutions for UAVs, in industry/ society in general. The development of artificial intelligence solutions for healthcare, agriculture, national resilience for infrastructure and natural catastrophes, transport and infrastructure, regional revival via smart cities, and manufacturing are key

industry sectors. In addition, the "Social principles for humancentric AI," released in 2021, outlines nonbinding AI R&D and usage standards. These principles are intended to foster the creation of society's accepted and appropriately used human-centric solutions.

#### **4.2. Management Optimization [MO]**

With an overall score of 11.2, Japan finished the competition this year in ninth place in the MO criterion. The Digital Agency's overarching goal is to build a fully digital society in which no one is left behind by the widespread use of digital technologies in all spheres of life, government, and business. The increased usage of the My Number social security and tax identity cards in Japan is crucial to achieving these first objectives. The cards, which have a 12-digit personal identification number given to every citizen of Japan, are being promoted by the agency as a method to digitally access emergency government services, such as those taken to combat the current COVID-19 outbreak. It's also pushing them to be a complete resource for finishing up bureaucratic processes and enhancing information exchange infrastructures among government departments, agencies, and jurisdictions. For instance, the cards may be used with a newly released government app to generate a digital vaccination passport that can be shown at airports, restaurants, and events.

The cards are used for identification during emergency preparedness, tax filing, and social security processes. Accessing services supplied by private companies is also possible with the help of an integrated IC chip with an electronic certificate identifying the person. By the beginning of 2023, My Number cards will have the capabilities to be used for electronic verification and to allow cardholders to apply for daycare and other municipal services online. Beginning in early 2025, cards are anticipated to be included with driver's licenses and residency cards.

#### **4.3. Online Service [OS]**

Creating and maintaining government-wide information technology infrastructure is an essential area of focus for the Digital Agency. Digital Agency systems, standard systems used by the agency and other government departments, and department-specific systems. In the first grouping, it has

the national information system, which will serve as the basis for other systems that

various government agencies may create together or independently. The Digital Agency is responsible for creating and running this initiative since it is the most urgent and politically significant job. The Government Cloud is one such service used by several agencies. A zero-trust architecture built on existing protocols is an additional layer of protection against the ever-evolving dangers in today's networks. The Government Solution Service also offers local governments a standardized setting to conduct their operations.

The second kind of system will be set up as a result of cross-departmental collaboration, with each unit responsible for its maintenance. The Immunization History Register is one such example. All other national information systems fall under the third classification. The Digital Agency will propose standard rules to guarantee systems are synchronized and give technical guidance. At the same time, individual government departments and agencies are responsible for constructing and managing systems to meet their respective responsibilities.

#### **4.4. National Portal [NPR]**

The Digital Agency which was established in Sept.2021 is responsible for maintaining the official government website, e-Gov. The Japanese government is actively pushing information security measures and implementing projects to improve the online administration of administrative operations, electronic information supply, work, and system optimization. This website also features Japanese language materials and links depending on the user's needs.

#### **4.5. Government CIO [GCIO]**

A chief information officer (CIO) and an associate CIO in each central ministry report to the Director-General of Administration (ACIO). The Federal CIO Council, made up of CIOs from different ministries, drafts a lot of legislation. Greater than 90% of prefectures and cities have a chief information officer. The government established a central point of contact for all Ministry Chief Information Officers in November 2012. Akihisa Miwa, a former executive vice president of Obayashikumi Construction Company, has been appointed to fill Mr. Endo's post on Federal CIO Council. Now, Newly established post in2021 with Digital Agency-Chief Digital officer is the top of administration

#### **4.6. E-Government Promotion [EPRO]**

The business and governmental sectors have been motivated to take action and speed up the shift toward digital by the impending "digital cliff" in 2025, an aging workforce, and the COVID-19 epidemic. A closer look at the numbers reveals that Japan has a long way to go in terms of digitalizing its public administration and services, as well as its corporate landscape; despite positive signals and the promotion of digital concepts like artificial intelligence (AI), the Internet of Things (IoT), or the cloud.

As a result, the government of Japan (GoJ) established lofty objectives, including the development of what it calls "Society 5.0," which it defines as "the merging of cyber space and the real world." In recent years, it has speed up its activities by reviewing and publishing a number of policies. In addition, it created the Digital Agency to oversee all policy choices about digital initiatives and propel the country's development.

#### **4.7. E-Participation [EPAR]**

Japan proposed "Governance Innovation" and "Data Free Flow with Trust" at the G20 summit, Osaka will soon be in a position to take the helm in shaping global digital legislation. The economy's growth depends on the creation of a system of governance that promotes and protects digital innovation.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Businesses and governments are rushing to modernize in response to several pressing issues, including the "digital cliff" in 2025, an aging workforce, and the COVID-19 pandemic. Despite progress and the promotion of digital ideas like AI, the Internet of Things (IoT), and the cloud, Japan still has a long way to go in digitalizing its public administration, services, and commercial environment. The Japanese government has lofty plans to merge the digital and real worlds into a new form dubbed Society 5.0. Recent years have seen a stepping-up of efforts, including policy revisions and publicity. A government agency called the Digital Agency was set up to better organize the various digital projects around the nation.

Government funding for the country's digital transformation has included the distribution of NFTs to local governments that use digital technology to address problems within their areas. The Open Data program, which has the support of the Japanese government,

argues for the release of public data in machine-readable forms and for permission to use that data for commercial benefit or other reasons once it has been made available. This program also argues for the release of public data in machine-readable forms. It is hoped that people's lives will be improved as a result of this endeavor and that commercial activity will be boosted as a result. A database that may be searched contains the information that can be obtained on the website of the Japanese government (<https://www.data.go.jp/>). The search functionality on the website is, thankfully, relatively comprehensive.

#### **4.9. Cyber Security [CYB]**

Japan has upped its focus on cyber security in response to an increase in the number and complexity of cyber assaults. The safety of infrastructure sectors such as railroads and data-dependent Internet of Things (IoT) networks and systems is gravely threatened by such assaults. The Japanese government is more conscious of the scale of the possible challenges it confronts and the gap between its capabilities and those of the United States and other countries. It has therefore made attempts to close this gap.

In recent years, CS Japan has seen a dramatic increase in the number of American cybersecurity businesses doing business in Japan, indicating that the United States has a competitive edge over global and local rivals. In recent research, Japan's Ministry of Economy, Trade, and Industry (METI) estimated a shortage of 220,000 IT specialists, projected to expand to 360,000 by 2025. This scarcity of qualified engineers, cyber specialists, and security managers has created an opening for American companies that can provide comprehensive cybersecurity solutions to small and medium-sized businesses in Japan.

Japan's National Center for Incident Readiness and Strategy for Cybersecurity (NISC) is the central government institution developing the country's cybersecurity strategy. NISC facilitates establishing and implementing cyber security policies and procedures by all central government agencies. In September 2021, NISC released its [National Cybersecurity Strategy].

The plan highlights an immediate need to strengthen cybersecurity measures at all levels

of Japanese society and in all facets of technology growth. Waseda rankings for CYB in 2022 place Japan in the third position, and it is evident that Japan holds this position.

#### **4.10. The use of Emerging ICT [EMG]**

Japan is a prime market for cutting-edge technologies, and 5G is no exception. NTT Docomo claims that in February of 2021, a fundamental agreement was made to form a consortium to supply 5G products to Thailand. The new technology will be put through its paces before a full commercial rollout in 2022. To improve digital competitiveness and advance the development of 5G and beyond 5G technologies, Japan has committed \$2 billion . Particles called qubits may assume the values of 0 and 1 simultaneously, making quantum computing a significant step forward in digital processing power.

According to the consumer study, the Japanese government assessed the value of the country's organic food industry at 185 billion, as reported by the Japan Times. The Yano Research Institute forecasts that by 2022, the market will have grown to an expected value of about 196 million. ICT firms like NTT AgriTechnology have been inspired to take further steps forward by the policy changes that have been taking effect since 2016. Fujitsu and the Research Institute for Knowledge Engineering and Science (RIKEN) have announced that they will jointly use the artificial intelligence (AI)-driven supercomputer Fugaku commencing in March 2021. Investment in Japan's green energy sector is safe since the government has committed to making the country carbon-neutral by 2050. Due to all of the work and investment in EMG, Japan achieved a total of 6,500 points, which placed it in the fourth position in the Waseda rankings for 2022.

Kazakhstan

### 1. General Information

Area: 2,724,900 km<sup>2</sup>

Population: 19,449,081

Government Type: republic

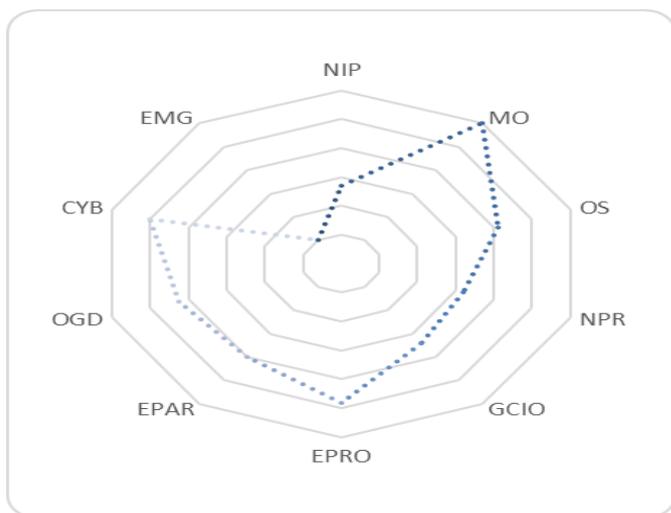
GDP: \$8,820

Internet User: 85.94

Wired (Fixed Broadband User): 13.96

Wireless Broadband User: 94.9

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With a score of 72.76 in 2022, Kazakhstan ranked 30th in the world for its digital governance by Waseda International. Digital Kazakhstan aims to accelerate economic growth and improve the quality of life through digital technologies. In the long term, Digital Kazakhstan aims to transition to a "fundamentally new development path"

grounded in the digital economy. Both of these goals can be achieved through the utilization of digital technologies. The foundation for Digital Kazakhstan was laid in 2013 with the publication of Information Kazakhstan 2020, which focused on the infrastructure. The Ministry is the one in charge of coordinating it.

Information and Communications has a US budget of around 362 million dollars for the five years leading up to 2022. The implementation task has been delegated to executive authorities at both the federal and municipal levels, as well as to semiprivate entities. The initiative has a broad reach, including not just the energy, transportation, and financial sectors but also the infrastructure, mining, and agricultural sectors and the fields of cybersecurity, education, municipal services, and political institutions. It does this through integrating smart systems, automation, extensive data analysis, and the concepts of openness and connectedness into various areas via the Internet of Things (IoT), artificial intelligence (AI), and 3D printing.

### **3.2. New Trends**

Due to the coronavirus pandemic, mankind will have to adapt to new world order. There will be a rapid transition to providing government services digitally. The government is trying to minimize the number of individuals visiting public service centers, and the facilities themselves will provide only paper services that cannot be accessed online. In Kazakhstan, 97 other organizations offered similar help. Among them are the reissue of birth certificates and passports, the resumption of pension payments, etc. All other government services are now available online via the electronic government site. A mandatory pre-queue has been instituted, which may be done in advance on the website or through the Telegram bot, to limit the number of individuals occupying public service facilities.

To execute the country's digital government program in the years 2018-2022, there are five significant paths:

1. "Digitization of the economy's conventional branches entails reorganizing the RK economy's classic branches in light of ground-breaking technologies and prospects that boost labor productivity and result in capitalization development.
2. "Transition to the digital state" refers to the modernization of governmental

infrastructure to meet the needs of citizens and businesses.

3. "Implementation of the digital Silk Way" - creating a fast and secure data transit, storage, and processing network.

4. Changes that constitute the "evolution of the human capital assets" include the emergence of a more inventive society and the adoption of cutting-edge practices in preparation for the arrival of a knowledge-based economy.

5. "Innovative ecosystem formation" refers to the process through which businesses, universities, and governments work together to create an environment conducive to the growth of technology entrepreneurship.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Kazakhstan has been putting in work over the course of the last several years to be ready for the rollout of 5G. In light of this goal, the nation of Kazakhstan has initiated the Digital Kazakhstan initiative. The government provided funding for the GIGA program that ITU led. The Caspian Digital Hub cable project, which would run from Kazakhstan to Azerbaijan, has received a proposal for its construction from a group of investors. Kcell has also launched a trial Internet of Things (IoT) agriculture service, which uses the LTE and NB-IoT networks.

##### **4.2. Management Optimization [MO]**

Digital Kazakhstan is now emphasizing a pilot project for precision agriculture in the country's agricultural industry. With the help of smart technology, the energy industry can systematically respond to consumer demand. The initiative intends to increase freight traffic by integrating video surveillance, traffic management, and user data into a single, smart transportation system. It is helping to promote electronic commercial transactions in the banking industry by developing service support centers and making electronic payment systems the norm. Distributed ledgers (blockchain) and open application programming interfaces are two examples of new technologies entering the market. The initiative inaugurated the Astana Hub International Technology Park to foster IT innovation. Established as a Special Economic Zone, it provides good financial

advantages to businesses. The center has incubated and accelerated 130 IT firms and 690 start-ups. Government research funding is provided for joint ventures between new companies and academic institutions.

There are plans to provide coding fundamentals to elementary school students, integrate the knowledge of emerging digital technologies into existing teacher education programs, and establish a national open education platform dedicated to STEM subjects. Governmental processes will also be digitized, with the result that "open budgets" will encourage public participation in financial planning, "open legal acts" will facilitate dialogue on proposed legislation, and "open data" will see information being made available in the public domain for commercial use. Thanks to advances in satellite technology, the rollout of fiber-optic connections to remote regions, and the creation of 4G mobile infrastructure in metropolitan centers, the program's backbone will be infrastructure. Financial, government, and other institutions will soon access a "digital identity system."

#### **4.3. Online Service [OS]**

To expedite the process of obtaining a visa, citizens of Kazakhstan who meet the requirements may apply for an electronic visa via the Kazakhstani government. The Kazakhstan visa obtained online may be used to visit the country for up to 30 days at a time. The application may be completed in a matter of minutes by applicants by supplying information on their data and passports. Visitors visiting Kazakhstan for purposes other than tourism, such as those going there for business or medical treatment, are required to get a visa in advance from the Kazakh embassy or consulate that is located nearest to them.

If a person plans to visit Kazakhstan for any purpose other than vacation, business, or medical treatment, they must get a visa from the Kazakh Embassy or Consulate nearest them. Online purchasing accounts for 83% of all cashless transactions in Kazakhstan.

#### **4.4. National Portal [NPR]**

www.egov.kz is a centralized government portal. The Kazakh, Russian, and English languages are all supported by various internet services. More than 2,000 information resources and 219 interactive and transactional services are available to the public through

Kazakhstan's "D Government" ([www.egov.kz](http://www.egov.kz)). Users may contact any federal department via the portal's online counseling service. Other services include "Mail Me," "Simple Scheduling," and e-mail accounts. The website also features information about D-Government development efforts and the results of the program's execution. Disabled users will not be able to navigate this site since it does not provide accessibility features, such as a text-to-speech function or the ability to change the font size. Some of the more advanced features, such as multimedia programming, and social networking, have been included.

#### **4.5. Government CIO [GCIO]**

The government has not established a Chief Information Officer. The role of the CIO is split between the National ICT Holding Zerde and JSC National Information Technologies.

#### **4.6. E-Government Promotion [EPRO]**

Digital Kazakhstan is a government program that uses digital tools to enhance the lives of all Kazakhs. The primary goals of the Program are to hasten economic expansion, raise people's living standards, and provide a radically new path for corporate and individual progress.

#### **4.7. E-Participation [EPAR]**

Through its multifunctional website, <http://e.gov.kz/>, the Kazakh government actively seeks to foster citizen participation. There's a place to voice opinions on government programs and services and another where authorities may have formal online discussions with citizens. State websites will also often include public meetings where state officials will be present. There is a general government blog where citizens may voice their opinions, ask questions, and submit ideas.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Digital transformation has been an issue that Kazakhstan has been aware of for quite some time. Government officials in Kazakhstan and representatives from numerous international organizations agree that digitization is crucial to the country's efforts to diversify the economy and lessen its dependency on natural resources. Kazakhstan's

abundant natural resources can fund the infrastructure upgrades and social services that will be pivotal to achieving this change. The provision of digital infrastructure in both urban and rural areas and the cultivation of technological competence throughout the whole educational spectrum have received considerable attention. Efforts like Astana Hub are made to foster entrepreneurship and new businesses, and at NUGSB, we emphasize researching what makes for a healthy entrepreneurial environment.

The Open Government initiative in the United States is multifaceted. When discussing the Freedom of Information Act, "open data" describes publicly available, machine-readable, and processable electronic information resources. In Kazakhstan's new, more transparent government, data sets may be sorted according to when they were created for publication.

#### **4.9. Cyber Security [CYB]**

The Kazakh government has adopted a plan to ensure the country's safety from potential threats in the years 2021 through 2025, and they're sure it will work. The Kazakh people's core national interests remain unwavering and must be emphasized. Kazakhstan's national security depends on protecting the country's independence and territorial integrity, two achievements that have been hard-won over the last three decades.

An action plan for managing national security risks in Kazakhstan is required under the strategy. The government has implemented a strategy for dealing with potential threats to the nation's food supply, transit, logistics, and economic security. Large-scale cyberattacks in recent years have shown the growing need to keep private information and vital infrastructure secure.

#### **4.10. The use of Emerging ICT [EMG]**

The nation's economy will grow thanks to better infrastructure, more efficient appliances, and more power. The M2M industry in Kazakhstan has been around for over a decade, and the IoT industry is a natural progression. An inter-machine network includes not just sensors, software, and management tools but also a suite of additional vertically integrated industrial solutions. The Institute for the Study of Artificial Intelligence (ISSAI) was established in September 2019 in the Kazakh capital of Astana to promote AI-related academic study and technological development in the country's burgeoning IT

industry. The C4 Research Building at Nazarbayev University is home to interdisciplinary AI studies to solve pressing economic and social problems. In order to advance artificial intelligence research in the United States, it is essential to incorporate ideas and insights from other regions, namely Asia and Europe. By providing a flexible environment for academics, businesses, and government agencies to collaborate on research and innovation, ISSAI is facilitating Kazakhstan's progress toward its digital ecosystem and national development goals.

Kenya

## 1. General Information

Area: 580,367 km<sup>2</sup>

Population: 54,272,218

Government Type: Unitary presidential constitutional republic

GDP: \$1,875

Internet User: 29.50

Wired (Fixed Broadband User): 1.25

Wireless Broadband User: 46.76

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Kenya's digital government scored 60.732 in 2022, maintaining its 54th place in the Waseda International rankings. Kenyan government agencies employed knowledge management platforms to track the spread of the COVID-19 pandemic in the country's transportation networks and in the distribution of vaccinations, among other measures.

These helped get the word out about policy changes, track down COVID-19 patients, get the public ready for a vaccination effort, and collect timely data. The advent of digital technology has been a catalyst for change in Kenya. Regarding technology, Kenya is among the continent's most advanced countries. It fosters an environment favorable to digital participation by providing resources like high-speed Internet and an innovation ecosystem where new businesses may flourish.

Digital platforms like M-Pesa, Ushahidi (a crisis mapping software), and the iHub (an innovation center) have their roots in Kenya. Kenya is the most welcoming to journalists compared to other East African countries. Several recent court rulings have upheld long-held civil liberties. The public sector reacted strongly, launching petitions and efforts to oppose the changes.

In contrast to other nations, Kenyans use social media to seize control of their lives. Social media platforms such as Twitter, Facebook, and Instagram have provided previously unheard voices a platform to be heard. Using digital media, Kenya has effectively engaged its population in educational reforms. We have a highly organized and textbook-based educational system. Experts agree that critical teaching thinking effectively provides students with the skills they'll need to engage in the digital world and contribute original ideas actively.

### **3.2. New Trends**

During the worldwide reaction to the COVID-19 epidemic, several governments increased the extent of technology adaptations and integration into public service delivery. For ICTA to succeed in its goal, the organization will put its resources where they will have the most impact, as outlined in the Strategic Pillars of the ICTA Strategy for Fiscal Years 2020-2024.

- The growth of the Digital Infrastructure is central to the Authority's plan. High-quality services for the public might be integrated across government systems if there was a more robust link and more secure data. For better service delivery, ICTA will provide suitable identification and verification procedures that promote openness and trust. One thing a country needs to keep its economy growing in the face of a pandemic is implementing its Digital Services process.

- The digital revolution has continued to affect people's daily life, as seen by the rise of new digital skills like artificial intelligence, big data, cloud computing, and mobile robotics. To encourage positive digital habits, ICTA will push for an atmosphere where people may trust one another online. Efforts and programs have been developed to prepare individuals and the workforce for the digital economy and to build a digitally literate and trustworthy workforce on a global scale. To ensure the continued growth of a growing economy, widespread access to digital technologies is crucial.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Kenya has not only amassed a large number of population, but it also boasts remarkable achievements. The following are examples of a few of them:

- Telkom Kenya and Airtel Kenya have issued statements confirming their ambitions to combine have been abandoned.
- Mobile phone service in remote areas of the north is made more reliable through the Universal Service Fund.
- M-PESA Global, a mobile payment service, is now accessible on Safaricom, and the government is considering increasing the cost of sending money through a mobile device.

##### **4.2. Management Optimization [MO]**

Despite the interruptions caused by the Covid-19 epidemic throughout the African continent, operational efficiency has been maintained with the assistance of digital technology. This assistance has been provided to both the public and commercial sectors. According to the President, African countries need to converge on a unified set of standards for their information and communications technology to ensure the interoperability of their digital infrastructure and speed up the process of consolidating their economies into a single market.

##### **4.3. Online Service [OS]**

E-governance, or electronic government, is making government services available online. As a subset of E-commerce, this refers to buying and selling goods and services through

the Internet. Kenya's government has made efforts to improve its ability to provide public services via E-governance by putting money into digital education to make sure its citizens have the technical skills they need, investing in ICT infrastructure to make sure those services are readily available, and creating digital inclusion initiatives so that people from all walks of life can use them. It is proved that the Kenyan government is serious about using technology to improve service delivery.

#### **4.4. National Portal [NPR]**

Digital Government in Kenya (<http://www.mygov.go.ke>) gives the public information about nations and government problems, with data from [opendata.go.ke](http://opendata.go.ke) completing the picture.

The Kenya Open Data Initiative was launched by President Mwai Kibaki on July 8, 2011, to provide citizens with easy access to a centralized hub of publicly available government data. The website is an easy-to-navigate hub that provides rapid access to data visualization and downloads for programmers. The goal of [opendata.go.ke](http://opendata.go.ke) is to provide researchers, policymakers, and IT professionals with easy access to high-quality data about Kenyan government development, demographics, statistics, and expenditures.

#### **4.5. Government CIO [GCIO]**

In Kenya, the position of chief information officer is not governed by explicit norms or requirements. The information and communication technology portfolio is managed by this department, which is a component of the Ministry of Information, Communications, and Technologies (ICT). It is responsible for a variety of tasks, including the formulation of national ICT policy, the promotion of e-government and ICT agencies, and the provision of ICT-related technical assistance. ICT and Communications Authority of Kenya is an entity that is owned by the Kenyan government and reports its activities to the Ministry of Communications and Information Technology.

#### **4.6. E-Government Promotion [EPRO]**

Through the Big Four Agenda and Vision 2030, the National Government has developed a variety of strategic and policy measures to encourage the adoption of a digital economy. Maureen Mbaka, the Chief Administrative Secretary of the Ministry of Information and

Communication Technology (ICT), Youth Affairs and Innovation, indicated further that the strategic and policy initiatives had positioned Kenya as an ICT powerhouse in the region.

It is believed that the country's dynamic information and communications technology (ICT) sector is a crucial driver and enabler of socioeconomic development. This is because it is in this sector that technology and innovation are utilized to accomplish strategic goals, advance the economy, and provide solutions to challenges faced in the area of development. According to the CAS, one of the interventions that have been put into place by the national government is the enactment of the National ICT Policy. This policy is intended to realize the potential of the digital economy by creating an enabling environment for all citizens and stakeholders. This environment is created by facilitating universal access to ICT infrastructure and services throughout the country.

#### **4.7. E-Participation [EPAR]**

Currently, the government of Kenya has more than 200 digitized services made available via Huduma Centres throughout the nation and an online self-service portal called E-Citizen.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The administration is fully dedicated to the digital transformation push to increase national GDP and improve the standard of all government services. Principal Secretary (PS) for ICT and Innovations Jerome Ochieng has said that the government's goal is to use digital technology to spur innovations and economic progress. Because of the tools made available by modernization, government agencies will be able to manage the economy and society better and serve the public more effectively. The way public and commercial organizations operate is rapidly evolving due to the advent of digital transformation.

Since the beginning of the OGP, Kenya has been an active member of the program. It is predicted that Kenya will make significant progress in reinforcing its commitment to a global governance system that is open and transparent. Over many decades, the world's governments have been forced to deal with their most significant crises, which has put both global progress and cooperation. The COVID-19 epidemic has harmed each

country's healthcare systems, governance standards, and social capital.

International collaboration is more important than ever to protect communities against adverse long-term effects on their economy and health. To do this, it is necessary to have more engagement and openness in the decision-making process and a more robust anti-corruption ecosystem. The Constitution of Kenya guarantees that all citizens have equal access to essential civil liberties and social and economic rights. The third National Action Plan that Kenya has submitted to the OGP demonstrates that citizens of Kenya are still encouraged to use their rights and freedoms as outlined in the OGP. It intended to promote business transparency via beneficial ownership, anti-corruption measures through open public procurement, and overall open government and OGP sustainability through greater engagement and collaboration from the government sector.

#### **4.9. Cyber Security [CYB]**

The rapid growth in the use of digital-related technologies, such as social media platforms, digital services, wireless money transfers, and the mobile systems of banks, amongst others, where thousands of transactions occur each day, is said to have necessitated the move to update the country's cybersecurity systems.

Given that there can be no national security without adequate cybersecurity, it is essential for governments on all levels—national, regional, and international—to cooperate and collaborate in the procedures involved in cyberspace governance. In addition, the government is continuing to enhance the integration of its civilian and military sectors in cybersecurity and digitalization to guarantee the correct coordination and performance of its tasks.

#### **4.10. The use of Emerging ICT [EMG]**

A national digital master plan has been released in Kenya by the Ministry of Information and Communication Technology, Youth Affairs, and Innovation. This plan is centered on using technology to advance the economy, accomplish the goals of vision 2030, and generate massive amounts of wealth and millions of jobs. Digital infrastructure, digital services, data management, digital skills and innovation, and enterprise and digital business make up the four pillars on which the Kenya National Digital Masterplan 2020-2030 is based. The government aims to connect all unserved and underserved areas with

information and communication technology (ICT). This will be accomplished through four pillars: the provisioning and management of e-Government services to enhance efficiency; the development of a digitally skilled workforce with ethical practices; and the collaboration between academic institutions and industry players in the search for sustainable digital solutions. According to the master plan's projections, six primary ICT digital infrastructure projects will be created by 2030. These projects will be done by building a national fiber optic communication network that is 100,000 kilometers long and other technologies. It also involves the construction of a government digitizing Centre and platforms to digitalize and automate 500 million government documents yearly, which would convert to 5 billion records by 2030.

Lithuania

### 1. General Information

Area: 65,300 km<sup>2</sup>

Population: 2,750,055

Government Type: parliamentary democracy

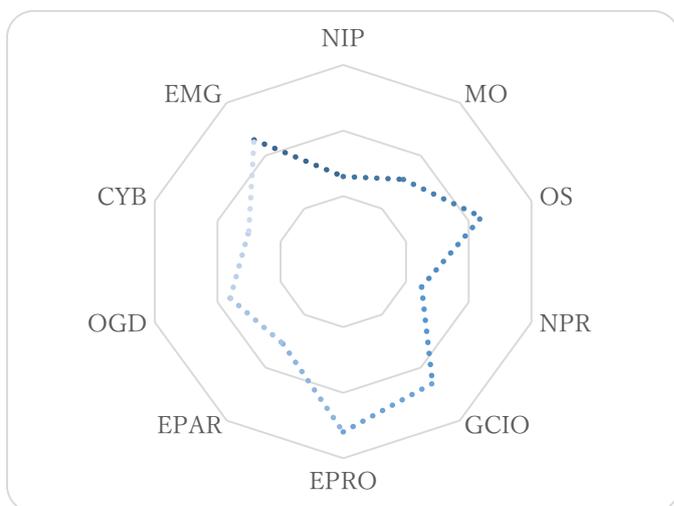
GDP: \$ 20,546

Internet User: 83.06

Wired (Fixed Broadband User): 29.27

Wireless Broadband User: 117.20

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

Lithuania owned 65.880 points in the Waseda rankings in 2022, leaving the country at 46. As a service to their constituents, governments in democracies look out for their best interests, keep them informed, and make government as open and accountable as possible. These responsibilities are accelerated and enhanced by the use of e-government. To this

end, the Lithuanian government has made the adoption of e-government systems a top political priority.

E-government advancement, which guarantees democracy, e-business promotion, society computerization, and Internet use, all contribute to this goal. The growth of information society and the implementation of e-government depend on one another, with the former serving as a necessary precondition for the latter. However, some issues must be addressed first. These include the following: the level of expertise of citizens and public administrators in using IT; the level of computerization of society and the public sector (access points); the adequate provision of e-services; and many others. The virtuous cycle is complete; low numbers of users do not encourage e-commerce, and high numbers do not spur more significant business. The sickle should be shifted by government e-projects, leading to a rise in both the demand for and supply of e-services.

From February 15th, 2022, visitors from the European Economic Area will no longer be needed to provide proof of having been vaccinated against or recovering from the coronavirus-induced encephalitis virus 19 (COVID-19) before entering Lithuania. In order to visit Lithuania, non-EU citizens and legal residents of non-EU countries that are part of the EU Digital COVID Certificate system must submit a negative test result proving that they have been vaccinated or have recovered from the disease. As of March 31st, foreign nationals would be allowed entry into Lithuania, provided they provide documentation of vaccination, recovery, or a negative COVID-19 test result.

### **3.2. New Trends**

In Lithuania, the process of constructing an electronic government is a complex and hard one. In order to employ e-government, one must first have enough planning, resources, political will, and a newly developed level of competencies within the public sector, administration, and society. Because of this, the level of development of e-government in the various states varies greatly.

In Lithuania, one may distinguish the following three primary premises about the e-government:

- The creation of an information society;

- The establishment of a legal foundation and an institutional environment;
- The planning of the public sector.

There's no consensus on either information society or electronic governance. Some definitions emphasize technology, while others emphasize public administration service. In most reports, e-government is described as a method through which governmental services may be accessed on the internet rather than in person. E-government is an information infrastructure institution in the plan to develop an information society. This institute provides society with information technology. The nation can keep track of global development after the pandemic from investments and innovations in digitalization.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The Ministry of Transport and Communications (Susisiekimo ministerial) in Lithuania coordinates and controls the rollout of broadband infrastructure in places where it is either not already present or there is no competition among service providers. Broadband infrastructure planning and construction are coordinated and controlled by the Information Society Policy Department, while strategic planning, financial concerns, and general administration duties fall under the purview of the Budget and State Property Management Department. The Ministry also serves as the country's official Broadband Competence Office.

The Ministry of Transport and Communications released its ultra-fast internet development plan in October 2021. The project would expedite the rollout of electronic communications infrastructure, meaning that by 2027, homes and public institutions in both urban and rural regions will have access to internet speeds of at least 100 Mbps. The expansion of super-fast Internet connection will be funded by €75 million. We may construct communication towers and run fiber optic connections with these funds. Priority will be given to connecting major public and economic activity hubs and government buildings to the broadband network as part of the investment planning process.

##### **4.2. Management Optimization [MO]**

The Lithuanian Parliament adopted the 2014–2025 National Health Strategy on June 26th, 2014. The strategy's completion of the Lithuanian eHealth system's development was one of its primary objectives. This objective depends on Lithuanian eHealth infrastructure and product development and integration into the EU eHealth space. By Order No. V-878 issued by the Republic of Lithuania's Minister of Health on July 17, 2017, and revised in 2019, Lithuania's 2017–2025 eHealth System Development Programme, which establishes additional measures for the strategy's execution, was authorized. The program's goal is to ensure that every healthcare facility in Lithuania may contribute to the development of the eHealth system and can use a specific portal to send patient health data to the central eHealth system (ESPBI IS). The action plan for the eHealth System Development Programme is included. Order No. V-362, issued on March 29 by the Republic of Lithuanian Minister of Health, authorized the Action Plan of the eHealth System Development Programme for the years 2018–2025.

According to the implementation plan for the XVIII Government Programme's health provisions, an efficient health system administration and funding are vital to ensure the operation and integrity of eSystems as they relate to the growth of Lithuania's eHealth system. Implementing a digital health system implementation plan, improving monitoring procedures, expanding the digital health history in the ESPBI IS, developing new functionalities, and guaranteeing the use of the Pre-Patient Registration Information System (IPR IS) at the national level; adopting legislation and establishing the infrastructure to enable secondary care; these are all things the country has identified as priorities for the coming years. Therefore, the strategy calls for developing a map of the information resources available to the health system and analyzing and evaluating the integrity and maturity of the information systems.

#### **4.3. Online Service [OS]**

To notify a Lithuanian electronic identification scheme that would be accepted at a cross-border level in the EU internal market, Lithuania completed the procedures outlined in the Regulation on Electronic Identification and Trust Services for Electronic Transactions in the Internal Market (eIDAS Regulation) in 2020. The process demonstrated that the electronic identification system used to issue identity cards in the Republic of Lithuania met a high degree of security and dependability. The National Electronic Identification

Information System has been established and is run by Lithuania in compliance with the eIDAS Regulation's criteria (eIDAS node). The Republic of Lithuania's Ministry of Interior's Information Technology and Communications Department manages this information system. When the identity cards of the Republic of Lithuania are used as a form of electronic identification to access online services in another State of the EU and European Economic Area, secure and reliable cross-border authentication is ensured thanks to the centralized technical solutions implemented and maintained by this institution and outlined in the eIDAS Regulation.

Electronic Transactions: Electronic Identification and Trust Services Law The Law on Electronic Identification and Trust Services for Electronic Transactions, which was adopted on April 26, 2018, made sure that Lithuania's legal system complied with the eIDAS Regulation. The legislation's primary goal is to provide a solid legal foundation for the Republic of Lithuania's market for trust services and electronic identity, ensuring the most excellent possible protection for service users and their interests. This law governs the terms and procedures for the suspension and revocation of qualified certificates for electronic signatures, electronic seals, or certificates for website authentication, as well as the legal implications of electronic signatures, electronic seals, electronic time stamps, and trust services. It also regulates the oversight of trust service providers.

#### **4.4. National Portal [NPR]**

The primary platform for public interoperability is called the State Information Resources Interoperability Platform (SIRIP). The Information Society Development Committee founded it and is now in charge of it. A data sharing platform and an eGovernment portal for central electronic services make up the two primary components of SIRIP.

The eGovernment gateway site provides companies and residents with a one-stop shop for governmental information and services. It contains connections to public information and services that guide people and companies to the websites of the relevant governmental bodies. Services are also divided into categories based on significant life events. The site welcomed 155.6 million users in 2021 and gave them access to more than 606 eServices. The total number of visits in the first two months of 2022 was 28.9 million.

#### **4.5. Government CIO [GCIO]**

The GCIO's closest Lithuanian equivalent is the Advisor of the e-Government Policy Division. The person in charge of the GCIO is Dr. Vytautas Krasauskas. He is accountable to Tomas Ilinskas, the current Interior Minister. They are responsible for the conception, execution, and overall strategy of all eGovernment projects and activities.

#### **4.6. E-Government Promotion [EPRO]**

On March 10, 2021, the adoption of the Decree on the Government Programme Implementation Plan (2021–2024) took place. Most eGovernment-related aims are included in the decree's section 9.2, named "360° eGovernment. Its scope includes the following:

- The construction of State information resources and a digital transformation management mechanism;
- The development of a State data architecture;
- The implementation of a new phase of centralization of State IT services;
- The employment of the fundamental necessities
- The construction of a curriculum for teaching computer literacy
- The Implementation of the Necessary Core Elements

#### **4.7. E-Participation [EPAR]**

In tandem with Lithuania's attempts to digitalize its operations, the "Bailiff Information System," "The Electronic Enforcement File Portal," and "The Cash Restrictions Information System" have all been built. The creation of an enforcement file, the monitoring of a debtor's financial situation, the result of procedural documents, the validation with an eSignature, and their electronic and postal delivery to recipients are all facilitated by the Bailiff Information System, as is the submission of cash restrictions or write-offs to the Cash Restrictions Information System. The Cash Restrictions Information System also accepts write-offs and cash restrictions. Citizens and businesses alike have the opportunity to participate in the process of enforcement by using the Electronic Enforcement File Portal to educate themselves on the content of enforcement files. Using internet technologies enables bailiffs and bankruptcy administrators to advertise and conduct forced auctions of property sold online. The openness of public

sector solutions and processes, in addition to the sector's overall accessibility and transparency, are both improved by this solution.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The State Digitalization Development Programme for 2021–2030 includes data openness as one of its strategic objectives for the nation’s digital transformation. The Lithuanian state will pursue this aim. In addition, data are a high priority in the four-year program that Lithuania's newly elected government will implement at the end of 2020. This is because, according to the program, data are the foundation upon which the decisions and communications of the government are built.

The Ministry of Economy and Innovation defines the Open Data Policy by the recommendations of the European Union (EU) and the Organization for Economic Cooperation and Development (OECD). Additionally, the Ministry of Economy and Innovation is responsible for ensuring that the provisions of the EU legal acts on open data and the reuse of public sector information are implemented in the program.

In this area of the law, Lithuania has made significant progress in modifying the existing statutes. The law reforms address duties on opening relevant data, enhancing the reuse of publicly financed information, and bringing the legislative framework up to speed with the improvements in digital technology. In July 2021, amendments to the Law on the Right to Receive Information and Reuse of Data came into effect. These amendments transposed the provisions of Directive (EU) 2019/1024 on open data and the re-use of information from the public sector. They also established a data opening model that obliges institutions to inventory their data to determine which data are owned by the state and which open data are based on user demand. The data opening model also provides a centralized data opening strategy, which should significantly speed up the process of data opening.

#### **4.9. Cyber Security [CYB]**

The resolution establishing the National Cybersecurity Strategy was passed by the cabinet of the Republic of Lithuania on August 13, 2018, making it official. It lays out Lithuania's primary national cybersecurity policy goals in the public and commercial sectors up to 2023. The implementation of the strategy is intended to achieve the following purposes:

enhancing the state's cybersecurity and developing its cyber defense capabilities; (ii) ensuring the prevention and investigation of criminal offenses committed against cybersecurity; (iii) promoting a culture of cybersecurity and developing innovation; (iv) working toward a closer collaboration between the public and private sectors; and (v) enhancing international cooperation and ensuring the fulfillment of international obligations.

To transpose Regulation (EU) 2019/881 of the European Parliament and of the Council of 17 April 2019 on ENISA (the European Union Agency for Cybersecurity) and information and communications technology cybersecurity certification and repealing Regulation (EU) No. 526/2013 (Cybersecurity Act), the Law on Cybersecurity, which was adopted on 11 December 2014, was last amended on 17 June 2021 and entered into force on 28 June 2021. This was done to adopt a coordinated vulnerability disclosure system. As a result of the recent amendment to the Law on Cybersecurity, the National Cybersecurity Centre (NCSC), which is part of the Ministry of National Defense, has been responsible for acting as the national cybersecurity certification authority. Additionally, the NCSC has been given the coordinator role in the coordinated vulnerability disclosure policy. In addition, the amendment made it possible to conduct a vulnerability search on information and communication systems held by the state and set the limitations that must be adhered to for a vulnerability search to be considered valid. Even before the passage of this amendment, private firms had the option to create and implement their coordinated vulnerability disclosure strategy.

#### **4.10. The use of Emerging ICT [EMG]**

The usage of cloud computing is governed by the Resolution of the Government of the Republic of Lithuania of 2015 on the Approval of the Consolidation of the State IT Infrastructure and the Optimization of IT Management. To accomplish all of the objectives established, Lithuania made additional provisions for consolidating the State's information resources infrastructure and using cloud services. The state institutions that are required to begin utilizing the services provided by the cloud computing service provider as of 2021 forward are outlined on a new list established by the changes to the resolution that will take place in 2020 and 2022.

The Communications Regulatory Authority of the Republic of Lithuania is currently holding auctions to grant the right to use 5G radio frequencies (bands) from the 3400-3800 MHz and 694-790 MHz spectrum bands. Due to these auctions, 5G frequency bands licenses will be distributed during the first half of this year. An amendment was made to the Law on Electronic Communications to encourage the development of the Internet of Things. This amendment ensures that users will have the right to access publicly available electronic communications services beginning in 2023 with devices that have integrated subscriber identification modules (eSIM), as well as the right to change the provider of a publicly available electronic communications service remotely. In addition, users will have the right to use eSIMs on their devices.

Macau

## 1. General Information

Area: 30 km<sup>2</sup>

Population: 697,444

Government Type: limited democracy

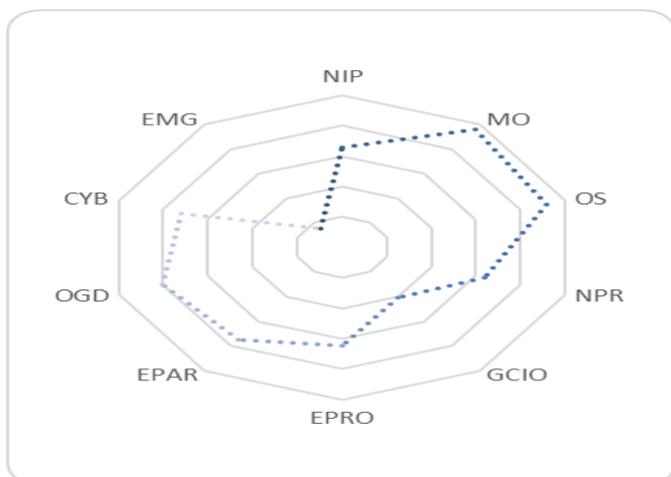
GDP: \$36,805

Internet User: 88.10

Wired (Fixed Broadband User): 32.03

Wireless Broadband User: 357.90

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

In 2022, Macau was 55<sup>th</sup> in the Waseda International digital government rankings, with a score of 60.497. As a result of the data and research that has been conducted, Macau is now in the lead in the efforts that are being made in the Greater Bay Area of Guangdong, Hong Kong, and Macao to decrease the number of occurrences to zero. Due to the particular conditions of Macau, which see many individuals entering and leaving the

territory daily, there is a significant danger of infection. The formal gathering of data will assist with contact tracing and clustering and lessen the work put forward by medical professionals in screening and monitoring.

Digital processes and several electronic appointment systems were introduced to promote rapid deployment of anti-pandemic measures and government-community engagement for greater efficiency and results. The Macau Health Code System, the COVID-19 vaccination appointment system, the Nucleic Acid Test system, the Port and Entry/Exit Quarantine system, and the Medical and Other Supporting systems are the most prominent types of digital systems in use in the Macau Special Administrative Region at present, according to data. These structures have helped spread the use of cutting-edge tech and fresh ideas.

### **3.2. New Trends**

The development of intelligent cities calls for a heightened focus on collecting and using data. This principle must be applied to all cities, regardless of the size of their residents. The development of new structures will no longer be the main emphasis of city planning. Creating large-scale digital "new infrastructure," gathering and analyzing reliable data, and implementing various urban issues to local circumstances are the key objectives of smart city building.

The assistance that bigger cities assistance to medium-sized communities in developing data collecting and application systems is not the only important factor. Because it is a relatively autonomous city that cooperates with Guangdong's large-scale system and has its data sources and application platforms, Macau has a high degree of resistance to the pandemic. This is one of the reasons why Macau has such a high degree of resistance.

## **4. Digital Government by Indicators**

### **4.1. Network Infrastructure Preparedness [NIP]**

I determined that the money towards Macau's digital progress was a successful investment. With the launch of a residential broadband service capable of 10Gb/s, the first phase of CTM's 5G network has been completed. There is no longer time to register a SIM card before the deadline. The creative city concept that Macau is working on has garnered a substantial amount of attention.

#### **4.2. Management Optimization [MO]**

The government of Macau detailed its plans to transform the territory into a "smart city" in both the city's first formal five-year growth plan for the years 2016-2020 and the 2021 policy speech. One of the critical components in making Macau's smart city concept a reality is the widespread use of mobile payment systems. According to AMCM, around 70,000 point-of-sale terminals in the city are used for QR code payments (e-payments). In reality, new rules have been released to encourage the development of the smart city since 2019, such as the cybersecurity legislation, e-governance law, and modifications to the cybercrime prevention law.

The government deemed over-the-counter banking services inferior to contactless payment and internet banking options. The banks in Macau have upgraded to a more cutting-edge, tech-based system in response to the proliferation of mobile payment apps and the rise of financial institutions that actively support electronic payments.

Through their smartphones, consumers will soon be able to pay for goods and services by scanning QR codes using AMCM's new Simple Pay system. The first stage of the pilot program began in February 2021. With the help of Simple Pay, companies may accept all current payment methods with only one terminal or QR code. Before the introduction of Simple Pay, businesses needed several airports to process transactions from various financial institutions.

#### **4.3. Online Service [OS]**

The Macau Monetary Authority (AMCM) has already established it as an all-in-one payment instrument for the area in preparation for Macau's pursuit of its "cashless society" objective, which is one of the government's five-year objectives. According to AMCM, banking and other financial institutions have begun working on integrating payment systems among themselves as well as with businesses. There are already a significant number of local, regional, and international companies active in this region. In a short time, it is anticipated that this corporate sector will develop into an anchor for IT-innovative organizations and other companies.

#### **4.4. National Portal [NPR]**

The Macao Special Administrative Region Government Portal ([www.gov.mo](http://www.gov.mo)) aims to

offer a consolidated portal for accessing government information and services that are also simple to use. The software programs behind the scenes of the government site make it possible for consumers to access various services. Some databases match people with jobs, social benefits, vehicles, and public libraries. These databases provide documents, search, apply, and pay for services. The new website will be service-oriented, with increased functionality and a more comfortable-to-use layout to deliver customized assistance. The user of the unified government service account will be able to examine ongoing applications being run by the government and get customized reminders and other notifications.

#### **4.5. Government CIO [GCIO]**

All government agencies have developed a specialized working team comprising the agency leader, IT head, and IT people of its IT and relevant business divisions. Because the SAFP is responsible for coordinating the development of the EGOV in Macao, it also takes the function of GCIO for the whole government. There are two layers of government, which are referred to as government and agency, respectively. The capability of a contemporary GCIO will be modeled after the training that will be provided for IT workers.

#### **4.6. E-Government Promotion [EPRO]**

The Strategic IT Planning for Public Enterprises project aims to establish a norm for strategic IT planning by drawing on the experiences of Macao's public sector businesses and the best practices of other countries. This initiative aims to facilitate horizontal and vertical integration of agencies' IT plans with government-wide objectives and strategies. It is expected that Macao's e-Government initiative would benefit from the strategic IT planning framework. In turn, this will help the government agencies in Macao get closer to COBIT Level 3 maturity in their IT strategic planning processes. To ensure that all relevant agency personnel are aware of and adhere to a systematic approach to IT strategic planning, it is required to develop an IT strategic planning policy.

#### **4.7. E-Participation [EPAR]**

Five hundred fifty-four thousand people aged three and above used the Internet, a 5% rise year-over-year. Those between the ages of 35 and 44 (98.0%) and 25 and 34 (98.0%) were

the most likely to use the Internet, while those 55 and older (69%) saw a rise of 5.3 percentage points. Most respondents said they utilized the Internet for both leisure and work.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The administration has invested significant time, energy, and money into forward-looking projects, such as the 2016–2020 and 2021–2025 Five-Year Development Plans and recent policy speeches. Macao's digital infrastructure is being upgraded due to these top-down initiatives. The number of practical mobile applications available to citizens is growing rapidly. These apps range from those that allow citizens to access e-government services, like "Common Access to Public Services of the Macao SAR," to those that provide comprehensive guides for visitors, like "Macau-in-Pocket." Partnerships with cutting-edge businesses like Alibaba and SenseTime have also helped Macao residents.

The "cookies" technology in the website's code allows user preferences to be saved and subsequent visits tailored to those choices. Users using "cookie-enabled" browsers will get a notification before any "cookies" are stored on their computers. By attempting to submit personal information through this website, you confirm that you have read and agree to the terms of this privacy statement and that the website's collection and use of data are following all local, state, and federal laws. When utilizing the online services provided by this website, visitors may be asked for personally identifiable information such as their name, phone number, and address. When a government agency is in charge of providing a service, it may provide helpful feedback to the company by sharing the data it collects about its customers. Legally, such disclosures are permitted. The policy of the administration and Public Service Bureau is never to share user information with any non-governmental entities unless required by law.

#### **4.9. Cyber Security [CYB]**

Macao Cybersecurity Law (MCSL) requirements created to secure critical infrastructure information networks and computer systems are binding on public and commercial integral infrastructure operators from a broad spectrum of organizations. The idea of essential infrastructure is new to the MCSL and China's Cybersecurity Law. Systems and networks that might threaten public health, safety, or law and order are considered

essential infrastructure under the MCSL. Utility, transportation, banking and finance, insurance, gambling, and medical care providers are just a few of the sectors that MCSL safeguards against cyberattacks and other dangers. A fine of MOP 5 million is possible for private operators that violate the MCSL. Being excluded from government contracts, subsidies, and other benefits are other examples. Consequences to a company's reputation over the long run should also be considered.

#### **4.10. The use of Emerging ICT [EMG]**

Artificial intelligence (AI) is a subject of computer science that tries to construct robots that can mimic human behavior and reactions. Combining AI with blockchain technology has many potential uses, including increasing business profits (AI). Accordingly, updating the system with new information helps it improve. AI is also becoming better and better at its job as time goes on.

Malaysia

### 1. General Information

Area: 330,803 km<sup>2</sup>

Population: 33,938,221

Government Type: constitutional monarchy

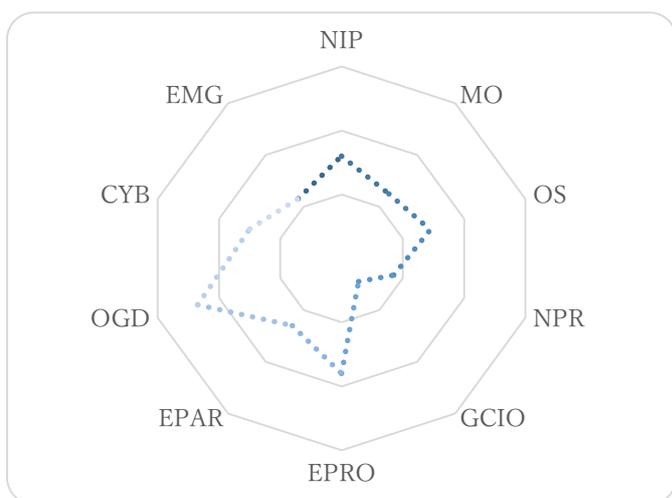
GDP: \$9,938

Internet User: 89.56

Wired (Fixed Broadband User): 10.38

Wireless Broadband User: 119.99

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

Waseda International's 2022 rankings of digital governments place Malaysia at position 27, with a total score of 73.547. As a result of COVID-19, governments rushed to embrace digital infrastructure. They may enhance the lives of their inhabitants by radically altering their methods in light of this development. The government of Malaysia acknowledged

both the opportunities and the obstacles presented by the digital economy as a new kind of economy. By implementing digital governance, Malaysia can improve lives, increase productivity, and stimulate innovation. This enables the country to provide service to all customers, reduce costs, improve efficiency for existing businesses and entrepreneurs, and encourage innovation and scale economies, making it possible for new companies and entrepreneurs to emerge.

As a result of the epidemic, individuals, organizations, and the government have all been compelled to utilize digital technology. They have all been encouraged to move their day-to-day requirements online, but none have done so. MyDIGITAL is a national program representing the government's goal of transforming Malaysia into an economically and technologically sophisticated high-income country. This goal is represented by the program's name: MyDIGITAL. The government of Malaysia is in the process of establishing a blueprint for the country's digital economy. This blueprint will provide the foundation for the digital economy, including strategies for closing the digital divide.

The government of Malaysia has previously carried out significant reforms in some different sectors, which have resulted in changes to both the market and the behavior of consumers. Because of regulatory changes, prices for fixed broadband internet have dropped by half, while speeds have increased by two times. The number of ultra-fast (more than 100Mbps) internet connections has more than doubled due to improved competition in the fixed broadband sector, which had previously been experiencing failure. Malaysia is one of the first developing countries to extend indirect taxes to non-resident digital services. This move helps to maintain a healthy balance in the expanding digital economy and protects public finances. It should be required that high-speed Internet access be treated as a utility throughout the construction of new physical infrastructure, just like water and electricity.

### **3.2. New Trends**

To attract investments and boost its digital economy, MDEC, Malaysia's principal digital transformation agency, has unveiled its 'Digital Investments Future5 (DIF5) Strategy,' a five-year plan centered on five core goals. The 2021–2025 initiative aims to enable new growth drivers in the digital economy and guarantee high-quality digital investments.

With a goal of RM50 billion, Malaysia plans to invest heavily in the digital economy in five priority areas: core technologies, emerging technologies, digital global business services, and digital content and platforms. Because they are founded on the country's essential digital businesses and are connected to its priority sectors, AgTech, HealthTech, Islamic Digital Economy and FinTech, CleanTech, and EduTech are singled out as distinguishing aspects. The advent of digital technology in these fields will have far-reaching effects on the world's economies.

To assist Malaysian families in coping with the difficulties brought on by the Covid-19 pandemic, the government has earmarked RM2.625 billion in Budget 2022. Also, 47 industrial zones and 630 schools would get a combined RM700 million to further the state's digital attempts to link them to the internet. It is expected that by 2022, Annuar will have 5G coverage in 36% of high-density areas. Also, the government will launch the Malaysia Digital Nomad initiative to provide a supportive environment for digital nomads in Malaysia. Budget 2022 safeguards Keluarga Malaysia and ensures that no one is left out of the country's development.

Also, the DIF5 Strategy would help Malaysia become a more appealing digital economy by focusing on five significant emerging technologies that have the potential to spur innovation. By supporting the growth of both new and current economic clusters, these technologies will add to the complexity of the national economy, resulting in the production of high-wage employment and the strengthening of domestic economic ties.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

There have been various breakthroughs in the NIP growth of Malaysia. It is anticipated that the percentage of households with broadband Internet access will keep increasing. The government has placed a greater emphasis on the national fiberization effort. The introduction of new multi-spectrum auctions will help forward the commercialization of 5G.

One of the goals that Malaysia has set for itself to accomplish by the year 2025 is to achieve full population coverage with 4G LTE mobile service. Despite this, the MCMC's Internet Survey 2020 found that the percentage of internet users in urban and populated

regions was 75.6%, while the share of internet users in rural areas was just 24.4%. This only demonstrates a concerning pattern of increasing digital inclusion.

The Prime Minister of Malaysia, Datuk Seri Ismail Sabri Yaakob, was quoted in a recent article as saying that his country has the potential and competence to achieve 100 percent digital inclusiveness, particularly among the most disadvantaged populations, as part of its attempt to bridge the digital gap.

As a direct consequence of this, Malaysia's government has implemented various initiatives to foster the growth of the digital sector in the country. It has made investments in digital infrastructures, such as internet connections that are speedier and other digital applications with scalability potential.

#### **4.2. Management Optimization [MO]**

Providing citizens and businesses with cutting-edge ICT solutions is a priority for the country. The end objective is to provide a government-wide service that prioritizes citizen requirements. The "1Gov\*Net" network design may help government organizations save money and provide better services to the public while making the most of available resources. In addition, Malaysia's Administrative Modernization and Management Planning Unit launched a government cloud system dubbed "1GovCloud" (Mampu).

By encouraging collaboration across departments, the Project Monitoring System helps advance e-Government project administration and growth. The government of Malaysia has developed an HRMIS better to track the country's human resources (HRMIS). GOE has also improved worker coordination. The federal government created the "1GovEA" enterprise architecture template to promote government agencies' widespread adoption of IT and back-end business processes.

#### **4.3. Online Service [OS]**

Although the online shopping market in Malaysia is expanding rapidly, there are still certain obstacles to be dealt with. Malaysia's pioneering attempts to join other developed countries in the online shopping revolution in terms of product selection, payment methods accepted, speed of delivery, and compliance with regulatory mandates. Three of Malaysia's most popular online shopping sites are Shopee, Lazada, and PG Mall. The next most popular is Lazada and PG Mall, but Shopee still dominates. American companies

eBay and Sephora.

The government of Malaysia is actively encouraging the growth of online businesses. The government's plan for economic revival heavily emphasizes developing the online marketplace. If you need to pay for a government or public service, you may use e-Paying, a cashless system that takes various payment types. As the community becomes cashless, the government's attention has shifted to building an electronic payment infrastructure that can keep up with the demand.

#### **4.4. National Portal [NPR]**

The performance of the National Portal may be broken down into parts: information, technology, and functionality. On the National Portal, which can be accessed from any location in the nation, one may get information about various government agencies, legal documents, and current events. The website is now accessible in a total of sixteen different languages.

According to Google PageSpeed™ Insights, the website is responsive and quick when viewed on desktop computers and mobile devices. In addition, it is possible to communicate via the portal, such as by receiving email notifications whenever new content is published on social networking sites such as Facebook, Twitter, YouTube, and Flickr.

#### **4.5. Government CIO [GCIO]**

On the MAMPU homepage, the job of the Government Chief Information Officer, also known as the GCIO, is explained in detail. As a result of the Public Sector CIO Information Systems, ministerial agencies also have jobs analogous to CIOs. By hosting seminars and CIO summits, the office of the Malaysian GCIO has consistently been at the forefront of efforts to educate and acculturate chief information officers in the most modern technologies and ICT tools for the delivery of public services. The government of Malaysia is now mulling the possibility of creating and filling Chief Information Officer jobs. They investigated how public officials see, require, and incentivize developing and mastering information and communication technology abilities.

#### **4.6. E-Government Promotion [EPRO]**

E-Government projects are now being utilized to make substantial changes to governance,

with the primary objective of enhancing the overall productivity of public services. This is being done to raise the overall productivity of public services. Because of the E-Government program, states are reevaluating their methods of operation to enhance their relationships with their citizens and businesses. These improvements include improving communication, increasing access, delivering high-quality services, and simplifying the processes that are already in place. In this day and age of digital technology, governments worldwide may make it simpler to access government resources and financial incentives. Telecenters play a significant role in the administration and development of the region since they provide Internet access to remote villages and a wide range of services, such as electronic government, to their customers. Since most telecenters have transformed into hubs for providing support services for rural development in the urban catchment areas where they are located, the majority of them will ultimately provide electronic government services. MyEG is the name given to Malaysia's collection of online government services. These services include those the Malaysian government offers its residents, corporations, workers, and even other governments. Communication from the Malaysian government to its people, which has a more widespread audience, is open to all citizens of the country.

#### **4.7. E-Participation [EPAR]**

The purpose of the e-Involvement policy of the Malaysian government is to research the culture and practice of electronic engagement to promote openness and public participation in improving the quality of services provided by the government of Malaysia. The involvement of the Malaysian public is highly appreciated because it enables the government to investigate a broader range of information resources and different ways of thinking to enhance both the quality of outcomes and the delivery of services. In addition to this, it sets the framework for healthy relationships, more debate and discussion, and a political administration system that is more orderly.

Using information and communication technology, this initiative aims to increase public participation in the procedures involving formulating policies and making decisions. A customer satisfaction survey, a portal poll, public engagement, portal feedback, and social media platforms such as Facebook, Twitter, Instagram, and YouTube are some of the communication tactics used.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

According to the Malaysian Economic Alliance (MEA), the government of Malaysia is encouraging digital transformation (DT) via its Shared Prosperity Vision 2030. MyDigital, Malaysia's Digital Economic Blueprint, was released on February 19, 2021, outlining how the country's digital economy may aid in the country's economic revival. By creating a sustainable digital environment that promotes high-value employment, creative and productive businesses, and the reduction of the digital gap, the MyDigital agenda seeks to connect to the global value chain. It marks a significant step forward in the ongoing digital transformation of Malaysia.

Assuming no more obstacles, these measures indicate that most government agencies have been informed and have the appropriate documentation to begin disseminating open data. The MAMPU has also established data.gov.my as a central platform for disseminating available data and a link to supplementary information. It is simple for users to access the information they need on the government data portal since it is arranged according to Open Data Barometer significant categories.

Regrettably, other policies and legislation may limit the dissemination of open data. This varies significantly from one agency to another and also depends on the specifics of the data being collected. Some of these rules and laws are crucial. They are in place for our safety and confidentiality. For instance, the health ministry should not make public any accessible data that may potentially identify individual users. Some of these rules may require revising to make it possible for more useful open data to be disseminated while still protecting individuals' privacy and safety. Committees will need to be formed, experts will be consulted, and the public will be invited to weigh in, which will be lengthy.

#### **4.9. Cyber Security [CYB]**

Due to deliberate efforts to advance business, commercial and public organizations, and society at large, digital information systems are becoming more widespread. The increasing reliance on digital information systems, however, introduces new vulnerabilities and threats, particularly to the Critical National Information Infrastructure (CNII), in the form of cybercrimes such as hacking, intrusion, fraud, harassment, malicious code, and denial of service attacks. Because of the increasing risk posed by cybercrime to the country's "e-sovereignty," a national strategy to protect its networks

was implemented. The CNII must be safeguarded to the degree appropriate to the threats encountered, which is why Malaysia has developed the National Cyber Security Policy (NCSP) to guide the country's complete, integrated execution of cyber security. The implementation has drawn on the resources of several departments and agencies throughout the government to realize the goal of creating a CNII that is robust and self-sufficient and contributes to national security, improved quality of life, and increased prosperity. A look at Malaysia's cyber security after four years of NCSP deployment shows that the country has become its own. Much has been done, and much more is needed as the landscape of cyber threats evolves in response to introducing new technology and techniques. The goals of Malaysia may be furthered with the aid of the CNII if it is executed well and can help the nation take advantage of the possibilities of technological progress.

#### **4.10. The use of Emerging ICT [EMG]**

Digitalization, technological adoption, and network connection were all given a higher priority. For Malaysia to rapidly increase its internet use, the National Broadband Initiative was launched to push conventional scientific and technological progress forward. To transition to a knowledge-based economy, ICT was singled out as crucial by the 11MP.

The National eCommerce Strategic Roadmap and the Malaysia Productivity Blueprint are two more efforts to boost digitalization among MSMEs by encouraging eCommerce and cutting-edge technology. To help small and medium-sized businesses (SMBs) gain access to international markets, the Digital Free Trade Zone was established. The Public Sector Big Data Analytics Project and the Public Sector ICT Strategic Plan are only two examples of the many initiatives launched since the beginning of the 2010s to modernize and enhance data sharing in the public sector. These measures were implemented to analyze data for insights and improve the quality of public services. The Public Sector Modernisation and Digitisation Committee was set up this year to oversee the rollout and progress of government-wide digital transformation programs. To fully realize the benefits of digitalization, improvements were made to the availability, cost, and quality of home broadband connections. The government launched the National 5G Task Force and the National Fiber Optic Cable Program (NFOP) to improve digital infrastructure and

speed up the transition to a digital economy.

Mexico

## 1. General Information

Area: 1,964,375 km<sup>2</sup>

Population: 127,726,750

Government Type: Federal presidential constitutional republic

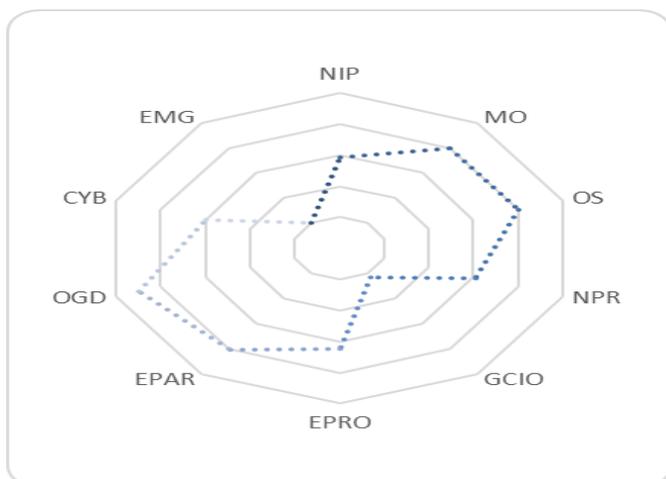
GDP: \$8,526

Internet User: 71.97

Wired (Fixed Broadband User): 17.01

Wireless Broadband User: 78.63

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

In 2022, Mexico's governmental digital performance placed 41st, achieving a 67.942 points on the Waseda International scale. A large portion of its poor and rural population is at risk as a result of this reality during the Covid-19 epidemic. They can't study alone, work from home, or even finish their education if they don't have access to the internet. This marginalization will have long-term repercussions, and the nation may inherit even

worse poverty and inequality rates than before the epidemic. Mexico's government has made great strides toward digitalization throughout the years. In terms of technology, it is among the most sophisticated nations in Latin America and the Caribbean. The Mexican economy has been flourishing in recent years, but it isn't the only reason for its rapid development. It's also because of how enthusiastically they've taken to the Internet. Mexico's government has relied more on technology over the last several decades. What began as an essential online administration is now a highly developed digital government that serves the public and private sectors.

E-government, often known as digital government services, has made significant gains in recent years. This article will examine the development of the country's e-government initiative, from its initial emphasis on only informing residents to its current goal of actively including them in policymaking processes.

Mexico might benefit from a strategy to swiftly improve its government systems to recruit the top digital talent in the public sector since technology is changing quickly. Using a case study to illustrate. The fast development of new technologies is changing how individuals interact with digital services. And it's not just about having access to the latest and greatest applications and gadgets; what matters is how this changes people's experience of the everyday government services they depend on.

### **3.2. New Trends**

The Covid-19 epidemic has highlighted the need for a more digitally inclusive society where more individuals have access to modern conveniences. In light of the recent Covid-19 epidemic, it is more crucial than ever to implement effective and long-term digital development strategies in order to keep up with the rapid pace of technological change. Going ahead, we must use the digital age to reshape government and society and fortify public-private and social partnerships, to ensure that all citizens have access to sufficient digital infrastructure.

It is necessary for each nation to have a strategy for how it will approach innovation to succeed. For Mexican policymakers who are committed to developing a digital economy, this entails defining what is meant by "digital economy" means and ensuring that there is consensus over how their policies are aligned with that vision. It also includes assisting

stakeholders such as corporate executives and politicians in comprehending the significance of those policies, why they should be engaged, and how they provide value. The government can determine which resources (money, time, human capital) will be required once those policy priorities have been identified, as well as how those resources will fit into already established priorities such as new information technology systems or programs such as financial literacy.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The Senate has approved a merger of COFECE, IFT, and CRE; AT&T Mexico has returned 800MHz of the mobile spectrum; Movistar has completely surrendered its 1900MHz and 2500MHz spectrum holdings; and Telcel has acquired another 50MHz of 3.5GHz range from Axtel by Codi, which enables customers to make NFC and QR payments with their mobile devices. These key achievements are the result of Mexico's digitalization initiatives, which have led to several positive outcomes.

##### **4.2. Management Optimization [MO]**

The digital plan for 2021–2024 is based on five principles: austerity, efforts to fight corruption, the efficiency of digital processes, the security of information, and technical sovereignty. It has two parts: administration of the federal government and social policy.

In terms of public administration, the main goals are to improve and harmonize the regulatory framework of digital policy by laying out the country's technological guidelines clearly and simply; to standardize ICT purchases through transparent, cost-effective actions that save money and make the best use of public resources; to promote autonomy and technological independence to establish the state as a leader in its ICT, and to promote the state's leadership in its ICT.

The digital policy aims to give public agencies, especially the state-owned CFE, fiber optic lighting. It plans to use institutional networks and services to increase capacity and coverage in public squares, health centers, hospitals, and other public places and to promote free connection. Overall, it is made to improve the quality of social programs by coming up with technical solutions that make population-focused activities easier and

better.

### **4.3. Online Service [OS]**

Mexico's National Digital Strategy has produced remarkable outcomes since 2012. It has launched crucial programs, such as MéxicoX, an e-learning platform that provides specialized and academic training for teachers and has benefited millions worldwide. For educators in Mexico, prende.mx serves a similar purpose as a repository for information on integrating technology into the classroom.

The InteroperaMX platform, modeled after the Estonian X-Road, enables government agencies to transmit high-quality data among themselves safely. The goal of this initiative, which has been running since 2018, is to have users only disclose their information once to the government.

Most (around 75%) of all government transactions nowadays can be started online. According to statistics, only 10% of Mexicans have lately reported utilizing digital channels to carry out government duties, even though these jobs sometimes need many encounters.

### **4.4. National Portal [NPR]**

Individuals are provided with information, procedures, and a place to participate on the Gob.mx website, which serves as a platform for government innovation and the enhancement of operational efficiency. Users of this service may consult one another and do their work quickly and efficiently without wasting time waiting or losing time. Because of these changes, customers may now view all of the documents supplied to them by the government from one spot. Consumers are allowed to participate in decision-making processes and change public policies via the use of cutting-edge digital media.

### **4.5. Government CIO [GCIO]**

A national CIO is selected and appointed by the Mexican government. The Chief Information Officer's (GCIO) equivalent is the eGovernment and Information Technology Policy Unit Director under the Ministry of Public Administration. This article does not mention any CIO groups or affiliations in any way, shape, or form. There is not a single educational institution in Mexico that offers CIO certification training.

#### **4.6. E-Government Promotion [EPRO]**

As a direct consequence of digitization, there is a demand for new talents in every field and sector. The Mexican government just presented its brand-new Digital Academy, an online learning platform for federal employees. The Digital Government Unit of the Ministry of Public Administration also provides information on access to in-person digital government training programs. This information may be found on their website. It is conceivable for those in project management and other critical roles to undergo retraining in digital potential and to use agile or DevOps methodologies as an alternative to waterfall project management. Implementing open standards, digital identities, reusable components, and interoperability criteria all contribute to the success of this endeavor.

By expediting procurement procedures, users may expand access to potential business opportunities and increase the number of suppliers that engage in these agreements. However, the ICT Policy encourages project managers to describe service demands and functionality in advance, but it does not give clear direction on managing digitalization operations. A software framework agreement has also been established, which will assist the government in meeting the software requirements of public enterprises.

#### **4.7. E-Participation [EPAR]**

The website [www.gob.mx](http://www.gob.mx) functions as a one-stop shop for all the services the Mexican government offers its citizens. Participation in the development of Mexico is now accessible via various channels, such as online discussion boards, polls, and collaborative publishing endeavors.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

New technologies for digitization and digital transformation have been developed and implemented across many different industries. Recent years have seen the introduction of numerous innovative technologies and digital services, such as blockchain, augmented reality, the Cloud, Big Data, social networks, the Internet of Things, electronic signatures, digital identity, hybrid human-digital experiences, information technology, mobile platforms, machine learning, machine-to-machine communication, cryptocurrencies, etc. While businesses in Mexico still have a ways to go in digitization, that doesn't imply there isn't interest, either domestically or regionally. Several Latin American nations actively

engage in this process and rapidly adopt cutting-edge technology throughout government and industry.

Open Government Data is a crucial component of the ongoing digital revolution because it paves the way for governments to function as platforms for the collaborative production of public value. The accountability of governments, the performance of the public sector, and the discovery of new social and economic achievements may all be improved by using the experience of individuals from outside of government. An Open Government Data Review of Mexico was conducted via a collaborative effort between Mexico and the Organization for Economic Co-operation and Development (OECD). The Ministry of Public Administration, the National Digital Strategy Coordination, and the Open Data General Direction were the ones that carried out the review. The OECD's open government data framework was used to analyze Mexico's open government data policy, and the findings shed light on the country's potential for digital transformation.

#### **4.9. Cyber Security [CYB]**

Cyberattacks in the contemporary technology age have become a continual concern, and unpreparedness may lead to economic and national security issues. Due to the minimal or nonexistent security measures adopted inside governments, the number of technical vulnerabilities and, therefore, the number of assaults has increased. Mexico lacks the institutional capacities necessary to combat cyber threats, and its initial effort to develop a National Cybersecurity Strategy was unsuccessful.

Cybersecurity is a wide notion that encompasses both the public and commercial sectors, the real world, and cyberspace. There are several risks to this issue. The most prevalent are information loss, identity theft, personal data issues, sensitive data leaks, unethical hackers, cybercrime, and cyber dangers such as viruses, malware, ransomware, etc. They may substantially affect everyday devices, services, people, businesses, governments, and international organizations. Cybersecurity is often studied as a problem but not a useful tool or solution.

Mexico lacks the institutional capacities necessary to combat cyber threats. The administration has not given this critical subject attention and has neglected that public institutions are susceptible to assault. No national cyber contingency plans, security

measures, objectives, or institution-specific duties exist. The government is presently advocating measures like the National Digital Strategy 2021-2024 (NDS); nevertheless, the NDS was designed to improve digitization and access to public services while decreasing public investment in technology. Insufficient Cybersecurity foundations are included in this plan.

#### **4.10. The use of Emerging ICT [EMG]**

A robust expansion of Mexico's information and communications technology industry will be essential to the country's prosperity as it continues its journey toward digitalization. According to the regulatory tracker maintained by the International Telecommunications Union (ITU), the laws governing the field of telecommunications in Mexico are among the most progressive in Latin America. Although the epidemic has sped up the speed of digital change, the Mexican government has not developed a national digital strategy or a detailed road map for ICT public policy. Additionally, continuing digitization and cybersecurity initiatives have been hampered due to the administration's cutbacks to the budget, which may have otherwise allowed for sustained expansion.

Morocco

## 1. General Information

Area: 446,300 km<sup>2</sup>

Population: 36,910,560

Government Type: Unitary parliamentary semi-constitutional monarchy

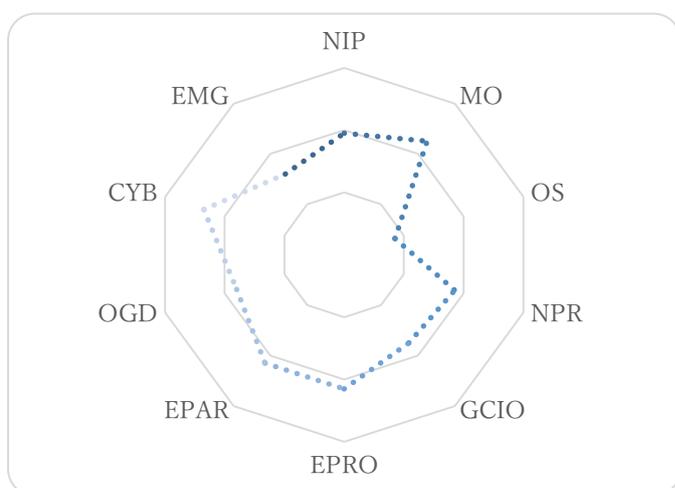
GDP: \$3,063

Internet User: 84.12

Wired (Fixed Broadband User): 5.7

Wireless Broadband User: 75.16

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Morocco ranked 57th in 2022 with a total of 58.798 points. Due to the rapid pace at which disruptive digital technologies are transforming every element of society and life, digital transformation (DT) in the public sector is becoming an increasingly crucial requirement and a strategic imperative for governments throughout the globe. Morocco's

administrative reform has set out on an ambitious course that impacts all facets of public administration. It is distinguished by an integrated and thorough change that unavoidably necessitates the reorganization and modernization of Moroccan public agencies. Additionally, administrative, and technological capabilities must be strengthened to optimize public expenditure and provide users with high-quality services. This reform completely complies with the logic of New Public Management, which aspires to modernize public operations by using new public management tools and concepts drawn from the private sector while considering the public sector's unique characteristics.

Morocco has designated the digital transformation of government, the economy, and society as a key priority for the country's new growth model and for reinforcing the social compact between the state and its inhabitants via repeated royal addresses and digital transformation programs. The king's statements during the COVID-19 crisis emphasized the need for an efficient and responsible public sector to promote reform initiatives. The COVID-19 situation has increased the need for nations such as Morocco to adapt to the world post-pandemic and the quick transition to digital infrastructure and data-driven services. In the proposed Budget Law for 2021, the Government of Morocco has allocated funds to facilitate the digital transformation of the Moroccan public administration in recognition of this necessity.

### **3.2. New Trends**

The Kingdom of Morocco has set a goal to become one of the most critical digital actors on the African continent. During the course of the last several decades, the nation has put into action several different plans, some of which include e-Morocco 2010 (2005-2010), Maroc Digital 2013 (2009-2013), and Maroc Digital 2020. (2015-2020). The Moroccan government is continuously working to modernize and digitize the country's governmental institutions, and these three plans illustrate the scale of those efforts. For Morocco to execute the "digitalization of public administration properly," the country plans first to ensure that most Moroccans have access to the internet at reasonable prices. Much effort has been put in, but more work still needs to be done to help the economy after the pandemic. The necessity of further developing this expertise in Morocco exists for the country to keep up with its pace worldwide, highlighting in this sense the work

carried out by the UM6P to move forward with digital transformation. This was in response to the fact that the presence of artificial intelligence is growing faster than expected.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Morocco's NIP has achieved some major advances. A loan of 500 million dollars has been made available by the Digital Inclusion Development Policy Financing program of the World Bank to help Morocco reshape its economy and expand its economic and social inclusion. The Wi-Fi 6E 6MHz spectrum has been given the go-ahead for commercial use by the authorities in charge of telecommunications, and a new mobile payment option called MT Cash has been introduced.

##### **4.2. Management Optimization [MO]**

The Health Ministry's (MoH) Strategy 2025 aims to reform and enhance the healthcare system in Morocco by 2025. Digital transformation is an ambitious approach to accomplish these objectives, making it the most comprehensive Moroccan healthcare-IT strategy. This effort assists public hospitals in developing information systems and electronic medical records. To protect the privacy of people's digital health data, data security, efficient administration, and regulatory approval of the security structure are required. The COVID-19 pandemic has quickened the digital health revolution in Morocco as practitioners and policymakers have become more aware of the significance of digitization, which has accelerated its acceptance in health care.

Current innovation projects in Morocco include the Innovation Initiative, the National Strategy for the Development of Scientific Research (Horizon 2025), and Digital Morocco. The Innovation Project is a government-led project promoting research and development in Morocco. The government strongly emphasizes the following objectives as it continues its digital journey:

- A heavy focus on scientific research significantly influences the development of new technologies.
- Increase GDP by 2025's end, R&D expenditures should be increased.

- Implementing procedures to ensure that scientific research and development-based innovations and intellectual breakthroughs are integrated into the innovation process.
- A proposal for financing to create a National Award for Science and Technology Innovation and Research
- Tourism, agriculture, and textile manufacturing are among the nine sectors that should get priority.

#### **4.3. Online Service [OS]**

By 2030, all government services and processes in Morocco will be accessible online, according to Mouhcine Yejjou, head of the Maroc e-ID initiative at the General Directorate of National Security (DGSN). While internet services may save people considerable time and money, security must not be compromised. DGSN is now developing quick, secure, and user-friendly methods to allow individuals access to personal data and government services. Several government projects in Morocco will assist in accelerating the transition since many individuals will use internet services.

The new identification cards have some security measures to prevent identity theft and fraud, as well as efforts to connect government services for safer, more convenient access to internet services. In recent months, the government of Morocco and the DGSN have collaborated to enhance Morocco's official digital services. It has accomplished this by pushing a new generation of identification cards and offering additional services, such as a national e-health platform. Ongoing efforts to enhance internet connectivity in Morocco include implementing improved networks and their extension to more isolated and rural areas.

#### **4.4. National Portal [NPR]**

One of the most well-known websites devoted to promoting Morocco's information technology sector and educating users about the online services supplied by the Moroccan government is the portal known as egov.ma. This website is one of the most visited websites in the world. Users are provided with a better knowledge of the program's overall growth by having access to the roadmap that details the future development of all eGovernment services and activities.

In addition, it is an interactive environment in which every user has the opportunity to express an opinion or make a remark on the performance of the site and the relevance of operational and ongoing operations by responding to frequently updated online surveys. This can be done in order to provide feedback on the effectiveness of the site and the relevance of operational and ongoing operations. All program participants may communicate via the website, which serves in this capacity.

#### **4.5. Government CIO [GCIO]**

There is neither a policy nor a strategy for the CIOs working for the Moroccan government. Consequently, Morocco's overall score in the GCIO indicator rating was not very high.

#### **4.6. E-Government Promotion [EPRO]**

In addition to Bahrain, Jordan, Kuwait, Nigeria, Oman, Pakistan, Rwanda, and Saudi Arabia, Morocco joins the DCO with a population of roughly 37 million and a GDP of 114 billion USD. The country's entrance raises the DCO's total GDP to more than \$2 trillion, with a population of well over half a billion people, of whom more than 70 percent are under 35. Morocco is a significant regional digital center with fast-increasing technology infrastructure and successful digital sector companies. International organizations, such as the World Bank and European Investment Bank, have acknowledged the country's further efforts to enhance its internet network and provide people and residents with digital access to government services.

Morocco has achieved significant progress in improving network coverage and using digital technology to make government information and services more accessible to residents. Having a nation that prioritizes digital transformation and has a strong start-up and innovation ecosystem as a member of the DCO will unquestionably increase our collective power and influence in establishing a more equitable global digital economy.

#### **4.7. E-Participation [EPAR]**

As ICT has developed, it has altered many aspects of society and government. Some of the many advantages of these technologies include increased speed, fewer expenses, and the ability to reach a wider audience. Government officials increasingly need to reach out to the public and build relationships with them to be effective. By streamlining

communication between citizens and government officials, ICT has a multiplier impact on citizen participation. To increase citizens' involvement in collective decision-making and broaden their access to government information and services, the government has made fostering electronic participation a top priority.

E-participation consists of two parts: e-access and e-inclusion. Access to public networks, online resources, and ICT-related education and outreach are all made possible by E-Access. To the contrary, e-Inclusion refers to the use of ICTs to increase the representation of a certain group in public decision-making processes.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

A decade ago, Morocco started its transition to the digital age. Since then, numerous measures have been implemented by the government to hasten the growth of digital technology in Morocco, which has significantly influenced society and the economy. On January 19 in Rabat, the president of the Economic, Social, and Environmental Council (EESC), Ahmed Réda Chami, said that AI should be given top priority in the ongoing digital transition and urged for the adoption of a national strategy devoted to AI. Morocco's long-term goal is to establish itself as a leading digital economy on the continent. Due to the rise of telecommuting and e-commerce, the pandemic has expanded internet and smartphone adoption, but this has only served to widen the gap between socioeconomic classes. However, it was impossible to accomplish the goals established throughout the many programs.

The current OGP in Morocco consists of:

- Supervisory Committee: There are eighteen people on the Supervisory Committee; half are government officials responsible for carrying out the OGP action plan, and the other half are representatives from civil society groups. After the candidate associations have fulfilled the conditions of the nomination announcement, the second half is selected by a Mixed Committee based on stated criteria. The membership is renewed every two years, and no one may be nominated more than twice. A key function of the oversight committee is to "define the strategic orientations of the OGP in Morocco and coordinate the important stakeholders."

- Implementation Committee: Members of the Implementation Committee for the Open Government National Plan. In addition to ensuring that Morocco's commitments are met, this body is tasked with drafting monthly reports.
- CSO Forum: a place where CSOs interested in OGP topics may get together to share ideas, have productive discussions and raise awareness.

#### **4.9. Cyber Security [CYB]**

Prudential laws enacted with the goal of safeguarding computer networks, telecom networks, and their users should, in principle, apply to the Internet as well. This code of conduct, similar to cybersecurity legislation, is meant to safeguard networks from malicious actors. Intentionally or not, these actions are taken to do damage to individuals, organizations, or even whole countries.

As the number of cyberattacks rises, it's more important than ever for each country to pass its own cybersecurity legislation and for the international community to work together to create a uniform set of regulations. Because the perpetrator of a cyberattack often does not live in the same nation as the target. The Internet's worldwide reach presents similar challenges to implementing traditional law. Morocco has established the first landmarks in cyber legislation and national cyber-security operations because, like other nations, it is vulnerable to cyber-attacks.

#### **4.10. The use of Emerging ICT [EMG]**

The government of Morocco has established overarching principles for expanding the country's telecommunications network to ensure that all areas of the kingdom have equal access to the internet, narrow the digital gap, and promote the growth of high-speed broadband services. A few of the things covered by this policy are:

- Investment encouragement in the vitally important telecommunications industry is driving the growth of the Moroccan economy.
- Infrastructure deployment that can adapt to new applications reflects the government's commitment to closing the digital gap regarding access, use, and content. To meet the rising demand for non-voice content (data, pictures, etc.), service providers must invest in costly fixed infrastructure (mostly based on fiber optics) to ensure that their customers can get the high-quality service they seek.

To achieve this goal, we must increase demand for products that provide a broadband Internet connection.

- Creating circumstances that may drive a considerable decline in call prices and decreasing their influence on family and company expenditure is key to facilitating the wider use of telecommunications services.
- Expanding multiple markets via the deployment of regulatory tools boosts competition between industry players. To achieve this goal, the government must enhance the regulator's power by enacting rules that set the stage for the efficient use of regulatory tools and unrestricted market competition.

Netherlands

### 1. General Information

Area: 41,850 km<sup>2</sup>

Population: 17,564,014

Government Type: Unitary parliamentary constitutional monarchy

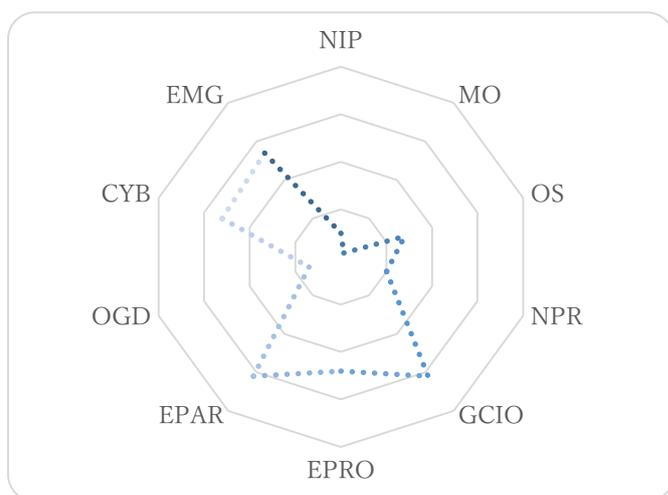
GDP: \$51,989

Internet User: 91.33

Wired (Fixed Broadband User): 43.92

Wireless Broadband User: 125.28

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With a total of 81.117points, the Netherlands landed in the 17th position in the Waseda rankings for 2022. The Netherlands has the resources necessary to make the most of emerging prospects, including a highly educated labor population that readily adopts new technologies. The development of innovative concepts is a direct result of productive

collaboration between corporate entities, the scientific community, and the government.

After the worldwide spread of the COVID-19 epidemic, everyone was compelled to stay inside and conduct their daily activities, including work, school, and leisure. In a short period of time, the government also shifted to an entirely digital operation, allowing for the creation and implementation of several policies despite the coronavirus restrictions. The country made great strides forward with widespread digitalization across industries and fields. Thankfully, the Netherlands was prepared, and essential parts of our business and society were able to continue operating with the help of digital infrastructure. The fast expansion also increased the need to address vulnerabilities, privacy, and reliance.

As of the 10th of January 2022, a brand-new position entitled Minister for Digitalization was introduced into the government. The dedicated Minister is going to be in charge of coordinating the digital targets that the government has set. In July 2020, the government of the Netherlands released several proposals for improving governance. Important takeaways from the proposal included the need for a more precise definition of the GDI, the need for a direction needed for the GDI's coherence and future development, the need for greater clarity in the roles and responsibilities of governance, and the unfavorable effects (such as less use) of a financing system based on the profit principle. All of these takeaways are essential lessons. The new plans include a multiannual investment framework and a year cycle for prioritizing and allocating resources with stakeholders. This is all part of the ongoing effort to build and revive the Global Development Index (GDI).

### **3.2. New Trends**

In the rapidly evolving digital world, civil society has shown to be adaptable and dynamic. The limitations imposed by COVID-19 have forced activism and campaigning to the internet. But as technological advancements quicken, so do civil society's difficulties in addressing the socioeconomic implications and abuses accompanying them. The use of facial recognition technology to track human rights defenders or identify protesters; the rapid spread of disinformation fueling polarization; censorship curbing freedoms of expression online; and the widening digital divide, which disproportionately affects women and girls, the elderly, and rural residents, where access to digital technology is

scarce, have all contributed to this. These online dangers make it harder for individuals and organizations to go about their business and express their rights freely on the internet. The Dutch government recognizes the importance of an accessible and welcoming online civic space for maximizing civil society's contributions to the 2030 Agenda and its promise to leave no one behind, as well as safeguarding human rights and fundamental freedoms.

The Strategic I Agenda 2021-2025 was presented to the House of Representatives by the Minister of the Interior in February 2019. The Strategic I plan is geared toward the central government and outlines the broad categories of work that the CIO council does (the interdepartmental council of Chief Information Officers). The following topics will be discussed on the agenda: reliable information and data; well-functioning, consistent, and resilient information and communication technology; knowledge and skills; and strategic Internet governance. The Parliament was given an update on the situation in a letter dated January 6th, 2021.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Along with the launch of NL DigiBeter2.0, the public was given access to a document titled Policy Framework for the Further Development of the Digital Government Infrastructure. The policy framework includes several guiding principles, the primary focuses of which are formulating a policy for the digital government's basic infrastructure and expanding the general capabilities of the digital government's basic infrastructure. These primary focuses are among the guiding principles incorporated into the policy framework. The available functions are built on a foundation that is comprised of several agreements, standards, and essential components.

##### **4.2. Management Optimization [MO]**

The Connectivity Action Plan was published by the Ministry of Economic Affairs and Climate Policy to refine the Dutch Digitalization Strategy's objectives and outline the government's efforts to maintain its position as the digital leader in Europe.

Its purpose is to provide connectivity that is of high quality, capable of meeting a diverse

range of requirements, and that is accessible at affordable rates at all times and in all locations. The Dutch government is committed to the goals of the European Union Gigabit Society as outlined in this plan. Broadband connections with speeds of at least 100 megabits per second (Mbps) should be available to every family. By 2023, most homes should be able to use connections with speeds of 1 gigabit per second (Gbps).

The Netherlands has created a Dutch API Strategy to make it easier for the government to utilize API technologies. The approach is divided into informational and prescriptive sections approved by national standards (Rest API Design Rules and the NL GOV Assurance profile for OAuth 2.0). To provide government, IT developers, and all subcontractors access to all information, the Developer Overheid site was established in 2019. This website is being promoted as an overview of the government's accessible APIs.

#### **4.3. Online Service [OS]**

The government spends over EUR 73 billion annually on labor, services, and supplies. PIANOo, the Dutch Public Procurement Expertise Center, was established to professionalize procurement and tendering in all government departments to increase efficiency and adherence to the law. A successful policy may benefit from professional procurement since it provides value for the taxpayers' money. PIANOo brings together specialists in procurement and tendering, shares their expertise and experience, and offers guidance and helpful hints. Additionally, the Expertise Center promotes communication between public contracting bodies and private businesses. A network of over 3,500 public procurement and tendering specialists is who PIANOo works for and with. The Dutch Ministry of Economic Affairs and Climate Policy has PIANOo in its portfolio.

The Netherlands' online public procurement platform Tendered assists all contracting agencies and providers during procurement. It is a crucial tool for achieving EU eProcurement goals and automatically posts contract notifications that reach the EU threshold on Tenders Electronically Daily. PIANOo is in charge of administering Tendered.

The creation and adoption of the NLCIUS is a national derivative of the European standard CIUS. Standardization Platform eInvoicing is responsible for maintaining the NLCIUS (STPE). The STPE encourages and supports the technical deployment of e-invoicing systems within sub-central government organizations and the adoption and

application of the European Norm. You may get more details on eInvoicing [here](#).

#### **4.4. National Portal [NPR]**

The portal Overheid.nl, which translates to government.nl, adds to the public administration's openness. Overheid.nl is the principal point of access for all information on government organizations. The site offers information on services for individuals and companies, organized by topic, life event, and geographical region. It provides integrated national law, official publications, municipal and regional legislation, and internet-based consultation services. The portal provides connections to EU law, the Open Data Portal, and the ministries' shared website, as well as papers, publications, and news items on all topics. The portal also provides access via a customized environment. There were 33 million visitors to the site in the year 2020.

For questions about regulations, subsidies, and permissions, enterprises and entrepreneurs can contact the Ondernemersplein site. The information covers all governmental levels. It focuses on the problems and requirements of the business community and is accessible via various media (websites, email, telephone, and chat). The business forum, where company owners may talk about issues directly impacting them, is managed by the Ministry of the Interior and Kingdom Relations.

#### **4.5. Government CIO [GCIO]**

The plan to achieve digital development on a federal level was given to Parliament in February 2019 by the Minister of the Interior, who was responsible for presenting the Strategic I plan for 2019-2021. The procedures for the CIO council were spelled out in the I agenda. The strategy includes knowledge and skills, as well as information and communication technologies (ICTs) that are sufficient, consistent, and dependable.

#### **4.6. E-Government Promotion [EPRO]**

The digitization plan aims to maximize social and economic advantages, improve the basics of digitalization, increase organizational and individual resilience, and advance fundamental digital rights and values. The Open Government Vision and Action Plan included several developments related to open government and emphasized openness's growing economic, political, and social benefits.

Accountability, citizen participation, and government transparency are three issues. To

preserve supplier independence, the Dutch government supports open standards. The International Standards Organization (ISO) released a list of open standards. The Dutch government could get help from the Standardization Forum.

#### **4.7. E-Participation [EPAR]**

In comparison to other metrics, e-Participation in the Netherlands is much lower. Despite receiving a very encouraging score of 8.5, the country was placed just 24th out of a total of 64 nations. A technique known as Application Programming Interface (API), which gives a connectivity interface to an application, is a crucial component of the digital transformation that the nation is undergoing. A national API alliance has been established to construct a national API strategy in the Netherlands. The Knowledge Platform APIs assist the Dutch government in overcoming strategic and tactical challenges associated with installing and using APIs.

Diginetwerk is a network that connects all of the different government agencies. Because of this, a government-related computer network has been brought under control. While GovNet allows governments to exchange information safely, Diginetwerk allows a single enterprise to share data with several government agencies via a network connection. The TESTA network, which serves as the core cross-border infrastructure for digital communication between EU agencies, institutions, and member states, is extensively used in the Netherlands. This is the case even though the Netherlands is not a member of the EU.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

As a result of the COVID-19 pandemic, the Netherlands has moved faster toward a fully digital economy. Many businesses quickly increased their digital capacity and implemented digital technology to remain in business, helping to buffer the initial economic impact. Additionally, the digitalization of goods and services made possible chances to enter new industries, including e-health. While long-term productivity growth has been poor in the decade preceding the COVID-19 crisis, digitalization may help reverse this trend.

The Open Government Vision and Action Plan were presented to the Parliament with the documents closely tied to the goals set for digital technology. The vision paper

highlighted the significance of increased openness from an economic, democratic, and social point of view. It summarized the many advancements that have occurred in open government. The vision document addressed three primary topics: more openness on the activities of the government, increased responsiveness of the government to initiatives proposed by members of society, and increased government accountability. The concept that guided this was the open and transparent dissemination of information.

The new government Data Agenda NL Digital was published in March 2019 and revised in April 2020. The agenda is geared toward the best and responsible use of data in public administration agencies and focuses on data flow in society. The agenda focuses on using data-driven methods to address social problems, advance general ideals, enhance data quality and facilitate its effective reuse, share knowledge about data-driven functioning, invest in people, organize, and transform culture. The Dutch inter-administrative data plan was released in 2021. The approach explains how the government may use data to address social issues ethically and efficiently. The data plan also offers preliminary recommendations for data system features that need to be accessible to all government agencies. The data plan also details how ethical data sharing has to be orchestrated.

#### **4.9. Cyber Security [CYB]**

The National Cybersecurity Action Plan The National Cybersecurity Agenda (NCSA) was related to the digitalization plan. The National Cyber Security Agenda's primary purpose is to address the growing vulnerabilities and dangers posed by the digital realm via various measures. This may be accomplished by outlining the necessary subsequent procedures in cybersecurity. The NCSA consists of seven different aims that work toward the following goals:

Having adequate digital capabilities to detect, mitigate, and respond decisively to cyber threats; Contributing to international peace and security in the digital domain; Being at the forefront of digitally-secure hardware and software; Having resilient digital processes and a robust infrastructure; Being able to capitalize on the economic and social opportunities securely presented by digitalization; Being able to protect national security in the digital domain; Being able to capitalize on the economic and social opportunities presented

#### **4.10. The use of Emerging ICT [EMG]**

The Dutch Blockchain Coalition (DBC) is a collaborative effort comprising partners from the government, knowledge institutions, and businesses. This endeavor is a component of the Dutch Digitalization Agenda. The objective of the DBC is to promote blockchain technologies that are dependable and resilient, to provide the best possible circumstances to enable blockchain applications to emerge and to use blockchain technology as a source of trust, welfare, prosperity, and security for the Dutch society. In the context of this objective, the DBC primarily serves as a catalyst and facilitator, helping to activate and link members of an extensive public-private network.

The use of new technologies in public administration is discussed in both the AI and blockchain coalitions. The Dutch government is concentrating on creating a Community of Practice in conjunction with the two powerful partnerships mentioned above, offering guidelines and tools to develop and implement new technological solutions, primarily blockchain and artificial intelligence (AI), to address societal challenges and enhance public services. Many tools, including hackathons, buyer groups, and pre-commercial procurement, are used to drive use cases.

New Zealand

## 1. General Information

Area: 270,467 km<sup>2</sup>

Population: 5,185,288

Government Type: parliamentary democracy and a Commonwealth realm

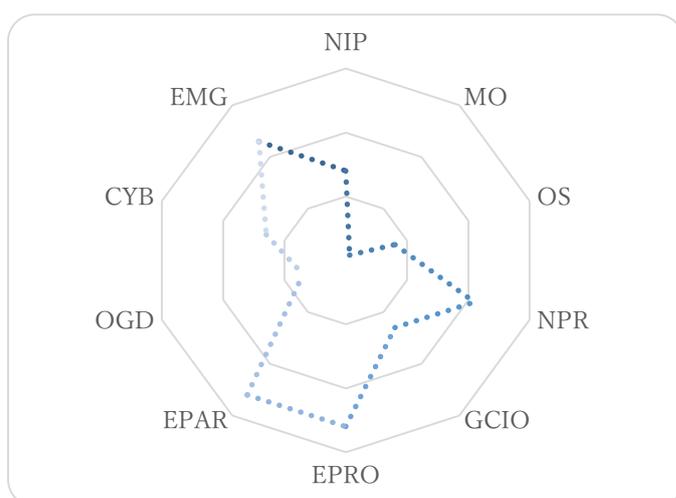
GDP: \$40,634

Internet User: 91.50

Wired (Fixed Broadband User): 36.60

Wireless Broadband User: 101.43

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

New Zealand, which has made significant investments in digital governance, ranks 2nd in the Waseda rankings in 2022, with 92.6 points. Governments and public services must undergo a digital transition to keep up with the times. Greater citizen expectations for online access to governmental services and customization are driven by citizens'

experiences with digital in other contexts. As governments face rising demand for fully inclusive digitization of public services, the current COVID-19 problem has provided a chance to speed up the supply of digital services. Around the turn of the century, New Zealand's government began making significant strides toward digitization.

Since 1996, New Zealand's government has used technology to streamline processes, and online services have been accessible since 2000. The nation is an early adopter of e-billing, e-forms, and other paperless government. More than a million people use the Common Web Platform to engage with the government weekly (CWP). Create and host websites for the government and public sector that integrate hundreds of digital services with this platform-as-a-service. Citizens may avoid long lines at the post office and other bureaucratic hassles by taking care of various government businesses online at govt.nz.

New Zealand has been a pioneer in the government's use of digital innovation. It's almost hard for modern New Zealanders to avoid using some kind of app or online site to interact with the government. In many ways, the government has been at the forefront of a new digital work paradigm, developing and refining it from the ground up. It's an example that other countries can and should follow. The following are the digital advancements that the nation has achieved or wants to deploy.

- Cybersecurity and New Zealand's Electronic Administration
- Digital Identity program in New Zealand
- Digital Service Provision in New Zealand

### **3.2. New Trends**

New Zealand was hard hit by the COVID-19 epidemic, making it one of the most consequential catastrophes in recent memory. Physical and mental health, the economy, travel, commerce, housing, communication, and politics are just some areas that have been affected. As a result, it has shed light on the inequalities that disadvantaged groups face. New Zealand's continuous reaction to the epidemic has been hailed as exceptional. Many reasons contributed to this positive outcome, including country's relative geographical isolation, which gave us valuable time to monitor the epidemic's progress and formulate a national reaction.

New Zealand's digital strategy aims to enable its citizens, businesses, and government

agencies to be more productive, efficient, safe, and competitive. This is accomplished by implementing a comprehensive set of policies that foster an environment amenable to digital innovation. The objective is to make New Zealand one of the world's most technologically enabled economies by emphasizing cooperation and ensuring that the advantages of digital transformation are shared with everyone. Not only is there an emphasis placed on using new technology, but there is also a focus placed on ensuring that the workforce designing and developing is successful in the new environment.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Despite the tremendous growth of New Zealand's internet infrastructure, some residents still lack the access they need to engage in the online world fully. More people in New Zealand have internet access, which improves their social and economic well-being because they can more readily communicate with others, do business with their government, learn new skills, and find new work. This means that now is the moment to figure out how our country will go forward regarding digital equality.

Getting hands on modern infrastructure isn't the biggest problem that New Zealanders face today. In a recent survey, 93% of Kiwis said they had access to the Internet at home. Fiber, copper, cable, and fixed wireless networks all exist. The majority of Kiwis will have access to speeds of at least 50 Mbps by the year 2025. The nation needs to shift their focus to the digital gaps that aren't related to infrastructure, such as whether or not people can afford Internet service and whether or not they have the knowledge, drive, and confidence in the medium to make the most of it. Completing the rollouts for both Ultra Fast Broadband and the Rural Broadband Initiative is expected to leave just around 16,000 homes and businesses without access to broadband with at least a 20 Mbps download speed.

##### **4.2. Management Optimization [MO]**

The goal of the government's Strategy for a Digital Public Service is a modernized and transformed public sector, with people and enterprises at its center. The goal of the Strategy is to ensure that government agencies have access to effective methods and resources. It's not trying to establish hard and fast regulations for the future. It is devoted

to the one Public Service and centers on the attitudes, practices, and institutional frameworks that allow the contemporary Public Service to adopt, adapt and expand in the face of a dynamic and unpredictable future. The goal is: As a whole, New Zealanders are flourishing in the information era, and the public sector reflects this. The three objectives were:

- New Zealand may benefit much from a fully digitalized public sector.
- New Zealanders are having a better experience with their government.
- A government that is progressive, flexible, and responsive

#### **4.3. Online Service [OS]**

The New Zealand government is generally open about its digital activities, including collecting and using citizen data. There is also an online complaints mechanism for people with government services issues. New Zealand's commitment to government openness is displayed in the country's privacy management framework, which facilitates open lines of communication between government agencies and the public on sensitive matters like the security of people's private information.

Collaboration, research, and interaction with leaders in the digital identity ecosystem have all been part of the Digital Identity Programme. People expect to be able to access services and conduct transactions remotely, quickly, securely, and with minimum paperwork as the commercial and governmental sectors migrate more services online. With this software, users may be sure that their data is safe.

New Zealand's government has been working to boost productivity, open up communication, and deliver a more satisfying service for citizens. The primary objective is to standardize the distribution of digital services to promote growth in all areas of society, including economics, education, social welfare, law enforcement, and technology. As a result, the government has released the Strategy for a Digital Public Service, which lays out the blueprint for modernizing government operations to make its services more accessible to the general public and commercial enterprises.

#### **4.4 National Portal [NPR]**

Govt.nz is the national website for New Zealanders who have everyday interactions with

the government and those who want to relocate to New Zealand or visit the country. In order to facilitate more productive interactions with the government, Govt.nz is trying to encourage agency cooperation and credibility. People may utilize the website to learn what steps they need to do and how the government can assist them in completing those steps. Because the information is organized in this way, they do not need to know which agency to contact.

Another website that may assist the shift of the public sector to digital platforms is digital.govt.nz, which offers information, tools, and direction. Both the Web Toolkit and ICT.govt.nz will be replaced by this website. This website is intended for worldwide audiences and other parties interested in the following goals: defining the digital strategy and approach; promoting public sector capabilities in a digital environment. Despite the fact that several divisions contribute to the site, the content may be under control of the government.

#### **4.5 Government CIO [GCIO]**

The GCIO is in charge of communicating with businesses to educate them about basic ICT services, aiding businesses in increasing their use of ICT, and monitoring business adoption and the results it yields. Businesses that are required to submit four-year plans to the Treasury must include strategies for making use of shared information and communication technology (ICT) services.

The GCIO or Chief Digital Officer and Chief Data Steward should evaluate the business value of any proposed ICT upgrades. The GCIO conducts audits to see whether businesses are using, or have plans to use, shared ICT services. Moreover, the GCIO is accountable for making sure that the returns on investments in ICT are being realized.

#### **4.6 E-Government Promotion [EPRO]**

The Chief Digital Officer of the New Zealand Government works in conjunction with the Chief Data Steward of the Government and other executives from throughout the state sector. Together, they have the goal of using digital technologies to their full potential in order to revolutionize the way the government operates for the benefit of New Zealanders.

This strategy is a group effort, and it involves 55 top officials from over 20 different agencies cooperating with one another via the Digital Government Partnership to promote

the objective of an integrated, all-government digital system.

In addition, New Zealand is a participant in a number of international partnerships. Within these organizations, they exchange information and collaborate on the resolution of shared challenges. This includes the OECD E-Leaders (which NZ is chair), the Open Government Partnership, and the International Open Data Charter. The Digital Countries, also known as the D9, is a collection of prominent digital nations that NZ helped create in 2014. The organization was originally known as the Digital Nations.

#### **4.7 E-Participation [EPAR]**

Culture and society in New Zealand have developed throughout the course of time within the framework of an increasingly technologically advanced civilization. Due to the influence of these variables, New Zealand is now at the vanguard of the e-next Government's generation. The term "information and communications technology" (ICT) refers to a set of tools that may be used in everyday life by individuals as well as by governments. Despite the results that were just described, New Zealand's advancement in this area is constrained by the presence of an online participation site.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

People in New Zealand will be better able to get the aid when they need it, have a voice in choices that affect them, and have faith in their government if the country's digital transition is speed up. The Chief Digital Officer of the New Zealand Government collaborates with the Chief Data Steward and other state sector officials. They want to use digital technology to improve governance for the people of New Zealand by working together.

The objective of the open data action plan was to create a setting that made it possible to utilize open data and speed up the release and reuse of open government data so that New Zealand could make the most of the potential benefits of open government data.

Stats New Zealand is the government organization in charge of the open data action plan. This action plan is backed by implementation plans and progress reports, which detail how the action plan is carried out and contain actions constrained by a certain amount of time and milestones.

The followings are some benefits that open governments provide for their citizens:

- how the government operates,
- how people might influence government policies and services
- how they may test to see whether the policies and services are functioning correctly.

#### **4.9. Cyber Security [CYB]**

The New Zealand Information Security Manual lays out the procedures and safeguards required to keep all government data in New Zealand secure. Additionally, best-practice controls and procedures are offered to supplement the fundamental controls. Acceptable minimum control levels are known as baseline controls.

New Zealand's CERT-NZ is one node in a global web of cyber security professionals. In order to better understand the New Zealand threat environment, CERT-NZ delivers reliable and expert advice and information. When handling sensitive information, government entities in New Zealand have a duty to adhere to all applicable privacy and security regulations. User benefits from adopting the PSR includes:

- Improve the handling of business risks
- Guarantee the Government and the people of New Zealand that appropriate and effective measures have been taken to protect New Zealand's people, information, and assets

Users may be confident that any site or service's necessary degree of security and assurance will be implemented effectively with the aid of the offered frameworks and guidelines.

#### **4.10. The use of Emerging ICT [EMG]**

The need to better understand and anticipate the behavior of customers is encouraging businesses to increase their reliance on human labor. Effective automation and analysis of large amounts of data are the primary focuses of efforts to improve the productivity and efficiency of labor.

Vodafone New Zealand introduced more Internet of Things (IoT) capabilities for businesses located in New Zealand. Connect is a regionalized version of the company's

Internet of Things Global Data Service Platform, which can be provided through the XONE innovation labs of Vodafone New Zealand (GDSP). Spark, a competitor in the market, has invested money in the development of Internet of Things solutions for New Zealand businesses. In addition, Spark provides productized solutions for the monitoring and management of assets to both small and large enterprises. On the other hand, Vodafone New Zealand controls the majority of the market in terms of connections, and it continues to have a global advantage owing to the global networks that are maintained by its member companies. Now that the solution has been localized, it will be able to aid domestic-only customers in developing their companies by boosting the number of services they provide.

Nigeria

### 1. General Information

Area: 923,768 km<sup>2</sup>

Population: 218,541,212

Government Type: Federal presidential constitutional republic

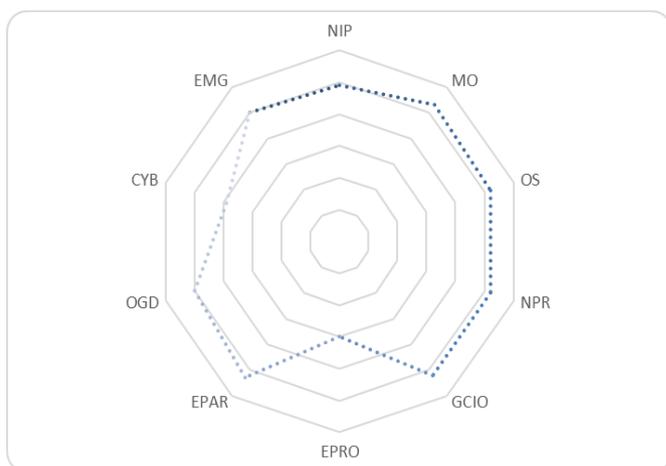
GDP: \$ 1,965

Internet User: 35.5

Wired (Fixed Broadband User): 0.03

Wireless Broadband User: 41.69

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

As of 2022, Nigeria placed 63rd with a total score of 53.111. In order to combat the COVID-19 epidemic, governments worldwide adopted unprecedented steps, including the use of technology. Many African governments, including Nigeria, have taken lockdown precautions and adopted the worldwide use of contact-tracing procedures to monitor anyone in contact with an infected person. The development of public and private

contact-tracing applications may seem benign and even altruistic at first glance. However, the Nigerian government's past record of spying on its own people raises severe concerns about the state's potential use of such technology to monitor and target its residents during the epidemic.

The effort of the government to go digital was launched at the beginning of the twenty-first century by the federal government of Nigeria. This was done to improve the operation of the government in terms of delivering public services in a transparent, effective, and efficient way. This paper investigates the level of progress that Nigeria's electronic government has made over the past sixteen years, as well as takes note of the challenges that have slowed its rapid development, and it also takes a look at the best practices from around the world that Nigeria can adopt and modify. The e-government initiative in Nigeria was launched in 1999.

Implementing digital transformation in Nigeria as a tool for the country's social and economic growth would make it possible for every person and every Nigerian company to do more. To develop a digital Nigeria in such a manner as to most effectively exploit the potential presented by the fourth industrial revolution, the Government of Nigeria should implement twenty policy interventions spread over four areas.

### **3.2.New Trends**

To diversify the country's economy and reduce its dependency on the oil and gas industry, the government of Nigeria published the National Digital Economy Policy and Strategy (2020-2030) in November of 2019. To accomplish this objective, the Nigerian Communications Commission (NCC) developed the National Broadband Plan for 2020-2025. The Broadband Plan aims to deliver data download rates of at least 25 Mbps in urban areas and 10 Mbps in rural regions. This is done to provide appropriate coverage for at least 90% of the population. The government is searching for private-sector infrastructure partners to carry out the expansion plan for broadband internet service.

It is common knowledge that the expansion of information and communications technology (ICT) and access to broadband internet is vital to Nigeria's plans to become one of the leading economies in the world. Some impediments have hampered broadband expansion and commercial investment potential in recent years. Theft of cables, the

building of roads, and other activities are only some of the things that have contributed to the industry's most significant challenges, which include damage to existing fiber infrastructure.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Over the course of the last several years, the government of Nigeria has exerted a great amount of effort toward the promotion of digitalization. The completion of the national backbone project was made possible by the provision of loans amounting to a total of \$328 million. The implementation of 5G in the public sector began after the development of an appropriate plan. In order to reach the national broadband plan's aim of achieving a broadband penetration rate of 70%, broadband service was extended to rural areas. In addition, two further satellites have been earmarked for the purpose of increasing capacity.

##### **4.2. Management Optimization [MO]**

To support the government-wide digitization process, the Department of e-Government Development and Regulation (e-GDR) was set up. As part of its mandate, it is responsible for laying the groundwork for a regulatory framework in the information and communications technology (ICT) industry that will encourage the expansion of Nigeria's homegrown ICT industry, attract foreign investment, and foster overall ICT sector development in the country. To aid in Nigeria's long-term development, the government's Department of e-Government Development and Regulation (e-GDR) is working to:

- Create and promote the development of IT regulatory frameworks.
- Tasks include: registering and maintaining the national site MDAs.gov.ng; coordinating the government's use of IT technologies for service delivery; and creating and implementing plans to increase IT usage in government service delivery.
- The Nigeria Internet Registration Association coordinates and monitors all domain registrations in Nigeria (NiRA).

##### **4.3. Online Service [OS]**

Examples of government strategies used by the Nigerian government include the National/State Economic Empowerment Strategies (NEEDS/SEEDS), the National e-

Government Strategy (NeGST), and a National Information Technology Policy that has been carefully established. Alongside National e-Government Strategies Limited, the Nigeria project was supervised by the National Information Technology Development Agency (NITDA) (NeGSt). The Nigerian Federal Ministry of Information and Communications states that its priority is to provide citizens with credible and timely information about government activities, programs, and initiatives to create a technological environment conducive to Nigeria's social and economic development. This is even though the ministry has been involved in several different initiatives in recent years.

#### **4.4. National Portal [NPR]**

The Nigerian e-Government site, <http://www.nigeria.gov.ng>, has certain limitations. The new design is complicated to use for many people. Aside from connections to important government departments and organizations, the site largely provides static information about news, the government, the army, and the police. Since no electronic services are integrated into the platform, and the average Nigerian has limited social media awareness, citizens would be unable to engage with their government. These challenges are frustrating, but they are understandable, given the state of fixed internet connections and the restrictions of different digital platforms.

#### **4.5. Government CIO [GCIO]**

The government of Nigeria has not created any law on CIO employment, nor has it formed a legislative division to handle such matters. Because no organizations or training institutes in Nigeria have specified criteria or standards for the job title of "chief information officer," the meaning of the word "chief information officer" is still very vague. The Chief Information Officer is responsible for functions comparable to those of the head of the National e-government Strategies, but no specific specifics or structure are provided.

#### **4.6. E-Government Promotion [EPRO]**

The Nigerian government has strongly emphasized developing a relationship between the government and technology service providers that would be advantageous to the people of Nigeria and the economy of the country. The strong association between these two

factors could speed up the implementation of appropriate governance technologies. It is necessary to generate additional revenue-generating channels for the government via the use of technology and digitalization to ensure public services' openness and dependability. One example of this would be the use of technology in collecting taxes.

#### **4.7. E-Participation [EPAR]**

The authorities in Nigeria have acknowledged the need to transform to take advantage of digitalization, which is now being investigated as e-government. As a result, an e-Participation system was developed to provide the government of Nigeria the ability to engage with the Nigerian population via text messaging on devices that support GPRS and electronic forms that can be found on the internet. By sending images and other information to the general public, it assists the government in its effort to keep the public informed about the progress of all public projects. Additionally, it invites locals to utilize this channel to seek general comments on any public initiatives that are currently underway.

#### **4.8. Digital Transformation [DX] & Open Government Data [OGD]**

The Nigerian government considers the benefits and dangers of digital change equally. However, it has only had limited success in actual implementation because of a lack of requirements in delivering energy and basic telecoms and IT infrastructure. Even in fostering innovation, the Ministry of Science claims there is potential for development. The National Board for Technology Incubation and the National Office for Technology Acquisition and Promotion are responsible for the growth of this sector.

Transparency, accountability, and a greater engagement of people in the programs and actions of their respective governments for sustainable development are at the center of democratic values on a global scale. This can only be accomplished if the general public has access to information held by the government, which is why there has been and will continue to be an increase in calls for freedom of information. The use of open government data (OGD) plays a significant part in the democratization of information and acts as a driver of open governance and transparency. This study used a descriptive informatics and literature review approach to investigate the internet presence of essential government ministries and agencies in Nigeria, such as the Nigeria Data Portal, to ascertain the availability of open government data and the current state of the situation

regarding its accessibility. The research has shown that while some websites have OGD present, over sixty percent of websites do not currently give such data on their pages. In addition, the data portal provides access to a variety of government databases. However, these databases are seldom ever updated.

#### **4.9. Cyber Security [CYB]**

Over the last several years, Nigeria's digital banking ecosystem has expanded significantly. In addition to the fintech solutions offered by banks and mobile network carriers, Nigeria is home to over 200 fintech companies. There is a growing need to protect the safety and confidence of customers as a result of the proliferation of new service providers, such as mobile money operators, payment service providers, fintech companies, and other financial services providers. Numerous critical digital components, including mobile apps, digital tokens, Unstructured Supplementary Service Data, and digital ledgers, are included in these services, each of which introduces new risks. Since financial institutions are the primary target of cyber-attacks, the country's financial sector must prioritize cybersecurity.

The Regulatory Framework for Mobile Money Services in Nigeria, the Nigerian Payments System Risk and Information Security Management Framework, and the Risk-Based Cybersecurity Framework and Guidelines for Deposit Money Banks and Payment Service Providers are valuable tools for this purpose. The CBN works with other relevant parties, including the Securities and Exchange Commission, to shape crypto market laws and with the Nigerian Communications Commission, the sector regulator for the telecoms industry, to oversee mobile money activities.

The National Digital Economy Policy and Strategy of Nigeria lay out a plan to diversify the country's economy and heavily emphasize cyber security. The banking, financial, and insurance industries are included as one of thirteen essential information infrastructure sectors in Nigeria's National Cybersecurity Policy and Strategy (NCPS) for 2021. The Nigerian government's plan for safeguarding its most vital computer networks is outlined in the NCPS. To further secure Nigeria's digital economy, the NCPS seeks to harmonize and enhance e-commerce and online consumer safeguards laws.

#### **4.10. The use of Emerging ICT [EMG]**

Globally, the concept of "good governance" has arisen as a significant component of the

evaluation process for public administrators. Therefore, using information and communication technologies (ICTs) to promote good governance has become a fundamental instrument for increasing social and economic development in Nigeria. This is especially true in recent years. This study will investigate how information and communication technologies (ICTs) may be used to advance democratic principles in Nigeria. The method of qualitative research was used for the investigation. The data were gathered from secondary sources such as previously published works, academic journals, textbooks, and the internet and media. The data were collected, analyzed, and the main ideas were extracted using content analysis. The essential ideas elicited were edited, pattern-matched, coded and then grouped into categories. Secondary data analysis and thematic analysis approaches were used to assess, interpret, and provide answers to the study questions. According to the findings, the government has attempted to address concerns about e-government, e-commerce, e-citizens, and e-employees' engagement to foster good governance. On the other hand, there were a few obstacles, such as poor quality infrastructure, an unstable supply of energy, a lack of internet connectivity, difficulties with cyber security, the development of capability, and a lack of political will. Despite these obstacles, there are chances for the government to promote good governance through enhancing infrastructure, raising the percentage of people who use the internet via broadband, growing capacity, and implementing cyber security best practices.

Norway

## 1. General Information

Area: 323,802 km<sup>2</sup>

Population: 5,434,319

Government Type: Unitary parliamentary constitutional monarchy

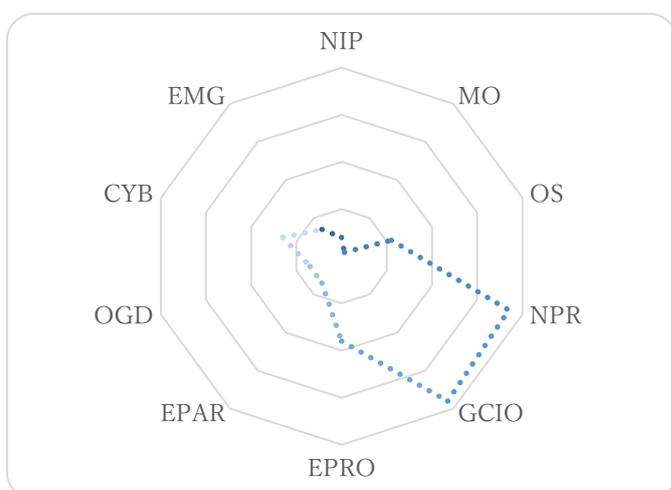
GDP: \$66,650

Internet User: 97.00

Wired (Fixed Broadband User): 44.04

Wireless Broadband User: 103.71

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Norway scored 79.55 on the 2022 Waseda table, placing it in the 21th position. Norway's government has long been recognized as having one of the most digitally advanced sectors, even before COVID-19. Several programs were initiated to digitalize formerly analog sectors in response to the crisis. Because of this strategy, Norway was able to keep

up a high standard of service despite the coronavirus limitations. The national plan "Digital Throughout Life," released in September 2021 by the Ministry of Local Government and Regional Development, aims to increase the population's digital involvement and competency. The plan's objective is to eliminate digital exclusion and provide people with the resources they need to access the digital tools and services on which modern society relies. Everyone should access digital technologies that enable participation in democratic processes, social networks, and communities.

The Norwegian government submitted the White Paper on Our Common Digital Foundation to the Norwegian Parliament in April 2021. The present and anticipated demand for mobile, broadband, and internet services as the cornerstone of Norway's digital growth are discussed in the white paper. This covers widespread internet access and the continued development and use of the 5G mobile network. The article discusses the future course of numerous domains, focusing on the digital foundation's requirements. The Internet of things and cloud services are two of them.

### **3.2. New Trends**

While the epidemic has entered a new phase, the whole world still has to deal with COVID-19. The Norwegian government is actively monitoring the situation and has developed a strategy and emergency contingency plan for the ongoing management of the pandemic. To cope with COVID-19 in the future, it will be essential to have good monitoring, solid planning, and immunization. The Ministry of Local Government and Regional Development will issue a national plan to increase digital involvement and competency among the populace in September 2021. The plan's objective is to avoid digital exclusion and ensure that the public has access to the digital tools and services upon which modern society relies. Using digital technologies, everyone should be able to engage in the community, democratic processes, and social networks. The approach focuses on many obstacles, including digital vulnerability, the digital divide, and exclusion. Government objectives are:

- To aid in the prevention of digital exclusion among people of all ages;
- To make it possible for individuals who have little or no digital competence to access free help services of a guaranteed high standard;

- To further deepen the collaboration with KS (Norwegian Association of Local and Regional Authorities) to enable the establishment of robust, local guiding services across the nation;
- Imposing stricter obligations on the commercial sector to ensure that all of the country's residents have access to the digital services it offers;
- To assist in providing low-threshold services that are publicly supported and directed at those who have little to no digital competence are, as a general rule, free of charge;
- To enable regular mapping of the degree of digital competency of people;
- To collaborate with public, private, and voluntary providers to launch a campaign that will encourage citizens who feel they need to improve their digital competence to sign up for classes; and
- To investigate whether or not a single government organization should be given the overall role of coordinating national initiatives to increase the digital competency of the general population.

The plan focuses on the following areas:

- Internet connectivity (the digital cornerstone);
- Accessible ICT hardware;
- Basic digital literacy;
- Easy-to-use digital services;
- Digital judgment (the capacity to think back on and

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Waseda's rankings of the NIP in 2022 placed Norway in second place after receiving a score of 8,035 for its Network Infrastructure Preparedness (NIP). All of Norway's successes in this area are evidence of the country's long-term commitment to digitizing inputs. The regulatory bodies consulted the multi-spectrum 5G auction and proposed measures to reduce the pressure on Telenor's network. By 2025, Telenor planned to completely decommission its GSM and 3G networks and phase down its PSTN infrastructure.

#### **4.2. Management Optimization [MO]**

The Digital Strategy for the Public Sector sets the shared objectives and key areas of emphasis for digitalization operations through 2025. It facilitates the government's digital transformation. The primary measures of the plan are centered on user-centric service creation and more efficient and coordinated usage of shared IT solutions. This is accomplished by developing a shared ecosystem for digital collaboration in the public sector. In line with the goals of the Norwegian National Cyber Security Strategy, the strategy mandates that cybersecurity be incorporated into the creation, operation, and administration of shared IT solution services. Consequently, the primary targets for 2025 are:

- Realize the digital transformation of the public sector in a transparent, inclusive, and dependable manner;
- Perform extra chores digitally in addition to service delivery;
- Encourage residents, corporations, and non-profit organizations to connect with the government online;
- Leverage the exchange and use of data to provide user-friendly services and facilitate the development of value for enterprises;
- Assist local and central government entities in the development of services based on a shared digital environment for collaboration; and
- Facilitate regional and national government entities' methodical adoption of digitalization.

#### **4.3. Online Service [OS]**

The Norwegian Agency runs the Anskaffelser.no Portal for Public and Financial Management for all parties interested in public procurement. Its knowledge supports effective procurement transactions with the public sector and comprises tools and information. The site provides sophisticated, comprehensive eProcurement and eCommerce services that lead all interested parties through all phases of eProcurement, including planning, competitive conduct, follow-up, and liquidation. The portal features the eCommerce-focused website eHandel.no. The website provides further services and details on electronic invoicing, newly formed eCommerce platforms, and eCommerce in

general. These services are designed to simplify acquiring in-depth information on eCommerce and advice on how these services may be helpful tools for making smarter, simpler, and safer purchases. The goal of eHandel.no is to provide suppliers to the public sector with simple access to a cost-effective and user-friendly platform for operational eProcurement.

#### **4.4. National Portal [NPR]**

The Norwegian Directorate for Civil Protection (DSB) owns the website Ovelse.no, run by the Norwegian Cyber Range at the Norwegian University of Science and Technology (NTNU). The portal features a workout program geared toward Norwegian organizations. These practice scenarios are meant to raise awareness of online risks and improve organizational readiness for handling information security crises. The technique is based on the DSB method books for exercise preparation, and all activities are put up as discussion exercises.

Norge.no is a portal and resource for digital services provided by Norwegian government agencies. Users may locate digital services via the platform's subject menu, search bar, or eight descriptions of real-world scenarios. Information on digital communication between people and public agencies is available on the webpage. Additionally, Norge.no provides details about the Digital Contact Information Register and Digital Mailbox for the Norwegian public sector. All governmental agencies must use a secure digital mailbox to communicate correspondence to residents electronically. People may receive official letters and papers by physical mail if they do not want to get their mail digitally. Citizens must have an electronic ID and maintain their current digital contact information in the national contact registry to utilize a secure digital mailbox.

#### **4.5. Government CIO [GCIO]**

The Norwegian public administration does not have the authority to fill Chief Information Officer or similar jobs. At the federal level, the position that is often held by the head of the Agency for Public Management and eGovernment is that of the chief information officer.

#### **4.6. E-Government Promotion [EPRO]**

The definition and direction of digitalization in Norwegian development policy and cooperation are provided in the White Paper on Digital Transformation and Development Policy. It seeks to improve the effectiveness of development cooperation and the ability of partners to utilize digital technology in development cooperation.

A new Strategy for Electronic Identification (eID), scheduled for publication later in 2022, has been implemented by the Ministry of Local Government and Regional Development. The One Digital Public Sector plan outlines the significant objectives for eID and trust services. According to this, citizens have access to an eID that they may use to access the services they need. All groups should have access to eIDs at the level they need, including children and adolescents, foreign nationals without a Norwegian national identification number, and children and foreign nationals. There must be an option for proxies to act on behalf of those unable to perform themselves digitally. To employ digital authorizations and consent, provisions must be provided. Additionally, there is a need to make electronic employee IDs easier to use.

#### **4.7. E-Participation [EPAR]**

Norway's eGovernment provides the necessary infrastructure for system interoperability and data transmission across the many government entities via its networks, services, and electronic government. One example of the government's involvement in developing specialized infrastructure is the National Health Network (NHN), which links five regional networks and acts as a platform for exchanging health and social services information. As a contributing member of the network that enables Trans European Services for Telematics between Administrations, Norway has access to a high level of security. This enhances the efficiency of data sharing between government entities across European countries.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

In general, Norway is distinguished by the pervasiveness of digital services. Everything from everyday life to government and business is experiencing a digital transformation. A trust-based collaboration between social partners and the public and commercial sectors, a leading role for the public sector, consolidations and consortia among organizations, and application-oriented projects are all critical factors in the country's innovation.

The government must voluntarily provide disclosures as part of the Open Government Act. This implies that the government puts out data for everybody to see. The following are some examples:

- documentation of enacted statutes, executive orders, and proclamations
- records of meetings, including minutes
- plans and tally sheets of votes and resolutions
- perspectives and recommendations from expert panels and committees
- information about how to get in touch with them and what they can provide
- organizational procedures (for example, tasks and responsibilities of the administrative units)
- formulation, enforcement, and assessment of policies, as well as reporting on investigations
- yearly goals and annual reports

In the Waseda rankings for 2022, Norway's OGD received 9,200 points, placing it ninth overall.

#### **4.9. Cyber Security [CYB]**

The ministries of Justice and Public Security and the Ministry of Defence collaborated to publish a new National Cybersecurity Strategy. This is the fourth event to be held in the country. Its purpose is to address the need to strengthen public-private, civilian-military, and international collaboration. Authorities and businesses located in both the public and commercial sectors, including municipalities, are the major organizations that will be targeted. Additionally, the plan establishes the groundwork for ensuring that private persons have the essential information and awareness of the risks to use technology safely and securely.

The primary objectives are broken down into five priority areas (preventive cybersecurity, cybersecurity in critical societal functions, competence, detecting and handling cyberattacks, and preventing and combating cybercrime), and a two-part list of measures accompanies them: part one outlines essential steps that support the strategy, and part two lists ten fundamental steps that both public and private businesses are encouraged to take.

#### **4.10. The use of Emerging ICT [EMG]**

Norway's National Artificial Intelligence Strategy was introduced on January 14, 2020. No time limit was set since the government promised to gradually modify it to reflect societal and technical advancements. It asserts that while upholding individual liberties and rights, Norway should take the lead in creating and using AI.

Norway's government hopes to make the country a desirable location for data centers and other data-related businesses. The strategy *Powered by Nature - Norway as a Data Center Nation* was released by the Ministry of Trade and Industry in February 2018. Data will be a more crucial resource and input as time goes on for the corporate world and society as time goes on. For Norwegian enterprises and culture, this offers a significant economic potential that will play a crucial role in future government programs.

There has been discussion on political communication in this sector within the context of other political communications. The Internet of Things is discussed in the white paper published by the Norway Common Digital Foundation.

Oman

## 1. General Information

Area: 309,500 km<sup>2</sup>

Population: 4,576,298

Government Type: Unitary Islamic absolute monarchy

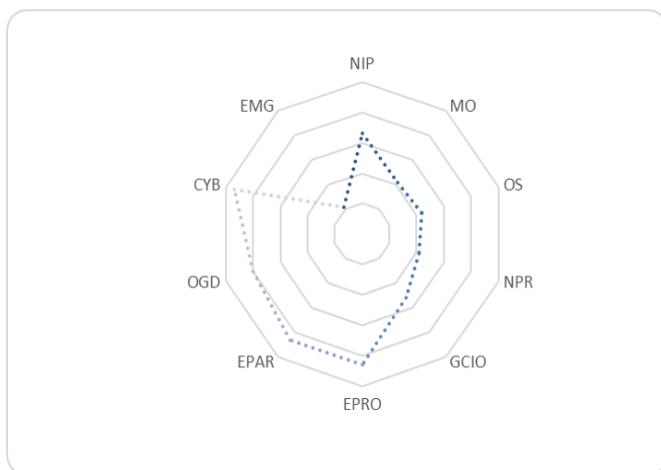
GDP: \$15,745

Internet User: 95.23

Wired (Fixed Broadband User): 10.85

Wireless Broadband User: 114.85

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Waseda International's 2022 rankings of digital governments placed Oman at number 32, with a total score of 71.6. Oman has been working on one of the world's most extensive digital government initiatives for over a decade. Thus, the Arab world's first sovereign state has set the standard for the ideal digital utopia. Oman, with a population of over 5 million people as of 2019 and its status as a leader in demonstrating the advantages of

eGovernment, has established concrete goals at every turn.

As a result of the COVID-19 outbreak, many Omani businesses have accelerated their digitization, making part-time and remote work a new reality; Oman's workforce will need access to knowledge on these developing possibilities, and new hires will need the training to make the most of them. E-learning sites have helped make lifelong education a breeze in the digital age. It's essential for our economies to be resilient; therefore, it's a good idea to learn and practice new skills pertinent to the demands of the moment.

Oman has taken this further by issuing ePassports to its citizens; these cutting-edge travel credentials have integrated biometric data such as digital fingerprints and pictures. The ePassports' cutting-edge security features and the streamlined border-crossing procedures made possible by their introduction will make international travel a breeze for everyone involved. With its successful implementation of eGovernment initiatives, Oman has shown that becoming a fully digital country is not an impossible dream.

### **3.2. New Trends**

The goal of e.Oman 2030 is to provide the groundwork for taking advantage of the digital and technological advancements that will characterize the Fourth Industrial Revolution. With humans and robots contributing to the "workforce," efficiency and output improve, leading to financial gains. Increasing reliance on data and analytics in business and in private life, as well as the consequences of higher mobility and longer life spans, are also discussed. These concerns will determine Oman's destiny in light of the present pandemic situation. In its entirety, e.Oman 2030 seeks to inform citizens about the consequences of increasing reliance on digital means of communication.

## **4. Digital Government by Indicators**

### **4.1. Network Infrastructure Preparedness [NIP]**

Oman's government agencies must ensure that the information systems they employ comply with the requirements outlined in the Oman eGovernment Architecture Framework (OeGAF). The Open Government Service Framework, also known as OeGAF, is a set of rules to enhance the delivery of government services in keeping with the aims and objectives that the ITA has established. The framework sets out the rules and

procedures that need to be followed in order to ensure that the aims and objectives of ITA are maintained and expanded upon by the IT projects and systems implemented by the government. Its additional aims include building a stable basis on which to create risk management and control mechanisms, as well as ensuring the success of information technology initiatives by lowering the level of uncertainty about the sustainability of such projects. OeGAF will support the government so that it may more effectively manage information technology (IT) as a strategic investment and operate as an "integrated enterprise." Checking over the website for the Oman OeGAF could provide you with further information.

#### **4.2. Management Optimization [MO]**

The e.Oman's strategy was created to help Oman successfully through this transition and into the 4th Industrial Revolution. This policy strongly emphasizes inclusion to ensure that no one in the community is at a significant disadvantage or left out of the digital future. Society and Human Capital Development was identified as a key tenet of the initial e.Oman plan. The very idea may be found in the newer edition, although this time it's called "Advancing the Digital Society."

The strategy's primary purpose is to ensure that people from all walks of life participate in and benefit from the digital future. ITA, on behalf of the government, is making concerted efforts in this direction by implementing many Human Capacity Building programs.

The Information Technology Agency (ITA) has implemented an e-Accessibility policy to empower individuals with disabilities and the elderly to make the most of information and communication technology (ICT) for the benefit of leading healthier, more productive, and more autonomous lives. The offering of sign language and text-to-speech (TTS) services are two examples of such technology.

#### **4.3. Online Service [OS]**

Starting in 2002, the government of Oman has been collecting information on its citizens and permanent residents via the National Registry System. Everything else that will be done in the name of eGovernment will build off the foundation laid by the National Registry System. In response, Oman built its electronic identity system from the ground

up. Thanks to the adoption of Mobile-ID, users in Oman may now sign legally binding papers and access services from any mobile device. However, electronic passports with biometric data are state-of-the-art travel papers with built-in biographical information, digital fingerprints, and digital photos. The ePassports will make travel easier to access by providing strong security and speeding up border administrative processes.

The Tarassud app, available for iOS and Android, was created by the Ministry of Health of the Sultanate of Oman to benefit its citizens. In it, we see how quickly and widely the epidemic spread worldwide. The Ministry of Health, in conjunction with Wareed.co, offers home delivery of prescription drugs to minimize the Coronavirus spread and make it easier for patients, especially the elderly, heart, and diabetic patients, to maintain a steady supply of their necessary medicine. Several platforms and apps complement Behar Plus, an online marketplace where sellers and merchants of fresh fish may offer their wares to buyers. People in Oman who have been advised to "stay at home" during the current epidemic may still get their fresh fish fixes from Behar Plus by placing an online purchase.

#### **4.4. National Portal [NPR]**

Oman's National Performance Rating (NPR) was rated 8,000 in 2022, which landed the country in the top spot in the NPR's Waseda rankings. There is a new name for Oman's eServices portal: Omanuna. Omanuna is a government e-Services platform that helps citizens with their problems. In this nationwide implementation of eServices, everyone contributes in the same way. The official webpage for the government of Oman is oman.om. The Ministry of Transportation, Communications, and Information Technology is the site's host and the exclusive owner of any information published there. The website gives users access to digital services and details on how to get supplementary services, such as text messages and paper copies of forms. Because each user's profile and needs are unique, we designed this site with them in mind and made it easy to navigate. The portal provides a centralized location for citizens to access a wide range of government resources.

#### **4.5. Government CIO [GCIO]**

The Oman Central Information Officer (CIO) for Government E-Services reports to the

Ministry of Transport, Communications, and Information Technology (MTCIT). To help spread the use of government e-services and broaden citizen participation, Oman's Chief Information Office, MTCIT, is training people to get comfortable with technology. It aids government ministries and other agencies in pursuing their IT objectives. Moreover, the MTCIT plans to aid government agencies in cutting costs by guiding all facets of IT initiatives. Unified Government Network, the ePayment Gateway, Government eServices Portal, the eGovernment Framework, and Information Security are all areas where MTCIT has made significant contributions.

#### **4.6. E-Government Promotion [EPRO]**

By fostering national capabilities, bolstering infrastructure, establishing an IT industry, and enhancing the quality and performance of government services, Oman's Digital Transformation Program seeks to create a sustainable knowledge-based society and boost public sector productivity and efficiency. These services must be completed at certain times and under certain conditions to fulfill their goal of expediting service operations for consumers, businesses, and government agencies.

The Ministry of Transportation, Communications, and Information Technology are in charge of the Digital Transformation Program (MTCIT). The system aids government agencies in automating service channels, increasing operations, and streamlining corporate processes. More than a million rials (about \$2.6 million) from the Oman Technology Fund will go toward helping SMEs find lasting answers to persistent health problems and pandemic crises. The objective is to support existing businesses, inspire new minds, and motivate them to develop high-tech solutions that facilitate remote participation and care for the greater good of society.

#### **4.7. E-Participation [EPAR]**

Citizens from all walks of life can participate in discussions and debates on all areas of the Oman Digital Society thanks to the Official eGovernment Services Portal of the Sultanate of Oman. People from the general public will soon have an internet channel via which they may communicate with us, provide comments, and provide recommendations. The principal objective of the nation is to design a process that will enable it to listen to and engage with the people and respond to the challenges, suggestions, and ideas they

provide.

Current online participation options offered by the Official eGovernment Services Portal of Oman include Facebook, which allows users to keep up with the most recent news and participate in discussions with other users; Twitter, which will enable users to receive brief, timely messages; Instagram, which will allow users to share photos and videos from the portal; and Youtube, which will allow users to view videos about the official eGovernment Services Portal and comment on those videos.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The Sultanate of Oman's government adopted Oracle Dedicated Region Cloud@Customer in order to hasten the country's government and semi-government agencies' cloud-led digital transformation. ITHCA (Oman Information and Communications Technology Group) is in charge of the implementation, allowing the government to manage its entire IT estate on Oracle Cloud Infrastructure (OCI) while maintaining physical control of infrastructure and data following the sultanate's data sovereignty requirements.

It has been shown that communities and economies worldwide benefit from fostering a culture of open data and adopting the appropriate policy settings when data is created or gathered. This policy was created to help government agencies throughout the Sultanate of Oman incorporate open data principles into their daily work in response to the eOman Strategy's emphasis on making all data publicly available. The goals of this policy are to

- Define the principles of open data to promote an information-based culture;
- Simplify and facilitate the release of data by Government agencies in the Sultanate of Oman;
- Create a practical policy framework that enables the release of high-value datasets to the public;
- Increase opportunities for the public to access and use open data;

The government agencies in the Sultanate of Oman may use this policy as a guide for adopting practical open data principles in other countries.

#### **4.9. Cyber Security [CYB]**

Cyber security is one of the program's medium-term objectives. It shows that its leaders acknowledge the importance of this field and are open to seizing the chances presented by the rising demand for cyber security goods, services, and a trained labor force. There doesn't seem to be any slowdown in the cybersecurity industry's rapid expansion. As a nation with a significant regional influence, Oman understands the critical nature of securing its Critical National Infrastructure (CNI) in the face of cyber threats (CNI). There has been an increase in nationwide attacks on government and critical infrastructure, particularly the energy and financial sectors.

Intrusion attempts, malicious code, malware infection, online phishing, and ransomware have been the most common forms of assault against CNI in recent incidents. Such assaults try to wipe out data and disrupt service, harm an organization's activities, and set off explosives that might cause fatalities.

#### **4.10. The use of Emerging ICT [EMG]**

The government has invested much in education and workforce development in recent decades. The Oman International Container Terminal has said that it prioritizes working with international technology companies and creating a center of excellence for SMEs (OICT).

The Ministry of Technology and Communications (MTC) manages the government's network and cloud services. The MTC is also pushing for more government functions to be available online. At least 59 government agencies have committed to a strategy to complete the government's digital transformation by the end of 2022. The Digital Oman Strategy claims that there is an opportunity for data center development due to the rising popularity of cloud computing.

The Royal Oman Police (ROP) has started employing drones to protect the public while maintaining the country's traditional isolation. Authorities might cover vast swaths of land in record time because of the enhanced situational awareness provided by drone technology. Successfully preventing the spread of this virus without exposing people to the risk of infection, Muscat Municipality (MM) has been using drones to clean roadways in the Muscat governorate.

Pakistan

## 1. General Information

Area: 881,913 km<sup>2</sup>

Population: 236,892,429

Government Type: Federal parliamentary constitutional republic

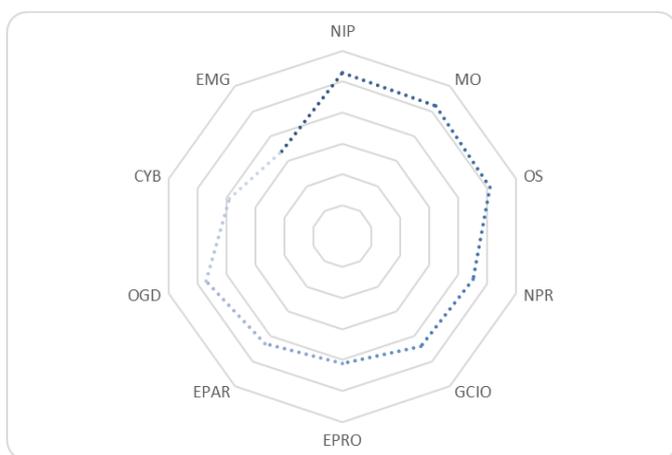
GDP: \$1,269

Internet User: 25

Wired (Fixed Broadband User): 1.14

Wireless Broadband User: 41.33

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Pakistan was ranked 56 in the Waseda International digital government rankings for 2022, with a total score of 59,423. About 60% of Pakistan's 200 million people are between the ages of 15 and 29, making the country a tremendous human and intellectual capital. It's estimated that Pakistan is home to over 2,000 information technology firms and contact centers, and that figure is rising. Over 300,000 IT experts in Pakistan are fluent in English

and knowledgeable about established and cutting-edge IT systems and products. Further a total of 20,000 computer scientists and IT professionals graduate annually.

Because of the epidemic, the poor and marginalized in Pakistan are at a greater risk of catching COVID-19 and are more likely to be negatively affected by it. To this purpose, Pakistan has introduced many novel approaches, including the Ehsaas Ration Donation Coordination Platform, an online hub for linking charitable organizations and food providers with those in most need. Growing digital services and making them more accessible are top priorities. These initiatives have highlighted the need to invest in health systems over the long run and in digital connection as a public benefit to revive once inaccessible services like telemedicine and Tele-education. Investments made by countries in digital infrastructure, especially training for youth from low-income neighborhoods, have paid off handsomely.

To put Pakistan on the international outsourcing map, the Republican Party has developed an all-encompassing plan that includes participation in international forums, the organization of domestic conferences, the expansion of software technology parks, and the facilitation of certification programs. It is now critical that the Digital Pakistan Policy, in light of the increased demand for and growth in information technology, take into account the widespread impact IT is having on every facet of society and economy as it is rapidly digitized and transformed into an integral part of a global knowledge-based economy. This policy paper was developed by the Ministry of IT and Telecom (MoIT) after extensive consultation with a wide range of interested parties.

### **3.2. New Trends**

To fully take advantage of the digital opportunity, three things need to happen:

- 1) Building infrastructure to support the local tech ecosystem;
- 2) Making a suitable environment for IT exports;
- 3) Promoting innovation and digital skills.

Pakistan's businesses and the government have benefited from the work done in all three areas to help the country become more digital. Pakistan has put a lot of effort into building the country's infrastructure so that innovative digital services, apps, and content can be

delivered to the local tech ecosystem. The government has approved the "Right of Way" policy to speed up the expansion of telecom infrastructure and has announced the "Digital Pakistan Policy" to build software technology parks, a national technology incubation center, and telecentres to help businesses get access to ICT facilities and services. Pakistan has been helping digital freelancers by waiving income taxes on IT and IT-enabled services (ITeS) export remittances and promoting the country's exports through digital platforms as part of the "Brand Pakistan" campaign. These things are meant to make the country a good place for IT exports.

The government has also announced a number of programs to help people learn digital skills to promote innovation and digital skills, such as through its "e-Rozgaar" centers, which teach people how to use online tools for freelancing, and its "DigiSkills" initiative, which works with the industry to build digital talent.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Creating a digital ecosystem that includes infrastructure and institutional frameworks for the speedy delivery of cutting-edge digital services, apps, and content is one of the primary objectives of the Digital Pakistan Policy. This policy indicates a change away from a piecemeal approach and toward an overall technology strategy focused on information and communication technology as a wide facilitator of every area of socioeconomic growth.

Increase Pakistan's standing in international indices and benchmarks assessing the business and innovation climate, affordability, skills preparedness, and socioeconomic effect of information and communications technology by improving Pakistan's rating. It would be beneficial to improve the data provided to international rating organizations.

Establishing state-of-the-art tier 3/4 national level data centers will allow the Federal Government to integrate its dispersed databases, making it possible to do data mining and analysis on large amounts of data. Improve the overall standard of e-Government services by integrating real-time management and data analytics. It is important to discourage the development of silo IT infrastructures (also known as little islands) in the various government departments to reduce unnecessary duplication of efforts, human resource

needs, and operating costs.

#### **4.2. Management Optimization [MO]**

Citizens' understanding of the risks posed by cybercrime must be increased. Creating an informational hub with an emphasis on cyber security. It is also important to host workshops and seminars to raise awareness and disseminate relevant data. There is a need to raise adoption rates by capitalizing on the low price of internet access and implementing efficient marketing strategies. The government may engage with the public through social media by creating a Facebook page and a Twitter account. If the government wanted to know which e-Services its residents used the most, they could easily run a poll to get the answer. The results of a poll like this may be used to boost the government's credibility and openness. The government may utilize ICT to educate underprivileged populations, especially women, and enhance their quality of life.

#### **4.3. Online Service [OS]**

Farmers in Bangladesh may now access a price tracking system over the internet, with daily price information posted on the Ministry of Commerce's various online platforms. But the significance of this data's use is little. Preprints in Barbados cannot function without Internet security training for students. To better the government, it is crucial to maintain a constant state of security consciousness. According to the United Nations' Sustainable Development Goals (SDGs), Pakistan's digital strategy prioritizes information and communication technology (ICT) education, e-learning for educational and other vital sectors, and the lifelong learning process for everyone. With technology as its backbone, Dubai's eGovernment program has embraced an all-encompassing e-Transformation approach based on ideas of modernization and development and by providing e-Services that are fully integrated.

#### **4.4. National Portal [NPR]**

The Directorate General of Immigration and Passports can provide online services to Pakistani residents anywhere in the world, even inside Pakistan, thanks to a website known as the e-Services Portal. If a person's Machine Readable Passport has either expired or their validity has been reduced to less than 12 months, they are eligible to renew their passports using the e-Services Portal.

#### **4.5. Government CIO [GCIO]**

As part of the National Information Technology Policy 2000, the Federal Cabinet of Pakistan authorized the D-Government Program in August 2000. This initiative has received a lot of attention. All relevant federal agencies were notified of their requests for many months. An Information Security Policy was issued by the GCIO in October 2012, as reported by the OGCIO. The National Directorate of Digital Government in Pakistan C was set up inside the Ministry of IT to oversee and direct all IT expenditures by the Federal Government. Consequently, the federal government is comprised of D-Government branches for each department. Since 2013, the government of Pakistan has hosted the "Pakistan CIO Summit & Expo," an annual gathering of the country's top IT executives, IT managers, and IT heads from South Asia, the Middle East, and other parts of Asia to discuss the implementation of cutting-edge technological solutions.

#### **4.6. E-Government Promotion [EPRO]**

The Pakistani government has a variety of incentives in place to promote independent contractors and businesses in the country to capitalize on the rising worldwide demand for IT services. For enterprises to fully capitalize on the expanding digital commerce potential, governments may want to relax restrictive data laws that might impede the capture of productivity benefits. Pakistan will benefit from establishing baseline standards for personal data commensurate with global norms.

norms. This should involve harmonizing with technologies and regulatory instruments, such as the APEC Cross-Border Privacy Rules, that are intended to facilitate the transmission of personal data between legal countries. To promote increased involvement in digital commerce, the nation should join multilateral digital trade accords such as the "Digital Economy Partnership Agreement" (DEPA) inked by Singapore, New Zealand, and Chile to facilitate cross-border data flows.

#### **4.7. E-Participation [EPAR]**

After more than a decade of research and development, the benefits of e-government are still outweighed by the negatives. These issues arise in fields where intelligent technology seems to have much promise. Governments still publish public-sector information (PSI) in a broad range of nonstandard and proprietary forms. The potential advantages of

reusing, merging, and processing PSI are readily obvious because of its vast volume and richness. The data they collect is valuable, but organizations are often hesitant to share it for cultural, political, or institutional reasons. As a result, they separate and protect their old systems and the data inside them. If they decide to provide their data, it will be in various forms without defined metadata or definitions, creating an essentially meaningless mountain of data.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The ecosystems in which businesses operate are in a constant state of change. As a result of the intense competition that exists today, businesses are rapidly adopting cutting-edge digital technology to revolutionize their internal processes. The time for theoretical considerations of digital transformation and industry 4.0 has passed; now is the time for actual implementation. Industry 4.0 tools like big data, cyber-physical systems, the internet of things, and interoperability are critical to the success of Pakistan's SMEs. Using SPSS's multiple regression tools, we discovered that big data, cyber-physical systems, and interoperability all significantly influenced a company's bottom line, but the impact of the internet of things was determined to be negligible. Given the paucity of studies on digital transformation and industry 4.0, the present investigation fills a need by providing new avenues of inquiry, fresh perspectives, and a valuable framework for future studies. This research will also assist business leaders in defending the need for investments in technical infrastructure. Finally, policymakers will find it helpful in devising policies to improve their absorptive ability and human capital development.

Governmental agencies are a significant source of massive data. The proactive release of large open data (BOD) by government institutions is spreading worldwide. The 2013 Pakistani Right to Information (RTI) Act has been identified as the driving force for the adoption of massive open data policy innovation by government agencies. Using the Dissemination of Innovation (DOI) theory and its application to public policy innovation research, this paper examines Pakistan's BOD policy diffusion trends at the government and public bodies' level through policy innovation. These trends are based on the timing of policy statements and government acceptance, the development of technology applications, and the proactive publication of statistical statistics by public entities. An Event History Analysis is conducted to analyze the dissemination of BOD policy

innovation. Results indicate that the Federal government is the inventor of the dissemination of policy Innovation among governments and succeeding public entities. In terms of establishing BOD technical platforms and the proactive sharing of massive datasets, we have also observed that the effectiveness rating of public organizations is relatively low. Politicians, policymakers, and policy practitioners in Pakistan should prioritize successfully implementing a sizeable open data policy to compete globally.

#### **4.9. Cyber Security [CYB]**

Pakistan has taken a number of noteworthy measures to enhance its cybersecurity capabilities, but more work remains. The Cyber Vigilance Division of the Pakistan Telecommunication Authority consists of three directorates: information and communication technology (ICT), cybersecurity, and vigilance. The ICT Directorate is responsible for enhancing the industrial sector's capability via research and analysis, the supply of IT infrastructure, and the hosting of conferences and stakeholder meetings. The Vigilance Directorate discovers and restricts gray traffic and illegitimate IP addresses through technological solutions and legal enforcement. The Cyber Security Directorate aids in the design of policies, performs security assessments of applications and infrastructure, and releases warnings and instructions to combat cyber threats. Pakistan has also created the National Centre for Cyber Security and offered academic degrees to promote cyber security education and research. Alongside these fledgling advances, the nation must implement other capacity development measures, including best practices, public awareness campaigns, professional training courses, incentive systems, and domestic industry.

#### **4.10. The use of Emerging ICT [EMG]**

E-governance is the implementation of Information and Communication Technology (ICT) into the government system to make working procedures more effective, accessible, and straightforward. Pakistan is steadily advancing towards adopting e-governance to improve the accessibility and quality of information and services supplied to the general people via ICT in a simple, affordable, and cost-effective way.

National Information Technology Board (NITB) assists the Federal Ministries and Divisions in implementing e-governance projects that seek to improve the government's

capacity to meet the demands of Pakistani residents. NITB guarantees that e-governance initiatives are result-oriented, cost-effective, and efficient by streamlining the access and delivery of services, distribution of information, and communication quickly and efficiently. We provide technical support for software development and deployment projects requiring high-quality standards, new concepts, and compliance. In addition, NITB identifies and offers specific steps for the procedures that need automation to provide better and more efficient service to Pakistani residents.

Peru

### 1. General Information

Area: 1,285,216 km<sup>2</sup>

Population: 34,113,548

Government Type: Unitary presidential republic

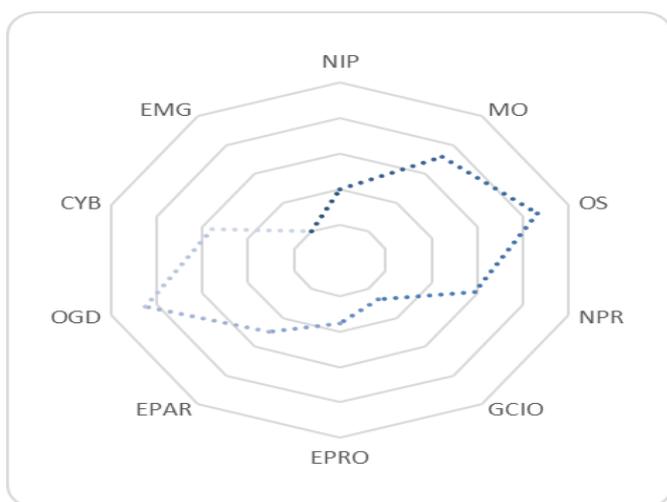
GDP: \$6,027

Internet User: 65.25

Wired (Fixed Broadband User): 9.23

Wireless Broadband User: 70.80

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With a score of 62.944, Peru's digital government ranked 51st in the world in the Waseda International digital government rankings for 2022. The Peruvian government has spent the better part of the last two decades developing the infrastructure and infrastructure for electronic governance necessary to make this ambition a reality. The Presidency of the

Council of Ministers has delegated authority over these initiatives to the National Office of Electronic Government and Information Technology.

The COVID-19 epidemic has reduced exports and imports in Peru, which has had an adverse effect on government income. However, the imports and exports necessary to sustain economic activity in the nation continued unabated despite the crisis. Exports of non-traditional Peruvian items, including fresh grapes, avocados, mangoes, and ginger, have increased due to worldwide marketing initiatives. It is mainly owing to the digitization and simplification efforts done over the years that Peru's Customs Administration (SUNAT) has been able to keep running smoothly. As the global pandemic has hastened everyone's move into the digital realm, the Administration has been working to accelerate and improve IT initiatives in collaboration with governmental agencies and private-sector partners to establish itself as a digital Customs.

In Peru, like in much of Latin America, e-government activities have concentrated on providing digital services through public institution websites and making information available via public portals utilizing a hybrid paradigm of static information and transactional services. This matches global trends. Other Latin American countries adopt this method. E-government must be implemented with technology and, more significantly, methodological resources for developing countries like Peru to reach the same efficiency and flexibility as wealthy ones. This can help poor countries like Peru catch up in e-government<sup>7</sup> and help emerging countries like Peru catch up.

### **3.2. New Trends**

The effects of Covid-19 go well beyond national boundaries. Human rights abuses against the most disadvantaged groups and the financial impact on families must be considered part of any effective remedy. A large portion of the undocumented workforce of Peru is of Venezuelan ancestry, and they may be subject to prejudice and hostility. When establishing policies, it is essential to consider macroeconomic and microeconomic impacts on low-income and vulnerable populations. For the sake of understanding gender disparity, this relationship must also be investigated.

Peru's leadership and the cooperation of all relevant parties, including corporations and individuals, are required to succeed in this challenging endeavor. In response, most people

have displayed cohesion, accountability, and creativity. In the United States, experts have used Google Hangouts and social media to help individuals quarantine and even throw parties there to promote awareness. A wider rollout of the collaboration with the Ministry of Production and other partners is possible at that point.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

There were significant breakthroughs in Peru's attempts to prepare and invest in the digitization of the nation, including the introduction of 5G services based on the country's existing concessions, which took place in recent years. Fibertel was granted an MVNO license by MTC for 20 years, allowing the company to provide services geared toward B2B customers and access to dark fiber throughout the country. The terminal for the Pacific Cable was located in Lurin.

Following the formation of a joint venture between the two companies, Eutelsat Communications and Telespazio, the latter was granted permission to utilize Ku Band capacity on the EUTELSAT 117 West B satellite to deliver telecommunications services to 1,300 unserved locations in the Peruvian Amazon.

##### **4.2. Management Optimization [MO]**

In this context, the ability to digitally transform services and expand access to the internet are now crucial for strengthening government agencies' ability to withstand the effects of future disasters. The nations in the area recognize this, and they have launched ambitious programs to modernize government operations and services via information and communication technologies.

The State may become more accessible to its inhabitants through digitizing public services, which paves the way for a more adaptive, responsive, and effective public administration. Communities that do not yet have access to the digital world must be provided with the means and the convenience to get access. It's also about encouraging the construction of channels that promote openness and involvement, which helps to build more public trust in governmental action and enhance the services and information supplied to individuals and organizations.

### **4.3. Online Service [OS]**

Websites that provide various services in a single location, such as electronic tax and customs filing, electronic health records, and electronic procurement, all contribute to the total score for online services. Access may be gained to the official websites of all five of Peru's e-services, which have been evaluated. The website for e-tax and customs, which can be found at <http://www.Sunat.gob.pe>, is complicated and dynamic, providing the public with information vital to their daily lives. The most often used processes are highlighted on a website that provides a basic and easy one-stop service and can be found at <http://www.tramites.gob.pe>. Because of their restricted scope, the government is not using e-procurement and e-health websites. These websites can only disseminate information to 241 residents and offer straightforward, uncomplicated services to the general public.

### **4.4. National Portal [NPR]**

The Peruvian government has been actively pursuing digital transformation in a number of different domains. For instance, the Peruvian government's website offers a wide range of digital services and transactions ([www.gob.pe](http://www.gob.pe)). But according to the most recent available data, just 4% of these deals can be made and closed online. The Digital Government Secretariat has set a target date of 2023 to complete the government's digital transformation, as stated in the Presentation of Results of the Comprehensive Design Process of the future National Policy for Digital Transformation.

### **4.5. Government CIO [GCIO]**

There is no provision for the Chief Information Officer (CIO) in the law that controls the policy for electronic governance. In addition to the responsibilities listed above, the ONGEI is responsible for various other activities, such as promoting information and communications technology in government and executing this strategy. At least one educational establishment has a CIO training program advertised on its website. Regrettably, more information on CIO rules cannot be located now.

### **4.6. E-Government Promotion [EPRO]**

The National Policy of Peru aims to enhance and fortify the country's capabilities in

science, technology, and technological innovation. The government distributes grants through financial transfers to public research universities and institutions. Direct funding for research and development innovation is available via various policy tools, including domestic and international funding mechanisms. The purchase of capital goods was the primary method of innovation used by the vast majority of Peruvian manufacturing companies (72,3%). 4.0% of their financial assistance came from the government, while 1.3% came from less conventional sources.

According to CONCYTEC's findings, Peruvian public sector enterprises are worried about the constraints of national policies on research and technology. Compared to other countries in Latin America, the Caribbean, and Ibero-America, Peru ranks lower than other countries in such categories as publications relative to GDP. Peru ranks first in the world regarding the ability to innovate, the availability of scientists and engineers, and the quality of institutions that do scientific research. Only 39.4% of the innovative manufacturing enterprises in Peru that were asked confessed to having their rights to intellectual property recognized.

#### **4.7. E-Participation [EPAR]**

A company's digital governance is its institutional structure for making decisions, encouraging participation, and holding people accountable for their actions in relation to the company's use of digital services and products. Specific fundamental regulatory frameworks in cross-cutting issues, including digital governance, transparency, open data, data-based public policy, cybersecurity, and personal data protection, have begun to get approval in Peru. Recently, efforts have been made to achieve greater convergence in all aspects that make up a complete digital transformation system based on the pioneering role assigned to SEGDI, even though the application and development of each of these regulatory frameworks present different and, in some cases, unclear governance structures.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The Peruvian government approved the "Peruvian Action Plan for its incorporation into the Open Government Partnership" as part of the Open Government Partnership international initiative, which it had previously indicated its willingness to join and for

which it sought to establish commitments related to, among other things, government transparency and openness, public integrity, citizen participation, e-government, and the enhancement of public services. To encourage the availability of information data from public bodies and the reuse of open data, the "National Open Data Government Strategy 2017-2021" and the "Peru Open Data Government Model" were released within the context of these Open Government Action Plans.

New pledges for gradual implementation have been prepared within the context of the 2020-2021 Open Government Action Plan Towards the Bicentennial, and others are already being executed. Among the former pledge to implement an open data portal in the State Procurement Supervisory Agency, manage a virtual platform for accessing information on the management of socio-environmental conflicts, include citizen participation mechanisms to improve the creation of Standards and regulations; and promote social control in monitoring the execution of works through an information platform on public infrastructure works. Digital police reports, providing a second digital police report, and virtual connection with the Comprehensive Healthcare System are only some of the promises that have already been fulfilled.

In many ways, a country's development is tied to its degree of digitalization and its ability to adopt new technologies quickly. However, to achieve successful national digitization, all of society's constituent players, including individuals, businesses, and the State, must participate. There has been a rise in the usage of electronic devices in Peru. The government has taken steps in many sectors to encourage a nationwide shift to digital practices, including digital health, educational technology, and electronic governance.

#### **4.9. Cyber Security [CYB]**

In collaboration with the Ministry of Transportation and Communications (MTC) and the U.S. Trade Law Development Program, the Embassy hosted a workshop to examine regulatory options for bridging the digital divide and implementing robust wireless communications networks for 5G technology. Under the auspices of the Digital Connectivity and Cybersecurity Partnership (DCCP), the workshop pushed the discussion on the efficient use of the universal service budget, best practices in broadband regulation, and growing 5G provider security and provider diversity.

Peru's attempts to alter regulatory frameworks to support the development of secure and interoperable 5G networks were bolstered by the Rural Broadband Connectivity Workshop. Additionally, the workshop promoted regional and worldwide collaboration in a required field to stimulate economic development in the region and beyond. This event also lays the framework for future government cooperation on network security and supplier diversity, which are essential components for the ubiquitous deployment of broadband services. This pledge was made possible by the DCCP, a multi-year initiative by the U.S. government to promote an open and competitive internet, secure 5G networks, and promote safe and responsible business opportunities abroad.

#### **4.10. The use of Emerging ICT [EMG]**

Access to the Internet remains the most significant barrier that must be overcome to guarantee digital education in Peru. This is one of the primary problems that digital education must overcome. According to the primary investigator for Grade, Mr. Hugo opo, even if young people have the most excellent Internet access, it happens outside the house (in the study center, at work, or in internet booths). It is also important to note that access to Information and Communication Technologies (ICT), such as the internet, closely relates to a country's socioeconomic levels. According to Ms. Maril Martens, head of CARE Peru and a former Minister of Education, the percentage of households with internet connection ranges from 96.7% in class A houses to just 43% in class E homes.

In light of these challenges, the government has launched a number of measures, including introducing a program for learning via online education and the distribution of tablets to both students and instructors in public schools.

Philippines

## 1. General Information

Area: 342,353 km<sup>2</sup>

Population: 115,559,009

Government Type: Unitary presidential constitutional republic

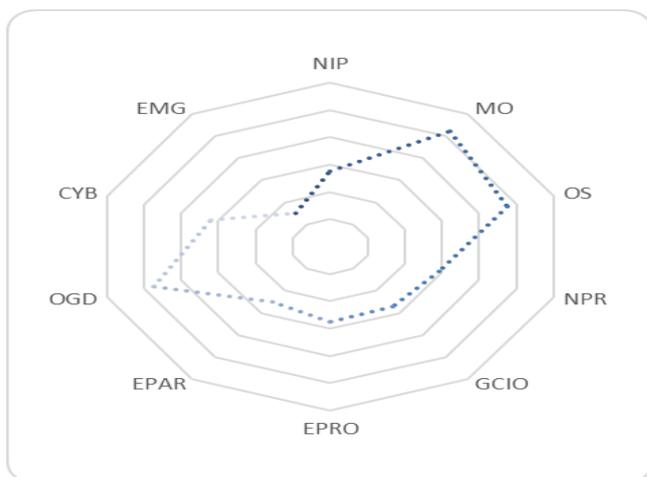
GDP: \$3,128

Internet User: 49.8

Wired (Fixed Broadband User): 7.24

Wireless Broadband User: 64.34

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

The Philippines had an overall grade of 69.604 in 2022, ranking 36th. The COVID-19 epidemic has brought into sharp focus the need for digital ecosystems to facilitate the quick delivery of essential services and aid to a country's citizens, including healthcare, education, and social assistance. The "stack" of digital IDs, digital payments, and data-sharing platforms was already in place in countries that could better react to the epidemic

and preserve the continuity of services by moving to online channels.

The Philippines is an excellent case study of a government working to fill the gaps in its digital ecosystem by improving infrastructures like digital identification, data governance, and digital financial transactions. The Philippine Statistics Authority (PSA) has begun implementing the Philippine Identification System since the Philippines is one of the few nations lacking a comprehensive ID system beyond the civil register. PSA identified digital SP delivery as a priority area after learning about the difficulties of providing social assistance without a foundational ID during the COVID-19 response and is now collaborating with the Department of Social Welfare and Development (DSWD) to use PhilSys to transform the country's major social assistance programs digitally. The World Bank has funded several projects to help with this (including the Beneficiary FIRST Social Protection Project, the Promoting Competitiveness and Enhancing Resilience to Natural Disasters Development Policy Loan series, and the Identification for Development (ID4D) and Digitizing Government to Person Payments (G2Px) sister initiatives).

### **3.2. New Trends**

The Philippines' government is still having trouble implementing its response to the COVID-19 outbreak. The country has taken measures to increase the pandemic's security and the importance of its security agencies. Because of lackluster public health response, the government has been unable to stem the tide of new illnesses. It has seen colossal joblessness and a drop in GDP of double digits due to the lengthiest shut down in history. As a result of these issues, calls for a new approach have come from many different areas. The business and governmental sectors are pressured to quickly adopt digital transformation methods and technology to transition to the new normal.

To promote the digital transformation of the Philippines, the Department of Information and Communications Technology has formulated the Philippine Digital Transformation Strategy for 2022. Economic transformation, people engagement, innovation, infrastructure development, human capital, and bridging the digital divide are the pillars upon which the 2015 ASEAN ICT Master Plan rests. The basic concept was to pay attention to national interests while keeping an eye on the ASEAN economic agenda.

Government-enabling activities in the future will center on digital transformation to improve government openness and accountability, operational efficiency and agility, direct public participation, and a platform for innovation to aid in the country's economic recovery in the wake of the pandemic. In addition, the e-government 2.0 digital transformation strategy prioritizes using open data, disseminating user-generated content, and creating network effects via increased user participation. Using a variety of channels, e-government 2.0 sought to legitimize citizens' genuine involvement in government.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The Philippines has made strides in becoming more digitally connected to the rest of the world. Commercial 5G services have been made available by Smart, Global Telecom, and D Telecommunity, respectively. DITO has initiated the deployment of mobile services. The government has boosted its investments in innovative data centers and is working to install more of these centers to promote 5G services.

##### **4.2. Management Optimization [MO]**

While the nation's e-Government infrastructure has remained steady, the e-Government ecosystem has made a lot of achievements. The National Privacy Commission (NPC), the National Telecommunications Commission, and the Cyber Crime Investigation and Coordination Center have all undergone significant restructuring as part of the Department of Information and Communications Technology (DICT). The new division and accompanying legislation show the government's acknowledgment of the importance of information technology in open government. The NPC is charged with protecting individuals' right to privacy and freedom of expression while encouraging technological advancements and promoting the nation's economic and social well-being. The Commission is responsible for overseeing, deciding upon, and managing all communications inside the United States.

Information security is a top priority for the government of the Philippines. In light of this, the State's strategy prioritizes protecting citizens' right to privacy and freedom of expression while encouraging scientific and technological advancement. Information and knowledge management and security are essential tenets of the law, which apply to

organizations of all sizes and all levels of government.

The goal of the EGMP 2022 is to create a "One Digital Government" via the use of e-government technology, and this presents a significant obstacle to its implementation. The Department of Information and Communications Technology (DICT) is responsible for, among other things, putting in place the necessary personnel, policies, processes, and information architecture to meet the challenges mentioned above and goals.

#### **4.3. Online Service [OS]**

At one point, websites were considered the critical e-Government conduit for disseminating information and offering services to people. In this regard, the e-Government Fund acted as a catalyst for e-government in the Philippines. It also pioneered the adoption of information and communications technology (ICT) in establishing a web presence and automating government processes, both of which have the potential to improve Government-to-Government (G2G) and Government-to-Citizen (G2C) services. According to data gathered through monitoring of the website's existence.

A regularly performed survey by the DICT found that the proportion of National Government Agencies (NGAs) with a web presence increased by 7.41 percentage points, from 85.58% to 92.99%. The percentage of NGAs that had an inaccessible online presence declined from 11.91% in 2016 to 4.80% in 2017, while the percentage of NGAs that did not have a web presence saw a significant reduction over the same time period.

#### **4.4. National Portal [NPR]**

The E-Government Development Index uses the National Government Portal, often known as the NGP, as a critical indicator of the quality of internet services across the nation (EGDI). Consequently, the NGP is necessary for boosting the visibility and accessibility of the public sector and cultivating citizen confidence. Because the majority of information and communications technology (ICT) services provided by the government, specifically online services, have traditionally been constructed in silos, the strategy for developing a national government portal (NGP) needs to be based on a structure that encourages more collaboration.

One example is creating a national government portal as part of a digital transformation

strategy to build an integrated government. Its role is to act as the official representative of the essential services provided by the federal government. Since 2014, the Open Data Portal ([www.data.gov.ph](http://www.data.gov.ph)) has released more than 3,300 government data files and information on various subjects, including public spending, agriculture, transportation, and education, among other issues. In light of this circumstance, the Philippine Statistics Authority (PSA) has introduced [openstat.psa.gov.ph](http://openstat.psa.gov.ph). This online platform makes accessible to the general public a variety of statistical data that has been gathered and collated by the government.

#### **4.5. Government CIO [GCIO]**

The chief information officer (CIO) balances operational business strategy, organizational change, and government regulation. Since implementing E-Government aims to boost productivity and openness, reforming the country's governing institutions is essential to the nation's progress. The DICT was founded as the primary national entity responsible for ICT development planning, coordination, and administration by Republic Act No. 10844. Establishing a full-time Department is a boon to the state of IT policy and policy implementation through the internet. According to the law, the Secretary of the DICT will be in charge of the Chief Information Officer Council. The CIO Council works with the Department to accomplish governmental IT goals.

CIOs are top-level government positions with specific responsibilities. To improve public service delivery and save costs, they advise businesses on how to make the most of information and communication technologies (ICTs). They develop, execute, and oversee the agency's overall information management plan (ISSP). CIOs will manage all IT projects, strategies, and policies. They will create a strategy for business transformation and execution and implement it using ICT technologies.

#### **4.6. E-Government Promotion [EPRO]**

The Philippine government has been working toward establishing a Department of Information and Communication Technologies for many years. Rationalizing essential components for the e-Government is one of the most significant difficulties for human resources departments inside DICT and other government agencies. In addition, the state has increased its efforts to entice the best and brightest technical talent by providing

salaries and perks that are on par with other similar organizations. In addition, current public officials must improve their knowledge of information and communications technology (ICT). These are essential components that contribute to the viability and resiliency of the long-term Government.

Coordination across different industries is essential for the success of specialized businesses or services. The Philippine eGovernment Interoperability Framework has been adhered to by all of an organization's business policies, standards for procedures, standards for data interoperability, and standards for process interoperability (PeGIF). The expansion of the whole economy will be a direct outcome of successful electronic government programs. The objective of changing the government of the Philippines into a digital platform that fosters transparency, accountability, efficiency, direct public interaction, and innovation has been created by the government of the Philippines.

#### **4.7. E-Participation [EPAR]**

E-Participation technologies are included in the National Government Portal to boost citizen engagement in public service delivery. On the website for the Philippine government ([www.gov.ph](http://www.gov.ph)), users may access tools for online petitions, policy consultation, and public participation. As a method of electronic participation, the Open Legislation Platform is now being developed in Albay, Bohol, and Surigao del Norte provinces. Facilitates participation at the local level in Sanggunian general assemblies and the judicial committee. Technology will enhance participation, allowing residents to use social media platforms like Facebook. The use of this online application gives individuals the ability to communicate with their elected officials in their communities.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Widespread, low-cost, high-speed internet is essential to the rapid development of the Philippines' digital revolution. Rapid progress is required, which can only be achieved by more investment, particularly in unserved and neglected areas of the nation, and legislative reforms that draw in private investment. Due to a lack of internet connection, many small and medium-sized businesses (SMEs) in the United States cannot take advantage of e-commerce and online transaction opportunities. As a result, telemedicine cannot grow as rapidly as it should have since it is too expensive for many urban and rural

locations. Stable, high-speed internet connections are crucial to the growth of digital transformation because of the importance of cloud computing, the Internet of Things, and the management of vast volumes of data.

The infrastructure for the electronic government consists of the National Government Data Center (NGDC). The National Government Data Center (NGDC) gives government entities access to centralized servers and storage. It is common knowledge that some departments within the government have persisted in maintaining their own data centers, even though doing so has proven to be both more costly and more challenging to safeguard. The former EGMP's goals were simplifying data center services and recruiting more government entities to become members of the NGDC. Establishing secondary data centers nationwide is required to ensure the system's reliability. If a primary data center suffers damage or loses its connectivity, it is vital to have a backup data center. The redundancies ensure that there will be no disruptions to the services and that they can be quickly restored in the event of an emergency.

#### **4.9. Cyber Security [CYB]**

Active network monitoring is now possible thanks to the technologies used in the Security Operations Center (SOC). The NextGeneration Intrusion Prevention System helps monitor security concerns and manage network infrastructure by detecting and preventing potential security attacks. According to the United Nations, government officials must be more aware of cybersecurity.

The COVID-19 outbreak has brought about significant changes to the digital environment in the Philippines. Electronic payment and banking systems have seen substantial expansion due to the epidemic. The Philippines Central Bank forecasts that by 2023, fifty percent of retail transactions will be conducted digitally, and seventy percent of the population will use various forms of financial technology. According to BMI's projections, software sales in the Philippines will reach \$95 million by 2025.

As part of the National Cybersecurity Plan 2022, the DICT is implementing a capacity-building program for all national agencies and local governments and rolling out cybersecurity infrastructure, including hardware and software. The government of the Philippines is working to tighten the Data Privacy Act of 2012 and develop standards for

data protection. It is pushing all firms to register on the government's internet portal and appoint a Data Privacy Officer (DPO). The planned rollout is promising news for software and hardware manufacturers in the United States.

#### **4.10. The use of Emerging ICT [EMG]**

Local businesses have spent more money on digital transformation initiatives of companies. Even if mobile and social media usage is on the rise, investments in ICT infrastructure are inadequate. There are over 400 software companies based in the Philippines, the vast majority of which are American or European.

As more businesses use cloud solutions for increased productivity and contagion resistance, the use of cloud storage and processing facilities is expected to rise. The government of the Philippines is implementing cutting-edge technologies and innovative solutions as part of its "Digital Transformation Strategy" to boost the country's IT capabilities, network speeds, and productivity. The government's cloud data center, employee email, and national archives are all examples of its "cloud-first" philosophy. Information and communication technology were employed to lessen the severity of the Covid epidemic. Datacenter renovations, digital health and education efforts, and cybersecurity and analytics are part of the project—expenditure on a central command and control facility for communication and crisis management.

The DICT issued new regulations for the development of freestanding cell towers. The three largest telecommunications companies in the Philippines now control the cell tower infrastructure. If a uniform set of rules governed towers, the deployment of mobile networks might proceed more quickly.

Poland

## 1. General Information

Area: 312,679 km<sup>2</sup>

Population: 40,661,282

Government Type: Unitary semi-presidential constitutional republic

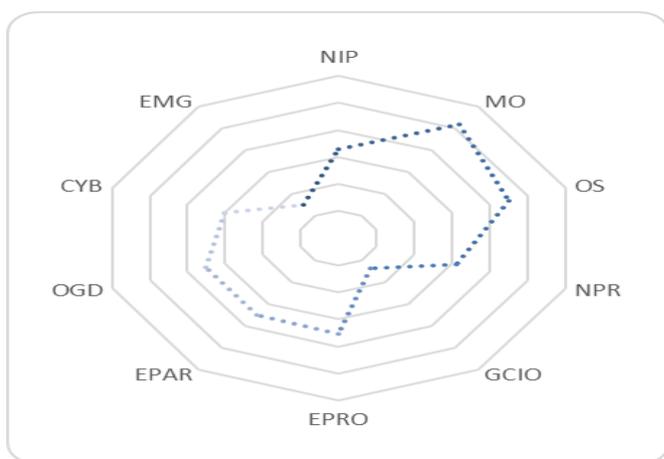
GDP: \$14,969

Internet User: 83.18

Wired (Fixed Broadband User): 22.11

Wireless Broadband User: 197.43

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Poland was rated 42<sup>nd</sup> in the Waseda International digital government rankings in 2022, with a total score of 67,619. As a result of COVID-19, several firms postponed or canceled projects and slashed their investment budgets, which weighed heavily on the industry as a whole. At the same time, the pandemic increased demand for remote work technologies, including collaboration software, virtualization, cybersecurity, remote asset

management, and sales of laptops and tablets. Additionally, lockdowns triggered a spike in online shopping, video streaming, and gaming, never seen before. Due to intense competition, e-commerce businesses have prioritized developing new features and upgrading existing ones to serve their clients better.

The outlook for the entire sector remains positive. However, it varied considerably from market segment to market segment, despite supply chain turbulence caused by COVID-19 and exacerbated after the outbreak of war in Ukraine, as well as early signs of economic slowdown combined with high inflation. Since the hardware market is becoming somewhat saturated, a cooling trend is anticipated. Cloud services are growing seven times faster than the overall IT market. This is especially true in the retail, fast-moving consumer goods, transportation, and logistics industries. Significant investments were made in Poland-based data centers by the likes of Google, Amazon, Microsoft, and several other foreign and domestic industry giants in the previous year. Consequently, by 2026, Poland may have established itself as a significant hub for colocation data centers.

Investments in e-administration, such as the integration of e-services with the land and mortgage registry system, open government, training, and other efforts aimed at boosting the digital literacy of Polish society, are all promising avenues for public sector spending. Current Polish government digital development goals include infrastructure, cybersecurity, education, and e-health.

### **3.2. New Trends**

Polish companies now have a better chance of joining value chains not only in Europe but all around the globe, thanks to Poland's commitment to digitalization. When the world is trying to recover from the pandemic, Poland's state-owned enterprises may gain from digitalization by using novel grid technologies and horizontal and platform solutions to boost crucial transportation and energy infrastructures. The ability to virtually implement manufacturing procedures is essential for small and medium-sized businesses, which is why such a platform should be available. Motivate them to develop new business models by integrating disparate data sets to enhance efficiency, adaptability, and output. This platform needs open machine data to foster innovation.

The next Industrial Revolution can't happen without extensive data collecting and

production. The original sectors that provide the data and the innovators who use it in novel ways to create new value chains will all reap the rewards. Data and information systems and data sets must be compatible with fostering collaboration across industries and avoiding harmful certification limitations that amount to protectionism.

Without trust in the digital world, digital transformation is impossible. An efficient advertising strategy for digital collaboration platforms is required. Poland is trying to accelerate digitalization with the help of trade agreements, treaties, and EU directives. A thriving data economy involves cloud computing and analytics firms. Dominance in a market might lead to unfavorable service terms for competitors.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The implementation of 5G has not yet begun in Poland since the country has not yet allotted any standardized radio spectrum. The rollout of 5G technology was halted when the first auction for frequencies between 3.4 and 3.8 GHz was canceled in the middle of 2020. The government has decided to alter some elements of the cybersecurity rules connected to the development of 5G, and this legislation is still being completed. As soon as these laws have been approved, the Office of Electronic Communications in Poland, which is in charge of regulating the telecom industry, is anticipated to launch the bids in the fall of 2022. The government will consider a plan to establish a wholesale operator in the 700 MHz band, which may become available in 2022.

Additionally, the government will consider establishing a Strategic Communications Operator, a state-owned entity that would provide telecommunications services to the public administration. Both of these plans will be under consideration. Mobile network providers have already begun working on 5G pilot projects and are providing 5G services based on the frequencies that are now at their disposal.

##### **4.2. Management Optimization [MO]**

Citizens, professionals in the information and communication technology (ICT) industry, workers of small and medium-sized businesses (SMEs), and members of the public administration and national organizations are all targeted by the Digital Competence Development Programme 2020-2030. The program's structure encompasses a wide range

of planned initiatives and activities that aim to improve digital literacy at all levels, from the most fundamental to the most sophisticated. The Programme also seeks to promote a cooperative atmosphere where IT experts can hone their technical expertise in preparation for the digital transformation or the skills required to work with emerging technologies like artificial intelligence (AI), cloud computing, data analytics, cybersecurity, and others. Skills for all people, the labor force, education, and digital specialists are the four pillars of the Digital Competence Development Programme. Therefore, the Programme sets the following priorities, organized along the digital skills pillars:

- Skills for citizens
- Skills for the labor force
- Skills for ICT specialists
- Skills in education

#### **4.3. Online Service [OS]**

The Act on Trust Services and Electronic Identification became law and passed. By combining at a single location all information and communication technology (ICT) systems that make public online services available and using a range of electronic identification standards, the Act made electronic service availability possible in Poland. Users may sign up for any public online service by presenting a method of electronic identity granted by an electronic identification schema linked with the national electronic identification gateway. Government portals and online services may be more accessible via the website. It is an organizational and technical solution that merges several information technology systems into a single entry point that the general public can use for online services.

In March of 2004, the law governing public procurement was finally enacted. It cleared the way for constructing eProcurement systems for Polish public administrations, advanced electronic signatures for tender submissions, and electronic auctions for specific contracts.

#### **4.4. National Portal [NPR]**

Access to digital information and e-Services in Poland is primarily available via the Republic of Poland Portal (GOV.PL). The Ministry of Digital Affairs developed the

platform. The news, press, multimedia, and other essential data may all be found at GOV.PL. Data on education, the environment, the budget, finances, culture, security, sports and tourism, and the labor market are only some of the many topics covered on Dane.gov.pl, an open data portal for consumers, companies, NGOs, researchers, and government officials. The vast bulk of data is accessible to the public. Open data specialists, best practices, and emerging initiatives in Poland can all be found here. Entrepreneurs in Poland may access useful eServices on the biznes.gov.pl website. The primary objective is to reduce the time and money needed to start and manage a company.

#### **4.5. Government CIO [GCIO]**

The Ministry of Digital Affairs has traditionally overseen the government's chief information officer role. Currently, the Ministry of Digital Affairs is in charge of ensuring the safety of the internet, developing digital content, and maintaining its infrastructure.

#### **4.6. E-Government Promotion [EPRO]**

The Polish Ministry of Digital Affairs has helped progress the information society by promoting investments in information and technology. This endeavor necessitates the provision of universal access to high-speed Internet, efficient and user-friendly public eServices, and greater digital literacy. This effort aims to ensure that all schools have access to high-speed internet connections and to increase the number of online resources available to instructors.

Since its founding in March 2007, the Committee of the Council of Ministers for Digitalization has been charged with providing both the Council of Ministers and the Prime Minister with strategic advice. The responsibilities include providing advice on proposed legislation or computerization projects to ensure interoperability, integrity, and complementarity with solutions already in place or being developed, in addition to architectural compliance with the State Information Architecture.

#### **4.7. E-Participation [EPAR]**

The TESTA network is Poland's major infrastructure for cross-border electronic communications. These conversations take place through the internet. In addition, Poland's first formal document devoted to the openness of public data was released earlier

this year. The paper was drafted to improve the quality and quantity of information and raise administrative involvement online.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The recent COVID-19 outbreak has sparked widespread interest in the digital transformation of government. Since 2015, the Polish government's digital policy, public administration reform, digitalization of the public sector, and growth of e-government have all been overseen by the Ministry of Digital Affairs. Since a few years back, the Polish government has been pushing for more openness and responsibility from its public servants. As a result, Poland can now count itself among the exclusive group of countries in the vanguard of governance in the digital age.

The Open Data Program, the first official government document on data openness, was approved by the Council of Ministers. The purpose of this section of the paper is to improve both the quality and quantity of the data that is made available on the open data portal. This site emphasizes open government, citizen participation, and the repurposing of public data. Launched as a subsidiary component of the Open Data Program is a brand-new program that goes by the name Open data plus.

In 2018, the Polish Ministry of Digital Affairs published guidelines for data preparation and sharing standards, including Application Programming Interface standards, security, technicality, and legality, to verify the quality of data given by the government. These guidelines were created to ensure compliance with the standards. Open data is used for the first time in a business and scientific community. The public has reasonable faith in how the government manages public data. It is not appropriate for laws or technical safeguards designed to protect individuals' personal information to limit users' access to data. The initiative about open data resulted in the developing of guidelines for the openness of government data. This concept emphasizes the need for appropriate data preparation and distribution in the context of increasing data usefulness.

#### **4.9. Cyber Security [CYB]**

In addition to the Policy for the Protection of Cyberspace of the Republic of Poland adopted by the government, the National Framework of Cybersecurity Policy of the Republic of Poland for 2017-2022 is a strategic document in a continuing process of

actions taken by the governmental administration, aimed at raising the level of cybersecurity in the Republic of Poland. Representatives from the Ministry of Digital Affairs, Ministry of Defense, Ministry of the Interior and Administration, and the National Security Bureau worked with the Internal Security Agency and the Government Centre for Security to draft the National Framework paper.

The dispersed actions of entities in the civil and military sphere, public and commercial sectors, and organizations responsible for combating cybercrime reduce the system's effectiveness. This will be strengthened by centralizing and harmonizing the different institutions' cybersecurity duties. Participating organizations in cybersecurity will coordinate closely to define each other's functions and share information about available resources.

Further development of structures dealing with cybersecurity at the operational level, such as the National Cybersecurity Centre (NC Cyber), the CSIRT at the national level, sectoral incident response teams (sectoral CSIRT), information exchange and analysis centers, is essential to the growth of the national cybersecurity system (ISAC). The government will draft new laws to clarify the expanded roles of the appropriate agencies to facilitate these changes. In particular, they will be revising NC Cyber's function and the national CSIRT's capabilities. Information concerning potential dangers and occurrences must be shared among many parties, therefore, setting up systematic solutions to facilitate this.

#### **4.10. The use of Emerging ICT [EMG]**

Information and communication technology are now a crucial part of every thriving economy. Essential service providers, digital service providers, and operators of critical infrastructure all rely on these technologies, making them vital to protecting residents and keeping government services running smoothly. The Ministerial Council has decided to prioritize saving information and communication technologies. The government will intervene to increase service providers' capacity and competence in cybersecurity since they are responsible for securing their services. Specifically, this action will assist 12 key infrastructure operators, digital service providers, and essential service providers in assessing their cybersecurity requirements and acquiring the appropriate training and education to meet those needs. Furthermore, the government will assist all organizations

in reacting to major catastrophes, particularly those that affect many industries at once. All relevant industries will work together to complete this task. The next step is to draft some guidelines for the barest minimum in ICT security, which should ideally include provisions for business continuity planning. To further protect the interests of the digital service industry, a different regulatory framework is being developed. The government is aware that these companies operate on a global scale and recognizes the need to enact legislation promoting the growth of Poland's digital single market.

Portugal

### 1. General Information

Area: 92,090 km<sup>2</sup>

Population: 10,265,155

Government Type: Unitary semi-presidential constitutional republic

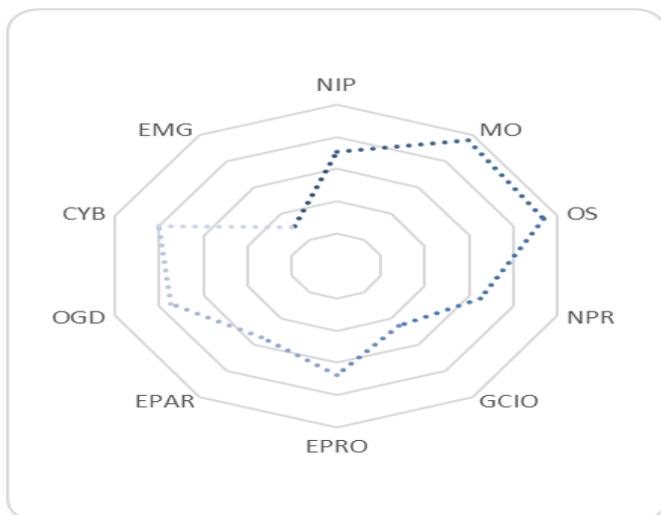
GDP: \$22,233

Internet User: 78.26

Wired (Fixed Broadband User): 40.81

Wireless Broadband User: 78.95

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With a total score of 69,876, Portugal landed at the 35th position in the Waseda International 2022 rankings for digital governance. Portugal's development cooperation can meet the demands of its partner countries since it relies on resources from all sectors of society. Portugal promptly reacted to the needs of its partner nations in a wide variety

of sectors during the COVID-19 pandemic because of the country's long-standing interaction with comparable institutions in those countries and its cross-government coordination at headquarters. Governments throughout the globe are rushing to upgrade their digital infrastructures to satisfy the increased demands of digital citizens for public services in the wake of the coronavirus outbreak. That which was formerly notable now plays a pivotal role. The crisis has highlighted the importance of digital resilience as a critical component of shared governance in managing and overcoming the consequences of the health catastrophe and "rebuilding better." Countries that have made significant progress toward digital transformation have weathered the storm and are now better positioned for a digitally-driven recovery. Changes in government made possible by digital technology are likely to result in better administration of public affairs, more efficient public policy, and more efficient service provision.

Ten years ago, the primary goal of digital reforms was to increase efficiency and save costs; now, the focus has switched to bettering people's quality of life and making government more accessible. Curiously, Portugal's digital government has never been seen as a stand-alone initiative but as an integral part of the country's broader administrative modernization initiatives. To effectively promote reforms and eliminate opposition to change, a politically powerful governance structure must be institutionalized at the center of government, as was the case in Portugal.

### **3.2. New Trends**

Regarding digital transformation, Portugal is considered a member of the EU's middle rank. The country's human capital performance is far below the EU average. The "Industry 4.0 Program" was developed by the Ministry of Economy as part of the National Strategy for Economic Digitization. After the consultation, the Strategic Committee (composed of members from the government, national agencies, and the private sector) approved the list of planned efforts to speed up the adoption of industry 4.0 by national firms. To aid the government's recovery after the epidemic.

The purpose of the Program was to disseminate knowledge about Industry 4.0 to Portuguese businesses and the general public. Phase II of the initiative emphasized innovation and knowledge creation to hasten the transition to industry 4.0 and was

structured around three axes: generalize, capacity, and assimilate. The government's goal is economic and social progress, and it plans to achieve this goal by mandating a comprehensive digital transformation of corporate models.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Broadband infrastructure in Portugal has benefited from ANACOM's Centralized Information System program to map the country's broadband infrastructure. Information on current and proposed infrastructure that may support electronic communications networks is included in the infrastructure-mapping tool. The primary goal of CIS is to save locals and businesses the hassle and disruption that comes with constant and substantial subterranean construction by reducing the need for redundant efforts.

A digital guide will be released in 2021–2022, and the Portuguese government, the ANACOM, and local governments will work together to standardize the permissions process. These steps are part of Portugal's plan to implement the Connectivity Toolbox. In addition to the centralized information hub and guaranteeing access to preexisting physical infrastructures, Portugal intends to establish an ongoing group dedicated to increasing openness.

##### **4.2. Management Optimization [MO]**

Portugal's government and services have experienced significant changes due to the country's digital transformation strategy. It prioritizes the use of digital technology to speed up the modernization of the public sector for citizens and businesses and to facilitate the public sector's digital transformation. Many different methods were used to highlight the change rather than the digital transformation. Strong political will and a clear vision, both federal and relentless in their purpose, have been essential for political leaders, especially women leaders, to steer this transformation from the center of government. To aid in promoting and, in some cases, compel the change of the whole government, a single digital agency with a clear mission and the ability to see it through has been established.

The combination of political and technological initiatives was crucial to the outcome.

Portugal made early and substantial investments in its digital infrastructure to make possible government digital services. Other strategic measures to keep political support for the changes include digital identification and interoperability platforms. One such long-term initiative is the SIMPLEX project, which has been working to streamline administrative processes since 2006. Additionally, the digital strategy intends to enhance the lives of residents by simplifying critical governmental services like health and justice. The creative digital solutions implemented by the Portuguese government are an excellent example of a people-centered strategy. Instead of automating obsolete or pointless processes, the government's goal has always been to reevaluate them. This country has avoided the mechanical bureaucratic trap that has ensnared many others. The Portuguese government is actively pursuing public sector interoperability to eliminate data silos and facilitate communication between different government agencies. The "once-only" principle is spreading throughout Europe so that customers only have to provide their data once.

To better serve the local community, these programs centered government assistance on crucial occasions in residents' lives and adjusted accordingly. A few examples from the actual world are electronic prescriptions, proof of citizenship, and the unified platform e-Portugal, which provides access to all government services in one place.

#### **4.3. Online Service [OS]**

Pushing a multi-channel service delivery paradigm. Portugal has adopted the electronic Citizen Card and the mobile-based Digital Mobile Key. The eID can physically and digitally authenticate a person's identification via biometrics and electronic signature. The Portuguese government maintains this domain at [ePortugal.gov.pt](http://ePortugal.gov.pt).

All government procurement opportunities must be posted on the BASE website. The official electronic journal is where tender notifications are published. Even in the post-award phase of eProcurement, eAuctions and dynamic purchasing systems are becoming increasingly frequent.

#### **4.4. National Portal [NPR]**

Government Portal is the Portuguese government's official website, where you can find details on the country's policies, its leaders, the papers they've released, and any ongoing

public consultations. It was launched as a centralized online portal for citizens and businesses to access all digital government services and data from the National Catalogue of Entities and Services.

#### **4.5. Government CIO [GCIO]**

CIOs are not acknowledged by the Portuguese statute governing e-government (Chief Information Officers). Governments today are mindful of the demand for a Global Chief Information Officer (GCIO) (GCIO). It is the responsibility of the AMA, in addition to its other GCIO functions, to promote the use of information and communications technology throughout the government and to carry out the strategy. At the very minimum, a college or university offers CIO education programs as part of its portfolio of offerings. During the search for CIO regulations, no other results were discovered.

#### **4.6. E-Government Promotion [EPRO]**

PORBASE's primary objective is to protect and promote the Portuguese library catalog, the present national bibliographies, and the catalog of Portuguese libraries as a whole. The "Transparency" section of ePortugal has featured this site to increase its exposure and traffic. The National Commission for the Promotion of the Rights and Protection of Children and Young People webpage offers a wealth of information for Portuguese residents on promoting and safeguarding children and young people's rights. For Portuguese citizens interested in learning more about the CNPDPCJ and its ongoing efforts to promote and protect the rights of children and young people at the local, regional, national, and international levels, the CNPDPCJ's portal is a wealth of information.

#### **4.7. E-Participation [EPAR]**

The Council oversees a worldwide action plan for Information and Communication Technologies in Public Administration. The SIMPLEX Program's goals include reviving and reinstating policies developed to harness the disruptive power of ICTs and developing novel techniques to enhance people's lives and lower businesses' costs. The success of CTIC's global ICT strategy will largely depend on the adoption of novel forms of ICT governance in public administrations that are both societally inclusive and compatible with government objectives (ICT). The Commission for Administrative

Modernization (CfAM) is in charge of the government's push to update its systems, including representatives from every relevant agency. Many individuals are engaged in public administration, and the government is trying to make it simpler for them to communicate with one another.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Portugal's government has undergone significant changes as a result of the country's plan for digital transformation. Its mission is to improve government services for individuals and companies via digital technologies and emphasize digital transformation in government. The method has, in a sense, prioritized change above digitization. This change has been pushed from the top down by political leaders, notably women politicians, who have had the foresight to establish this as a priority for their administrations and the stamina to see it through over the long haul.

The participation of the general public, accessibility to government data, and increased openness are the objectives of this strategy. In order to accomplish the goals of the initial action plan, a total of four commitments have been fulfilled. If anyone is interested, the National Action Plan for Open Administration may be seen on the Open Government Partnership Portugal website and the Open Government Partnership website. The Open Government Partnership, which evaluated Portugal's participation in the OGP on its own, gave Portugal's first Action Plan a favorable rating after assessing its participation in the OGP. Two of its commitments were dubbed "Standard Commitments."

The official open data site for Portugal is called Dados.gov, and it may be accessed online. Two of the most important goals of an available data repository are to collect and reference material that is publicly accessible and to operate as open data.

#### **4.9. Cyber Security [CYB]**

A new National Cyberspace Security Strategy 2019-2023 was published to preserve critical infrastructures and essential information services while simultaneously boosting the usage of cyberspace by people as well as public and commercial enterprises. This policy is reviewed annually by the High Council of Cyberspace Security to account for developments in digitalization.

CNCS, Portugal's National Cyber Security Centre, is the country's coordinating body and

authority in cyber security. To ensure that cyberspace is utilized as a place of freedom, security, and justice, CNCS collaborates with governmental institutions, operators of critical services, and digital service providers. Through the coordination of all competent authorities and the implementation of measures and instruments required for the anticipation, detection, reaction, and recovery from situations that may compromise the operation of critical infrastructures and national interests, the CNCS works to ensure that Portuguese citizens can use cyberspace freely, reliably, and securely at all times. In other words, the CNCS's job is to ensure the safety of the nation's vital infrastructures and national defense by preventing, detecting, responding to, and recovering from any potential threats.

#### **4.10. The use of Emerging ICT [EMG]**

The Artificial Intelligence (AI) Portugal 2030 research, innovation, and economic growth plan aims to build and improve Portugal's advanced cyberinfrastructure by the year 2030. Portugal's National Strategy for AI is integrated within the country's larger INCoDe.2030 strategy and closely relates to AI Portugal 2030. These initiatives are both parts of Portugal's INCoDe.2030 strategy. As a result, it promotes cross-sector and cross-national cooperation and broadens the public's access to scientific computing.

The National Digital Competencies Initiative - Portugal InCoDe.2030 is a package of initiatives designed to encourage the use of new technologies by organizations within the public sector. AI Portugal 2030 and ACP.2030 are also components of this initiative. Funding for data science and artificial intelligence in the public sector was initiated. This was done to encourage an increase in public tenders.

Romania

## 1. General Information

Area: 238,391 km<sup>2</sup>

Population: 19,659,267

Government Type: Unitary semi-presidential republic

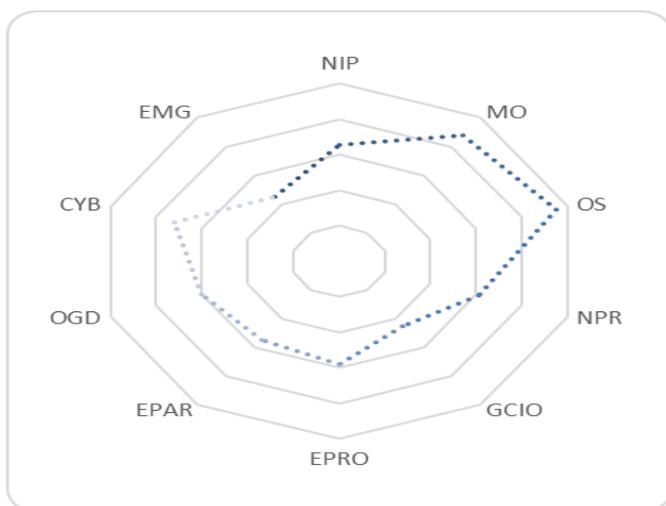
GDP: \$12,692

Internet User: 78.46

Wired (Fixed Broadband User): 29.55

Wireless Broadband User: 92.01

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Romania was ranked 47th in the Waseda rankings in 2022, with a total score of 65.820. The eRomania policy seeks to improve the ability of public organizations and agencies in Romania to create and execute eGovernment solutions. The issue with Romanian public policy in eGovernment is the underdevelopment of public eServices, which becomes

apparent when examining the shortage of electronic public services made available to the general public that is more sophisticated than level-2 digital sophistication (one-way interaction with citizens, e.g., downloading electronic forms). Thus, the urgent necessity for an eRomania public policy.

Despite its enormous telecommunications infrastructure that provides highly fast and affordable access to the network, Romania stands out as having one of the most miniature developed systems of online public services in the EU. This is due to a combination of factors, including public resistance and distrust of the e-government solutions offered and the policy of governments, which did not show much interest in the country's digitization process or failed to propose a comprehensive program for its implementation. The breakthrough came about because the COVID-19 epidemic drove Romanian society to utilize public digital services and prompted authorities to implement legislative reforms and install new technology solutions that had been delayed.

The overarching goal is to increase the number and quality of electronic public services in Romania. Specific objectives include:

- Objective 1: Developing life-event-related public eServices for citizens and businesses by the end of 2030, with a digital sophistication level of at least level 4;
- Objective 2: Strengthening the capacity of public institutions and authorities to operate in an advanced digital environment and providing mature public eServices by the end of 2030;
- Objective 3: Increasing the efficiency with which public institutions and authorities provide mature public

### **3.2. New Trends**

The National Electronic Registers Draft Law assured the REN's coverage, constitution, administration, and functioning. It sought to eliminate the duplication of data used by the public sector, prohibit the repetitive collecting of information from individuals or organizations, and assure the accuracy and security of data. The regulation was primarily designed for persons and organizations interested in establishing strategies for the information society and developing and operating electronic services.

Concerns were expressed concerning the Romanian government's preparedness for and ability to handle the COVID-19 epidemic, particularly during lockdown periods. The Authority for the Digitalization of Romania came at a good time for the nation (ADR). Supporting and coordinating the transition to a digital economy and society, as well as developing a system for the electronic management of government operations, were among the stated goals of the newly formed agency. The epidemic allowed the ADR to speed up their preparations. A qualified electronic signature is legally equivalent to a handwritten signature, and as of April, the government issued an emergency order mandating that all government agencies produce and recognize digitally signed papers.

Information society and communications are governed by the Ministry of Research, Innovation, and Digitization (MCID). This specialized Ministry is the primary source of policies and strategies in this area, which also acts as the central public administration's technical authority for the communications and information society industries. In addition, the MCID carries out policies and plans in communications and the information society with the subordinate agencies and departments.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The digitalization effort in Romania has benefited from large expenditures made by Romania in developing inputs for the initiative. Orange Romania has expanded its 5G service to include over ten cities and established its fiber network. Around 79 percent of fixed broadband connections are faster than 100 megabits per second.

##### **4.2. Management Optimization [MO]**

Romania produced a strategy designed to improve and promote the availability of eCommerce solutions throughout the nation. This policy was developed on the recommendations provided by the European Commission. The paper included a comprehensive review of eCommerce development's current status and identified the future primary paths and strategic goals.

The strategy was followed by an action plan that included a series of tasks and due dates for each of its goals. The primary purposes outlined for the advancement of e-commerce solutions in Romania are: Establishing an enticing and compelling regulatory framework

for e-commerce; Educating suppliers and online service providers about e-commerce solutions; Strengthening the institutional framework for e-commerce solutions.

#### **4.3. Online Service [OS]**

System for National eProcurement The ADR is in charge of Romania's central electronic procurement platform. Any Romanian contracting authority must post notifications as part of the public procurement process. This solution streamlines processes for suppliers and buying organizations. The country's central hub is the system for sending public procurement notifications to the EU Official Journal. It also provides interactive and transactional capabilities that support 20% of the public purchase budget.

#### **4.4. National Portal [NPR]**

Online access to central and local government services and information is made possible via the transactional platform known as the eGovernment Portal. Numerous transactional and interactive services are readily available to consumers. Additionally, there are connections on the website for contacting the Public Administration and for all federal, state, and local government departments.

The Electronic Point of Single Contact webpage aims to offer the necessary details, operational procedures, and interactive forms for service providers intending to do business in Romania. Also provided is information on the country's objectives, benefits, and business environment. Residents who use the portal may save spending a lot of time and energy physically showing their documents at a counter. The site provides a wide variety of proper forms, processes, and legal references for its visitors.

#### **4.5. Government CIO [GCIO]**

The job of Chief Information Officer is managed by the National Center for Management of the Information Society, which reports to the Ministry of Communications and the Information Society, which is in charge of the position. A newly established private organization known as the Chief Information Officer (CIO) Council comprises high-ranking executives from various of Romania's most renowned domestic and international enterprises.

#### **4.6. E-Government Promotion [EPRO]**

A strategy that will be implemented in 2019 by Romania to encourage and facilitate the development of e-commerce platforms compliant with EU criteria has been disclosed. In this piece of writing, an analysis of the current status of eCommerce development was presented, as well as a prospective look at the possible strategic goals that may be achieved with the assistance of eCommerce. It wasn't only a strategy; there was also a comprehensive action plan that laid out when and how each target would be achieved. The primary objectives of developing eCommerce solutions in Romania are to provide a legal framework that is enabling and uniform, to educate and inform suppliers and online service providers, and to upgrade the institutional structure for eCommerce solutions. These are the three main goals of developing eCommerce solutions in Romania.

The Digital Romania Consulting Council brought together this group of digital society experts to advise on the growth of Romania's digital society. The Romanian National Computer Security Incident Response Team (CERT) is an organization that is backed by the Romanian government and is responsible for conducting research, developing new tools, and providing guidance to individuals and businesses that are looking to improve their computer security. Creating and deploying public safeguards that will discourage and mitigate assaults on the nation's cyber infrastructure is the responsibility of the Computer Emergency Readiness Team (CERT).

#### **4.7. E-Participation [EPAR]**

With the use of electronic local community networks, communities on a local level have access to the Internet. Every single area that is serviced by the networks has its very own public access point. In addition to bridging the digital divide between developed and undeveloped regions, one of the goals is to increase the use of information and communications technology (ICT) in educational settings. Another objective is to create a link between residents and their government. Digital communication between EU agencies, organizations, and the Member States is made possible through the Trans European Telematics Services across Administrations.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The Romanian government's Ministry of Research, Innovation, and Digitalization have issued an urgent decree through the internet. A vital first step in Romania's digital

transformation and a significant milestone in the PNRR (National Recovery and Resilience Plan). By facilitating collaboration between government agencies, Romania may speed up its path to modernization and prosperity, and its population can enjoy the fruits of that progress.

Even though letters of official notice were sent on the 30th of September 2021, the member states named above could not communicate all of their national measures, even though the deadline for transposition had passed on July 17th, 2021. Adopted on the 20th of June in 2019, the Directive on Open Data and the Reuse of Public Sector Information intends to liberate the potential advantages of data. It contributes to making more of the enormous and vital pool of data resources created by the public sector accessible for reuse. This will make more data accessible, lower the costs of reusing data, and expand commercial prospects via data sharing through application programming interfaces. It will also remove the barriers to market entry for small and medium-sized enterprises (SMEs) (APIs). The Directive encourages the creation of innovative solutions like mobility applications, boosts openness by expanding access to research data sponsored by the public sector, and provides support for emerging technologies like artificial intelligence. Within the next two months, if these Member States do not offer a response that the Commission deems sufficient, the Commission may decide to refer the case to the Court of Justice of the European Union.

#### **4.9. Cyber Security [CYB]**

Government Decision No. 271/2013 authorized the National Cybersecurity Strategy. Through the responsible authority of the new Agency for the Digitization of Romania, under the direction of the Prime Minister, the government can strategically coordinate the national level actions to maintain a high joint degree of security of the networks and information systems. The NIS Directive, also known as Directive (EU) 2016/1148, was transposed in 2018 with the help of Law No. 362/2018, which established a strategic framework.

The National Directorate of Cybersecurity (DNSC) is a new entity tasked with research, development, and cybersecurity competence. It replaced the Romanian National Computer Security Incident Response Team (CERT). The DNSC is tasked with preventing, analyzing, and responding to cyber incidents. It is also responsible for

creating and disseminating public policies to prevent and counteracting events inside national cyberinfrastructures.

#### **4.10. The use of Emerging ICT [EMG]**

The major development drivers for the Romanian digital economy are expected to be ICT and digital commerce, which may increase the country's GDP by as much as 3.5 times, reaching about 52 billion euros in 2030 from 14.8 billion euros in 2018.

From 2017 to 2021, ICT spending in Romania increased by almost 8% yearly, reaching €3.5 billion. Romania's more advanced information and communication technology (ICT) infrastructure might lead to a more tech-savvy populace. Because of this, ICT may remain the digital economy's primary growth engine until 2030. The size of Romania's digital commerce sector can quadruple, reaching 19.6 billion euros in 2030, thanks to the implementation of ultra-convenience technologies.

Russia

### 1. General Information

Area: 17,098,242

Population: 144,703,750

Government Type: federation

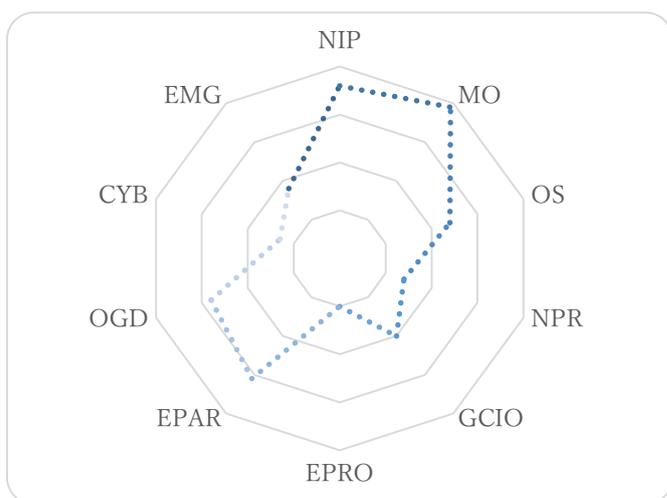
GDP: \$ 10,250

Internet User: 84.99

Wired (Fixed Broadband User): 23.23

Wireless Broadband User: 100.22

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

In 2022, Russia was ranked 37<sup>th</sup> in the Waseda International digital government rankings, with a score of 69,239. Although the COVID-19 epidemic has progressed in Russia, the nation has not been on "high alert" since early April; only some localities have done so. Authorities in Russia have pushed for digital technologies to restrict public mobility and

slow the spread of the virus. These "securitization" usages are influenced by those in China, Korea, and Singapore but are also consistent with the "sovereignty" rationale of the Russian Internet (Runet). Before the outbreak, this logic was put into action by integrating preexisting monitoring systems.

Russia's government has been aggressively implementing IT import substitution and supporting protectionism in local software and internet services while also putting up roadblocks for international tech enterprises to realize its key objective of developing a sovereign internet. Russia's economy is still heavily reliant on Western firms and goods for the time being. However, in critical hardware and software industries like microprocessor manufacture, 5G solutions, operating systems, and the cloud, neither the quantity nor the quality of domestic solutions is sufficient to replace the widely used foreign technology. Data acquired by foreign firms and held outside Russia is also essentially out of the country's control. Russia's long-term objective of IT independence requires the development of domestic substitutes for the whole gamut of international technology. This enormous undertaking is almost impossible to complete in the near and medium future. Russia's digital and innovation strategy is insufficient to catch up and attain true technological sovereignty and global competitiveness.

Surprisingly, Russia remains hesitant to abandon tried and true American and European IT systems in favor of Chinese alternatives despite increasing disputes with the West and declaring tighter collaboration with China. It worries greatly about its security if it needs to depend on Chinese IT and is aware that, due to the United States and China's competitiveness in the computer industry, the adverse spillover effects of US sanctions on Chinese enterprises might return. Given the present escalation of tensions between Russia and the West, it is uncertain how Russia will strike a future balance between its tech reliance and its dependence on China.

### **3.2. New Trends**

The epidemic has revitalized and firmly established the role of digital government, both in the traditional delivery of digital services and in the development of novel approaches to crisis management. Governments have implemented innovative technologies in response to the health emergency, including COVID-19 information portals, hackathons, electronic services for the provision of medical items, virtual medical appointments, self-

diagnosis applications, and electronic permissions for curfews. Apps for remote work and education and tracking and tracing tools have been adopted rapidly in many nations.

Over the last decade, Russia's drive for "digital sovereignty" has emerged as one of the country's most crucial but underappreciated geopolitical actions. The Russian government knows full well the relevance of the phrase. Still, they are keeping it nebulous to not give away their goal for more centralized control over information and their pursuit of technological independence and global competitiveness.

In order to ensure Russia's continued existence and solidify its place in the new international order, President Vladimir Putin's administration is looking to digital technology. However, Russia is still highly reliant on other players, notably the information and communications technology (ICT) of the United States and Europe. The Russian government, businesses, and individuals all rely on a wide variety of internationally held technologies and resources, including hardware, software, and social media platforms.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

To aid Russian network operators in streamlining the required knowledge for 5G networks and obtaining assurances of the band's usage, the Russian Ministry recommended converting the 4 GHz spectrum to "civilian." In 2023, the initiative's implementation is anticipated to begin in earnest. It will aid in deploying 5G in Russia and the consequent acceleration of Internet speeds.

The Ministry of Digital Science said in late June 2022 that the frequency band of 3.4-3.8 GHz will not be utilized for 5G networks. Instead, the Russian government settled on the 4.8-4.9 GHz range for its 5G infrastructure. The Ministry identified a critical frequency range for 5G to be between 3.4 and 3.8 GHz; however, this band is already used in Russia for various other services, including power distribution. Operators requested a one-year license extension from the State Commission on Radio Frequencies (GKRCH) after the first ten-year licensing term expired in 2021. The SCRF has given the licensees more time to use the airwaves until July 1, 2022. In order to continue offering WiMAX-based wireless Internet access services to customers, companies including Rostelecom,

MegaFon, and VimpelCom petitioned for an extension of the permission for frequencies in the 3.4-3.8 GHz range but were denied.

Ministry officials assume domestically produced networking hardware would be used in the rollout of 5G systems. That decree was issued before sanctions were imposed on Russia for its involvement in the crisis in Ukraine. The Russian Ministry of Finance announced in September 2021 that only base stations produced in Russia might be used in the country's communications infrastructure. The transition to 5G base stations is expected to occur during the next two to three years after the mass manufacture of such LTE standard stations.

#### **4.2. Management Optimization [MO]**

The country's leadership perceives itself on two fronts, and its reliance on foreign technology makes it vulnerable to both.

Indeed, there has been a growing belief in recent years that "the West" may use digital technology as a weapon against Russia. Since 2014, the regime has repeatedly presented a scenario in which Russia is cut off from the global internet and hit with technological sanctions from the United States while technologically superior states from the West infiltrate the country's critical infrastructure, all to evoke fear and justify greater control and IT substitutions. Russia's worries have become severe as the geopolitical war with the West deepened in that period.

At the same time, Putin's leadership is under internal pressure and is trying to strengthen its position in Russian politics by consolidating power. The constant danger comes from the unrestricted availability of the internet and the spread of vital information. The social order depends on a centralized authority that might be threatened by any type of subversion, actual or imagined, aided by information technology.

Russia's declared objective of creating its digital technologies and innovations is being hampered by the conflict on both of these fronts, dictating the nature of Russia's digital sovereignty policy. Separating the term into "sovereign internet" and "technology sovereignty" can help one better understand Russia's overall effort in digital sovereignty.

#### **4.3. Online Service [OS]**

Russia's security apparatus, the siloviki, has been more vocal in the digital arena in recent

years, even though the country's digital economy is still competitive and diversified. There is promising potential for building technological sovereignty in some fields. As time goes on, the tension between the Russian government's need for safety and the openness of the market that is essential to progress becomes more apparent. The dictatorship has redefined digital sovereignty as ensuring its continued rule by controlling the information technology industry.

Recently, Russia has deployed sophisticated technical tools for censorship and shown astonishingly adept information management on massive sizes. Nevertheless, continuing down the path of securitization undermines the foundations upon which the IT industry may thrive and compete globally. Numerous international IT giants with Russian origins have moved their headquarters overseas, and Western firms have acquired other Russian IT powerhouses directly from this course of action. Most of today's IT students desire to leave Russia, which might lead to a severe shortage of human resources in the sector.

#### **4.4. National Portal [NPR]**

The Russian government has an official website at <http://government.ru/> where interested parties may get complete and up-to-date information on the organization's activities. The decisions, legislation, directives, and programs of the government and the work of the Prime Minister and their deputies may all be found here for simple reference. The Government Executive Office will regularly update the Russian government's official website. The public relations team will inform the media about the site's ongoing updates, including adding new features and sections and revising existing ones. To rephrase, the Ministry of Telecom and Mass Communication website is an authoritative and comprehensive resource for all things related to the department.

#### **4.5. Government CIO [GCIO]**

Russia does not have a designated chief information officer at the federal level. The initiative is overseen by the Deputy Minister of Digital Development, Communications, and Mass Media, who oversees coordination and oversight. The Minister of Digital Development, Communications, and Mass Media appoints the department head. This year also saw the debut of the country's new Chief Digital Officer (CDO).

Government officials are in charge of Russia's progress in the digital sphere. The first step was the introduction of digital managers in key government agencies, including the Department of Building and Construction, the Department of Health, the Department of Education, the Department of Energy, and the Department of Transportation. The deputy ministers advancing digital technologies are often expected to have a trifecta of state, digital, and industrial portfolios. The President also signed a decree creating the position of Presidential Representative for Digital and Technological Development of the Russian Federation.

#### **4.6. E-Government Promotion [EPRO]**

Upon closer inspection, the Russian government's declarations and stated intentions are met with sobering reality. Russia's government is working hard to establish a completely independent internet and exert even more direct control over its citizens and local IT industry. While other countries are becoming more technologically independent, Russia is still heavily reliant on those around it. Here, we do a thorough job of painting a picture by mapping and analyzing how the concepts of technological sovereignty and the sovereign internet have been put into practice.

Internet sovereignty and measures to ensure the integrity of online material have been widely adopted in recent years. The Russian people used the open internet to stay informed and organize demonstrations only ten years ago. It is becoming common practice for governments to utilize digital tools to stifle citizens' freedom of expression, halt the spread of vital information, and exert power over internet service providers.

#### **4.7. E-Participation [EPAR]**

Russia has developed a comprehensive legislative framework and several rules during the last decade to determine its future digital sovereignty. Due to the widening chasm between the Russian government and its citizens and the intensifying geopolitical conflict with the "West," the country's digital strategy has two primary objectives: the regime seeks to ensure Russia's technological independence and global competitiveness through state control of the internet (known as "technological sovereignty"), while also gaining content security through state control of the internet (known as "sovereign internet").

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The digitalization of Russia's economy is rapidly becoming a priority for the country's leaders. The President has made it clear that he is aware of Russia's difficulties in transitioning to digital technology. This sparked more debate on the digitization approach across numerous Russian online forums. In only one month, there were dozens of conferences, seminars, and meetings focused on digital concerns organized by prominent Russian business and scientific groups. The government's effort to digitally change the Russian economy is based on the results of public talks that served as the foundation for further organizational work.

Russian President Vladimir Putin issued an executive order mandating the release of open government data, and in 2014, the Open Government Data Portal ([data.gov.ru](http://data.gov.ru)) was introduced. According to EU officials, "open government data" is "the information gathered by the public bodies (PSI) and made freely accessible for re-use for any purpose." There is still a need to give open data, despite eliminating the minister of Open Government, proclaimed by Medvedev and intended to increase transparency in Russia's legislative and executive branches.

#### **4.9. Cyber Security [CYB]**

New information suggests Russia's government is investigating hacking strategies. DDoS assaults and the distribution of harmful malware against the Ukrainian government and critical infrastructure institutions are just two examples of Russia's state-sponsored cyber operations that have made headlines in recent years. In addition, several cybercriminal organizations have recently declared their support for the Russian government. Cybercriminal organizations with ties to Russia have threatened cyber operations as punishment for what they see as cyber attacks on the Russian government or the Russian people. Some organizations have also threatened cyber attacks against those who provide Ukraine with military hardware. Other cybercrime organizations have lately launched destabilizing operations against Ukrainian websites, most likely in aid of the Russian army onslaught.

The joint CSA advice, "Understanding and Mitigating Russian State-Sponsored Cyber Threats to the United States," has been updated. An Overview of Russian State-Sponsored Cyber Operations and Commonly Observed Tactics, Techniques, and Procedures for Critical Infrastructure (TTPs). This CSA was written by cyber authorities from the United

States, Australia, Canada, New Zealand, and the United Kingdom, with input from members of the industry working in the Joint Cyber Defense Collaborative (JCDC). It provides an overview of Russian state-sponsored advanced persistent threat (APT) groups, Russian-aligned cyber threat groups, and Russian-aligned cybercrime groups to help the cybersecurity community prepare for potential cyber threats.

#### **4.10. The use of Emerging ICT [EMG]**

Because of the speed with which ICT is evolving, manufacturing processes are being disrupted, and new industries are being created. Businesses adjust their supply and demand models to better use information and communication technologies. Government agencies are changing how they operate internally, connect with businesses and people, and provide public and municipal services. Since ICTs are ubiquitous and valuable in many contexts, their impact goes beyond the monetary sphere. Changes in modes of interaction and the emergence of new patterns of lifestyle, leisure, and work organization may be attributed to them. The outcomes of ICT development impact almost every economic factor.

The 'Information Society Development Strategy in the Russian Federation,' the State Program 'Information Society 2011-2020,' and the strategies for the development of IT in the Russian Federation for 2014-2020 and up to 2025 all reflect the fact that the remarkable expansion of ICT-related markets and the emergence of new areas of ICT usage pose unprecedented challenges and bring forth new public policy objectives. The goals of public policy in the areas of e-government, telecommunications, the IT industry, and the content and media sector include the growth of the information society, the betterment of people's everyday lives in economic, social, political, and cultural terms, improved governance, and increased market competitiveness for ICT-related products and services.

Saudi Arabia

### 1. General Information

Area: 2,149,690 km<sup>2</sup>

Population: 36,535,147

Government Type: Unitary Islamic absolute monarchy

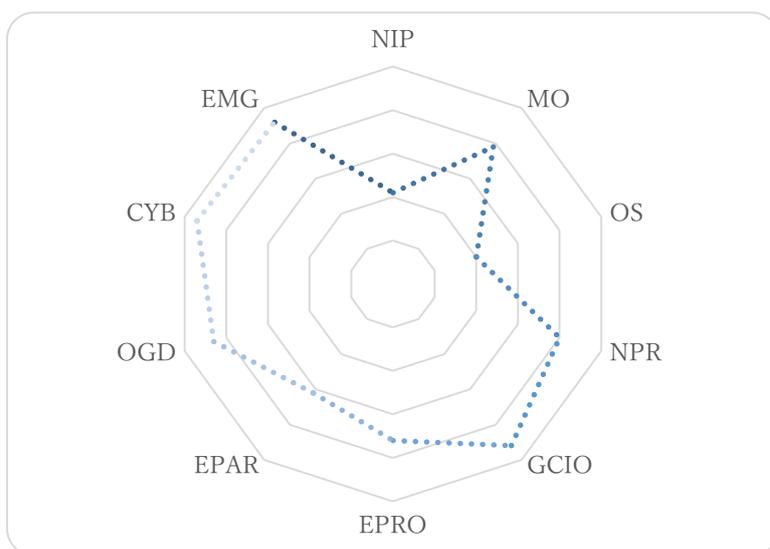
GDP:\$ 19,319

Internet User: 97.86

Wired (Fixed Broadband User): 22.66

Wireless Broadband User: 118.86

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

As of 2022, Saudi Arabia's digital government has an overall score of 75.369, placing it 25th in the world according to the Waseda International Digital Government Rankings.

The Government Electronic and Mobile Services Maturity Index (GEMS) released earlier

this year by the Economic and Social Commission for Western Asia rated Saudi Arabia in the top place (ESCWA). This index evaluates the degree to which different governmental services, such as education, law, finance, business, and tourism, are delivered digitally via web portals and mobile apps.

According to the Digital Maturity Report published by the World Bank in 2021, the nation also placed among the top nations in terms of offering digital government services and contact with residents.

The Digital Government Authority, the reference organization for regulating the services of government agencies offered to people and residents, is in charge of overseeing the Saudi digital government. In digital administration, the Kingdom has achieved significant advancements in recent years. Government agencies maintain promptness, correctness, quality, fairness, and openness in all aspects of their operations. Focusing on citizen-centered government, the tremendous interest in innovation, and the necessity of employing it in the field of digital government, there is a close link between achieving advanced levels in the maturity of digital government applications and practices and knowledge management. This link is especially important when considering the necessity of employing innovation in the field of digital government.

### **3.2. New Trends**

As one of Saudi Arabia's most ambitious endeavors, "Move to Tech" represents a major transformation in the country's economy. Initiated on March 10, 2020, by the Saudi Ministry of Communications and Information Technology, this initiative will run through March 9, 2021. It paves the way for the adaptation of already digital resources to COVID-19 and the creation of new ones. In response, several sectors, including academia, the food industry, and healthcare, have increased their use of digital technology. There will be more work on this project in the future as the monarchy strives for economic success.

The Smart Government Strategy lays out the long-term objectives, short-term targets, and intermediate steps for the government of Saudi Arabia (2020-2024). The Sustainable Development Goals and the Saudi Vision 2030 are the primary foci of strategic planning. By 2024, the Smart Government Strategy says, the government of the Kingdom will be more reactive, efficient, and inventive, leading to new integrated Smart Government

experiences tailored to the demands of its beneficiaries. The government has many aims, including those listed below:

Maintain a high standard of exceptional smart service at all times.

The digital transition may be sped up by tapping into a partner network.

- Maximize the use of community assets to improve public services

The plan of action will ensure that the objectives of the Kingdom are accomplished by developing a Smart Government that caters to the needs of its citizens, residents, and guests.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Digital solid infrastructure in the Kingdom of Saudi Arabia helps move the country's digital transformation forward rapidly. Because of this method, the Kingdom has been able to address issues affecting the public and private sectors while ensuring that commercial, educational, and resident life continues as usual. During the outbreak, the Kingdom could quadruple its regular internet traffic more than, boost its internet speed from 9Mbps to 109Mbps, and complete an expansion of its interior coverage.

##### **4.2. Management Optimization [MO]**

As part of the Smart Government Strategy, improved citizen services and more efficient government operations are prioritized via better data governance. To improve the reliability and accessibility of public sector data, the Smart Government Strategy prioritizes the definition and implementation of data governance.

National Data Management works to design and build necessary frameworks and agreements to ensure that best practices keep data and to create and enable data sharing among government institutions.

The Once-Only Principle also plays a significant role in the Saudi Arabian strategic goal. Increased Smart Government Services led to higher levels of customer satisfaction. By requiring citizens to input their information only once and by improving the security and usability of digital services by connecting the data provided by citizens via this standard digital identity across Government, the goal is to ensure that citizens trust all services and

that their data is securely managed through a single typical identity service.

#### **4.3. Online Service [OS]**

In recent years, the concept of digital identification has emerged as an essential part of the eGovernment system in Saudi Arabia. Every citizen of Saudi Arabia or a resident can establish a Digital Identity by registering with the National Information Center and the National Single Sign-On system run by the Ministry of the Interior. They can use their digital ID to access over 700 online government services by logging into my.gov.sa, other government websites, and third-party providers, such as banks and telecommunications firms.

A special recognition of this fact may be found in the Smart Government Strategy's strategic aim. The goal is to ensure that citizens trust all government services and that their data is securely managed through a single typical identity service by improving the safety and usability of digital services and enriching these services with the information provided by citizens through this standard digital identity. This can be accomplished by increasing the security and usability of digital services.

#### **4.4. National Portal [NPR]**

The Kingdom of Saudi Arabia has made significant strides in developing the country's national portals.

- The Ministry of Justice has centralized its service distribution on the Najiz Portal to increase customer happiness.
- By facilitating the filing of electronic applications for the granting of frequently used licenses and enhancing the quality of services given to beneficiaries, the 'Balady' Portal delivers interactive services that support the concept of 'community participation. It also helps those who benefit from it make choices that may boost consumer satisfaction with municipal entities and improve the quality of municipal services provided to all secretariats and municipalities throughout the Kingdom. To improve and expand investment services, assure the quality of service provided to investors, and speed up relevant procedures, the "FORAS" Municipal Investment Portal provides a centralized platform for publishing investment opportunities offered by secretariats and municipalities.

- Improve educational outcomes and student success using the 'iEN' National Education Portal's range of e-learning services for public education and interactive material.

#### **4.5. Government CIO [GCIO]**

CIO Portal is a unified and interactive e-portal for government IT executives that aims to provide users with an exceptional experience that seems to be tailored to their specific requirements. The portal was created to provide users with an exceptional experience that seems to be tailored to their specific needs. The Yesser Program allows users to embrace common national services and apps to expand and improve Saudi Arabia's digital transformation.

#### **4.6. E-Government Promotion [EPRO]**

In Saudi Arabia, the Digital Government Authority (DGA) has initiated the Inclusive Government Program to provide the government sector with integrated digital services. The goal is to enhance the amount of data shared across government departments to promote integration and speed up the process of achieving a sustainable digital transformation of government.

By establishing uniformity across a select group of essential platforms and applications, the purpose of this initiative from the government is to enhance the quality of the digital experience that end users have. The Inclusive Government Program aims to provide a better digital experience for the beneficiary through unified platforms. This will be accomplished by designing and operating comprehensive government platforms using a set of technologies that allow the authorities to develop exchange, and link services without redesigning, testing, and running the same platforms.

#### **4.7. E-Participation [EPAR]**

The government of Saudi Arabia has made great strides toward its goal of universal internet access, particularly for the handicapped, women, youth, the elderly, and foreigners. The Saudi Vision 2030 aims to ensure that no one is left out of the digital revolution. In addition, the National Transformation Program lays out some essential goals to ensure that all individuals, particularly underserved ones, have access to digital

resources.

However, the ICT Sector Strategy emphasizes expanding opportunities for women in the ICT industry. Open data and participatory citizenship initiatives around the nation. Meeting national expectations for E-participation is another benefit of e-engagement. The Open Data initiative aims to make more publicly-available data usable by individuals and organizations for various purposes, including but not limited to civic engagement, scientific inquiry, and the creation of novel goods and services.

Watani and Ma3an's current survey and polling skills are enhanced by the Participatory Citizenship E-Engagement, which implements and promotes e-consultation capabilities throughout the government to boost participation in policymaking and service enhancement.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The Kingdom of Saudi Arabia (KSA) government has adapted to digital transformation due to worldwide government and institutional technology development trends. To improve productivity and quality, it has abandoned manual procedures in favor of digital ones and devised strategies to implement over five years. The program's ultimate goal is to transform government to serve the public better digitally. The International Telecommunications Union has presented the Government Leadership Award to the Kingdom of Saudi Arabia for enacting the most progressive policies and laws to advance the digital economy, encourage investment and innovation, and help achieve the SDGs.

It is the responsibility of the Saudi Data and Artificial Intelligence Authority (SDAIA) to oversee all national data in the Kingdom of Saudi Arabia. In preparation for future national laws on data categorization, data sharing, data privacy, freedom of information, open data, and others, SDAIA has established the Open Data Strategy and Framework for National Data Governance.

A centralized repository called the Open Data Repository has been set up to keep track of everything uploaded to the National Open Data Portal. This repository serves as a central catalog for all various datasets that government agencies have made accessible through the National Open Data Portal. Dataset inventories must be created and kept up-to-date by each government agency under the metadata requirements outlined in the Data Quality

Guideline.

#### **4.9. Cyber Security [CYB]**

In March 2021, the National Cybersecurity Authority of Saudi Arabia and the Saudi Ministry of Education agreed to work together on cybersecurity education and investigation. It is essential to do so to make a contribution to cybersecurity activities and to realize the goals of the 2030 Strategy. The National Curriculum Authority (NCA) and the Ministry of Education actively collaborate on various projects to advance online research and higher education.

Following the most recent cyber assault on Saudi Aramco, Saudi Arabia attempted to limit the number of instances in which cyberattacks are carried out. The administration has shown interest in increasing the amount of money invested in cybersecurity infrastructure. they already founded the National Centre for Cybersecurity Technology, intending to research the safety of networks, software, and information. The Center's research assists the nation's preparation for the execution of "Vision 2030."

#### **4.10. The use of Emerging ICT [EMG]**

Saudi Arabia is well on its way to becoming the world leader in the digital economy thanks to the widespread use of technologies like artificial intelligence (AI), the internet of things (IoT), blockchain, big data, robotics, machine learning, and 5G in both the public and commercial sectors. Saudi Arabia is an early adopter of blockchain technology, opening the door for international companies to experiment with cutting-edge digital solutions. The goal of the Kingdom of Saudi Arabia's use of AI for development is to make it a global leader in the field. To reach its national objectives, the Kingdom has developed mechanisms to increase its efforts, passed the National Strategy for Data and Artificial Intelligence (which includes various recommendations), and launched or sponsored some initiatives.

Some of the country's organizations have made strides through implementing Internet of Things solutions in such public sectors as education, energy, environmental management, health care, open data, smart cities, and smart manufacturing; these sectors are expected to grow and develop in the coming years. Many businesses around the nation have reaped significant advantages from IoT, including improved productivity, security, customer

happiness, resource efficiency, analytical accuracy, cost control and management, and more.

Singapore

## 1. General Information

Area: 710 km<sup>2</sup>

Population: 5,984,924

Government Type: Unitary dominant-party parliamentary constitutional republic

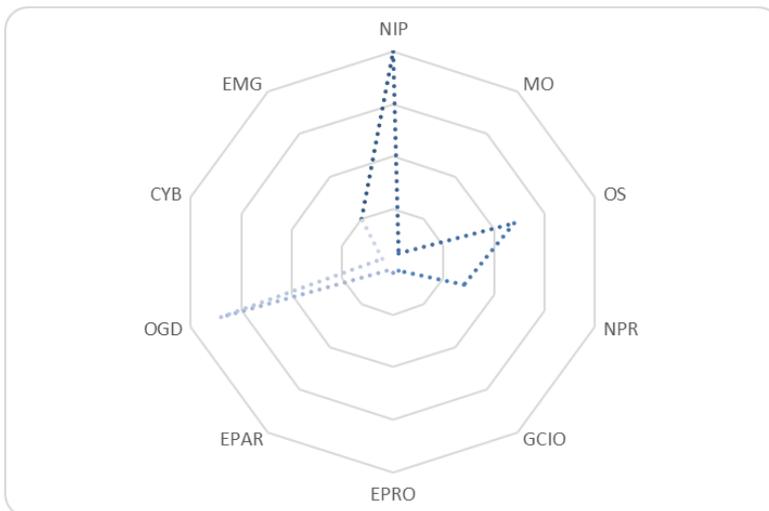
GDP: \$57,782

Internet User: 92.00

Wired (Fixed Broadband User): 25.81

Wireless Broadband User: 144.35

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Singapore's digital government achieved the 4th position in the 2022 Waseda International Digital Government Rankings, with an overall score of 91.6292. Singapore has made significant headway in establishing itself as global-Asia research and development powerhouse, and its expertise in digital technologies has been recognized

globally. Singapore's Smart Nation and Digital Government Group employed cutting-edge technology to act rapidly and decisively in the face of the pandemic, ensuring the safety of its citizens. Today, research articles from Singapore in the fields of artificial intelligence (AI), quantum, and trust technologies (such as technologies that preserve users' privacy and technologies that use distributed ledgers) are among the most widely referenced in the world.

Earlier investments in digital technology and innovation activities helped to create a robust and attractive startup environment in Singapore. Many digital companies have recently developed in various industries, such as e-commerce, digital health, and finance. Some of these firms have achieved unicorn status, such as Razer and Sea (Garena). In addition, international digital businesses such as Google and Salesforce continue to make significant investments in Singapore, with the goals of growing their research and development (R&D) or engineering operations here and providing more employment opportunities for the local population. The public research skills in a wide range of technical fields have also resulted in several spin-off companies, one of which is the National Cybersecurity R&D Programme (NCRP), which spawned six firms in the cybersecurity industry .

### **3.2. New Trends**

The global digital world is constantly changing quickly. The current COVID-19 epidemic has expedited digitalization across all industries, which has brought to the forefront an increasing need for digital platforms, software, hardware, and services. During these shifts, the monitor group must focus on product development and implementation of digital technologies in both the public and private spheres. Additionally, they will need to continue to rapidly transfer the advantages of R&D into commercial applications for the industry.

As changes to global supply chains continue to take place, and more services and interactions take place online, there will be a greater focus put on bolstering the assurance of supply and provenance for products such as food, medicine, and components used in technology. Through the development of digital technologies, such as blockchain, Singapore has the potential to play a role as a trusted innovator and value-adding

middleman. These technologies are designed to give assurance of supply and provenance. The government will create new skills to reinforce the trusted Singapore brand, and it will form new relationships that will offer new expertise and new markets. Both of these initiatives are going to be undertaken shortly. These activities will be supported by digital talent, and SNDE will continue to establish a solid local base of scientists, engineers, and product managers in critical technological fields.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The implementation of 5G services in Singapore has commenced, which has improved the level of connection experienced in various public locations. 30 million Singapore dollars were allocated for adopting and implementing 5G technology. Large volumes of data are created by various organizations using various sensors to the Smart Nation Platform, which is implemented. These may result in valuable analyses and applications that the government can use to improve the delivery of essential public services such as transportation, utilities, and many other services. Citizens may also be much more informed and can make better choices by using the apps and data analytics that are accessible, most of the time, via their mobile devices.

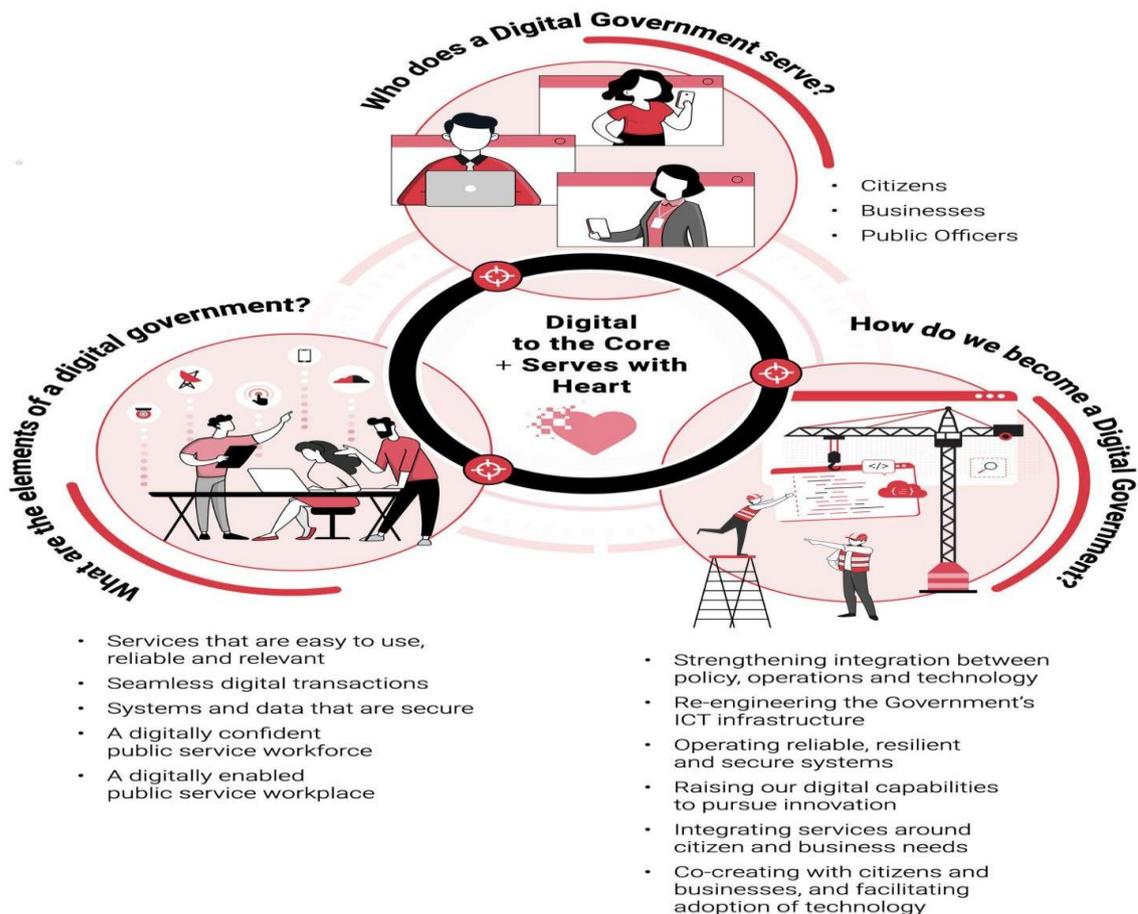
In addition to putting in place the essential infrastructure required to guarantee that officers continue to have easy access to the Internet for work-related purposes. The government is in the process of adjusting and adapting the work processes, as well as introducing productivity solutions and tools, to keep the Public Service both efficient and productive. The delivery of the government's many public services has not been affected in any way.

##### **4.2. Management Optimization [MO]**

As one of the top five nations in the world based on OS criteria, Singapore scored 12 points in the Waseda rankings for 2022. Singapore has established its goals for 2023 and beyond:

- Seventy percent of adornment systems will be housed in the private cloud.
- A fundamental understanding of digital technology is required of all public servants.

- Each ministry family should be responsible for at least one AI project to provide services or formulate policies.
- Every year, at least ten high-impact data analytics initiatives across many agencies must be completed.



### 4.3. Online Service [OS]

When it comes to the delivery of digital services, the Government Digital Services (GDS) section of GovTech uses agile methodologies such as Kanban, XP, Scrum, and LeSS. For instance, GDS is able to create the mobile application myResponder in only six months using the agile methodology. This program is intended to offer victims of heart attacks prompt assistance. It was built iteratively via a series of workshops with persons and officers from the defense force to guarantee that the experience would be user-centric. On this regard, one stop service for citizen is excellent.

Another subsidiary of GovTech, Open Government Products, is an enthusiastic proponent of agile development. Open Government Products is responsible for the creation of digital public goods. For instance, within a year, the division created FormsSG from the ground up, taking it from a concept to a platform. The platform allows public servants to design digital forms compatible with the various computer systems used by the government. It has resulted in savings ranging from S\$5,000 to \$150,000 per form after being used by 90 different organizations. Transitioning to a more iterative and agile software development method has not been easy. Public officials have accepted that a change in attitudes, hierarchies, and positions, as well as the construction of a large amount of trust, is required in addition to a change in methods.

#### **4.4. National Portal [NPR]**

The most recent information on various topics, such as taxes, public health, immigration, and the economy, can be found on the official National Portal of Singapore, accessed at <http://www.gov.sg/>. This portal is available to both Singapore residents and tourists visiting the country. This website makes it easier for people in Singapore to communicate with one another by supplying them with critical economic facts, digital public services, and Singaporeans' hopes and aspirations for the country. In addition, there are copies of ministerial speeches, press releases, and other important information, as well as guidance on how to get in touch with the various government departments.

#### **4.5. Government CIO [GCIO]**

The Infocomm Development Authority was reformed on October 1, 2016, which resulted in the establishment of the Government Technology Agency of Singapore, often known as GovTech. Its goal is to equip a nation of possibilities with cutting-edge information and communications technology (ICT) and engineering that is linked with it. A Government Chief Information Officer (GCIO) is designing and supervising ICT initiatives as part of GovTech to maintain Singapore's leadership position in using ICT creatively to please customers and connect people. In addition, Singapore received the 4th highest score for GCIO.

Cluster Development and GCIO responsibilities are managed by the Government Technology Agency and the Deputy Chief Executive Office, respectively. A

comprehensive and resilient service delivery framework and operational model for CIO services across government agencies is being developed by the Cluster Development Group. The Government Chief Information Officer (GCIO) is responsible for promoting ICT projects throughout the nation to retain Singapore's leading position in the creative use of ICT to guide, train, and interact with other people.

#### **4.6. E-Government Promotion [EPRO]**

Singapore actively promotes the co-creation of services. According to the Deputy Prime Minister of Singapore, "Government must take on the responsibilities of a facilitator and enabler—to partner with the public and private sectors in developing new solutions, new enterprises, and new wealth." In line with this policy, the Government of Singapore co-created more than 110 apps using 3,000 datasets with its citizens.

Advancing to the next level of digital governance requires a more revolutionary set of changes to be implemented to refresh the provision of public sector services. Within the digital government agenda, Government will use digital technology and data sharing to achieve openness, transparency, engagement, and informed decision-making and offer integrated services to citizens and companies.

This Digital Government Transformation Strategy 2018-2022 (DGTS) outlines the governmental imperative for making government services "digital by default" and improving public service efficiency, effectiveness, and governance through a successful digitalized transformation. The DGTS is developed by the Department of Digital, Culture, Media, and Sport (DCMS). The DGTS determines government priorities and promotes cooperation in the design of government services.

#### **4.7. E-Participation [EPAR]**

The people of Singapore are used to communicating with their government online and taking part in public affairs by using a variety of platforms that the government gives. Reach ([www.reach.gov.sg](http://www.reach.gov.sg)) is a platform that enables citizens to contribute their perspectives on many aspects of public policy and affairs via online forums, in-person events, and public consultations. The exercise of deliberative democracy is mirrored in using information and communication technologies in the public sector. The government may also collect citizens' opinions and recommendations via another portal

([www.suggestions.citizen.sg](http://www.suggestions.citizen.sg)), which is accessible to the general public.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Singapore has made significant efforts to embrace digitalization. As a result of strict goals, its public servants are increasingly using AI and learning data analytics. The first goal was accomplished by year's end of 2021; in support of the second, all 20 ministries have presented proposals to use AI in policymaking. All government employees will be expected to demonstrate a minimum level of digital literacy by 2023, and each ministry family will be tasked with developing and implementing at least one artificial intelligence (AI) project in service provision or policymaking by that year. In addition, the Singaporean government mandates that public officers complete 10 cross-agency high-impact data analytics projects annually, that data sharing for cross-agency projects occur within seven working days and that 90%-100% of core data fields be in a machine-readable format and transmittable by the application programming interface.

Through the Open Data portal, the government intends to promote the following:

- Transparency, which means that citizens will have unrestricted access to information about what their government is doing;
- Public Service Improvement, which means that citizens will be provided with the raw materials necessary to engage in and contribute to the improvement of public services, as well as improve the quality of decision-making.
- Innovation – providing individuals and companies with the tools necessary to carry out data-driven projects, including developing mobile applications, analyzing data, producing innovative products, and researching, among other things.
- Efficiency: Governments is able to devise public services and apps that are smarter and more efficient if they make it possible for the information to be reused more readily inside the government and if they enable individuals to contribute to the improvement of data quality.

#### **4.9. Cyber Security [CYB]**

On the CYB scale, Singapore ranks could not be included in the top position this year, The government of Singapore seeks to tighten the cybersecurity legislation in the country,

which is known as the Cybersecurity Act 2018, and has been examining it, in particular, the following three major issues:

- Strategies for enhancing one's situational awareness inside the confines of Singapore's online;
- What aspects of the current information infrastructure need to be prioritized as Critical Information Infrastructure (CII); and
- Strategies to ensure the safety of vital pieces of digital infrastructure and services that go beyond CIIs.

After the review (expected to be finished by 2023), amendments will be added to the Cybersecurity Act of 2018, which will consider discussions with stakeholders and the general public.

#### **4.10. Emerging ICT [EMG]**

It is essential to successfully execute the Smart Nation plan to recruit and retain talented employees. During his remarks at the introduction of the Smart Nation initiative, the Prime Minister of Singapore, Lee Hsien Loong, acknowledged the need for diversified skill sets. In response to this need, Singapore developed a personnel management strategy emphasizing career advancement opportunities and competitive compensation. For instance, to get top-tier professionals to work for GovTech, the company reworked its Human Resource (HR) system to provide remuneration that is on par with that offered in the private sector. In addition, the revamped HR strategy allowed technicians to further their careers by enabling them to accept ICT jobs in various agencies. In addition, GovTech established the Smart Nation Fellowship Program as an incentive for Singaporeans working in technology businesses outside the country to participate in government projects for shorter periods, ranging from three to six months. The most talented engineers and data scientists in the sector are drawn to the possibility of working on substantial digital initiatives and affecting policy. Accordingly, EMG of Singapore ranks the 4th in the Waseda rankings in 2022 with a score of 6.5.

South Africa

## 1. General Information

Area: 1,221,037 km<sup>2</sup>

Population: 60,008,527

Government Type: Unitary dominant-party parliamentary republic with an executive presidency

GDP: \$5,599

Internet User: 70

Wired (Fixed Broadband User): 2.2

Wireless Broadband User: 110.65

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

A score of 71.055 earned South Africa the 34th position in Waseda International's digital government rankings in 2022. Improvements may be observed in the way the government of South Africa uses information and communication technology (ICT) to provide essential services to its people. An eGovernment or D-Government policy framework has

been put in place, which advocates for using information and communication technologies to improve government accessibility, responsiveness, and efficiency.

Because of the interconnected nature of the global economy and political system, the COVID-19 pandemic and its fallout were felt in a wide variety of countries and groups. National interests govern responses to COVID-19 in a world composed of independent nations and regions. The South African government is fielding inquiries about Covid-19 using a chatbot on WhatsApp messaging app. To speed up the passport verification process for those holding public health papers, the African Union has established a Covid-19 pass system.

Recognizing the importance of ICT, the government has built an e-Government or D-Government policy framework that encourages the use of ICT to improve government efficiency and effectiveness and to make government services more readily available to the public. For crucial e-government goals, the provincial government of Gauteng is at the forefront. The goal of establishing the Department of eGovernment under Gauteng was to facilitate more coordination across government agencies in the province. For the time when South Africa's digital economy is thriving, this province's government wants to maintain its ICT infrastructure investment to make it a center for State Security Agency-related R&D. (SSA).

### **3.2. New Trends**

South Africa's NDP 2030 intends to eradicate poverty and narrow economic gaps. By maximizing its resources, expanding its inclusive economy, investing in its people, strengthening its government, and fostering interdepartmental cooperation and leadership, South Africa hopes to achieve its stated objectives. To maintain policy coherence and uniformity throughout government, the NDP is linked to long-term plans at the department level, and policy shifts are accounted for. Achieving change requires several steps, one of which is ensuring public services are of the best quality. The local government's potential as a development tool has to be strengthened, and there is an urgent need to identify and remove the barriers that hinder better results.

To maintain competitiveness, grow the business, and satisfy consumers in the digital era, businesses must upgrade and strengthen the digital capabilities of their whole staff and

their digital leadership. Considering that the COVID-19 pandemic has led the world into an era of a "new normal," the necessity for digital transformation and adopting new working practices is more pressing than ever.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Governments all across the African continent are beginning to acknowledge the potentially game-changing impact that digital technology may have inside their own nations. It acknowledged the significance of the government's role in fostering the development of a linked, digital economy that capitalizes on the potential of technological advancements as a motor for economic expansion and innovation. The expansion of digital adoption and inclusion throughout the whole of society, as well as the improvement of whole-of-government coordination of digital service extension and delivery, are two of the most important steps that need to be taken in order to realize this promise fully.

A significant advance has been made thanks to investments made in the digital infrastructure of the South African government. Telkom's fiber-optic network serviced over three million households and companies; MTN South Africa restored m-money services, and a new 5G spectrum auction was planned. These are just some of the developments that have taken place in South Africa.

##### **4.2. Management Optimization [MO]**

Over the next several years, the department aimed to pass legislation in Parliament to facilitate digital transformation, roll out the internet to government buildings through the South Africa Connect initiative, and execute the broadcasting digital migration strategy to free up the digital spectrum. The department's goal is for every citizen of South Africa to have access to the internet and the tools to use it effectively, resulting in a more equitable and prosperous range of services. The agency had completed a Digital Economy Master Plan by mid-2021 and consulted with interested parties to build an implementation strategy.

Since then, the department has developed the National Digital and Future Skills Strategy, which aims to create a learning and development ecosystem that equips every South

African with the knowledge and abilities necessary to contribute to and benefit from the country's burgeoning digital economy.

#### **4.3. Online Service [OS]**

The Online Service score is broken down into five categories: e-Procurement, e-Tax and Customs, e-Health, and One-Stop Citizen Service. When assessing these services, we considered their complexity, security, and ease of use.

The eProcurement and eTax portals may experience significant delays in access due to performance difficulties. The average speed in eHealth is not quite as fast as what has been found in the literature. Most web services now use common security features like secure sockets layer (SSL), site authentication (SA), and password protection (password protection).

Clients now have access to the most cutting-edge and safest means of remitting funds, thanks to the SARS MobiApp and EFT. Payments may be made using online banking with the typical drop-down list of pre-loaded beneficiary IDs. Each SARS beneficiary ID begins with the standard "SARS-" prefix. If you pay SARS online, they are responsible for properly identifying your payment and applying it to your account. Users are unable to submit payment if the reference provided is incorrect. ABSA, AlBaraka, Access Bank, Capitec, FNB, HSBC, Investec, JP Morgan, Mercantile Bank, Nedbank, and Standard are just a few financial institutions that back this strategy.

#### **4.4. National Portal [NPR]**

Eservices.gov.za, South Africa's national site, makes it easier for citizens to access government services at a lesser cost, with fewer hassles, and in shorter amounts of time, all while increasing transparency, accountability, and customer service.

The National Portal's evaluation considers the quality of its content, technology, and functioning. This information collection covers various government-related topics, including demographics, national initiatives, organizational structures, governmental bodies, statutes, and recent news stories.

Unfortunately, this information can only be accessed in English; no other languages are supported. The site is functional on regular PCs but has some formatting difficulties on mobile devices. Technical issues were found that might slow down the portal's loading

time.

#### **4.5. Government CIO [GCIO]**

The Chief Information Officer of the South African government has not seen much progress (GCIO). The post of Chief Information Officer (CIO) in South Africa was given official authorization in 2002 by the Council of Government IT Officers (GITO). The role of the Government Information Technology Officer (GITO) is to act as a liaison between the different government entities. The council serves as a forum for both the people and the government to ensure that the government is aware of the citizens' concerns via this forum.

#### **4.6. E-Government Promotion [EPRO]**

A department responsible for public service administration manages creating and coordinating the Digital Government's strategy (DPSA). The South African government formed the State Information Technology Agency (SITA) and the Governance Information Technology Officers Council to oversee and execute actions related to digital government (GITOC).

Public-private partnerships have been actively promoted for some time to hasten the development of information and communication technologies in South Africa. It is not uncommon for there to be efforts made to enhance a wide variety of ICT infrastructure, including data centers, services, and residents.

The South African government's goal is to make high-speed, broadband Internet connection available to all of the country's citizens at rates within their financial means. To assist the government in accomplishing this goal, the first phase of a project that will take place over three years has begun. In the first phase, there were a total of 5803 government-run institutions included. These institutions were located in seven different provinces. Officials from the province's Offices of Education, Public Health, Cooperative Governance, and Traditional Affairs serve on these committees, together with members from each of the eight district towns' higher education, safety, security, and liaison departments.

#### **4.7. E-Participation [EPAR]**

The Office of Provincial and Local Liaison has been instrumental in providing development communication and developing the government's information infrastructure. These efforts have been carried out in collaboration with provincial and local governments. This organization will coordinate the Thusong Service Center (TSC) project, which will be a one-stop shop in Thusong for information and services provided by the government. It is hoped that members of the general community would have easier access to the many services offered by the government.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Like most other industries, government services have had to undergo a digital transition to remain competitive. Businesses and governments have digitized their operations to save money, boost productivity, and broaden their reach. The government of South Africa has made the transition to digital alternatives for providing services a top priority. The government has spent the previous five years building up its digital platforms, and the epidemic has only served to underline the need for increased remote access to different public sector services. There's more to digital transformation than merely improving citizens' access to government services. According to studies, digitization in South Africa might increase GDP by more than R2 trillion. To quantify the influence of digital technology on public services, private enterprise, and social well-being, Accenture and the World Economic Forum (WEF) collaborated to create a measurement methodology. Using this paradigm, we can predict the potential benefits of these technologies a decade from now.

After a lengthy hiatus, South Africa hopes to revive the OGP process with its fourth action plan. The plan's suggested three useful topics provide a solid structure upon which to expand. However, the current pledges are ambiguous and underwhelming. South Africa may take advantage of the chance to submit a revised action plan with clear implementation roadmaps and increased government participation to increase its domestic impact and global leadership. Since its third plan expired in 2018, South Africa has not filed a new one. The new fourth plan reflects an effort to reinvigorate the OGP process in the nation (2020–2022).

There is considerable maturity across all three promises since they all build on established open government initiatives and have the backing of influential public members. The

quality of the action plan was negatively affected by shifts in the OGP government's point of contact, as well as the timing and intricacy of the discussions. Only one of the three promises can be checked off as fulfilled; the other two are more like brainstorming sessions than firm promises. For instance, the action plan's commitment to "transformative fiscal transparency" does not specify what those actions are or what outcomes are to be anticipated from them, but it does give important context for understanding why they were included.

#### **4.9. Cyber Security [CYB]**

Several ransomware attacks have occurred in South Africa, including one on Liberty Holdings (causing a 5% drop in the company's share price), the ViewFines data breach (exposing nearly a million records containing sensitive personal data), the attack on Johannesburg City Power, and the massive DDoS attack on IT service provider Cool Ideas. South Africa, like the rest of Africa, is behind the times when it comes to cybersecurity, and the country's government faces a number of obstacles in this area, such as a shortage of information and communication technology (ICT) experts and a failure to coordinate among different government agencies. Numerous efforts have been made to tighten and modernize the country's cybersecurity laws and procedures, yet many holes remain. Citizens will suffer the most as a result of this susceptibility.

South Africa's cybersecurity is being strengthened by some government agencies and non-profits working together. These include the South African National Defense Force (SANDF), the South African Police Service (SAPS), the Hawks, the Department of Communications and Digital Technologies, and the Centre for Scientific and Industrial Research (CSIR) (DCDT). As part of its constitutional duties, the Department of Defense (DOD) of South Africa coordinates, accounts for and enforces the nation's cyber-defense measures.

#### **4.10. The use of Emerging ICT [EMG]**

Through the implementation of an Internet of Things (IoT) plan by the government that uses sensors, detectors, scanners, and monitoring technologies to collect pertinent information, the lives of individuals may be safeguarded or enhanced. Collecting and processing information has to be simplified, and the processing of government data needs

to take place in real-time to enhance the number of facets of government analysis, planning, and execution of action plans for better citizen service delivery. When considering consumer privacy and data security, the satisfaction citizens feel with the services they get from their government is an essential indication for determining the success of digital government transformation. The government's existing policies hinder the exchange of information to build an environment for providing government services to people that is more integrated.

South Korea

## 1. General Information

Area: 100,210 km<sup>2</sup>

Population: 51,809,624

Government Type: Unitary presidential constitutional republic

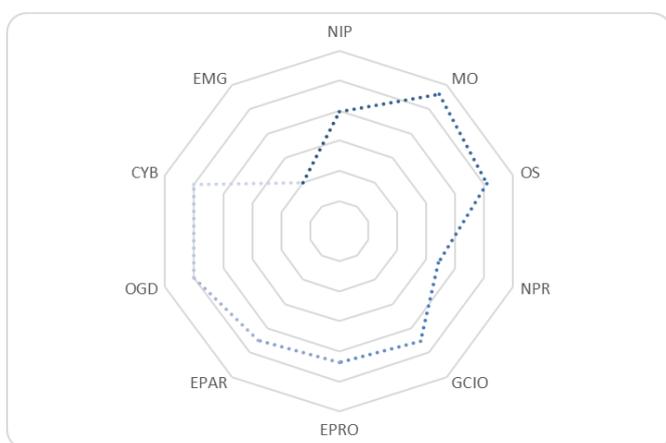
GDP: \$31,617

Internet User: 96.51

Wired (Fixed Broadband User): 43.55

Wireless Broadband User: 116.90

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

Waseda International's digital government rankings for 2022 placed South Korea seventh, with an overall score of 86.582. In an era of rapid digital transformation, individuals look to their governments to implement policies and programs that help them make the most of the opportunities presented by the information age. Suppose governments are to meet their people's demands and expectations in today's global and digital society. In that case,

they must strategically use digital technology and data in the public sector. Leveraging the benefits of digital technologies and data will make the public sector more responsive to citizen demands, increasing resilience and making it more resistant to shocks like the COVID-19 epidemic. Competent digital governments are also in a better position to create digital economies and societies to meet the challenges and seize the possibilities presented by the digital revolution.

The government of South Korea first began executing its e-Government plan and associated initiatives in the 1990s in response to rising citizen interest in and demand for online public services and public information disclosure. The success of Korea's e-Government is mainly due to the country's commitment to and funding of the initiative. Like other major governments, Korea has had to adapt and migrate to digital governance to keep up with the pace of digitalization.

### **3.2. New Trends**

The Korean government was tested for the COVID-19 issue. With an eye toward openness, transparency, and democracy, it quickly and aggressively put its administrative innovation skills to use. The Korean government released its 2021–2025 digital government strategy in June 2021, outlining its plans to implement intelligent service design and delivery, data-driven public administration, and a robust and inclusive digital infrastructure, all while shoring up weaknesses identified by the DGI. To better residents' everyday lives, the government will work to expand the current public data and public service digital ecosystem.

South Korea and the Organization for Economic Cooperation and Development (OECD) signed a Memorandum of Understanding on the digital government last December, and the country intends to play a more active role in the OECD's Global E-Leaders Initiative, which assists non-Member countries in their digital transformation of the public sector.

## **4. Digital Government by Indicators**

### **4.1. Network Infrastructure Preparedness [NIP]**

With a total score of 7.842, South Korea earned the seventh spot in this year's NIP

rankings, placing it in seventh position overall. South Korea has made great headway in laying the groundwork for a digitally advanced future. MNOs have been punished KRW51.2 billion for 5G device subsidy violations; Huawei and LG U+ have teamed up to develop Seoul TechCity of 5G clients is nearing eight million. SK Telecom has conducted public road testing of autonomous vehicles.

#### **4.2. Management Optimization [MO]**

Waseda rankings for MO in 2022 placed South Korea in sixth place after the nation's MO received a score of 11.600. This put South Korea in the sixth position. By using the power of digital technologies to their maximum extent in a responsible and secure manner, digital governance innovation can usher in a better future for its residents. By regularly updating and refining its digital government approach, the Korean government can better anticipate its people's requirements and meet them promptly. The COVID-19 epidemic prompted the Korean government to assist the digital government innovation strategy to make the government more resilient and responsive. To continue leading the digital revolution at home and working with its partner nations to create a better digital society for everyone, the Ministry of the Interior and Safety (MOIS) is committed to continuing its role as a global leader in this area.

- Focused Efforts and Crucial Commitments
- Improving government responsiveness to the public by increasing the availability of non-personal services
- The government is doing a process reengineering to improve the delivery of non-contact services to its residents.
- Changing how the government provides services
- Using natural language processing and user-friendly interfaces to integrate better and customize service delivery.
- Making optimal use of data across all levels of government
- Helping people feel more in control of their data and develop innovative new services.
- Adopting a data-driven approach to government management at all levels
- Building a Digital Ecosystem that includes everyone
- Strengthening the digital economy via public-private partnerships.

- Improving the government's preparedness for disaster and its ability to respond to it requires investing in and bolstering the digital
- Creating a universally accessible, technologically robust system for delivering public services.

#### **4.3. Online Service [OS]**

Online shopping is a major factor in Korea's retail industry expansion. Online shopping has grown unprecedentedly, putting pressure on traditional retail infrastructures. Shoppers frequent brick-and-mortar establishments for research purposes yet often make purchases from internet merchants. The integration with other systems is a major improvement for online shopping. Customers want to be able to research products, compare prices, make a purchase, and pay using one convenient platform and one of the many emerging online payment methods.

A study by the Bank of Korea found that more and more consumers are making purchases using their personal computers and mobile devices. As the number of people who shop online grows, more people opting to pay using their computers and mobile phones. The use of mobile payment and digital wallet systems like Samsung Pay and Naver Pay continues to grow in popularity.

#### **4.4. National Portal [NPR]**

The Waseda rankings 2022 based on NPR criteria ranked South Korea in 6th place with 7.867 points after giving the country an overall score. At [www.korea.net](http://www.korea.net), the official website of the Korean government, you may find information on various topics, including the most recent events, the government, the economy, the arts and culture, the history, and the society. You may find links to government and private websites written in English about Korea in the section under "Directory."

#### **4.5. Government CIO [GCIO]**

The Ministry of Security and Public Administration is now in charge of supervising the electronic governance of the government. Each department and agency within the government has what is known as a Chief Information officer (CIO). The Presidential Directive and the Fundamental Law on National Informatization detail the nomination

process for Chief Information Officers at the national and bureau levels. Following Presidential Directive No. 157, each ministry and the federal entity must have a Chief Information Officer.

The Chief Information Officer is responsible for various vital functions, including allocating the budget, updating e-Government regulations, and planning information and communications technology initiatives. This position requires a strong willingness to implement new administration using information technology in addition to extensive knowledge of current agency operations, a comprehensive viewpoint and professional competence in information technology, and extensive knowledge of all aspects of information technology.

#### **4.6. E-Government Promotion [EPRO]**

Korea participated in the OECD Digital Government Index in 2018. (DGI). The Digital Government Initiative (DGI) evaluates and sets criteria for how mature digital government policies are and how well they are being implemented throughout the whole government. By doing so, it hopes to assist in evaluating the capabilities of governments to function in a world that is becoming more digital and global. It offered the government of South Korea the chance to evaluate its progress in six different areas, including digital by design, government as a platform, data-driven public sector, open by default, user-driven, and proactiveness, respectively. In addition, via the E-Leaders theme groups, Korea gained insights and lessons on digital identity, the data-driven public sector, and service design and delivery from its peers and the OECD.

#### **4.7. E-Participation [EPAR]**

In 2022, South Korea's EPAR score was 9.500, which placed it in ninth place in the EPAR's Waseda rankings. In 2010, Korea topped both the E-Participation Index (EPI) and the E-Government Development Index (EGDI) published by the United Nations e-Government Survey. Since then, Korea has been at the forefront of e-government throughout the world for the last decade, ranking first in the UN's Electronic Performance in Government Index (EPI) and third in the Electronic Governance Development Index (EGDI) in 2018. However, getting to this impressive point was no easy feat. Constant work has gone into developing the Korean e-Government, which aims to make citizens'

lives easier and increase their input into the government. The "Gwanghwamoon 1st Street" and "Blue House Online Petition System" are two of the most critical public involvement measures implemented by the Moon Jae-in administration, allowing individuals to submit policy recommendations online and have the government implement them. To add insult to injury, the administration must address concerns voiced by its constituents. In addition, residents may access government services designed just for them through a website called "Government 24." The Korean government hopes to actualize digital innovation by combining new technologies of the 4th Industrial Revolution into digital governance. It would like to share its expertise and knowledge with the worldwide community. This will help Korea's cause by encouraging the government and society to adopt new ideas continually.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The DX and OGD-based Waseda rankings for 2022 put South Korea in ninth place with 9.200 points. The Republic of Korea's central government has long made it a top priority to uphold the principles of open government to increase openness, encourage public participation, combat corruption, and fortify the country's administration by leveraging cutting-edge information and communication technologies. The Korean government has created and executed four National Action Plans (NAPs) since joining the Open Government Partnership (OGP), demonstrating its dedication to open government and democracy.

Three key features of the GovTech strategy align with the Korean government's goals for digital transformation in the public sector. The Korean government has committed to a government-wide digital transformation with the announcement of the Digital Government Master Plan 2021-2025. Based on the simple, efficient, and transparent government processes, they have also worked to increase citizen-centric public services by incorporating new innovative technology into the public sector.

#### **4.9. Cyber Security [CYB]**

Since the National Cyber Security Master Plan was created in 2011, the cybersecurity framework has been in place. The Information and Communication Infrastructure Protection Act is included in this framework. Moreover, it provides a solid legal platform

for the growth of cybersecurity in Korea. The Korean government views the KrCERT/CC and the KN-CERT as computer emergency response teams. The Korea Internet and Security Agency is responsible for safeguarding networks and information. The National Cyber Security Center (NCSC) is the government's major center for detecting, preventing, and responding to cyberattacks and threats inside Korea. In conjunction with the private sector and the military, the National Cyber Security Center (NCSC) of North Korea seeks to improve security incident warning and response times and safeguard Korea's vital national infrastructure. The Korea Information Security Agency (KISA) must educate customers on using the Internet responsibly via broadcasts and online courses. Clearly, South Korea has the sixth place in the Waseda rankings for CYB in 2022.

#### **4.10. The use of Emerging ICT [EMG]**

South Korea intends to become a global leader in the Artificial Intelligence (AI) sector. The government of Korea views AI as crucial to the growth of the country's information and communications technology capabilities. They want to make Korea a worldwide leader in the area in the future. The government launched the first national AI policy in 2019 with the specific intent of attaining this objective. Digital New Deal initiatives cover corporate and governmental sectors, with the federal government proposing nearly \$2 billion in the fiscal year 2021 for artificial intelligence (AI)-related activities. By 2021, therefore, ten colleges in South Korea will have received accreditation as AI Engineering programs. For the AI ecosystem in the United States to flourish, AI-focused businesses and enterprises must multiply. South Korea's governments have established various AI business incubator programs to promote the country's expanding AI sector.

In addition to its current leading position in memory chips, South Korea must develop its microprocessors and sensors to be globally competitive. Beyond memory chips, national development efforts have been formed to enhance the country's semiconductor leadership. The government has planned increased efforts in 2019 for system and AI semiconductors. These national plans emphasize state-led investments in local fabless enterprises and educational support to produce competitive semiconductor professionals by 2030, to capture 20 percent of the global market.

The growth of the cloud computing market in Korea is anticipated to be driven by the

growing use of cloud services by Korean businesses and government entities. South Korea was an early user of cloud computing services. The cloud computing activities of the government were a part of the wider Digital New Deal plan, which comprised state-led projects and investments. The South Korean cloud computing industry was dominated by Amazon Web Services (AWS), Microsoft (Microsoft), and Google. Foreign companies are increasing their investments in Korea to acquire a greater share of the Korean market.

Spain

### 1. General Information

Area: 505,992 km<sup>2</sup>

Population: 47,550,020

Government Type: Unitary parliamentary constitutional monarchy

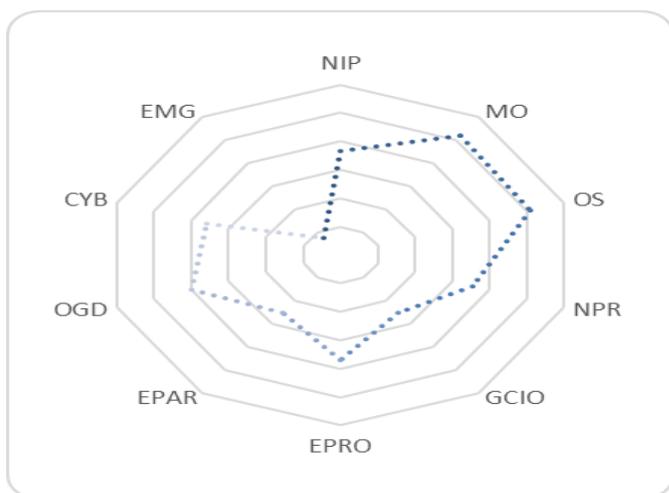
GDP: \$26,924

Internet User: 93.21

Wired (Fixed Broadband User): 34.62

Wireless Broadband User: 105.30

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

This year, Spain ranked 28<sup>th</sup> in the Waseda International digital government rankings in 2022 with an overall score of 73.327. The COVID-19 pandemic emergency has sped up the trend toward increasing digitalization, drawing attention to its advantages and disadvantages from economic, social, and geographical perspectives. Indeed, the

capability and durability of telecommunications networks to manage an extreme scenario of super-connectivity were tested during the months of limited mobility. Spain performs above par in all four measured categories compared to the rest of Europe, notably in digital public services and connectivity.

- Online government assistance: According to the research, sixty-seven percent of Internet users are regular consumers of e-government services. It is anticipated that by the end of 2025, at least 50% of digital public services will be available through mobile, thanks to the Public Administration Digitalization Plan. Through these measures, we want to increase the government's capacity for personalized service and openness.
- Connectivity: When it comes to really powerful connections, Spain shines. Urban and rural communities are becoming more similar to one another, although disparities still persist. Regarding population, 99.9% of places are covered by 4G, whereas just a tiny percentage have access to 5G. The problem is being addressed through the Plan for Connectivity and Digital Infrastructures and the Strategy to Boost 5G Technology, which aims to ensure that everyone in the country has access to speeds of at least 100 Mbps by the year 2025.
- Human capital: According to the data, over half of the Spanish population has digital literacy. The Spanish government recognizes the need to boost the digital literacy of its citizens to meet the European Union's goal of 80 percent by 2030; hence it has made this a central focus of its Digital Spain 2025 policy. There is still a lot of potential for development in information and communication technology (ICT); thus, the government has developed the National Digital Skills Plan with seven lines of action to address the issue. The Educa en Digital Program, which the study praises for its establishment of measures to foster increased digitization of the Spanish education system, is also highlighted.
- Combining analog and digital systems: While 24% of small and medium-sized enterprises (SMEs) in Spain have adopted electronic commerce, and 62% have at least some degree of digital intensity, very few SMEs in Spain are using artificial intelligence, big data, or cloud services. SME Digitalization Plan 2021-2025 was created as a response to this problem, and it focuses on five areas: essential

digitalization for SMEs; support for digital change management; promotion of disruptive innovation and digital entrepreneurship; support for sectoral digitalization; coordination and efficiency; and fostering digital innovation.

### **3.2. New Trends**

As part of Spain's Digital Spain 2025 Agenda, eleven primary areas of reform and investment are laid out to revive the economy and reduce inequality, increase productivity, capitalize on technology breakthroughs, and turn the public sector into a digital economy. Because Europe is currently experiencing simultaneous digital and environmental revolutions, all aspects of society must come to terms with this transition and find a way to make it compatible with constitutional principles, European goals, and the protection of individual and collective rights.

The Sustainable Development Goals (SDGs) and the 2030 Agenda for Sustainable Development all have a common thread, and this thread is proposed by Digital Spain 2025: a significant contribution to closing the various digital divides, which have grown wider in recent years for socioeconomic, gender-related, generational, geographical, and environmental reasons. During the first months of the Covid-19 pandemic, gaps in access to and use of digital technologies became especially apparent, prompting the Spanish government to take immediate action, such as providing half a million connected digital devices to students affected by the digital divide as part of the digital learning program Educa en Digital.

## **4. Digital Government by Indicators**

### **4.1. Network Infrastructure Preparedness [NIP]**

Spain's efforts to be ready for and invest in the country's digitalization have made tremendous progress. Two-tenths of a megahertz of the spectrum was awarded to Vodafone, Orange, and Movistar in the long-delayed 700MHz auction. A 10 MHz chunk of the 3.5 GHz band was also allocated to Orange and Movistar. The estimated lifetime of spectrum licenses in future auctions is 40 years. Following the testing of WDM photonics meshes by Telefónica and Huawei in Madrid, photonics mesh transport networks will have the capacity to handle transmission rates of up to 800Gb/s. Satellite internet service provider SpaceX is conducting a trial in Spain of its Starlink service.

Vodafone and Canalink proposed to extend a submarine cable from the Canary Islands to mainland Spain.

#### **4.2. Management Optimization [MO]**

The Spanish government's General Secretariat for Digital Administration (SGAD) has set a three-year objective of 2021–2024 to build a new digital administration and information and communication technology plan. The plan will be executed within the framework, aligned with Agenda 2030, its Sustainable Development Goals, and European initiatives like the Digital Europe Programme 2021-2027, the OECD, and Spanish norms. The main goals of the Plan are to strengthen SGA's coordination role in ICT, improve services for citizens, create a unified model of data-centric organization, improve services for public administration, reflect on and study opportunities presented by emerging technologies, and implement a training program to improve public employees' digital skills. In addition, the Plan would address the inadequacies noted in the eGovernment baseline, such as mobile-friendliness, public participation, and cross-border mobility and accountability. The Plan would be implemented.

#### **4.3. Online Service [OS]**

The national eID card allows individuals to sign documents and contracts digitally. About 38 million Spaniards hold a DNIE card. By Article 9 of Law 39/2015, the administrative branch of the government is required to acknowledge identifying systems founded on electronic certificates that meet specific criteria and are issued by authorized trust service providers. The PCSP (Plataforma de Contratación del Sector Pbllico) is the principal source of information on public sector contracts. It offers electronic notice, tendering, and awarding in one convenient package.

#### **4.4. National Portal [NPR]**

The eGovernment Portal is a resource that offers further details about the functioning of Spain's electronic government at the present time. Through the use of the General View Point, users have the opportunity to examine the Citizens' folder. This database compiles all of the information the administration has collected over time about a particular individual or business and places it in one convenient location. The Observatory for eGovernment is a gathering place for public administration professionals interested in

gaining new perspectives and information about e-government in a consolidated location.

#### **4.5. Government CIO [GCIO]**

Coordinating the execution of a national e-government strategy is one of the responsibilities of the Director of Information Technology for the State General Administration. This role is somewhat analogous to that of the GCIO and fulfills a function that is pretty similar. The public now has access to information regarding the chief information officer (CIO) training program offered by at least one educational institution.

#### **4.6. E-Government Promotion [EPRO]**

Due to the initiatives conducted by the Ministry of Economy and Digital Transformation, government entities across Spain have been encouraged to embrace digital transformation. The Secretariat for Digitalization and Artificial Intelligence and the Secretariat for Telecommunications and Digital Infrastructures are the two State Secretariats that fall under this Ministry's purview and are responsible for addressing technical concerns. The Secretary of State for Digital Infrastructure and Telecommunications monitors the telecommunications sector and audiovisual services to build and maintain an information society. In addition to this responsibility, the agency is entrusted with engaging in dialogue with the corporate community, the academic community, and the research community, as well as coordinating and collaborating with other government authorities over this issue. To oversee the regulation of and participation in international efforts aimed at certifying and standardizing digital and telecommunications infrastructure, the relevant Ministers of Policy have nominated new Secretaries of State. These individuals will be responsible for the oversight of these efforts.

The Spanish government has developed a plan as part of the country's Digital Agenda to foster the expansion of natural language processing (NLP) and machine translation (MT) in Spanish and the other co-official languages. One of the goals is to improve both the variety and quality of the resources provided in Spanish and the other national languages. The government is acknowledged as a critical factor in this rising economy, and this effort intends to reinvigorate the language business by fostering the flow of ideas between

university and industry.

#### **4.7. E-Participation [EPAR]**

In Spain, the Red SARA government intranet is overseen by the Ministry of Economic Affairs and Digital Transformation. Through the website 060.es, a toll-free phone line, or a network of local offices, individuals and businesses can communicate with administrative agencies at any of the three levels of government. If customers' organizational requirements are to be met, support must be made available 24 hours a day, seven days a week. The number 060 has been allotted to replace the almost 600 current phone numbers that the general public may use to get in touch with the federal government. The Trans European Services for Telematics network is the one that Spain relies on most often in order to facilitate digital communication between EU institutions, organizations, and the Member States.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

With a digital infrastructure network that is among the best in the world, leading companies in key sectors (health, food and agriculture, mobility, tourism, and finance), modern cities, and diverse and adaptable society, Spain is in an excellent position to tackle the next phase of the country's digital transformation. Our nation is also very well-positioned in terms of the digitization of government and has enormous potential for the use of new technologies to information management and the execution of public policy.

To achieve the nation's goals, Spain has been a member of the Open Government Partnership since it was established in 2011. Since then, Spain has produced three national action plans, all of which have contributed to an improvement in democracy across the country. Spain has reinforced its commitment to consistently enhance openness and accountability, public participation, and democracy via the establishment of this alliance.

The qualities of involvement and cooperation are ones that it promotes. This has taken place within a sociopolitical context in which, concurrently with the organization of general, regional, and local elections, an expression of democratic normality, Spanish society and its public institutions have also expressed their unequivocal intention to advance in the fulfillment of the Sustainable Development Goals included in the 2030 Agenda. This has taken place within a sociopolitical scenario in which, concurrently with

the organization of general, regional, and local elections, an expression of democratic normality. The role of the government as a policy lever is critical to developing more fair, peaceful, and inclusive societies.

#### **4.9. Cyber Security [CYB]**

Individuals, the government, and enterprises are all affected by the protection of personal data under Organic Law 03/2018, which went into effect on December 5, 2018. EU Regulation 2016/679, approved by the European Parliament and Council on April 27th, is currently being revised. Regarding digital content governance, Title X offered information on the digital rights and liberties that are inherently associated with the online environment. Neutrality and universal access were among the rights enumerated, along with data security protections and digital media education. Also included in this title are the rights to digital disconnection in employment privacy, the protection of minors online, and the digital media freedom of expression and information clarification. Organic Law 3/2018 introduced minor amendments to Law 39/2015, enacted on October 1, 2015, and outlined the Common Administrative Procedures of Public Administrations. These amendments strengthened the role of the National Security Framework (ENS) 's role in protecting personal data and made it simpler to adhere to the Once-Only principle.

#### **4.10. The use of Emerging ICT [EMG]**

The Spanish government's Ministry of Science, Innovation, and Universities recently unveiled a plan to advance the country's artificial intelligence research and development. The development of the European framework for AI R&D relies heavily on the work done in Spain in this area. This method could coordinate and integrate national investments and policies as part of the National Artificial Intelligence Strategy. Investment from public and commercial sectors will help disseminate these technologies across society and the economy. Regarding AI, teachers and workers in Spain need to learn new skills. This will lead to establishing a network of AI research institutions and creation a map of Spain's AI capabilities for the government. Agents involved in RDI will have the opportunity to test cutting-edge innovation before it hits the mainstream, and their input will be sought as a

Code of Ethics for AI is developed.

The State Plan for Scientific and Technical Research and Innovation in Spain aims to promote talent and employability, create and enhance knowledge, and lead corporations in R&D and innovation that is societally relevant. These are the overarching goals of the plan (R&D&I). The General State Administration's R&D&I activities are cross-cutting, requiring tight collaboration with the sectoral plans set by the several ministerial ministries. These plans, such as the Connected Industry 4.0 Strategic Action and the Health Strategic Plan, are rolled into a unified State Plan.

Sweden

### 1. General Information

Area:450,295 km2

Population: 10,565,116

Government Type: Unitary parliamentary constitutional monarchy

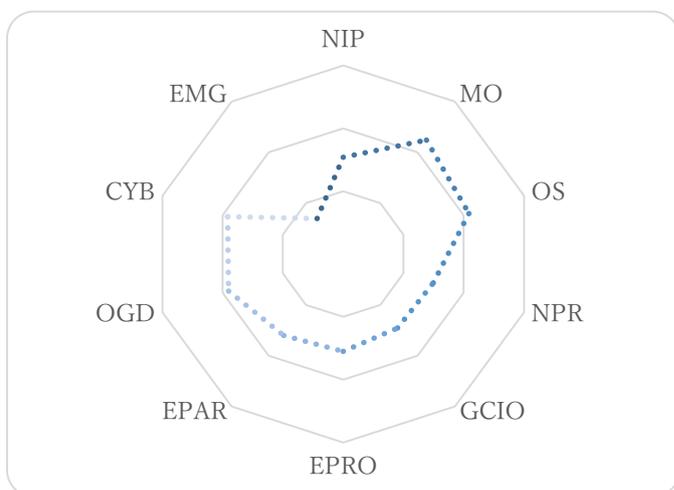
GDP: \$51,329

Internet User: 94.54

Wired (Fixed Broadband User): 41.38

Wireless Broadband User: 128.99

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

Sweden maintains its 12th place in this year's Waseda International digital government rankings 2022 with a score of 82.997. There is a severe economic downturn in Sweden because of the epidemic, despite the country's relatively modest separation measures and

the government's prompt effort to safeguard its citizens. The public sector in Sweden is characterized by social ideals consistent with those of Swedish society. Decision-making in the public sector is characterized by agreement and avoiding confrontation because of the prevalence of these principles, which include consensus, teamwork, equality, inclusiveness, and a temperate mindset. Culture plays a role in the coordination of policymaking in Sweden, both at the national and public sector levels, and highlights the significant discretion given to agencies once an agreement is formed. Although this tone has undeniable social and professional value, it may hinder the flexibility required to adapt to the growing importance of digital government by slowing the development of more integrated methods and more precise direction.

To promote collaborative ways of debating and driving change in the Swedish public sector, to involve a wider variety of players, and to convert the government into a platform for value co-creation, the aforementioned societal ideals serve as an essential basis. However, they may also obstruct effective decision-making, the need for clear and robust policy leadership, and erect institutional impediments to the successful implementation of cooperation.

The Swedish government has a significant problem balancing fostering cooperation and ensuring consistent conduct across its agencies. Reforming governance structures within the consensus-based culture of the Swedish public sector is necessary. Sweden's e-government has progressed thanks to the government's consistent efforts. Uncoordinated prior IT initiatives at the agency level and specific sectors' objectives may be traced back to the government's unsteady institutional frameworks, which are insufficient for digital governance. Since 1980, the e-institutional government's framework has varied from agency-led to council-based governance approaches. These alterations have been made to enhance inter-institutional cooperation by capitalizing on the consensus-based norms in the Swedish government.

### **3.2. New Trends**

The Swedish economy is recovering from the shock of the COVID-19 disaster, but dangers persist. To revitalize employment and develop a lasting recovery, it will be essential to go forward with a labor reform that facilitates adaptability to a rapidly

changing economic environment and to invest in digital skills and infrastructure.

The Swedish government has a plan for digital transformation in which digitalization is recognized. This policy aims to "become the global leader in leveraging the prospects of digital transformation." The process of digitization in Sweden has been successful in the past. On the other hand, digitalizing government agencies has just recently started. It might be difficult for any institution to get all of the advantages of digitization. When developing software, the public sector has some particular obstacles. When acquiring specialized information technology services, a government agency may discover that it is the only buyer in the market for such services. This is because government agencies often have demanded that any other player does not share. In addition, there are occasions when just a few service providers on the market provide services tailored specifically for the public sector, limiting the number of possibilities available for procurement and sourcing. Previous research on Swedish GovAgs indicates that general software process improvement and scaling have been underway in recent years. However, there is no overview of the present state of practice in the GovAgs' software projects.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

In 2022, Sweden's NIP scored 7.864, which put the nation in the sixth position in the NIP's Waseda rankings. To achieve the objectives outlined in its broadband plan, the Swedish government has focused on three key areas: the roles and regulations governing the broadband market, the cost-effective growth of broadband infrastructure and services, and universal broadband access. The broadband plan A Completely Connected Sweden by 2025 states that meeting the needs of its citizens, whether they reside in urban, suburban, or rural settings, must be the top priority. Sweden is dedicated to becoming a global leader in developing 5G technology. The Nordic-Baltic collaboration on 5G, carried out within the Nordic Council of Ministers' framework, is one example of this. The prime ministers of the Nordic countries signed a statement on fifth-generation mobile networks in May of this year to make the area the most advanced and integrated into the world. The ministers of digitization in the Nordic and Baltic countries have established a unified action plan for the expedited implementation of 5G technology towards this end.

## **4.2. Management Optimization [MO]**

The Swedish government prioritized an integrated approach emphasizing economic growth, full employment, and long-term resilience. To become a world leader in taking advantage of digital transformation, the following goals are included in the plan: improving citizens' digital literacy, raising public trust and confidence in digital services, fostering digital innovation, and guaranteeing universal access to digital opportunities.

To improve the ability of its departments to collaborate, the Swedish government established "Putting the Citizen at the Center." These days, consumers and businesses benefit from the increased availability of the most popular online services. They should be accessible to everyone, simple to use, and risk-free. Facilitating access to and using public information and digital services has sparked innovation. Transparency and citizen involvement have been simplified by the widespread availability of government data on the internet and social media. Integrating information management, bolstering data security, and automating operations have contributed to a higher quality of government administration.

## **4.3. Online Service [OS]**

The Swedish government released the national biometric electronic ID card. It won't replace paper IDs. You can't enter Schengen without it, and you can't go without it. In addition, a traditional microchip is incorporated.

E-procurement services are provided via a digital procurement system developed by vendors that focus on specific aspects of the digital procurement process. The central e-procurement authority is accountable for ensuring service quality instead of creating a single online hub for government purchasing. There is a wide selection of independently operated websites, some of which focus specifically on government contracts.

When most Swedes stop using paper money, the Riksbank, the country's central bank, will ensure the payment system continues to work smoothly and safely. eKronas, a digital currency backed by the government, may be used by the general public. Riksbank's eKrona program prompted this inquiry. The team has reached out to domestic and foreign groups to get their feedback on the eKrona. The credibility of these middlemen depends on the Riksbank's continued capacity to issue eKronas.

#### **4.4. National Portal [NPR]**

The national portal in Sweden may be found on the official website of the Swedish government and all of its agencies. The website provides information on current government laws and initiatives, ministerial actions, and explains how Sweden's decision-making process works.

Geodata.se is the website you should visit if you are interested in learning more about Sweden's geographic information system. The Geodataportalen is a national registry of geographical data services that allows customers to search for data, examine it, and even download it. Through the Geodataportalen database, which is managed by the Sveriges data portal, the European Commission's Inspire Geoportal may be accessed. Sveriges data portal is Sweden's open data portal. The Swedish organization responsible for cadastre and land registration, Landmateriet, is in charge of coordinating the Swedish geographic data infrastructure.

#### **4.5. Government CIO [GCIO]**

It would seem that there is a Chief Information Officer (CIO) at each level of government; however, their titles and responsibilities may vary in each ministry somewhat.

#### **4.6. E-Government Promotion [EPRO]**

The national government of Sweden has lofty plans to serve as worldwide leader in increasing digitization throughout the provisions of the public sector, and they have laid forth a plan to achieve this goal. The Swedish government and the Swedish Association of Local Authorities and Regions came to an agreement in 2016 on a joint vision called "Vision e-Health 2025," which stated that Sweden should become "the best country in the world at seizing the opportunities offered by digitalization" within the realm of health and social services by the year 2025. Even though Sweden's public sector is ranked 12th when it comes to digital maturity, the country has risen to the front of the pack in terms of connection and internet usage, placing it in second place among the 28 member states of the EU in the year 2020. As a result, efforts to improve the digitization of the public sector have acquired a new emphasis, which has led the Swedish government to allocate two hundred million Swedish crowns to increase the digitalization of the public sector between the years 2021 and 2023.

At the moment, Sweden does not have a central knowledge management system that is both effective and efficient. Many governments around the nation have joined forces to establish a platform for the collaborative use of sharing best practices and increasing the usage of eGovernment at the local level. Over the previous 15 years, one-third of the municipalities in Sweden have worked together on more than 30 different projects to provide basic functionality, platforms, and a standard design for municipal eServices via the pooling of their resources. This platform enables the active exchange of digitization and change management knowledge.

#### **4.7. E-Participation [EPAR]**

Individuals and companies will have a far more extensive selection of available possibilities when connecting to public electronic services through the internet. As part of the revised national eHealth vision for Sweden, it was intended that all health and dental data of people in the country who are 16 years old or older would be accessible to anybody in the country.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Sweden's government has released a digital transformation plan to "become the global leader in exploiting the prospects of digital transformation," which acknowledges the importance of digitalization. When it comes to digitization, Sweden has a solid track record. However, digitizing GovAgs is still in its early stages, and it is difficult for any company to realize digital transformation's advantages fully. The public sector has its own set of issues that are specific to software development. And there are sometimes just a few vendors who provide services tailored to the public sector, restricting procurement and sourcing possibilities.

The difficulty for contemporary municipal governments, notably in Sweden, is how to make their data available, identify which data will be most beneficial for their end users, and for what social reasons. The literature in this area seems to be a heterogeneous mix of technical project reports and academic studies of OG, OGD, big data, and the role they play in the economy and democracy as a whole, with a particular focus on issues of data quality and ethics. However, developing evidence-based policies to facilitate the rollout of open government data projects at the municipal level seems to have received less focus.

While governments have continuously gathered and analyzed data to serve their constituents better, they now must consider how best to convey and make accessible the information and data already in their possession. While the availability of agency resources is regarded as a primary barrier to making OGD public, the data must be made available in various forms to accommodate a wide range of user needs.

#### **4.9. Cyber Security [CYB]**

Swedish government agencies face formidable challenges in digital work, cooperation, and cyber security. They walk a fine line between regulations that safeguard people's privacy, laws that ensure the kingdom's safety, and a system that permits workers to maximize productivity. Our product, Outpost Collaboration, is based on the same premise.

As the need for remote labor emerged overnight in the wake of the epidemic, the authorities' comfort zone shrank further. The officers then demonstrated digital flexibility using existing resources like Skype/Teams. The Swedish government is an admirable model. They decided to critically assess Skype while adopting it to adapt to the new circumstances brought on by the epidemic.

There exist favorable circumstances for data storage that worldwide behemoths have chosen to build their data centers in Sweden, making us one of the world's most connected nations. Combined efforts from many agencies resulted in a detailed report on the investigation into the incident. In their opinion, the tried-and-true methods no longer work. The IT systems used by the government to protect residents' data and the kingdom's physical security must evolve as the world outside does.

#### **4.10. The use of Emerging ICT [EMG]**

Sweden's ability to employ digital technology to promote long-term economic growth increased productivity, and societal progress is unparalleled. Sweden is dedicated to using AI and IoT to tackle social problems while maintaining core values like transparency, cooperation, and honesty. Small and medium-sized Swedish enterprises (SMEs) are among the world's leaders in e-commerce and online sales growth.

When measured as a percentage of GDP, the ICT sector is one of the country's most

important contributors. Only Ireland has a more significant percentage of value added related to computers and software. Moreover, a quarter of a million Swedes work for ICT firms directly, and that number swells significantly when one includes the numerous individuals whose jobs have digitalizing other sectors. Statistics Sweden reports that the digital industry contributes 5.8% of GDP and employs over a quarter of a million people directly in ICT enterprises; this figure increases dramatically when other sectors are included. One in ten Stockholmers are used in the digital technology industry, and this proportion is rising rapidly throughout the country, necessitating a larger pool of foreign workers to complement the existing collection of Swedish specialists.

Switzerland

## 1. General Information

Area: 41,284 km<sup>2</sup>

Population: 8,753,776

Government Type: Federal semi-direct democracy under a multi-party assembly-independent directorial republic

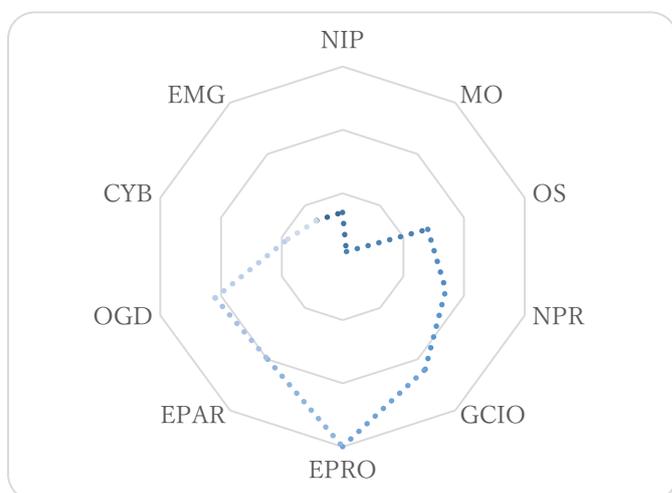
GDP: \$86,007

Internet User: 94.2

Wired (Fixed Broadband User): 46.54

Wireless Broadband User: 101.48

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development:

In the 2022 Waseda rankings, Switzerland scored at 16 position with 81.167. To save time and effort for the government, the economy, and the general public, the Swiss government has developed a solid e-government approach. Businesses may use e-governance offices

to accomplish a variety of administrative tasks online. The pandemic highlights the significance of digital communication channels, such as websites, online stores, social media accounts, CRM systems, etc. Organizations cease to exist if employees cannot access vital records, files, databases, and schedules online. These days, you may schedule your trip to a museum, a mountain train, a fitness center, or an outdoor swimming pool entirely online to maintain a comfortable level of social distancing. Switzerland appreciates these systems for their insights into their operations and how they smooth out seasonal fluctuations in visitor numbers.

These interfaces reduce their burden and enable them to devote more time to critical business processes. Documents formerly transmitted from one government agency to another in writing before reaching government customers must now be completed and sent electronically. The Swiss approach to e-government emphasizes the usability of administrative operations. Without any compatibility issues, information must be able to flow directly from customers to the appropriate offices and subsequently to the archives. Universally agreed standards are necessary for the management of data and digital documents in a manner that is both reliable and well-organized.

The federal government, the cantons, and the municipalities of Switzerland all share the goal of promoting electronic transactions from the private sector. However, the federal government also has the goal of encouraging its own departments to digitally communicate and modernize their processes. Additionally, the bulk of contacts with the Swiss government, both those that are normal and those that are complicated, should be feasible through online channels. In order to accomplish this objective, uniform approaches need to be put into place at all levels of the federal government. In addition, the planning software has to be completely open and continuously updated so that users can easily keep track of all events. Every person has the same chance to utilize the e-government services that have been developed by the competent authorities in the same way.

### **3.2. New Trends**

The importance of cables, hardware, software, and platforms to modern life, including labor, consumption, culture, research, communication, and democratic discussion, has

been glaringly apparent during the last several months. Non-investment in a digital infrastructure is costing people and businesses dearly. The epidemic serves as a wake-up call to enhance this system. As government operations become increasingly digital and more data is collected, the question of what checks and balances can be put in place to prevent the rise of a surveillance state while still encouraging its growth and providing networking opportunities for its proponents becomes more pressing. To sum up, Covid-19 allows us to reevaluate the value of collaboration across several sectors, including business, society, politics, and the sciences. Where private businesses cannot address societal issues, this approach is essential. The next six months will call for digital foundation work rather than big data and AI.

Electronic licensing, application, and registration processes must be more straightforward to reduce bureaucracy. Government electronic services are becoming increasingly popular in the economy owing to their simplicity and customer-centered design, as well as the digitalization of processes. The Federal Council sees e-government as an essential part of the growth agenda. E-government aims to make government as effective and open to the public as possible by using information and communication technologies. The government must supply everything electronically instead of transferring it from one office to another and then to the customer.

The importance of knowing services and processes is emphasized in Switzerland's E-Government Strategy. The uninterrupted delivery of data from the client to the authorities and, ultimately, to the archives is required. There is a need for common standards for the orderly and safe handling of electronic data and documents. The State Secretariat for Economic Affairs (SECO) SME Policy Section is hastening the use of electronic government services by small and medium-sized firms (SMEs). SECO has acted in this role regarding the eGovernment Switzerland project since 2008. The 2020-2023 implementation plan's execution aim of "expanding EasyGov.ch" is the responsibility of SECO.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Switzerland is one of the most advanced countries in the world because it has

accomplished several substantial breakthroughs in the sector of infrastructure preparedness compared to other countries, making it one of the most advanced countries in the world. The following are examples of some of them:

- The establishment of requirements for 5G towers was intended to accelerate the deployment of network equipment. Swiss Fiber Net has inked a deal with Salt to extend its FttP footprint, while Swisscom has discontinued its GSM network.
- The USO division of Swisscom has improved its baseline internet speed.

#### **4.2. Management Optimization [MO]**

With a Waseda score of 11.800 for its MO in 2022, Switzerland ranks 5<sup>th</sup>. Information and communication technology (ICT) usage is evolving in personal and professional contexts. The new opportunities are being used to foster growth in society and the economy, building on established processes and modes of engagement. Transformation is occurring throughout all facets of society, including public administration. It takes information and communications technology to provide modern, service-oriented results. Due to Switzerland's federal structure, there are usually many government agencies engaged in processing a single visit to the authorities. Moreover, agencies within the same state often provide the same services.

Consequently, digitizing administrative offerings calls for tight collaboration and, at the same time, presents a significant opportunity for learning from one another's mistakes. In light of this, the Swiss federal government and the cantons outline and communities in the Swiss e-government plan 2020-2023, outlining the digital objectives they are pursuing jointly and the key areas of activity in the digital transformation of administration and control. The federal government, the Cantons, and the local level must work together to manage the digital transition; thus, attention should be paid to those areas.

#### **4.3. Online Service [OS]**

This year, Switzerland first ranked in OS criteria, with an overall score of 11.760. The Swiss government has been establishing online services to assist small and medium-sized businesses complete administrative processes more efficiently. Its goal is to implement e-governance or the computerization of previously paper-based administrative procedures. The corporate administration platform EasyGov.swiss was launched, a user-friendly way

for small and medium-sized companies (SMEs) and business owners to meet their administrative needs while focusing on their core business. EasyGov gives users access to government-supplied online services like EasyGov - services offered. By the end of 2023, the most common administrative procedures will be accessible on EasyGov.swiss, and companies will be able to perform them online.

Several instances of completed e-government initiatives are as follows:

- E-invoice is a safe method of paying bills online.
- E-dec web is a web-based tool that allows you to complete customs declarations.
- E-trademark is a platform that enables the registration of trademarks through the Internet.
- Simap.ch is a website that provides the Swiss government with public bid requests.

#### **4.4. National Portal [NPR]**

The website [www.admin.ch](http://www.admin.ch) is Switzerland's official website. It serves as Switzerland's electronic business card and is the principal source of information in French, German, Italian, and Romansh from the federal, cantonal, and local administrations. This website is organized into parts depending on the target population. It contains, among other things, dossiers on significant themes and current events and a comprehensive directory of administrative authorities for the whole country.

Access to all of the departments and services of the Swiss government may be gained via the administrative website [admin.ch](http://admin.ch). It gives corporations and people instant access to seven government ministries, the federal offices connected with those ministries, and the Federal Chancery, Parliament, and federal courts. As a direct consequence, Switzerland's NPR earned 8.000 points, placing it first in the Waseda rankings for 2022.

#### **4.5. Government CIO [GCIO]**

Switzerland has established a structure and agencies for government Chief Information Officers at the national and municipal levels. This is both a development and an improvement in digital governance. In the realm of education, there are no programs that are specifically designed to train Chief Information Officers (CIOs). However, MBA programs focus on information technology and educate highly qualified workers who, among other things, have CIO capabilities.

#### **4.6. E-Government Promotion [EPRO]**

Electronic signatures are used in Switzerland for items that don't need to be written. Electronic signatures have a greater probative value than handwritten signatures since they are simpler to prove legitimate. These signatures need a third-party trust service provider to deal with a complex infrastructure. Two laws in Switzerland regulate electronic signatures. The FAES covers four electronic signatures, provides guidelines for how service providers may employ certification services using electronic signatures, and outlines the provider's obligations and rights while providing certification services.

The Swiss Code of Obligations (CO) specifies a digital signature based on a certificate is the same as a handwritten signature, provided it's validated and produced by an accredited Swiss certification services provider. Swisscom (Schweiz) AG, QuoVadis Trustlink Schweiz AG, SwissSign AG, and the Federal Office of Information Technology, Systems and Telecommunication are the only accredited bodies. The Swiss Civil Procedure Code holds RES and QES providers liable for any loss or harm caused by a valid certificate.

Under Swiss procedural law, provided by the Swiss Civil Procedure Code, Swiss courts are allowed to decide how to consider evidence, and the law gives no evidence greater weight than others. An electronic signature can't be thrown out of court or barred from being used as evidence because it's electronic or doesn't fulfill the qualifications for a certified electronic signature (QES). Using an SES or AES requires the signer to prove the document's integrity. SES, AES, and RES may not be denied legal effect and admission as evidence, but they won't be considered the same as a Handwritten signature. In Switzerland, a handwritten signature is only authorized with a QES and a stamp.

#### **4.7. E-Participation [EPAR]**

Digital Public Services Switzerland will support the projects in 2022 to use new technologies to develop regional cooperation and create new electronic channels for political and administrative engagement. As part of its digital strategy, the Swiss municipality of Uster, canton of Zurich, is constructing a new website. It incorporates its stakeholders in the early stages of the design and development of its online services to maximize the advantages and assure widespread adoption. In addition to analog involvement methods, the public will be largely engaged via digital participation options.

Uster is also examining more thoroughly how to optimally mix analog and digital kinds of engagement. The results will be shared with other towns, cities, municipalities, and cantons. A methodology for e-participation initiatives and the user-centric design of digital channels will be established.

In particular, the COVID-19 epidemic has made it increasingly difficult to gather physical signatures for referendums and initiatives. E-collecting is a continuation of the digital revolution of administrations and procedures. The project "e-collecting for cantonal signature collections" will first evaluate, as part of the research, what prerequisites must be established to allow e-collecting in the canton. Among other things, the usage of the SwissID for electronic identification will be investigated. In addition to a technological examination, the research will analyze the organizational and legal prerequisites for using e-collecting. The purpose of the study is to provide a foundation for using e-collecting in Basel Landschaft and other cantons.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Open government data (OGD) is publicly available and unprotected public sector data. SFOE implements OGD Strategy 2019–2023 and "open data by default." The SFOE releases fresh data on the Swiss Open Government Data site ([opendata.swiss](https://opendata.swiss)) and tries to improve its quality and accessibility. It was stated that towns and municipalities have the opportunity to publish their electronic services on the enhanced e-Governance portal and that a significant contribution of the program is raising awareness of the importance of e-Governance, developing the regulatory framework at the local level, and acquiring practical skills to provide e-Services.

As part of the public information campaign implemented throughout Serbia, eServices were promoted on public squares, and over 1,800 citizens could directly and quickly access certain rights and services through the e-Governance portal. Approximately one million people were informed via social media about the benefits of using eServices and open data.

The mission of Digital Public Services Switzerland (DPSS) is to guide and coordinate digitalization initiatives at the federal, cantonal, and municipal levels. On January 1, 2022, the coordinating body officially began its mission. The Confederation and the cantons have authorized its establishment and assigned it specific duties by the "public-law

framework agreement on Digital Public Services Switzerland." The Swiss federal government's Digital Public Services operates on a four-year strategic cycle to fulfill the government's digital transformation process. The operational actions are included in the rolling implementation plan. It lays forth the primary functions of the project and the service. Each year, changes are made to the implementation strategy. Switzerland's Digital Public Services also acts as a third-party auditor for other organizations' efforts.

#### **4.9. Cyber Security [CYB]**

It is anticipated that Russia's aggression against Ukraine would have enduring effects on national and international security policy. The security of Switzerland continues to be defined mainly by the intensifying competition between great powers. For preventative actions to be taken, the Federal Intelligence Service's (FIS) capacity to predict, detect, and analyze risks and developments of strategic relevance to Switzerland is essential. The FIS situation report details the most significant intelligence developments over the last year.

#### **4.10. The use of Emerging ICT [EMG]**

A group of D-Government experts from Switzerland's Confederation, as well as cantons, municipalities, and affiliated enterprises, came up with the cloud computing plan as a way to support the D-Government Strategy. A team produced this strategy. This paper lays out recently discovered choices as well as the necessary steps to take to implement them.

The Federal Council of Switzerland published research on the ongoing evolution of the federal regulatory framework, which included blockchain, fintech, and other distributed ledger technologies. The Federal Council has established an internal working committee inside the United States Federal Government to investigate artificial intelligence. This institution is chaired by the State Secretariat for Education, Research, and Innovation, which also maintains Switzerland's position in international organizations, promotes the exchange of information and opinions and facilitates research and development. The Department of Environment, Transport, Energy, and Communication has developed an action plan to assist cantons, municipalities, and towns in developing "Smart Cities."

Taiwan

## 1. General Information

Area: 36,193 km<sup>2</sup>

Population: 23,900,681

Government Type: Unitary semi-presidential constitutional republic

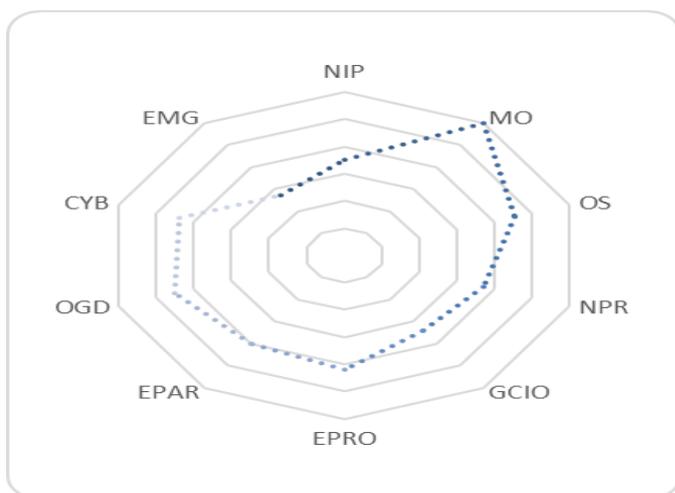
GDP: \$28,010

Internet User: 89

Wired (Fixed Broadband User): 25.4

Wireless Broadband User: 115.94

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

With a total score of 85.3311, Taiwan owns the 9th position on the Waseda ranking 2022. There is a prevalent belief on a global scale that Taiwan punches above its weight in technology, industry, and innovations in government. The Taiwanese government has always understood that the nation's continuing independence is contingent upon a better

strategy, with economic expansion, technical innovation, and institutional flexibility at its heart. In an attempt to replicate the best of the West, the Taiwanese government made concerted efforts during the 20th century to develop an indigenous industrial foundation and, subsequently, an indigenous "Silicon Valley" on top of it. Ironically, these efforts have now exceeded the West and produced a high-trust, technically savvy administration and society that can apply the same open-mindedness and strategic thinking required for foreign policy to domestic challenges.

Taiwan is one of the world nations to notice and react to the expanding epidemic, due in part to a top government health official reading a post on Taiwan's most popular internet message board concerning a new illness spreading from China. This may be a humorous narrative in other situations, but in Taiwan, it exemplifies why Taiwan's pandemic reaction was so remarkably successful compared to that of most other nations. The country's success with COVID was due not only to the government's response but also to the productive interactions between centralized state institutions and civil society.

The information on COVID-19 was swiftly disseminated over the whole of the internet in Taiwan, where it was carefully watched by both regular individuals and officials of the government. As a reaction, those who call themselves "civic hackers" collaborated closely with the government to build resources that would assist individuals in avoiding infection and preparing for the pandemic. These resources included real-time infection maps and bots that would counteract disinformation. Existing centralized efforts, such as integrating data from the national health insurance program with institutions dealing with customs and immigration, online reporting of personal data, and the establishment of a national Command Center for disease control, as well as rapidly developed new ones, such as tracking cell phones, ramping up production of masks, and quarantine procedures.

### **3.2. New trends**

As digital technology advances rapidly and aims to revolutionize and empower every aspect of our lives, the next decade is poised to be a turning point. The energy transition must address concerns resulting from human activity, such as climate change. Engineers and scientists must collaborate to integrate technology into daily life. All sectors, from basic research to applied research and industry, must be integrated to respond quickly to

fast and dramatic societal changes. The worldwide pandemic is a problem because it has altered the IoT landscape by accelerating the rate of digital transformation. However, the epidemic has also allowed Taiwan to showcase its exceptional technologists and industrial chains. Taiwan has been able to safeguard public life and industrial operations during the last year due to governmental and private initiatives. Despite recent instability, the number of cases has dropped due to the community's dedication and international assistance.

Green energy is an important issue that is now being investigated in Taiwan. Before 2016, green energy was just a minor part of the picture. The new administration subsequently introduced new eco-friendly policies, with the minister anticipating that around 20 GW of solar energy would be accessible by 2025. The price of electric cars is relatively high, but they will significantly contribute to the energy shift. Electric mobility is a crucial driver of the energy transition, and it is anticipated that this will result in a rise in the demand for electricity supplied from renewable sources. This indicates that the need for flexible electrical systems is developing rapidly. As the smart grid and renewable energy increase, energy storage will play a crucial role in the sector. As the cost of energy storage decreases, several technologies will find a place in backup and time-shifting applications.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

With a total score of 8.002 out of 10, Taiwan was able to earn the position of fifth place in this year's NIP rankings.

The spread of the epidemic is hastening the transition to digital technology. The pandemic presents several obstacles and possibilities to rethink the process of developing technologies and managing supply chains. For the most part, Taiwan has been able to withstand the devastation caused by COVID-19 due to efforts made over the last year by both the governmental and private sectors.

Taiwan has shown its capabilities and knowledge in various fields, including public health and digital technology. Because the government operates under the philosophy that "Taiwan can assist," it has been sharing its pandemic experiences and resources with foreign partners. As a result, many people from other countries learn about Taiwan. The epidemic is a problem for Taiwan, but it also presents a chance for the country to showcase

its exceptional technological personnel and industrial chains.

In the world that will exist after the pandemic, Taiwan will place its primary emphasis on the following six main industries: precision healthcare, digital transformation, semiconductors, space, and 5G/6G Internet infrastructure. Taiwan has placed a significant emphasis on digital regulations and will be focusing on emerging technologies such as blockchain and the Internet of Things (IoT) in the next few years. Everything will be interconnected, and digital technology will be central to all aspects of life. Because of the epidemic, Taiwan has to pick up the pace to make even more rapid progress in digital transformation.

#### **4.2. Management Optimization [MO]**

Taiwan intends to implement a state-level transformation strategy to grow its government, industry, talent, and society. The National Development Council (NDC) has established the "Digital Government Program 2.0 of Taiwan (2020-2025)" to expedite the implementation of different reaction measures to promote the digital transformation of the government. NDC will adhere to the plan's strategy for coordinating the implementation of multiple ministries, enhancing the transformation of cross-domain service processes based on the people's demands, and using a secure and dependable data transmission platform for interagency data sharing. The government will continue to contribute to the following endeavors:

- Enhance the digital infrastructure surrounding all government agencies: With the maturation of Internet technology and the widespread adoption and application of 5G wireless broadband communications, we will continue to invest in the digital infrastructure and support the innovative service operations of the government.
- NDC will aggressively support the data management measures of public agencies, prioritize the improvement of data standards, data interface standards, etc., and attach significance to the release of high-value data, such as map information, transportation data, and other data sets. It is vital to develop a method for the public to apply data and clarify the rights and responsibilities associated with data usage.
- Implement governance choices based on evidence: The government's digital transformation is illustrated through the use of data-driven policy decisions to

enhance the effectiveness of government governance. In the future, big data analysis will be used to address governance concerns and react swiftly to external threats.

- Construct data-driven public administration: By analyzing data to determine the requirements of the populace, integrating government resources to assist the populace in resolving life's challenges, and taking the initiative to suggest actions for the populace. In the future, digital applications will employ data to drive the transformation of services, making data the central component of services.

#### **4.3. Online Service [OS]**

In the year 2022, Taiwan's operating system received a score of 11.400, which placed the country in the 2<sup>nd</sup> position in the Waseda rankings for OS. Taiwan has proved for decades that it is among the world's leaders in establishing e-government technologies that increase the population's efficiency, transparency, and representation. This has been adequately proved by Taiwan's reaction to the COVID-19 epidemic, which relied significantly on these e-government services and was among the finest in the world.

Specifically, Taiwan has distinguished itself by applying for digital advances in all facets of government using a government-wide strategy. Its innovative approach to ICT has led to increased civic engagement and the partial eradication of the conventional divide between the government and the public. Taiwan has built a more responsive, effective policy formulation and execution process that other societies with comparable people resources may use by enabling the government to utilize the latent ICT skillsets of its inhabitants. Specifically, India, which has a big national pool of skilled programmers, will gain greatly from developing its e-government efforts using the Taiwanese model.

#### **4.4. National Portal [NPR]**

The Digital Government Program in Taiwan aims to "provide one stop digital services" and build a diverse collaborative work environment. These are two of its most important objectives. To meet the market's needs and make the country more competitive, there is an increased emphasis on providing digital services for areas of concern to the general public, such as education and medical care. To this point, the implementation of e-government projects by the government has resulted in significant improvements, not

only in quantity but also in the quality of the services provided by the government. Using the My e-Government single portal website, users may now submit requests for more than 25,000 different types of government services. Because of the deployment of integrated data centers, the total number of machine rooms and data centers has decreased by around 44.

#### **4.5. Government CIO [GCIO]**

Taiwan's GCIO comprises the Deputy Ministers and Chief Secretaries of several cabinet-level government agencies. Convener of the National Information and Communications Initiative Committee (NICI) is the GCIO in the Executive Yuan. CIOs at the ministerial level is responsible for driving business process re-engineering, coordinating the use of business and ICT resources, and reporting directly to the minister. As a consequence of this, Taiwan's GCIO received 7.273 points and was placed ninth overall in the Waseda rankings for 2022.

#### **4.6. E-Government Promotion [EPRO]**

The tendency of all governments, including Taiwan's, has been toward digital government, data governance, and enhancing the impetus for national growth as the globe has entered the digital era. The idea of "digital government" refers to how data and digital technology may help the government provide better services to citizens and businesses. Taiwan's government optimizes the quality of governance decision-making by using data as the foundation, making good use of digital technology, strengthening government efficiency and national security, and combining government services with people's needs.

The role of information and communication technology in Taiwan's public governance has developed from the early management of public affairs to the current innovative governance efficiency. It will gradually change to the development goal of creating public service value in the future. This is in line with the development trend of digital governments in advanced countries. The strategy for the ongoing promotion of digital government involves using new technology to streamline the delivery of public services, reinvent how they are delivered to the public, and fulfill their requirements. It should be no surprise that Taiwan holds the ninth spot in the Waseda rankings 2022 in terms of EP

#### **4.7. E-Participation [EPAR]**

The Smart Government Action Program with the following three objectives "integration of service functions, cutting-edge smart services, Transparency of open data, maximum added-value application Link to governance network, top-notch decision-making " However, only four of the seven strategies for fostering open government data, public involvement and social innovation, integrated service functions, and intelligent service have been fully implemented. The additional steps are to "develop a regulatory adjustment platform," "deploy privacy protection monitoring," and "boost data security defense in depth." The channels of information and cooperation in public policymaking need to be broadened.

The local administration should make use of the internet forum. It is now being used by the National Audit Office and all Taiwanese special municipalities, including Hualien and Hsinchu. The public's involvement helped solve 55 people's livelihood problems, such as the growing restriction on single-use tableware, the opening of fishing ports to fishermen, and the reform of mountain climbing application procedures.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The government will continue to lead different agencies in using data to streamline the interaction between the government and the public, cut down on duplicative administrative processes and wasteful use of resources, and bring about tangible government services for the people. The government must design government services from the perspective of diverse topics and, according to external requirements, carry out inter-agency integration of digital services to establish the "people's needs driving service reform" digital transformation model.

Despite Taiwan's exclusion from the international Open Government Partnership, the government in Taiwan is working to implement an open government and parliament plan. This plan includes implementing "participation officers" to increase openness and transparency across all government agencies. This is an impressive aspect of Taiwan. The strength of civic hacking communities in Taiwan, such as g0v and other tech organizations, as well as the government's receptivity to the mobilization of civil society in such a manner, is an excellent aspect of the country. The aspects of Taiwan that are most impressive are not digital at all; instead, it is the fact that a critical mass of

individuals and government effort is being spent on gradually developing channels of discussion. Waseda's rankings for 2022 placed Taiwan in the sixth position, with a total score of 9.400 points, due to all of the work and investment in OGD.

#### **4.9. Cyber Security [CYB]**

The global industrial environment has changed recently due to the cross-generational, cross-border, cross-domain, and virtual-real developments that the digital economy has pushed. Additionally, with the emergence of the digital economy and the Internet of Things (IoT) era, the promotion of the national information security development plan in the following stage must guarantee digital security from the viewpoint of information security. This requires building a sound industrial ecosystem, accelerating industrial innovation, optimizing the industrial structure, and coordinating with the direction of information security and national security policies. In this regard, the National Information and Communication Security Council of the Executive Yuan proposed the "National Information and Communication Security Development Plan (106-109), which aims to strengthen the development of information security independence while enhancing overall information security protection mechanisms. Self-directed energy and the development of top information security professionals.

#### **4.10. The use of Emerging ICT [EMG]**

Taiwan's efforts to strengthen its ICT sector are well-timed, given that the global market is very competitive. The island began its venture into ICT in 1974 with the assistance of a large American electronics company and was a minor participant at the time. Taiwan is making significant waves in the area. Indeed, the country's industrial prowess and the tenacity of its people have made it a beehive of invention. Foreign and domestic investors find a fruitful environment for the development of technology.

According to OpenGov Asia, a recent example of this is the ambition of a large manufacturer to make Taiwan a launching pad for innovative digital healthcare gadgets in Asia. The country's competent workforce and degree of competitiveness should not be an issue despite the many obstacles.

Thailand

### 1. General Information

Area: 513,120 km<sup>2</sup>

Population: 71,723,383

Government Type: Unitary parliamentary constitutional monarchy

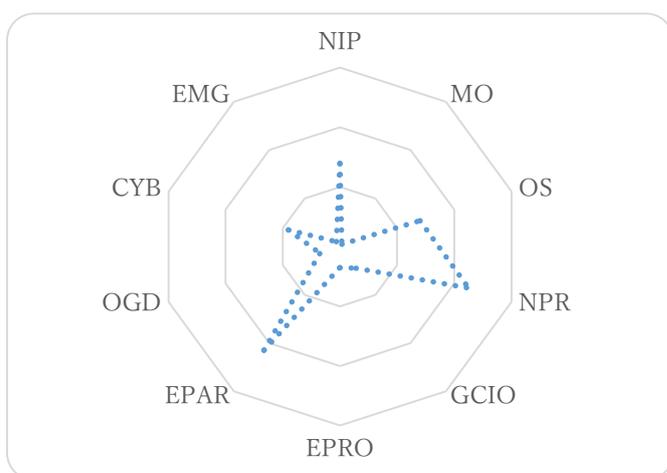
GDP: \$6,978

Internet User: 76.2

Wired (Fixed Broadband User): 32.4

Wireless Broadband User: 124.9

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

Thailand received a total score of 78,098 on Waseda International's digital government rankings for 2022, placing it in 22nd place globally. According to the World Bank's latest Thailand Economic Monitor, "Living with COVID in a Digital World," released today, economic activity in Thailand has returned after being severely damaged by a rise of COVID-19 cases in the third quarter of 2021 and is predicted to expand by 1.0 percent

this year. A more competitive economy and a speedier recovery from the COVID-19 outbreak might be possible outcomes of greater use of digital technology in the future. With improvements in vaccination rates and a subsequent uptick in tourist arrivals, the economy is predicted to recover by the end of 2022 fully. In 2022, growth is expected to rise to 3.9%, and in 2023, to 4.3%, thanks to a pick-up in the service sector. The present rate of vaccination, about 750,000 per day, and the lack of a further recurrence of COVID-19 are both factors that should boost consumer confidence and foreign tourist confidence.

Inequality disparities, economic and financial instability, and a new wave of identity politics are some of the complex global policy problems that governments must face today. Distrust is a significant obstacle in the development of public-private partnerships. Additionally, individuals have become increasingly outspoken and demanding in their expectations for government openness, honesty, and accountability in all areas of public service delivery. Pressures from the increasingly digitalized world in which people live, work, and interact add another layer to an already complex problem. This means the public sector must undergo a digital transformation.

Thailand and other Southeast Asian (SEA) governments are now reevaluating how public policies and services are developed and provided to meet these demands. This necessitates not only accepting and being prepared to overcome the related policy design and implementation challenges of open and connected government reforms, which improve the quality of public policies and services, make the state more efficient and effective, and bring it closer to its citizens, but also acknowledging that doing so improves the quality of public policies and services.

### **3.2. New Trends**

In the long run, a more competitive economy might aid Thailand's recovery from the COVID-19 outbreak thanks to the country's embrace of digital technology. As a result of the prolonged limitations on movement, the pandemic has seen a rise in the usage of digital devices and the use of digital services. Businesses' use of digital technology has been connected to growth in trade and output. Because of the cheap transaction costs and the ease with which small businesses may enter new markets, online trade has become more significant for micro, small, and medium-sized enterprises (MSMEs) in Thailand.

Enhancing the Quality of Life, Improving Business Competitiveness, Strengthening Public Stability and Security, Promoting Government Efficiency, and Integrating and Building Digital Government Infrastructure are the five strategies outlined in the Thailand Digital Government Development Plan (2017 – 2021).

Strategy 1 : Elevating Citizen’s Quality of Life

Strategy 2 : Enhancing the Capacity of the Business Sector’s Competitiveness

Strategy 3 : Increasing National Security and Public Safety

Strategy 4 : Improving Government Efficiency

Strategy 5 : Developing the Capacity to Support Government Services

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Much like other nations, Thailand places a significant emphasis on its economic policies to take advantage of the new and developing economic opportunities presented by the digital economy. To this point, modifications have been made to action plans and policy responses at the national level and across all government departments. The Thai Digital Economy and Society Development Plan is a digital blueprint jointly developed by the Ministry of Information and Communication (MICT) and the Ministry of Science and Technology (MOST). This plan is intended to revolutionize how the government does business, how businesses operate, and how people live their lives in relation to Thailand's digital economy. Not only have policies that are directly relevant to the digital economy, but strategic investment plans and other decrees have also been adopted to drive economic change.

##### **4.2. Management Optimization [MO]**

Public services, economic growth, citizen engagement and participation are all areas where Thailand sees open and digital government policies as having the ability to make a difference. Ambitious open government initiatives may help restore faith in government and revitalize democracy if they are crafted and carried out with care. Medium- and long-term development goals, such as providing public value to citizens and businesses through digital and open government initiatives, are articulated in instruments like the 20-

Year National Strategy (2018-2037), the National Economic and Social Development Plan, and the Thailand 4.0 economic model.

To this end, the government of Thailand has developed initiatives, policies, and institutional responsibilities for creating and providing digital services with the citizenry in mind and for including the citizenry in policy making. However, achieving such lofty long-term objectives would need further work to establish a framework for open and connected government and adopt consistent and well-thought-out policies. Stronger control, oversight, and coherence in the financing of digital projects; the development and alignment of digital standards; and the establishment of stronger data governance arrangements in the public sector are all examples of what can be done to improve government transparency and accountability.

#### **4.3. Online Service [OS]**

With a Waseda OS rating of 11.25 in 2022, Thailand came in at number nine. The meteoric ascent of online shopping suggests that electronic payment methods like PayPal may soon be widely used. In the next half-decade, online and mobile banking in Thailand may become increasingly commonplace. This is due, in part, to the widespread use of electronic payment systems and the rapid development of mobile internet across the nation.

Businesses and customers have been encouraged to abandon cash in favor of electronic payments as part of the national e-Payment project, which has received a heavy promotion from both the public and private sectors. Users of PromptPay may send and receive payments through mobile phone numbers or citizen identification numbers between consumers and businesses after they have registered.

#### **4.4. National Portal [NPR]**

A single point of entry that allows consumers to access different services without having to go to multiple websites is known as an internet gateway. [Thaigove.net](http://thaigove.net) has successfully elevated the quality of online communication between the government and its citizens. The website offers a broad range of e-services and general news by linking to all of the websites maintained by the federal government. Through the use of e-Government, the people of Thailand have the ability to access government services whenever and wherever

they want. People can now pay their taxes and renew their licenses online thanks to the integration of the portal site with all federal government institutions.

#### **4.5. Government CIO [GCIO]**

Chief Information Officers, often known as CIOs, are appointed at all levels of government, including the provincial level, and by definition, their posts are administrative bureaucracies. It is possible to locate CIO associations in Thailand with a forward-thinking mindset, such as the CIO Association of Thailand and the International Academy of CIOs. Both of these organizations bring together CIOs and ICT specialists from the public and private sectors. As a component of the DGA, the D-Government Academy collaborates with other organizations to provide CIO-related events like as conferences and seminars. These events are made possible via partnerships. Under the aegis of Digital Thailand, chief information officers (CIOs) in Thailand's public sector have overseen the digital transformations of their respective enterprises. To this day, the interim ICT training sessions for government CEOs have been undertaken every year in an effort to narrow the gap in ICT literacy that exists between the CEO and CIO.

#### **4.6. E-Government Promotion [EPRO]**

One major factor driving this demand is Thailand's national development strategy, dubbed "Thailand 4.0," which aims to increase the number of small and medium-sized enterprises (SMEs), industrial firms, and service sector organizations that use digital, automation, and robotics technology. By implementing measures such as the Smart City Development project, a big data platform and analytics for agricultural, educational, and healthcare policies, and investment in digital infrastructure, Thailand 4.0 seeks to leverage digital technology to improve citizens' quality of life, participation in political governance, and the country's economic competitiveness.

The Digital Government Administration and Services Law B.E. 2262, passed by the Thai government, lays forth four objectives for improving the public sector's capacity to serve the people. There has been an effort to implement this system, spearheaded by the Digital Government Development Agency (DGA), which is mandated by law to promote the widespread implementation of digital government architecture among government agencies. The Thailand Government Information Exchange is a centralized database of

government agencies to ease the paperwork requirements for businesses, boost government efficiency by eliminating unnecessary processes, and encourage the use of digital identification and related technologies like digital signatures. Building a government data catalog is a massive undertaking, especially for the private sector.

#### **4.7. E-Participation [EPAR]**

This year's online public forum was titled "Thailand: Implementing access to information legislation to build back strong institutions for the people," It was hosted by UNESCO Bangkok, the Thailand Office of the Official Information Commission (OIC), and COFACT, a civil society fact-checking network. Given the present epidemic, the debate between more than eighty participants, including duty bearers from Thai government agencies and rights holders from media and civil society, was very fruitful.

Every country in the area has the enormous task of balancing the need to manage information overload, or an "infodemic," with the need to safeguard freedom of speech and the public's access to knowledge in the modern digital era. However, there was consensus across the group that an independent and efficient supervision organization is required.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The government has created the "Thailand 4.0" economic model to accelerate this transition and encourage digital transformation; this model prioritizes digital upgrades that improve people's quality of life and work efficiency. The idea of Thailand 4.0 emphasizes the importance of public and private cooperation. In this model, the private sector takes the initiative via its own commercial operations and investments, with the government playing the role of facilitator and promoter. By offering adequate incentives, the government can attract more capital to digital technology sectors.

The Digital Government Act, recently approved in Thailand, aims to make the government's actions more effective and efficient. According to President Tiarawut, the DGA intends to construct a federal data exchange platform to establish security standards for data sharing following this legislation. – Before the development of cloud computing, a data transfer agreement had to be a minimum of six months. When the necessary

technology is available, this transaction will be carried out entirely automatically.

Government organizations are required to make their data available to the general public, except for any sensitive information. This is done to safeguard the privacy of individuals as well as the security of the country. By evaluating data on topics such as transportation and agriculture, for example, potentially innovative new services and technologies might be produced. To monitor and maintain track of government projects using data, the DGA has been collaborating with the Thailand Anti-Corruption Association. Additionally, a program helps organizations keep track of their income sources, expenditures, and procurement methods.

#### **4.9. Cyber Security [CYB]**

Over 86 percent of Thai businesses have begun a digital transformation, according to the ASEAN Enterprise Innovation Survey 2021/22. As a result, cyber resilience is more important than ever. Although businesses know the risks associated with data breaches and other cyber assaults, they also need convincing evidence of the security investments' value.

To combat possible cyber dangers, the Thai government established regulations in 2019 that provide authorities access to digital data for tracking and monitoring purposes. To aid businesses in their attempts to become more cyber resilient, the National Cyber Security Agency (NCSA) was established to draft recommendations for the security of the key national infrastructure.

With the potential cost of a data breach under Thailand's PDPA legislation standing at up to THB 5 million, investing in cybersecurity may be justifiable as insurance (USD 145,645). It is possible for Thai businesses to make use of new technologies while shielding themselves from the financial and reputational damage that cyber assaults may cause.

#### **4.10. The use of Emerging ICT [EMG]**

As a result of DGA's progress, the government has begun adopting cutting-edge technologies, including cloud and mobile computing, big data, and the Internet of Things

(IoT). The government's G-Cloud as an Infrastructure as a Service (IaaS), which uses cloud computing technologies to manage government resources, has been accredited thanks to its certification to ISO/IEC 27001:2013. To begin, MDES is lending a hand to fledgling businesses that use government-held Big Data to create new markets. Over the course of many years, the EGA Research & Development team has been working on various government IoT pilot projects and has produced a development strategy for each. Some academics emphasize the critical role that central government institutions play in driving the implementation of e-government and ICT policy, indicating that these institutions are prepared to undergo the transformation required for E-Government 4.0. Despite these findings, the issue of the digital gap still persists over a significant portion of the developing globe. This issue is tied to the often-overlooked but critical role that residents and local consumers play in shaping policy implementation.

Tunisia

## 1. General Information

Area: 163,610 km<sup>2</sup>

Population: 12,378,148

Government Type: Unitary semi-presidential constitutional republic

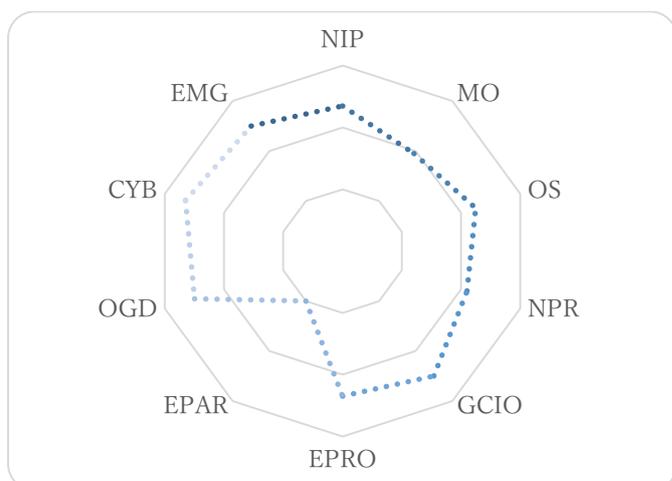
GDP: \$3,440

Internet User: 71.9

Wired (Fixed Broadband User): 11.29

Wireless Broadband User: 76.05

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

With a total of 55.809 points, Tunisia landed in the 61st position in the Waseda rankings. Although it receives less attention than its North African and African counterparts, Tunisia is a major driver of the continent's digital economy and a hidden champion. The digital economy is one of the nation's most robust and rapidly expanding industries, accounting for over 11% of GDP growth. So far, over one hundred thousand high-paying

jobs have been generated directly from the efforts of more than 1,600 digitally engaged businesses.

Furthermore, Tunisia has a large number of recent college grads that are proficient in digital fields. The administration has plans to make even more use of the opportunities presented by digitalization. In the wake of the current COVID-19 epidemic, Tunisia's national policy, "Digital Tunisia 2020," will be replaced with an equally ambitious successor. In 2019, GIZ began planning a Digital Transformation Center in Tunisia for the Federal Ministry of Economic Cooperation and Development's Special Initiative for Training and Employment - "Invest for Jobs" (BMZ). Two critical supports hold up the core: Startups, Industry 4.0, and the digitalization of strategic industries, including digital banking, e-commerce, and healthcare, all areas of emphasis for the "Digital4Jobs" initiative. Digital4Reforms, the second pillar of the initiative, is concerned with GovTech, digital infrastructure, and cyber security.

### **3.2. New Trends**

The government of Tunisia passed new legislation supporting startups at the beginning of 2018. It establishes a comprehensive framework for bolstering Tunisia's start-up ecosystem by means of tax rebates, founder subsidies, and patent assistance. If Tunisia's industrial companies can compete in the global market, they need to be ready for the disruptions coming with Industry 4.0. Therefore, the government is putting a premium on Industry 4.0 solutions that boost businesses' ability to compete internationally. Many of Tunisia's bureaucratic processes might benefit from being more open, accessible, efficient, and streamlined with the use of technology developed by the government. Many disorganized efforts are underway to bring public procedures and establishments into the digital age. Tunisia has an above-average digital infrastructure. Given the relatively stable political climate, Tunisia may serve as a significant Internet cable landing place. There is now work to establish a digital port in the northern town of Bizerte that can house up to seven cables.

In cyber security, Tunisia has just released its first national policy. The digital transformation will largely be shaped by the availability of secure and solid infrastructures and the requisite skills. Diverse industries are becoming more digitized,

with initiatives underway in almost every field to oversee the transition to digital. A few examples: are digital currency issued by a central bank, electronic commerce (a new framework to facilitate online shopping), and digital health.

Tunisia has a large pool of young, educated, and digitally savvy graduates. In the future, the government hopes to make even more use of the advantages brought about by digital transformation. Digital Tunisia, the country's overarching plan, has already begun addressing the difficulties and opportunities presented by the current COVID-19 epidemic. Tunisia has released its first national plan to protect its critical infrastructure from cyberattacks. The digital transformation will be heavily influenced by the availability of secure and robust infrastructures and appropriate skills. Management of the digital revolution is an ongoing focus for almost all industries. Digital currency issued by a central bank, electronic commerce (a new framework to facilitate online shopping), and digital healthcare are only a few of the most significant (introduction of a digital health data system).

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The country of Tunisia has a digital infrastructure that is satisfactory. It is possible that Tunisia may become an important landing site for Internet cable due to the political climate in the area, which is as stable as it is secure. The municipality of Bizerte, located in the northern part of the nation, is now in the process of building a digital port that will have the capacity to house up to seven cables. Tunisia has embraced the Internet Universality Indicators developed by UNESCO as part of its agreement with India (UIUs).

##### **4.2. Management Optimization [MO]**

As part of Tunisia's National Strategic Plan, the country's digital economy was being created. The goal of Tunisia Digitale was to improve the country's information and communication technology (ICT) infrastructure and to better use the assets of the ICT industry to speed up the country's economic and social growth. In addition to fostering innovation and entrepreneurship in Tunisia's information and communications technology (ICT) sector, Tunisia Digital sought to close digital divides throughout the nation and alter the public's view of the IT sector by emphasizing the importance of trust.

Also, on 12 May 2020, a government decree was released by the Minister of Local Affairs and the Minister of Communication Technologies and Digital Transformation to create a national unique citizen identity system. A second decree was issued on 15 May 2020 to explain its execution. According to Fakhakh, the Tunisian government favored a decree on the unique identity to settle the COVID-19 controversy.

#### **4.3. Online Service [OS]**

The Tunisian government's capacity to build e-commerce platforms that can be utilized for the long term has been tested due to the ongoing coronavirus outbreaks occurring in the country's hospitals. Since the epidemic, there has been an increase in the use of electronic services. Nevertheless, the industry is still confronted with several challenges, the most significant of which is the reluctance of both individuals and the government to embrace digital technology, as well as the continuation of legal and logistical barriers that impede the development of digital systems in the country.

E-commerce is seen as a potential bright light by analysts, even if the epidemic is expected to have disastrous effects on the economy. At the outset of this health concern, the government of Elyes Fakhfakh opted for digital alternatives and curtailed the circulation of currency.

#### **4.4. National Portal [NPR]**

There are several channels via which one may get information about the government of Tunisia; one of these channels is the official government website, which can be accessed at "<http://www.tunisie.gov.tn/>." The website only offers information on various internet services and links to other websites. Visitors who speak Arabic have access to most of the site's material; nevertheless, the website provides information in French.

On the National Open Data Portal, which can be found at [www.data.gov.tn](http://www.data.gov.tn), users have access to a wide variety of public data via a centralized location. The provision of unrestricted and unrestricted access to information that may afterward be utilized to produce additional value through mobile apps or online services is one of the objectives of this website. Another objective of this website is to promote openness and accountability.

#### **4.5. Government CIO [GCIO]**

At either the national or municipal level, Tunisia's public administration cannot select chief information officers (CIOs) or functionally equivalent functions. At the national level, the Chief Information Officer (CIO) position can be held by the Director-General for eGovernment, who reports to the Prime Minister.

#### **4.6. E-Government Promotion [EPRO]**

Most development organizations are pushing Investment in digitalization and digital technology because of its perceived importance as a driver of economic and social growth in underdeveloped nations. It is believed that digitalization could have far-reaching positive effects on society and the economy, including the creation of entirely new industries, the hiring of previously unemployed people with advanced degrees, the attraction of foreign direct investment (FDI), the eradication of barriers to participation in society for those with physical impairments, the lowering of prices for consumers, the expansion of access to higher quality education, the promotion of globalization through the export of e-services, the acceleration of business processes, the streamlining of administrative procedures, the acceleration They also express concern about digital gaps. Tunisia has included ICTs and methods for their deployment in its economic and social development objectives since the early 1980s. Though it has strong Internet access and was an early adopter of digital technology, Tunisia does not seem to be making the most of the possibilities that these advancements provide. Due to the COVID-19 lockout, some crucial industries could not function, further dragging down the country's already abysmal economic performance. There is a greater need than ever to call attention to the current qualifications and gaps.

#### **4.7. E-Participation [EPAR]**

E-Participation has the potential to be effectively implemented in Tunisia, which is one of the countries in the area with the highest level of technical proficiency. Despite this, there hasn't been much of a leap forward in this area recently. On average, websites operated by government agencies provide their services in Arabic and French. Websites at a higher level of government, such as the national portal, exhibit interactive capabilities and have designs that have been carefully researched. Growing public understanding of the significance of information and communication technologies is essential to the

success of national ICT operations. It is evident that the government considers the general public's views in its decision-making process since they have polls and feedback systems. There has been little progress in addressing accountability concerns and providing specific policy declarations.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The National Open Data Portal is a centralized repository that houses data from public institutions. Its purpose is to ensure that the requirements of the Organic Law on Access to Information requirements are met while simultaneously encouraging the creation of innovations and services by encouraging the reuse of public data. The National Open Data Portal serves as the central archival location for any information that is freely accessible to the public (NODP). It does this by using the administrative areas of many government websites and other industry-specific open data portals to consolidate the information that the general public has voluntarily provided.

Currently, the Tunisian government is crafting a decree on open data to continue and institutionalize the process of public entities sharing accessible data and cultivating an environment conducive to innovation and economic growth. This law establishes a governance framework for the initiative to make nationally accessible data and outlines the technical requirements that must be satisfied.

While everyone is on board with the idea that the Tunisian government should undergo a digital transformation, each organization still has a different view on how much control it should have over its data. Not all organizations are at ease with fully automated exchanges; others prefer to approve access requests individually. The Tunisian government must make changes to the law to fully take advantage of digital transformation, but this is not enough. Secure electronic exchange is more dependable, efficient, and secure than the existing method, all of which need to be communicated to government authorities.

#### **4.9. Cyber Security [CYB]**

As the third of the target nations for the CyberSouth project, Tunisia organized a national workshop in 2021 to contribute to developing a dedicated cybercrime reporting system. It was addressed by officials from the Council of Europe and Tunisian authorities. They

were instructed on the structure, models, and means of collecting complaints used by the Romanian cyber crime reporting apparatus. The Tunisian delegation presented an overview of their procedures for reporting cybercrime, outlining the duties of the institutions involved and emphasizing the preventative measures they take. During the session, participants determined the need for more assistance for Tunisia's online reporting tool for cybercrime assaults and specified methods for processing cybercrime complaints.

#### **4.10. The use of Emerging ICT [EMG]**

Internet and telecommunications services providers in a given area have long since supplied "cloud" services to their clientele. To construct and improve its cloud services for Ooredoo Tunisie, the Qatari telecoms operator Ooredoo and the American technology company HP struck a collaborative deal two years later. Cloud Temple is a joint venture between Intrinsic and the Paulina Holding Group. Businesses were the primary focus of the arrangement, which aimed to improve Ooredoo's cloud and cybersecurity services.

In addition, the Tunisian government is attempting to establish a cloud-based network. Digital information is being shared across government agencies; hence, interministerial networks are being established to guarantee data privacy and security. Individuals' personal information (such as their date of birth and social security number) will be accessible to relevant government entities via a unified login system, which the government is currently developing.

Turkey

## 1. General Information

Area: 783,562 km<sup>2</sup>

Population: 85,465,036

Government Type: Unitary presidential constitutional republic

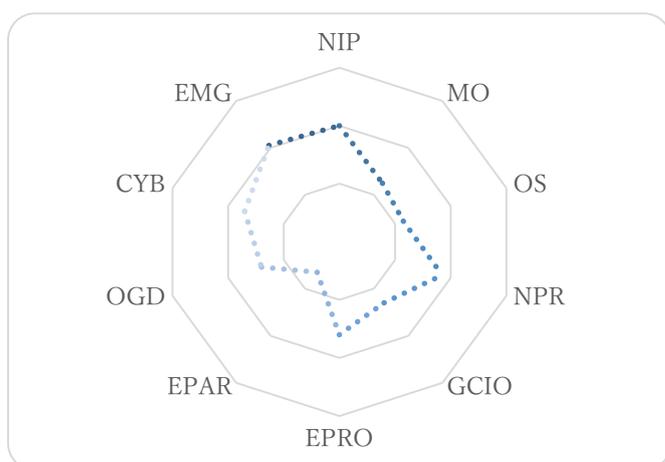
GDP: \$8,436

Internet User: 77.67

Wired (Fixed Broadband User): 19.84

Wireless Broadband User: 77.82

## 2. Digital Government Overview in Country



## 3. Digital Government Development and new trends

### 3.1. The development

In the Waseda International digital government rankings 2022, Turkey was 38<sup>th</sup> with 68.965 points. Turkey is the only nation in the world with an education system covering the whole country. Turks who are young, active, and motivated can propel their nation to the forefront of global leadership in the creation of new economic sectors. In addition, MoIT has formed a partnership with Ecole 42, part of a new wave of free coding schools.

These schools educate students using a project-based, peer-to-peer, and gamified learning method. After three years of integration, a one hundred percent employment rate is possible at two schools with two thousand students each. The corporate world shapes the mentorship program, academic curriculum, and extracurricular activities.

There are new challenges, but there are also new opportunities as companies re-align their investments in particular technologies to accelerate their digital transformation journeys while positioning themselves for future growth. This re-alignment allows companies to set themselves up for future growth while accelerating their digital transformation journeys. This IDC Sector Presentation overviews Turkey's post-pandemic IT industry, investment targets, and technical approach.

### **3.2. New Trends**

Even though Turkey is now in a recovery phase in which restrictions have been removed, and the number of COVID-19 cases has fallen, companies are still feeling the effects of the pandemic and need to adjust to life with and beyond the virus. Companies and governments are both under pressure to adopt market-oriented strategies and put them into practice. Private services will undoubtedly remain at the forefront of mobile strategy orientation, but public and non-profit entities are rapidly rising to prominence as "Mobile Players." Improved data connections through smartphones have raised hopes that governments would, at long last, provide services compatible with their citizens' information and communications technology way of life. Whether improved m-services or more conventional Internet-based apps will emerge as the dominant type of technology is still unclear. The presently untapped sector of the population has the potential to have access to government services at a cheap cost with the launch of interactive apps and fully transactional services through 3G smartphones.

## **4. Digital Government by Indicators**

### **4.1. Network Infrastructure Preparedness [NIP]**

This acceleration has been made possible by the foundation Turkey has established. Thanks to a competitive market, a legislative environment favorable to the growth of broadband, and substantial expenditures, broadband's reach, speed, and affordability have been established. Low demand among entry-level users, trailing demand for faster

speeds, excessive taxes on devices, spotty coverage in suburban and rural regions, a tough wholesale market, and inefficiencies in distribution are all factors slowing the growth of the Turkish broadband industry. Our study offers six policy initiatives that might promote the development of broadband access in Turkey by overcoming these constraints, drawing on the precedents of successful policy interventions in markets comparable to Turkey's.

1. Promote high-touch distribution channels, raise broadband awareness, and quicken high-speed Internet adoption to increase demand.
2. Boost useful local information and software, focusing on educational, governmental, and economic enhancements.
3. Revise the taxation structure on equipment and services connected to broadband to reduce the cost of broadband
4. Extend or redefine the regulatory vacation and introduce new regulatory incentives, and infrastructure-based competition may be fostered.
5. increasing present subsidies
6. Get the help of local governments to reduce right-of-way costs by combining demand.

#### **4.2. Management Optimization [MO]**

The Ministry of Industry and Technology of the Republic of Turkey has released its Industry and Technology Strategy for 2023. High Technology and Innovation, Digital Transformation and Industrial Move; Entrepreneurship; Human Capital; and Infrastructure are the five pillars upon which the plan rests. An array of supporting sub-strategies have been developed and are in the process of publication and implementation.

The fundamental goal of Turkey's Digital Transformation of the Industry Strategy is to improve the country's competitiveness via increased efficiency and autonomy in the industry. Following are some of the goals of the plan:

1. Collaborating with the public and commercial sectors to set up the suggested governance framework for the industry's digital transformation program.
2. The finalization of technologies will guarantee the management, monitoring, and efficient use of resources for the industry's digital transformation.
3. Sharing news about the initiative to aid in the transition to digital.

4. The digital transformation infrastructure will be finished.
5. Acquiring the know-how to bring a digital transition inside the current and future labor force.
6. Creating innovative products and services in the field of Operational Technologies.
7. Creating innovative IT goods and services that can compete in the market.
8. Development of innovative Transactional Technology products and services.

#### **4.3. Online Service [OS]**

The Central Population Management System (CPMS) was improved by adding three new modules: Identity Information Sharing System, Key Population Statistics module, and Multi-Ethnic Research and Network Identification System. Public institutions and agencies may use the KPS to obtain MERNIS database ID information. Users are given their login and password to access the VPN.

The Public Procurement Authority's automated processes aim to streamline and enhance the government's ability to purchase goods and services. To that end, the Platform was built as a mandatory requirement for all government entities as part of Turkey's Information Society Strategy to improve government services. Constant updates are being made to the system in light of the ever-evolving nature of the market and the technological landscape.

The eGovernment Gateway was established to manage digital transactions. Payments to government agencies are often made using a credit card. Seven local governments have joined the eGovernment Gateway's ePayment network. In Turkey, the private electronic payment system operator (TCMB) reports directly to the central bank.

#### **4.4. National Portal [NPR]**

The eGovernment Gateway for Turkey is known as the e-Devlet Kaps, which the Turkish government issued. Through the Portal, which serves as a central access point, individuals and businesses can use eGovernment services. To provide an even higher level of convenience and accessibility, the eGovernment Gateway may also be accessible via the contact center that is associated with it. The eGovernment Gateway has been tested and found to comply with accessibility standards such as ISO/IEC 40500 and 9241-151.

#### **4.5. Government CIO [GCIO]**

The position of Chief Digital Officer within the Government was given to the person in charge of the Digital Transformation Office. The Government Chief Digital Officer is ordered to lead the public sector into the digital age by devising public digital transformation plans, overseeing implementation procedures, and creating a digital transformation road map to boost public sector performance and efficiency. Chief Information Officers (CIOs) and Chief Digital Officers (CDOs) have been appointed in public sector enterprises in nations with a history of successful digital transformation.

#### **4.6. E-Government Promotion [EPRO]**

The Grand National Assembly of Turkey approved a development plan for Turkey that emphasizes enhancing the country's social welfare and its standing on the world stage. Following the new Presidential Government System being implemented, the plan was created as the first Development Plan to be implemented after the system. The strategy to solve these concerns was devised as global economic and geopolitical balances moved and tensions increased throughout recent history. The plan included recommendations to minimize the risk of potential harm while maximizing operational effectiveness to expand economic opportunity and guarantee equitable distribution of benefits.

The plan has a primary emphasis on the following development axes: environmental sustainability and healthy cities; qualified people and a strong society; the rule of law, democracy, and good governance; competitive production and productivity; as well as a stable and robust economy. The Plan has a part that is titled "eGovernment Applications in Government Services." This section contains the policy on eGovernment. The Eleventh Development Plan includes transformation and innovations to increase service quality and consumption via the eGovernment Portal. These innovations will guarantee that the system is both efficient and compatible.

#### **4.7. E-Participation [EPAR]**

PublicNET, a virtual private network, enables data sharing between the many agencies that make up the Turkish government. By Decision No. 2012/1 of the Council on Cybersecurity, the General Directorate of Communications is responsible for configuring the web. Installing software and hardware that enables Turkish residents to utilize

electronic governmental services safely was necessary to reach the most significant degree of security that could be attained with an eGovernment Gateway. It was decided to replace some network equipment for the eGovernment Gateway. More than 45 million enrolled residents have been able to continue receiving services without experiencing disruptions thanks to the eGovernment Gateway.

The Ministry of Treasury and Finance established a countrywide communications network so that people could submit their tax returns electronically when the time came. Connected to the system are the tax administration offices of the Revenue Administration, as well as provincial finance administrations, traditions, and tax inspector offices. Online filing of tax returns is permitted, and individuals have permanent access to their tax records.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

With the new government structure in Turkey, the presidency is one of the institutions included in the administrative structure. Human resources, finance, digital transformation, and investment are four departments that might play a more significant role as change agents in public service delivery. The office tasked with overseeing Turkey's transition to a digital economy is called the Digital Transformation Office. E-government apps are widely recognized as a manifestation of the impact of digitalization on the government.

In Turkey, several eGovernment initiatives have been launched, all to enhance the functioning of the public administration and give priority to those with the greatest need. As a result, developing a National Open Data Portal is recommended under this initiative to enhance transparency, accountability, and public involvement. In addition, the Central Service Design Platform will be built to streamline the procedures of the government.

The Right to Information Act protects anyone who repurposes information obtained from public sources (RTIA). The National eGovernment Strategy and Action Plan comprised several initiatives, one of which was reusing and sharing information from the public sector. These included endeavors such as modernizing information in the public sector and establishing the Open Data and Sharing Portal and the Public Expenditure and Monitoring Portal, respectively.

#### **4.9. Cyber Security [CYB]**

Two primary goals must be accomplished by implementing the National Cybersecurity Strategy and Action Plan. The first stage is ensuring the nation's cybersecurity, which is essential to our overall defense strategy. A circular on information security was published to lower the likelihood of potential security breaches and protect vital categories of data that might jeopardize public order or the nation's security. According to the Presidential Circular, Turkey's top priority is developing and implementing national cybersecurity solutions. This goal is emphasized throughout the document. Personal data protection, processing, and cross-border data flow laws for traffic and location data are all controlled by Legislation 5809/2008. This law also covers traffic and location data.

#### **4.10. The use of Emerging ICT [EMG]**

Turkey's economy is performing well compared to others in its income bracket. The expansion of the broadband environment may be attributed mainly to e-government programs. Businesses in the information and communication technology industry have seen demand grow, and individuals have been inspired to boost their Internet use. Support for e-government initiatives has also come from ensuring that political leaders and technocrats have the same goals. When it came to public reforms and structural improvements, political leaders recognized e-government as a vital tool. Strategic, high-value, and high-transaction initiatives were prioritized, and a centralized organizational structure was developed to establish plans and put public money into the pipeline for them. Also helping is the rapid expansion of the Turkish economy during the last decade. Large amounts of foreign money have flowed into the nation due to the many market-oriented reforms undertaken and the government's proactive foreign policy. A lot of progress has been made in the communications, software, and hardware facets of the ICT sector. There has been a lot of money put into making mobile networks broadband-ready. The Turkish people have also shown a significant response to social media. Among all countries, it is the fourth biggest Facebook market. There is a rise in both the popularity and variety of Turkish websites and Turkish-produced content on social media platforms.

The nation still faces economic and societal constraints that make it difficult to widely adopt broadband technologies and maximize their potential for boosting economic competitiveness. ADSL is the only option when it comes to fixed broadband since the company monopolizes the market. There is a need for commercial efforts to close the ICT

skills gap faced by SMEs and the undereducated. International comparison of ICTs and innovations is hampered by the absence of an appropriate national accounting framework for further research.

United Arab Emirates

### 1. General Information

Area: 83,600 km<sup>2</sup>

Population: 9,458,754

Government Type: Federal elective constitutional monarchy

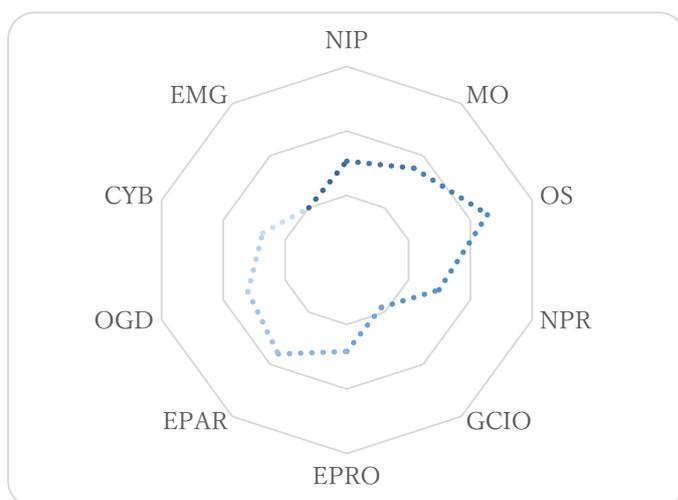
GDP: \$38,011

Internet User: 100

Wired (Fixed Broadband User): 32.84

Wireless Broadband User: 224.24

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With an overall score of 80.141, the United Arab Emirates ranked 19th in Waseda International's digital government rankings for 2022. The United Arab Emirates is making a number of moves to advance its digital economy and make the most of the opportunities presented by developing technology. The Higher Committee for Future Technology and

Digital Economy was stated to have been established in Dubai only the week before. This committee would concentrate on the expansion of the industry. According to the World Bank's GovTech Maturity Index 2021, which evaluated the degree to which modern technology was utilized in the operations of governments in 198 different states, the United Arab Emirates (UAE) was ranked among the world's best countries in terms of the pace of the government's digital transformation. It was the only Arab nation to achieve this distinction.

Different nations have taken various approaches to deal with the present epidemic of COVID-19 that has swept the world. There are several elements at play, including a country's position in the international political and economic order, the quality of its healthcare system, the depth of its public health institutions, and so on. Therefore, it is crucial to examine the UAE's public health response to the present epidemic, the most significant public health disaster ever. Individuals in the UAE may access their COVID-19 test results using the ALHOSN UAE app, the official integrated digital platform for such testing. For similar reasons, the StayHome app allowed for patient isolation and quarantine. In response to people's emotional distress and worry during the pandemic, the Ministry of Health and Prevention (MoHAP) set up a coronavirus helpline and a mental health therapy hotline.

According to the Future Readiness Index published by the Portulans Institute and Google the previous year, the Emirates are also at the forefront of digital advancement and are at a level of readiness that places them ahead of the rest of the Arab world. The country ranked third out of the 27 rising economies worldwide and 23rd out of 123 nations. In addition, the United Arab Emirates Ministry of State for Digital Economy, AI, and Remote Work Systems signed a preliminary agreement with blockchain data platform Chainalysis at the end of the previous month to provide virtual training programs for the various government entities within the UAE.

### **3.2. New Trends**

The goal of the "Digital Economy Strategy," which was introduced in April 2022, is to more than double the contribution of the digital economy to the gross domestic product (GDP) of the UAE during the next ten years, from 9.7 percent as of April 2022 to 19.4

percent. In addition, it intends to strengthen the United Arab Emirates' status as a regional and global center for the digital economy.

The strategy will define the priorities of the digital economy, especially in the pandemic recovery process, and the involvement of all other economic sectors will be ensured so that it may be supported. Periodically, it will measure its growth using a single method so that it may track its indications. It consists of over 30 different projects and programs aimed at six different industries and five new areas of development. To support the aims of the strategy and facilitate the execution of its initiatives across all economic sectors, the UAE government decided to create a Council for Digital Economy.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The infrastructure of the United Arab Emirates (UAE) has come a long way toward being ready for the digital era thanks to the efforts of the UAE. The regulatory body has confirmed that GSM networks will be decommissioned by the end of 2022. The maximum amount of foreign ownership held in UAE telecoms businesses has been raised to 49 percent. The United Arab Emirates (UAE) boasts one of the world's fastest median download speeds for 5G. In addition, during the first half of 2022, Amazon Web Services intends to begin the construction of data centers in the United Arab Emirates.

##### **4.2. Management Optimization [MO]**

The government committee tasked with digital transformation in the UAE will improve synergy amongst government institutions while working toward more effective digital assets. It is responsible for establishing government policies for digital transformation, assessing and following up on the appropriate strategies, programs, and activities to assist the transition, and preparing federal policies for digital transformation.

In addition to this responsibility, the committee will be in charge of offering advice on strategic initiatives connected to the digitalization of government services, businesses, and operations. Officials from the Telecommunications and Digital Government Regulatory Authority (TDRA), the Federal Authority for Government Human Resources, the government's chief of cyber security, the UAE chief of government services, and a representative from the Ministry of Finance are all included in the membership of this

committee.

According to what the Ministry of Economy said at the time, the United Arab Emirates Chainalysis Centre of Excellence will assist government employees in enhancing their knowledge of blockchain. This decentralized platform is considered a secure way to conduct transactions and other technology that will shape the future economy, such as digital assets.

#### **4.3. Online Service [OS]**

There has been a recent increase in the number of government agencies in the United Arab Emirates that will accept payments made over the internet. Customers can use a centralized government site where they may apply for services and make payments or a government portal exclusive to their emirate. Users may make payments on their utility bills, such as those for energy or water, as well as other fees. In the United Arab Emirates, residents may now pay for various government services using apps for mobile phones that the government created. Some of these programs are solely devoted to the process of payments, while others include payment choices directly into their designs.

Credit cards are a payment method for services given to the general public by government agencies and organizations. A credit card may be used either at the counter or online when paying for government service. When it comes to paying taxes and other fees required by the government, most banks in the United Arab Emirates provide their clients the option to use their bank accounts rather than credit cards. Several government service providers accept Bill payments and payments for extra services through electronic kiosks in shopping malls, business centers, and other public locations. To pay using an electronic kiosk, customers need to enter their account information and follow the instructions on the screen.

#### **4.4. National Portal [NPR]**

Sheikh Mohammed bin Rashid Al Maktoum, the current Vice President and Prime Minister of the United Arab Emirates and the Ruler of Dubai, launched the official government website of the United Arab Emirates in May 2011 at <https://u.ae>. It was designed to be a one-stop shop for citizens, tourists, and companies, but it also helps the government itself. The eGovernment's goal is to increase the UAE's competitiveness by

catering to its residents' tastes and providing them with first-rate services through various convenient channels.

The official open data site in the UAE encourages the digital economy by making better open data platforms accessible to the public. To show how seriously the government takes its goal of creating more welcoming and inclusive neighborhoods, it has launched the <https://bayanat.ae/en/> website. The portal's first page features a wide variety of statistical collections covering the economy, society, technology, transportation, the environment, government, health, and infrastructure. This data hub is maintained and updated by the Federal Competitiveness and Statistics Authority (FCSA). The government of the United Arab Emirates provides a variety of services to its inhabitants, businesses, and foreign partners.

#### **4.5. Government CIO [GCIO]**

The Chief Information Officer (CIO) of the United Arab Emirates (UAE) is His Excellency Hamad Obaid Al Mansoori, who also acts as the Head of the UAE Digital Government and is responsible for overseeing the digital transformation efforts that are being carried out in the nation. Heir E. Al Mansoori has been entrusted with steering the digital government in the United Arab Emirates (TDRA). In June of 2021, His Excellency Hamad Obaid Al Mansoori was selected as the Director-General of the Dubai Digital Authority.

#### **4.6. E-Government Promotion [EPRO]**

A new strategy has been implemented in Dubai to lower the yearly customer visits to service centers from 9 million to 7 million, saving the government more than 300,000 working hours annually. The Executive Council of Dubai gave its approval to a policy that is being referred to as the "360 Services Policy." Its goal is to provide digital services by integrating its data and unifying its distribution methods.

Sheikh Hamdan bin Mohammed bin Rashid Al-Maktoum, Crown Prince of Dubai and Chairman of the Dubai Executive Council, tweeted that the action was carried out in accordance with the directions of the ruler of the emirate, Sheikh Mohammed bin Rashid Al-Maktoum. He noted that it is a component of the council's aim to establish global leadership in providing governmental services.

#### **4.7. E-Participation [EPAR]**

The government of the UAE has placed significant focus on participation and the use of existing technologies and ICTs to include every one of its inhabitants in establishing public services and upcoming initiatives. The United Arab Emirates has begun offering a free course on eParticipation that may be taken online. The goal of the course is to encourage civic participation and open government. eParticipation techniques are essential for successful involvement in decision-making, which is why this course aims to educate everyone in the community on the significance of public engagement.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The UAE's Cabinet has given the go-ahead to establish the Higher Committee for Government Digital Transformation as the government moves forward with its objectives to build a digital economy and take advantage of emerging technologies. The Dubai Media Office said that Ohood Al Roumi, the Minister of State for Governmental Development and Future, would preside over the committee. The group would be co-led by Omar Al Olama, the Minister of State for Digital Economy, AI, and Remote Work Systems. The committee's mission is to oversee the UAE's digitization initiatives and improve the country's preparedness, competitiveness, flexibility, and alignment between projects and the digital systems of federal agencies.

Disclosure of government data gives more openness to governmental dealings and holds officials responsible for their acts. It makes it easier for the people to scrutinize and evaluate how the government is doing its job. Open data enables more effective use of resources, the development of individualized service delivery models, and the generation of additional employment opportunities. Learn more about the open government data laws, policies, and platforms.

If a legal framework backs open government data, its advantages may be fully realized and used. The United Arab Emirates has taken the following measures to foster accessible government data:

1. the open data guidelines
2. adopted open data policy
3. launched the Dubai Data strategy

4. passed the Dubai Data law
5. launched DubaiPulse
6. launched the UAE's data portal - Bayanat
7. launched the Abu Dhabi Open Data portal
8. launched Abu Dhabi Government Data Management Policy
9. launched Abu Dhabi Government Data Management Standards
10. launched Ajman Data

#### **4.9. Cyber Security [CYB]**

The United Arab Emirates National Cybersecurity Strategy has as its overarching goal the development of a reliable and secure cyberinfrastructure that supports economic growth and helps UAE residents achieve their dreams. The organization in charge of the country's ICT sector and digital transformation, the Telecommunications Regulatory Authority (TRA), released an updated version of the plan in 2019. To activate the whole cybersecurity ecosystem in the UAE, the plan relies on several procedures and pillars designed to foster the growth of start-ups in the country.

MOHRE implements the National Cyber Security Strategy of the United Arab Emirates to secure data and communications and create a more secure and informed society online. Specifically, it has the ISO27001 certification for protecting sensitive customer data. Considered a global standard, it aids MOHRE in safeguarding sensitive information such as financial records, proprietary information, and customer details by helping to detect threats and developing countermeasures.

Further, MOHRE and the Telecommunications and Digital Government Regulatory Authority entered into a collaboration agreement (TDRA). The deal calls for the Computer Emergency Response Team to help strengthen UAE's information security policies, safeguard the country's information and communications technology infrastructure against online threats, and foster an environment where cybercrime is not tolerated.

#### **4.10. The use of Emerging ICT [EMG]**

The United Arab Emirates is set to become one of the region's preeminent data center centers. By 2026, it is expected that more than a billion dollars will have been invested.

Microsoft Azure opened two new cloud zones in the United Arab Emirates in 2019. Amazon Web Services will build a data center area in the United Arab Emirates in 2021. The launch of the new area, which will have three distinct availability zones, is scheduled for the year 2022. After the success of its Dubai cloud region, Oracle announced in November 2021 that it would be launching a second cloud region in Abu Dhabi. Etisalat and G42 Cloud, controlled by the government, also operate

United Kingdom

### 1. General Information

Area: 242,900 km<sup>2</sup>

Population: 67,565,854

Government Type: Unitary parliamentary constitutional monarchy

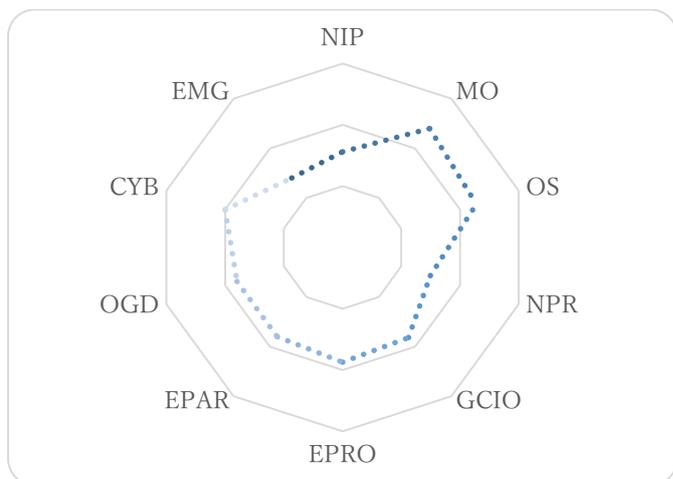
GDP: \$40,867

Internet User: 94.82

Wired (Fixed Broadband User): 40.26

Wireless Broadband User: 107.68

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

A comparatively high score of 86.766 placed the United Kingdom 6th in the 2022 Waseda International rankings of digital governments. Since the beginning of the COVID-19 pandemic, the commitment of the UK public sector to digital service transformation has increased. Government agencies, local governments, the National Health Service, and other public bodies have long prioritized improving citizens' ability to participate in

decisions that affect their health, safety, and quality of life.

The United Kingdom is dedicated to the Digital Government principles outlined in the Charter of the Digital Nations and to continue collaborating with our international partners to share experiences and best practices to maximize the potential of digital services and technologies.

With the help of other government agencies, the Government Digital Service (GDS) spearheads the United Kingdom's digital transformation. It ensures that citizens get cutting-edge, citizen-centric digital services and solutions. The Government Digital Service (GDS) is mainly responsible for the United Kingdom's position as a digital government leader.

- Providing the best-practice guidance and recommendations for delivering consistent, coherent, and high-quality services
- Guidelines for digital service provisioning and enforcement
- Constructing and maintaining shared infrastructures
- Aiding in the selection of appropriate technologies for government use.
- Directing the government's data, digital, and technological efforts
- Fostering the government sector's adoption of cutting-edge technology

### **3.2. New Trends**

The UK's response to COVID-19 demonstrates the immense potential of digital, data, and technology to solve the difficulties in health and social care, and the country should take advantage of this opportunity. Five critical challenges facing the UK's digital transformation hinder the country's economic recovery and expansion.

#### **1. Information as a creative catalyst**

Company executives increasingly incorporate data-driven approaches to enhancing the customer experience into their long-term strategies. Ocado employed AI and analytics to improve its real-time stock management throughout the epidemic.

#### **2. New online business models are the key to further expansion.**

Businesses are scrambling to find alternatives to the virus and creating new digital ecosystem-based online business models. One of the most revolutionary applications of

videoconferencing in the medical field has been used for doctor-to-doctor consultations. Unfortunately, businesses still depend on digital channels without supplementing them with human service or support.

3. Putting a lot of effort into creating reliable supply networks is a priority.

Europe's logistics revolution will center on the changing supply networks connecting the UK and the rest of the continent. This might mean a switch to smaller, more locally based distribution systems, away from the use of massive vehicles and shipping entirely.

4. Complementary artificial intelligence technology for a wide range of uses

The full potential of artificial intelligence can only be realized by incorporating complementary technologies and focusing on the customer. This pattern is anticipated to become increasingly prevalent in the UK over the next several years as AI-based technologies proliferate.

5. There will be a tremendous expansion on the backs of cloud computing and the Internet of Things.

The cloud and the Internet of Things (IoT) will be priorities for companies in the United Kingdom as the country rebuilds from the epidemic's aftermath. Because of IoT, many UK businesses prioritize customer service and strive for operational excellence (IoT). As a result, efficiency and output are increased while unnecessary labor is eliminated.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

In order to investigate the government's promise to provide gigabit-capable internet to every house and company in the UK by the year 2025, members of parliament have begun an investigation into broadband and the route to 5G. The inquiry will concentrate on determining how achievable the goal is, what steps are necessary to accomplish it, and what the implications of the government's plan will be for both enterprises and consumers. In addition, it will investigate the potential role that 5G technology may play and the implications of projects like the Shared Rural Network for enhancing mobile coverage across the UK. The investigation will also investigate how the Covid-19 event may affect the deployment of full-fiber and 5G infrastructure.

#### **4.2. Management Optimization [MO]**

To promote digital inclusiveness, the government has plans to work with other public, corporate, and nonprofit organizations. Giving people the skills they need to make the most of the internet is a big part of this. Since the team moved, they have shifted its focus from Digital Inclusion to Digital Engagement. The policy is recast in this situation as an issue that stimulates participation. The Digital Engagement Team is responsible for determining what must be done next in terms of delivery and setting a priority for it. It will take the place of the current governance structures of the Sub-Group and the Delivery Board, which are directed by the Minister for Culture and Digital Economy and consist of members from the public, private, and volunteer sectors, respectively. The Council will manage several initiatives and task forces charged with addressing critical concerns surrounding the use of technology in classrooms.

#### **4.3. Online Service [OS]**

With an overall score of 11.4, the United Kingdom ranked second in the OS criteria this year. The United Kingdom is more reliant than ever on the services provided by the internet for a wide variety of activities, including home-based education and employment, communication, information, entertainment, and commerce. During the height of the epidemic, a more significant number of individuals utilized the internet for activities such as online gaming, video conferencing, and receiving medical care.

Online services played an essential part in disseminating information on the pandemic, which assisted governments in monitoring and controlling the spread of the virus. When it comes to online registration for shopping sites and other online services, email is still quite ordinary. Gmail has been the most popular email service for adults, with 61% of the UK's online adult population using it. This percentage makes Gmail the most popular email provider overall.

#### **4.4. National Portal [NPR]**

The United Kingdom's NPR received a score of 8.000 in 2022, placing it at the top of the NPR's Waseda rankings. The last seven years have seen profound shifts in technology capabilities and consumers' expectations. When it comes to interacting with users, GOV.UK will shift from a reactive approach to a proactive one to better serve their needs.

A strategy that is based on users' informed consent will alert them to tasks that they are required to complete, assist them in processing information that they might not be aware is pertinent to them, direct them through complex events in their lives, and advance them to the next stage of their job. GOV.UK is undergoing a transition that is being driven by vision and strategy, and it is being patterned on the way things should be done.

Users are also able to make safe payments with GOV.UK Pay is simple to integrate and develop to fulfill the requirements of the Digital Service Standard. Citizens can now make secure payments to the government online, which cuts down on the time and effort required to do business with the government and eliminates the need for the government to purchase or create new payment systems repeatedly.

#### **4.5. Government CIO [GCIO]**

The United Kingdom was ranked 6<sup>th</sup> in the Waseda rankings, with 7.954 points. The GCIO was still operational in the United Kingdom. The Government Accountability Office (GDS) is the new General Data Service (GDS) name. Local governments are not required to comply with GCIO mandates.

#### **4.6. E-Government Promotion [EPRO]**

Human lives have been and will continue to be drastically altered by the advent of digital technology. Success in digital technology is crucial to the UK's economy, employment, pay levels, prosperity, national security, cost of living, productivity, capacity to compete worldwide, and geopolitical status. The government is working to make the UK an even greater force in science and technology globally.

The United Kingdom (UK) has a lot going for it right from the get. The foundations of the UK's digital economy, such as universal high-speed internet access and robust cyber security infrastructure, are either in place or developing. The United Kingdom (UK) has emerged as a global leader in cutting-edge areas, including artificial intelligence (AI), sophisticated semiconductor design, and quantum computing. In addition, UK has the resources and support of the worldwide alliances to be a driving force for digital good on the international stage.

#### **4.7. E-Participation [EPAR]**

Public Services Network (PSN) is a government service system that promotes cooperation, eliminates duplication, and allows for resource sharing across government agencies (PSN). It will simplify for government agencies to exchange services in a secure environment and collaborate effectively. This applies to every city hall and county administration in the United Kingdom and every federal agency.

It's important to note that the GSi family of legacy networks includes not only the Government Secure Intranet (GSI) but also the Government Connect Secure Extranet (GCSx) and the Government Secure Extranet (GSI) (GSX). Both members of the GSi community and those outside it may use these networks' dependable Internet connection, file sharing, and searching tools, directory and online publication platforms, and electronic mail services. Customers' GSi networks were migrated to the PSN under a GCF framework, giving them the freedom to choose their preferred PSN service provider(s). Numerous EU institutions and organizations, as well as the Member States, depend heavily on TESTA. This cross-border infrastructure is the principal conduit when communicating between the UK and the EU.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

With 9.4 points, the UK ranks 6th in the Waseda rankings in 2022 regarding DX & OGD criteria. The UK's Central Digital and Data Office has developed a 21-step plan for digitally transforming the central government. The strategy is divided into six different missions throughout government and is named "Transforming for a digital future: 2022 to 2025 roadmap for digital and data. Public services have been improved to the point that they provide desirable results.

Through Data.gov.uk, anybody in the United Kingdom (UK) may see, explore, download, and analyze data collected by the government. In support of the G8 Open Data Charter, the UK government opened government data to the general public via the data.gov.uk website, joined the Open Government Partnership, rated first in the Open Data Barometer, and issued the "Open Government National Action Plan." Over 10,000 datasets have been made available to develop products and services by the UK government, local government, and other public organizations. The Find Open Data application assists consumers in locating and utilizing this data. Additionally, the application helps data producers maintain their data's accuracy.

Because of the GDS Open Standards team, government agencies must provide their data in available formats. The Open Standards Board has produced 14 standards to ensure the broadest possible range of data is shown as "open data," and it is the responsibility of the Cabinet Office and the Open Standards Board to choose and implement these standards openly and transparently. It has helped government decision-making, contributed to the UK's global open data leadership position, and enabled external stakeholders to hold the government accountable. The Performance Platform includes nearly 800 services required to submit performance data under the Digital Service Standard. Consequently, the United Kingdom's OGD scored 9.4 points and took 6th place in the Waseda rankings for 2022.

#### **4.9. Cyber Security [CYB]**

The United Kingdom has initiated a new artificial intelligence (AI) study, spearheaded by the Office of Artificial Intelligence (OAI) and the Government Digital Service (GDS), to investigate how AI and automation might be used to improve government operations and stimulate economic growth. The Government Data Science Partnership (Cabinet Office) is a collaboration between the Government Digital Service (GDS), the Office of National Statistics (ONS), and the Government Office of Science (GOS) to maximize the government's use of data science by guiding how to implement it effectively and funding for the training and tools necessary to promote its widespread adoption.

Analysts in the public sector may use the Data Science Accelerator to hone their data science expertise (also linked to the Government Data Science Partnership). For this reason, they team up with seasoned advisors to solve actual issues plaguing businesses today. So far, this effort has trained around 150 government and public sector workers. Data Science Accelerator facilities may be found in London, Newport, Bristol, Sheffield, and Newcastle. The United Kingdom's Government Technology Innovation Strategy was published firstly to adapt government processes to the new technology. It addresses how the government may set the stage for technological innovation to flourish. Notably, the United Kingdom was able to move up to a 1<sup>st</sup> position in the Waseda rankings in 2022 with a score of 10.00 points because of all the work and investment it made in EMG.

#### **4.10. The use of Emerging ICT [EMG]**

Almost all software companies in the UK now make use of cloud computing, and new

opportunities can be found in both the public and private sectors for businesses who offer cloud computing and related services. The British government was given the green light to make direct purchases from cloud service providers after agreeing to standard terms of service and employing G-Cloud frameworks.

Companies like DeepMind, SwiftKey, and Babylon are among the most cutting-edge in the history of AI and ML, and they're all headquartered in the United Kingdom. Jobs abound in these sectors as well. The United Kingdom recognizes the commercial potential of artificial intelligence. The UK's Industrial Strategy white paper even names AI and Data as one of the country's four "Grand Challenges" (together with the Future of Mobility, Clean Growth, and Ageing Society). British Prime Minister Theresa May has proposed a \$1.3 billion help program called the AI Sector Deal to encourage the development of the AI industry. A portion of the \$2.4 billion pledged to the interdisciplinary Industrial Strategy Challenge Fund will be leveraged and amplified by this investment. There is investment in AI-based solutions from both the governmental and business sectors. That's the case with the government, private service providers, the biotech and pharmaceutical industries, and the farming community. The UK artificial intelligence industry has received massive investments from companies like Google (owner of DeepMind), Microsoft (owner of SwiftKey), Amazon Web Services (AWS), Hewlett Packard Enterprise (HPE), Beyond Limits, and many more.

Uruguay

### 1. General Information

Area: 181,034 km<sup>2</sup>

Population: 3,422,879

Government Type: Unitary presidential constitutional republic

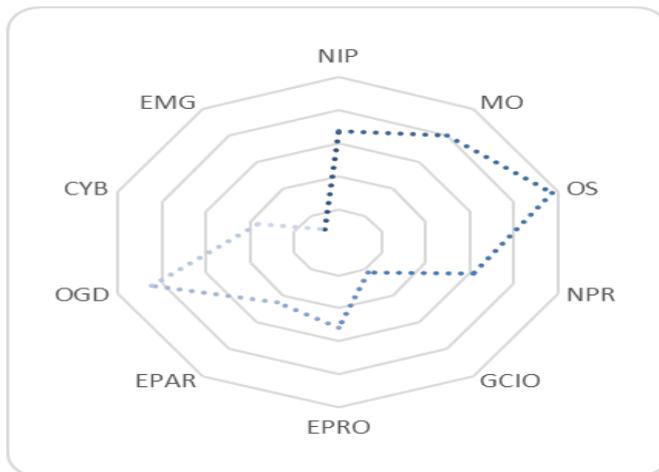
GDP: \$15,648

Internet User: 76.2

Wired (Fixed Broadband User): 32.4

Wireless Broadband User: 124.9

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With a total score of 63.569, Uruguay ranked 50th in the world in the Waseda International digital government rankings for 2022. With a focus on social justice and improving the standard of living for everyone, Uruguay is a nation whose goals are in harmony. Uruguay is economically comparable to industrialized nations, although its

economy is far smaller in this same global and highly competitive system. Under these conditions, it was crucial to make judicious use of technology to enhance the quality of government services, educational opportunities, and productivity growth to benefit the populace and the economy.

One of the world's greatest corporations believes that digital transformation is the key to economic recovery after the effects of the COVID-19 epidemic. Google considers Uruguay to be a top "digital sprinter" in all of Latin America. As reported by the Uruguayan newspaper El Pas, Google's director of government affairs and public policy for Latin America, Ana Luca Lenis, attended a virtual workshop on Sustainable Finance and Investment organized by the Inter-American Development Bank (IDB).

Uruguay has consistently implemented a robust digital strategy through many administrations, with a solid framework tasked with promoting it. Instead of being a top-down initiative, Uruguay's commitment to digital innovation is articulated in the country's Digital Agenda, which is the result of collaboration between the government, academia, business, and the technical community. All relevant parties are represented on a National Council for the Information Society that guides and oversees its development. The most crucial part is that these pacts aren't just about implementing some kind of national technology strategy; instead, they aim to improve the lives of society's most marginalized members and develop national capabilities by means of information and communication technologies.

### **3.2. New Trends**

Uruguay's 2025 Digital Agenda is the country's road plan for the continued growth of its digital economy as a smart way to recover from the pandemic. The plan was approved in May 2021, and its management is handled by Agesic, Uruguay's e-Government, and Knowledge Management Agency. This new development will open up opportunities for telecom providers and those in the software and hardware industries. The plan calls for the expansion of fiber-to-the-home (FTTH) networks to areas with fewer than 3,000 people, the completion of 4G cellular coverage across the country, the assignment of new spectrum bands for mobile technology, and the expansion of 5G coverage. The

government also intends to enhance the detection and response to cyber events by implementing new technologies that enable the use of predictive analysis and automated responses. This is part of the government's goal to improve the detection and response to cyber issues.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The Uruguayan government has boosted the use of mobile services by reducing obstacles to affordability by lowering taxes specifically levied on mobile devices. This has led to an increase in the utilization of mobile services.

The rise of the mobile industry, along with the attendant advantages of increased employment and investment, was made possible by the government's adoption of policies in the areas of taxes and regulation conducive to the sector's expansion.

##### **4.2. Management Optimization [MO]**

The implementation of digital health services is another goal included in the Digital Agenda for 2025. Opportunities are anticipated to arise from the incorporation of electronic medical records, the creation of digital prescriptions, and the upgrading of communication procedures. The Uruguay government will promote the digital transformation of Industry 4.0 by adopting the Internet of Information and Automation processes in strategic sectors. In addition, they will incorporate Internet of Things technology into the management of public services, including energy, water, communications, and transportation.

For instance, the government intends to deploy automated tolls on the national road network and automatic radar stations to increase road safety while simultaneously lowering the expenses associated with running the roads. In addition, there will be chances to improve the communications infrastructure in jails to allow telemedicine, distance learning, and virtual court sessions. In addition, municipal governments will implement smart city projects that are centered on environmentally responsible growth. Other goals include establishing a national meteorological and climatic database, building a meteorological radar, and constructing a network of meteorological stations. All of these

things are to be done soon.

#### **4.3. Online Service [OS]**

The official website of Uruguay has a welcome area that offers information to the general public in addition to informative and interactive components that visitors may use. In addition, the Presidency Channel on both YouTube and Twitter is leveraged to encourage citizens of the United States to participate politically online.

#### **4.4. National Portal [NPR]**

Uruguay intends to adopt a national strategy to encourage the use of public software as part of its efforts to reduce waste and save resources. The architecture had been completed as of December 2012, and the application could be accessed via the IMM's System of Electronic Resolution Programs (SAE). This system is also available through the main page of the State portal, which can be found at [software.public.gub.uy](http://software.public.gub.uy). This section features applications originating from six different nations. Citizens and electronic collaborators can participate in [Trantic.gub.uy](http://Trantic.gub.uy) for prolonged periods, enabling feedback collection and continuous development of information about government operations and services.

#### **4.5. Government CIO [GCIO]**

to advance the use of ICT in government, bolstering the country's digital policy, and realizing Uruguay's Digital Agenda targets for the years 2010, 2015, and 2020, the Uruguayan parliament established the Agency for Electronic Government and Knowledge and Information Society (AGESIC) in 2007. In 2012, the AGESIC established a subgroup called the Society of Information and Knowledge (SIC) to hasten progress on Information Society and SIC initiatives. Regarding advocating for Open Government, the Information Society, and Digital Government, the AGESIC is essentially taking over for the GCIO.

#### **4.6. E-Government Promotion [EPRO]**

AGESIC is a presidential agency responsible for defining national digital policy and steering the implementation of e-Government initiatives. Information security, electronic certification, data protection, and Internet governance are all areas that intersect under its

purview, all under a holistic vision that has become its primary differentiator to promote better levels of trust while utilizing ICT.

A Board of Directors made up of appointees from the executive and legislative branches, the commercial sector, and the technical community runs the Agency. It includes five advisory councils: the Information Society, the Public Sector, the Business Community, Geo-referenced Systems, and Information Security. The Agency is subservient to three autonomous regulatory divisions dealing with transparency, privacy, and electronic certification. Digital Citizenship, Agencies and Processes, Technology, Operations, and Information Security make up the e-five Government's primary Divisions, with the Computer Emergency Response Team reporting to Information Security. To articulate, monitor, and advance the digital agenda's promises, the Agency maintains a Department for Information Society dedicated to digital policy.

#### **4.7. E-Participation [EPAR]**

Due to the Uruguayan government's efforts to standardize the electronic contacts between its residents and the state, all of the Central Administration's services may be accessed through the internet. Among the many aims of this effort is the standardization of first-level assistance at the Central Administration and the development of new channels for service delivery that use emerging technology.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

The ideals of open government include being more open, accountable, inclusive, and creative. People's demands for the government to be more open have increased. Citizens may be looking for methods to make their governments more accessible, more considerate, and more accountable, all while increasing their effectiveness. When Uruguay joined the Transparent Government Partnership in 2012, the country pledged to create a national strategy for fostering open government. The plan was expected to include both targets and metrics for success. The project aims to establish a government that prioritizes the requirements of its citizens and works to enhance its administration accordingly. After completing the first three tactics in the Open Government plan, Uruguay began implementing the fourth. Now that governments can communicate with citizens, people are better equipped to assert their rights. As part of this drive, the DGS is trying to broaden

public access to information, encourage citizen involvement in problem-solving, and promote open data.

The Uruguay 2025 Digital Agenda, approved in May 2021, serves as the country's road map for future digital growth and is overseen by the Uruguayan e-Government and Knowledge Management Agency, Agesic. The government also intends to introduce new technologies that enable predictive analysis and automated reactions to cyber events to enhance detection and response. The adoption of digital health services is also encouraged under the 2025 Digital Agenda. The integration of electronic medical records, the creation of digital prescriptions, and the modernization of communication procedures are all areas where opportunities are anticipated. To further integrate IoT into the administration of public services, energy, water, communications, and transportation, the Uruguayan government will push for a "digital transformation" in Industry 4.0. This will involve adopting Internet of Information and Automation processes in key sectors.

#### **4.9. Cyber Security [CYB]**

Despite the high degree of information technology competence, cyberspace defense initiatives have not kept pace with digitalization, leaving Uruguay's cyberspace susceptible to assault. With several successful programs to safeguard cyberspace, Uruguay has established itself as a leader among Latin American and Caribbean nations regarding cyber security. Unfortunately, neither CERT.uy nor the GSOC has the full complement of tools necessary to keep up with the demands of the ever-evolving digital landscape. The government, nevertheless, is dedicated to ensuring a safe digital environment, as expressed in the "Uruguay Digital Agenda."

Two biggest obstacles are the shortage of educated cybersecurity specialists and the inability to scale monitoring, detection, and response operations. As a result, the IDB has sanctioned a loan of \$10 million to help Uruguay enhance its ability to defend its cyberspace. This will be done by bolstering the country's infrastructure for detecting, preventing, and responding to cyberattacks. A consultancy estimated 600 more cybersecurity workers would be needed in Uruguay to match current demand.

#### **4.10. The use of Emerging ICT [EMG]**

Compared to other countries in Latin America, Uruguay is one of the most developed

nations regarding e-commerce, e-government projects, and total per capita internet adoption. The information and communications technology industry play a significant role in Uruguay's economy.

The information and communications technology industry is a significant aspect of Uruguay's economy, with software exports accounting for 12% of the country's yearly exports of \$3.5 billion. The United States buys around two-thirds of all of these exported software products. Additionally, the level of expertise of Uruguay's computer programmers is exceptionally high, and as a result, many businesses use Uruguayan computer workers to assist their regional operations. In addition, Uruguay participates in the "One Laptop Per Chile Program," also known as Plan Ceibal, which ensures that every kid attending a public school receives a laptop to improve the quality of their education and enhance their ability to study remotely.

United States

### 1. General Information

Area: 9,372,610 km<sup>2</sup>

Population: 338,682,109

Government Type: Federal presidential constitutional republic

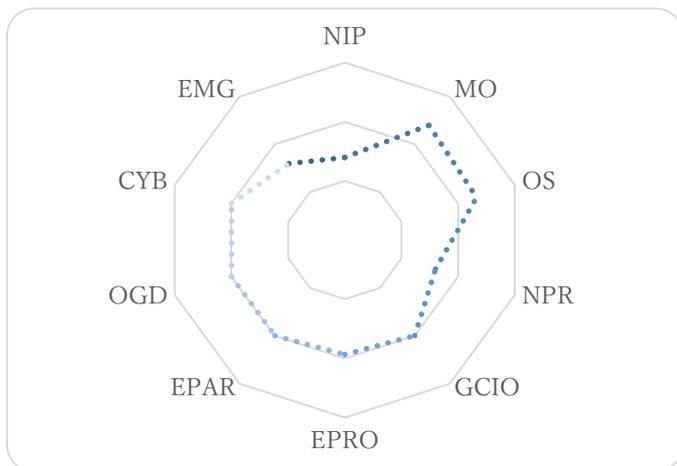
GDP: \$61,763

Internet User: 90.90

Wired (Fixed Broadband User): 36.61

Wireless Broadband User: 107.68

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

With a score of 91.046, the United States ranks fifth in the world in the Waseda International rankings of digital governments in 2022. Everything is different once the worldwide pandemic struck. An increase in the Technology Modernization Fund in the United States by the expected amount of \$9 billion would make the government's information technology and cybersecurity services consistent across the board.

Automating formerly manual processes and installing artificially intelligent virtual assistants are just two examples of how governments employ automation to enhance services while simultaneously reducing the strain on their workforce. The United States Department of Housing and Urban Development, the National Institutes of Health, and the Internal Revenue Service all used robotic process automation to keep up with the rising demand for essential services in the country.

The unanticipated growth in remote employment has caused the government to conclude that the current options for remote work, such as remote desktops and virtual private networks, are inadequate to deal with the situation. Because cloud computing allowed for more adaptability, the shift to remote work was less complicated. The early research of cloud computing by the California state government made it possible for 90 percent of the state's approximately 200,000 workers to transition to telework without much difficulty.

A significant amount of the medical system in the United States now operates digitally. People can receive medical advice and diagnoses through telemedicine and remote diagnostics, eliminating the need to visit a doctor's office or hospital. 3D printing accelerates the production of essential medical supplies, saving lives without a successful vaccine or treatment, the most effective preventive medicine.

### **3.2. New Trends**

The implementation of fully digital governance has been hastened by the COVID-19 epidemic. As the fourth industrial revolution progresses, the digital payment and identity infrastructure may assist address structural issues like financial exclusion and informality. Only half as many people in developing nations have mobile internet. Developing nations actively seek international aid to meet their growing need for information and communications technology. The United States can aid developing nations in realizing their economic and social potential by competing in the emerging digital banking and identification infrastructure sector. To close the gender gap, they need a concerted and gender-sensitive approach to designing regulatory frameworks.

Inadequate funding and leadership from the United States in the digital infrastructure sector have long-term political and economic effects. Aligning with US foreign policy

objectives, digital financial inclusion and identification infrastructure provide several advantages. The United States government has launched programs to boost the economic security of the poor, women, and other oppressed groups and increase women's participation in the labor field. The United States Agency for International Development believes digital technology may help reduce the gender wage gap and boost economic output.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

Consequently, the United States has made significant headway toward digitizing the world. Through the RDOF auction, the government gave SpaceX a total of \$885 million in subsidies to help fund the development of Starlink. Schools and libraries have also written to Congress that an emergency funding boost for the E-Rate program of \$12 billion is approved. Google has constructed a new subsea cable that connects Spain, the United Kingdom, and the United States.

##### **4.2. Management Optimization [MO]**

The developments that have taken place in information technology over the last decade have had a profound impact on productivity, ease of use, and effectiveness in the commercial sector. Due to poor management of its technology investment funds, the Federal Government has largely been unable to take advantage of this shift. Regarding information technology (IT), projects that spend hundreds of millions of dollars more than required take years longer to execute and offer outdated solutions by the time they are finished. As a result, one of our goals is to narrow the gap between successful private companies and the federal government's operations.

The Office of E-Government and Information Technology (E-Gov) is directed by the government's Chief Information Officer (CIO). This office is responsible for developing and overseeing Internet-based technology to facilitate citizen and corporate interactions with the Federal Government, to reduce costs, and speed up participation.

##### **4.3. Online Service [OS]**

The United States received an OS score of 11.400 in 2022, placing it second in the OS's

Waseda rankings. Technology firms monopolize the mobile payment market in the United States. In addition to that, there are a few newcomers which are actively working to obstruct their progress. There is a chance that businesses may benefit from expanding mobile payment methods, but this will hurt the most lucrative aspects of the company.

After more than a decade and a half after Congress established the ID Legislation, all fifty states fully complied with the act's rules for issuing these cards. Most states have complied with the act within the last four years. Today, actual ID-compliant licenses and ID cards have been published in all fifty states, which accounts for 38% of all drivers and holders of ID.

Among the necessary safety precautions are anti-counterfeiting technology, the suppression of insider fraud, and the documentation and verification of an individual's identity. It is against the law for federal authorities to let people into government facilities like nuclear power plants or commercial airplanes with licenses or identity cards that do not comply with the standards. Because of these restrictions, state-issued identification documents like driver's licenses and ID cards are now more reliable and accurate.

#### **4.4. National Portal [NPR]**

In 2022, the United States NPR received an 8,000, placing the country top in the NPR's Waseda rankings. On the official government website, [www.usa.gov](http://www.usa.gov), Americans may find many resources. Information and online services from several government agencies are consolidated here. It helps bridge the gap between citizens and their government by facilitating citizens' access to data and services that might otherwise be inaccessible. In addition, it includes details that help the audience grasp the gravity of the situation. Customers may create government accounts and tailor the site to their needs. The website has flexible chat hours, a live chat platform, and accessibility features.

This website provides access to official government resources. Listing the numerous government programs and resources is a breeze with this site's straightforward layout. The National Portal is a one-stop service for filing taxes electronically, getting a driver's license, filing complaints, finding a doctor, applying for a passport, and researching a trip. The site layout provides easy access to broad, general information and specialized user-specific services. To map out the next stage of government modernization, the

government has developed enterprise Roadmaps and modernization profiles.

#### **4.5. Government CIO [GCIO]**

According to the GCIO criterion used in the Waseda rankings for 2022, the United States came in at number 10 with a score of 7,272. The Chief Information Officers of the United States are selected by the Office of Management and Budget (OMB) at the White House to monitor and supervise the expenditure of federal agencies on information technology. Every federal agency must have a Chief Information Officer by the Clinger-Cohen Act. CIO jobs in the government are significant markers of international e-Government rankings, not to mention the relevance these roles have in improving American e-Government platforms. Suzette Kent, who serves as the Federal Chief Information Officer, is now in charge of the IT infrastructure of the federal government.

#### **4.6. E-Government Promotion [EPRO]**

Without solid American leadership and investment, developing and emerging economies are more likely to adopt the digital model China and other authoritarian powers proposed. Some of the civil freedoms these models violate include the right to privacy and the freedom of speech, the rule of law, and the protection against social tyranny. Furthermore, new types of digital infrastructure often come with strings attached, undermining the sovereignty of nations and incentivizing them to adopt a model of growth that does not suit the strategic and security objectives of the United States and its allies. There is an opening for the United States to participate and maybe even take the lead in developing digital financial and ID infrastructure, which would aid developing nations in realizing their full economic and social potential. Foreign investment may advance U.S. national security goals and open new consumer markets for American products and services.

In the long run, investing in safe digital financial systems and digital ID infrastructure may help promote sustainable and equitable development by providing advantages to governments, civil society, and the business sector. However, the most significant obstacles in establishing digital financial infrastructure are securing sufficient funding to address the investment gaps, establishing open and democratic regulatory and legal frameworks to regulate these systems, and protecting these systems from cyber assaults. Consequently, the United States's EPRO was rated seventh in the Waseda rankings in

2022 .

#### **4.7. E-Participation [EPAR]**

People living in the United States can communicate with one another, make contributions, and acquire more autonomy via cutting-edge methods. For the government to be more efficient, it must arrive at better judgments in collaboration with the population. It may be possible to increase the level of transparency inside the federal government by enlisting the assistance of innovative methods, such as increasing the amount of public engagement. This endeavor is carried out with Challenge.gov, the Open Government Dialogue Platform, and the Citizen Engagement Platform.

According to this statistic, there has been tremendous development achieved in e-Government in the United States. The national portal provides residents with access to a vast array of online services, such as the ability to pay taxes, submit tax returns, apply for a driver's license, register a complaint, get a passport, or receive a travel advance, among other options. With a total of 9.500 points, the United States' EPAR placed ninth in the world in the Waseda rankings for 2022.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Understanding the state of digital transformation in the United States government is the focus of the research and advice service to United States Government Digital Strategies. This service produces scholarly articles using customer feedback, case studies, survey results, and recommendations for improving digital government operations. Central to this offering is thought leadership articles on federal laws and legislation and the federal government's motivations, difficulties, and advantages of using digital operations solutions.

With the help of Data.gov, members of the general public may locate, download, and use datasets compiled and managed by the federal government in a far more timely and effective manner. This website explains how to get government datasets, as well as how to make use of national data, and gives information on the metadata associated with such datasets. The catalog size will increase as new datasets are added through the upload process. Data from the Federal government and the Executive Branch are made available as part of the inaugural release of Data.gov. The website has undergone consistent

maintenance and improvement throughout its existence. In terms of DX and OGD, it is clear that the United States ranks fifth in the Waseda rankings for 2022.

#### **4.9. Cyber Security [CYB]**

Through the Digital Connectivity and Cybersecurity Partnership, the United States will offer developing country governments assistance in the form of technical assistance as well as capacity building to help them establish information and communications technology (ICT) policy and regulatory frameworks that enable a vibrant and inclusive digital economy. This support is aligned with the P2C pillar "Value Creation: Building Digital Ecosystems," which is why the United States Government has contributed more than \$47 million to these initiatives thus far.

Investing in Connectivity Providers and Fintech companies: The United States is mobilizing private capital for digital connectivity infrastructure and financial services through the Digital Invest program, which is part of the Digital Connectivity and Cybersecurity Partnership (DCCP). These investments aim to strengthen open, interoperable, reliable, inclusive, and secure digital ecosystems in emerging markets. This program is in line with the "Accelerate: Incentivizing Investments" pillar of the P2C initiative. The United States of America is ranked third on the Waseda rankings 2022 list based on CYB.

#### **4.10. The use of Emerging ICT [EMG]**

The United States' innovation in information and communication technology profoundly affects domestic and international progress. As a result, the United States 4<sup>th</sup> the Waseda rankings for Emerging ICT. The United States Department of State is devoting more resources to artificial intelligence (AI) because of its opportunities and threats to democracy and human rights.

The Department of State collaborates with other organizations to foster an international policy climate that advances state of the art in artificial intelligence (AI), protects national and economic security, and advances universally held values. To promote the safe use of reliable AI technology, the Department participates in bilateral and international conversations with several other agencies.

In a five-year, \$625 million effort, the Department of Energy built five quantum

computing facilities at US national laboratories with funding from IBM, Microsoft, Intel, Applied Materials, and Lockheed Martin. Voice-recognition and spam-filtering systems, among other advanced computer applications, are already standard in most businesses. Even though quantum computing is still in its infancy, many experts think that the peculiar physics of the ultra-tiny will dramatically influence the development of novel materials, financial forecasting, and delivery mechanisms. To counter this, government initiatives seek to increase the volume of fundamental research in these fields.

Developments in critical areas are prioritized by the government, private industry, and universities in the United States. The Apollo program, which sent humans to the moon, and the Defense Advanced Research Projects Agency, which sponsored the development of the internet, all followed this pattern. By all the work and investment in EMG, the United States reached the fourth spot in the Waseda rankings in 2022 with 6.500 points.

Vietnam

### 1. General Information

Area: 331,212 km<sup>2</sup>

Population: 98,346,759

Government Type: Unitary Marxist–Leninist one-party socialist republic

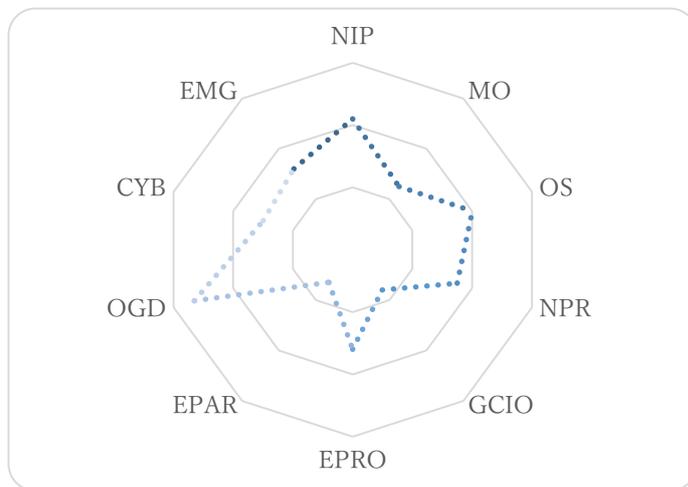
GDP: \$3,493

Internet User: 70.3

Wired (Fixed Broadband User): 16.7

Wireless Broadband User: 80.23

### 2. Digital Government Overview in Country



### 3. Digital Government Development and new trends

#### 3.1. The development

Waseda International's 2022 rankings of digital government placed Vietnam at 49 overall, with a score of 64.634. The country's commitment to digital transformation supported Vietnam's reaction to COVID-19 was swift and evidence-based. Local governments

employed multiple electronic means to provide alerts (text messages, websites, and social media). As a direct consequence of this initiative, more people are using government services online. A further consequence of the COVID-19 pandemic is a sustained increase in adoption across Vietnam. At the height of the epidemic in Vietnam, when the National E-government website had only been up for a month, it had over 28 million visitors, up from the 11 million it had seen at the end of January. A new research project is that by 2025, Vietnam's Internet economy will be worth US\$ 52 billion, making it the fastest growing in all of Southeast Asia.

Prime Minister Nguyen Phu Trong has often emphasized the importance of technology and IT companies to Vietnam's economic future. Vietnam's two largest e-commerce platforms, Tiki and Sendo, are receiving government support as part of the country's new "Make in Vietnam" initiative, which was introduced in May 2019. Because of this assistance, two of Southeast Asia's most prominent online marketplaces, Lazada and Shopee, were able to compete effectively with one another. VCCorp, a major Vietnamese internet conglomerate, is only one of several domestic IT firms that have begun building a social networking platform to compete with Facebook in Vietnam.

As the post-COVID innovation landscape rapidly evolves, the government has shown its resolve to develop a homegrown competitor to China-based Zoom. The Vietnamese government has already devised three technical solutions to stop the spread of COVID-19 and meet the evolving demands of consumers during the pandemic. The business claims that in April 2020, it will introduce a contact monitoring program called Bluezone and a virtual health screening platform in Vietnam. The remote medical exams made possible by the checkup platform are a boon to the government's efforts to digitize the health care system in Vietnam fully.

### **3.2. New Trends**

The plan for the growth of e-government toward a digital government in the years 2021-2025, with an eye toward 2030. The plan, meant to serve as direction and orientation for the development of the digital government, as well as the digital economy and society in the new era, has emphasized six important points of view in its central sections. The initial and most essential of the country's initiatives is the creation of a Digital Government. The

government will carry out all of its operations in a protected online setting and will make use of a rethought operating model as well as data and digital technology to improve the quality of the services that are provided, the timeliness with which they are provided, the quality of the policies that they enact, the efficiency with which they deploy resources, the rate of development, and the leadership role.

In an interview with the Vietnam News Agency, Minister of Planning and Investment Nguyen Chi Dung outlines the goals and targets of the socioeconomic recovery project for Viet Nam in 2022. The greatest initiative in the nation's history, costing VN350 trillion (US\$15.42 billion), to revive the economy and bring it to full speed again after the COVID-19 epidemic slowed it down. To help companies and employees, particularly those hit hard by the epidemic, Viet Nam has implemented a recovery plan based on the country's capacity to acquire vaccinations and medical supplies.

#### **4. Digital Government by Indicators**

##### **4.1. Network Infrastructure Preparedness [NIP]**

The level of effort Vietnam puts in to be ready for and invest in digitization has increased dramatically. The MIC is mulling over whether or not to begin phasing out GSM infrastructure in 2022 and reallocate the spectrum to LTE and 5G networks. It was anticipated that commercial 5G services would be available on Vietnamese mobile networks somewhere in the middle of the year 2020. In addition, Viettel carried out a pilot project to investigate the viability of LTE services operating in the 2.6GHz frequency range.

According to statistics provided by the World Bank, the digital industry in Vietnam has been growing at a rate of 10 percent annually and is projected to reach over \$200 billion by 2045. This is an enormous sum compared to Vietnam's GDP, which was approximately \$352 billion in the previous year. According to him, four essential components must be present to boost innovation and make the most of the development potential of the digital economy: digital entrepreneurship, digital infrastructure, digital skills, and digital financial services.

For small and medium businesses to be prepared for digital transformation, there needs to be a policy that is transparent and credible, investments made in 4G and 5G technology

infrastructure, improvements made to digital and technological skills, and the government should offer fiscal incentives for small and medium businesses.

#### **4.2. Management Optimization [MO]**

The plan foresees that by 2030, Vietnam will be among the top 30 nations in the world regarding e-government and digital governance, as determined by a rating from the United Nations. Providing high-quality services to society; expanding public engagement; enhancing state agency operations; effectively addressing key issues in socioeconomic growth; having a breakthrough change in the national ranking for E-Government, Digital Government, E-Participation, and Open Data as evaluated by the United Nations are also identified as key target groups.

The strategy identifies six groups of national key tasks (improving the legal environment, developing digital infrastructure (cloud-first), developing digital platforms and national-scale systems, developing national digital data, developing national applications and services, and ensuring the safety and security of the national network) to achieve these goals. There are six clusters of related responsibilities within the purview of government agencies and regional businesses, emphasizing building online public services around people's needs and milestones in life. Vietnam's digital transformation goals are based on the three pillars of Digital Government, Digital Economy, and Digital Society; in line with the global development trend, and the country's e-Government development strategy for the digital government in the 2021-2025 period with a vision to 2030 will undoubtedly create a breakthrough in the development of e-Government and digital government in the new period.

#### **4.3. Online Service [OS]**

The four largest online marketplaces in the nation are Lazada, Shopee, Tiki, and Sendo. In Vietnam, Shopee use has increased dramatically. Retailers, from mom-and-pop shops to multinational consumer packaged goods conglomerates, utilize the main e-commerce platforms to sell their wares online. E-commerce is unquestionably the future of the retail industry in Vietnam. With the next epidemic, mobile payment applications in Vietnam are expected to surge in popularity. Apps set up their payment systems and link up with stores

and vendors so customers can pay with their phones. They provide a rather limited range of services. Vietnam has a plethora of payment methods, including Zalo Pay and VNPay.

#### **4.4. National Portal [NPR]**

In the last three months of 2021, the Directorate for Standards, Metrology, and Quality (DSMQ) within the Ministry of Science and Technology is slated to launch a nationwide monitoring platform. The Ministry of Industry and Trade's market management system, the Ministry of Finance's taxes and customs system, and the Ministry of Health's healthcare data may all be connected together via the portal.

Manufacturers, packers, transporters, distributors, retailers, suppliers of traceability solutions, and governmental management agencies will all be integral cogs in this site's larger role in Vietnam's overall traceability system. It also creates a normative framework for tracking down the government and private sector entities associated with a national landmark. In the name of "Standards, Metrology, and Quality," the Directorate is taking this action.

#### **4.5. Government CIO [GCIO]**

The council's power has been shown by various activities, one of which was the spending of public funds on implementing ICT by various government agencies. As a direct consequence of Ministerial Decision No. 814 / QD-BTTTT, the Chief Information Officer Council of State Agencies has been subjected to a comprehensive restructuring.

#### **4.6. E-Government Promotion [EPRO]**

The Vietnamese government has recently prioritized the creation of ICT applications and an e-Government system to increase state agencies' effectiveness. Thanks to the Prime Minister's leadership, the efforts of government ministries, agencies, and local governments, and the backing of the international community and domestic and foreign specialists, e-Government in Vietnam has been a tremendous success.

In other words, in recent years, there has been a rise in the general public's understanding of the advantages of electronic governance and the adoption of digital practices in administration, industry, and community. The research and implementation of crucial information systems in Vietnam are now complete. These include the national text

communication axis and the government meeting and affairs information system. Furthermore, measures to ensure everyone's safety have increased throughout the years.

Implementing the final systems has been inefficient, leading to restricted data connectivity and exchange. However, the legal legitimacy of papers sent and received electronically has not yet been standardized. There is also no uniformity in the digital signature formats between federal departments, agencies, and local administrations. The Prime Minister has said that despite the ingenuity and sophistication of the concept of e-Government, its execution would be unachievable without the will and commitment to do away with the old system.

If e-Government is to maintain its upward trajectory over the next years, it will need strategic planning and funding from the heads of relevant ministries, agencies, and territorial administrations. They must establish a protocol for the use of digital signatures in the approval of electronic documents and take full accountability for the outcomes of their efforts. To be able to use electronic documents, these businesses must modernize their text management, administration, and digital signature systems and expand their existing technological infrastructure.

To meet the new standards, the relevant authorities must expeditiously create public service gates and electronic one-stop information systems at the ministerial and provincial levels connected to the national public service portal. There is also the matter of completing the provision of officially sanctioned online public services at the third and fourth levels.

#### **4.7. E-Participation [EPAR]**

The Prime Minister of Vietnam has approved a directive allowing the National Public Service Portal to provide 55 online governmental services by 2021. These governmental services include the issue of identification cards, their re-issuing and renewal, the registration of permanent and temporary residence, the declaration of temporary absence, the registration of births and residencies, and the issuance of ordinary passports. The aforementioned list has 44 different services considered crucial online public services.

#### **4.8. Digital Transformation [DX] and Open Government Data [OGD]**

Access to information and data is simplified via the national data portal, which serves as a central hub for all State departments. The portal provides a centralized location for processing and accessing state data that is open to the public and a number of publications and services. The national data portal facilitates cooperation between State agencies by providing a central location for exchanging information and inventories. In addition, it will work with other state agencies to build a data infrastructure to help them achieve their long-term objectives and deal with any complications that may arise from sharing data across departments. Access to digital services for data synthesis from various sources and new digital services that provide consumers and enterprises access to their data collected by State agencies are both part of the roadmap for e-Government growth. Citizens, companies, and communities will have access to data stored by state agencies, paving the way for them to undertake research, study, and product development that will ultimately benefit the country. It's a way to help the government be more open and accessible to the public.

To guarantee that their data is up-to-date and correct, state agencies may utilize the portal to get comments and information from other organizations, companies, or people. The Ministry of Information and Communications has identified the state of national databases and the resources they need with the assistance of other government entities. Now that there is such a strong push toward digital governance and the digital economy, agencies see the value in making their data available to others.

At the same time, the government authorized the National Digital Transformation Programme by 2025, with a view toward 2030. The project aims to speed up the digital transformation process by encouraging and rewarding the digitization of corporate processes, government operations, and manufacturing. This program is aimed at companies, cooperatives, and business houses interested in adopting digital transformation to boost their productivity, efficiency, and ability to compete. To achieve goals, the Ministry of Planning and Investment (MPI) will provide documentation and tools to guide the digital transition and increase collaboration with the necessary institutions. This entails providing a guide for manufacturing plants and granting them a 50% discount on consulting fees. Finance and banking, healthcare, education, agriculture, transportation, logistics, energy, natural resources, the environment, and manufacturing

are just some of the eight industries that have made digital transformation a top priority.

#### **4.9. Cyber Security [CYB]**

In response to cyberspace issues until 2025, the government has established a national cybersecurity policy with an eye toward 2030. To better supervise, inspect, and handle administrative infractions and prevent and fight law violations and cyber crimes in the internet environment in Vietnam, the Ministry of Information and Communications (MIC) has released a plan. This is part of the larger endeavor to carry out the 2016–2025 National Strategy for Crime Prevention and Control, which has an eye toward 2030, and a direction from the Politburo on strengthening the Party's leadership of crime prevention and control in the current circumstances. Along with preventing and combating law violations and cybercrimes, the plan aims to increase knowledge and accountability among agencies, organizations, and individuals who engage in activities on the internet and social networks.

Therefore, it will be up to the MIC's Authority of Information Security (AIS) to coordinate nationwide responses to cybersecurity incidents and maintain information security. This organization also coordinates efforts to stop spam.

#### **4.10. The use of Emerging ICT [EMG]**

Vietnam has a great deal of untapped potential in artificial intelligence (AI). At the same time as the United States is expanding its influence worldwide, artificial intelligence (AI) is being applied in various businesses on every continent. Ho Chi Minh City's FPT Corporation, a Vietnamese company, is a prime example of the successful use of AI in the country. Viettel Group, a Vietnamese telecom company, is using AI for endoscopy. Viettel also provides IT and anti-cyberattack security services using AI. Resolution No.50-NQ-TW, announced in August, outlines the government's goals to boost the number of enterprises in advanced technology and Industry 4.0 to 50% by 2025, further promoting AI.

There is hope that Vietnam's e-commerce industry will rise to third place by 2025, behind only Indonesia and Thailand, according to the E-Business Index 2019 published by the Vietnam E-Commerce Association. Most of Vietnam's e-commerce occurs in its two main cities, Hanoi and Ho Chi Minh City. These metropolitan areas account for 70% of all U.S.

retail sales. Most people reside in rural regions, where internet access is strong; thus, this is a great chance to get into the underserved rural market. Local e-commerce enterprises like Shopee, Sendo, and Tiki compete with regional e-commerce giants like Lazada and Shopee via their own online storefronts. In addition, consumers use these social media platforms to do e-commerce. Investment in Vietnam's digital economy has topped \$1 billion over the last four years. Despite this, e-commerce enterprises in the nation continue to fight an uphill battle to win consumers' trust, contend with stiff competition, and cover high logistical costs.