

16th Waseda University-IAC World
Digital Government Ranking 2021 Survey

Part II Country Assessment Report

Rank	Country/economy	Rank	Country/Economy
55	Argentina	50	Macau
11	Australia	33	Malaysia
21	Austria	47	Mexico
52	Bahrain	59	Morocco
24	Belgium	14	Netherlands
58	Brazil	7	New Zealand
41	Brunei	62	Nigeria
5	Canada	18	Norway
46	Chile	29	Oman
49	China	61	Pakistan
39	Colombia	57	Peru
60	Costa Rica	32	Philippines
43	Czech	44	Poland
1	Denmark	36	Portugal
56	Egypt	53	Romania
6	Estonia	26	Russia
63	Fiji	30	Saudi Arabia
13	Finland	2	Singapore
22	France	37	South Africa
51	Georgia	8	South Korea
20	Germany	27	Spain
28	Hong Kong	12	Sweden
17	Iceland	15	Switzerland
38	India	10	Taiwan
34	Indonesia	25	Thailand
19	Ireland	64	Tunisia
40	Israel	48	Turkey
23	Italy	16	UAE
9	Japan	3	UK
31	Kazakhstan	35	Uruguay
54	Kenya	4	USA
42	Lithuania	45	Vietnam

Argentina

1. General Information

Area: 2,780,400 km²

Population: 45,688,354

Government Type: Federal Presidential Constitutional Republic

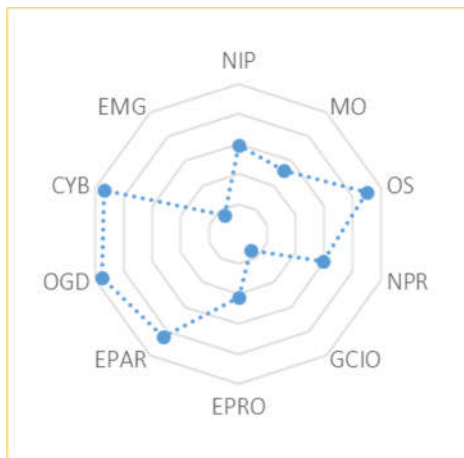
GDP: \$ 9,120

Internet Users: 74.29

Wired (Fixed Broadband Users): 21.18

Wireless Broadband Users: 80.65

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Prioritizing digitalization since 2015, the creation of Argentina's Digital Agenda has helped to clarify governmental priorities. The overall approach, termed the Digital Agenda, defines clear and coherent policy goals for the digital government via several presidential decrees and laws. To make government more digital and paperless, several essential cross-government systems have been developed. From its origin until its publishing as open data, Argentina has devoted a significant amount of time and resources to improving data management as a government asset. The government set policy guidelines and implemented initiatives to improve the quality and dissemination of government data. However, data governance in the public sector can be reinforced to promote data interoperability, administration, and sharing protocols and encourage re-use. This year, Argentina ranked 55th in the Waseda International digital government rankings 2021, with 60.4899 points.

A decade ago, Argentina launched a significant effort to improve its digital infrastructure for its citizens. More people are using the internet, and both mobile and fixed broadband subscriptions have risen as a result. The nation has made progress in the digital transformation of government and is one of the most advanced countries regarding open government data legislation.

As Covid-19 spread, so did the number of people using teleworking services. Telecommuting and the usage of digital communication and collaboration technology have become commonplace in the workplace. Apps that facilitate remote work (such as Zoom, Skype, Microsoft Teams, and others) increased downloads between January and March 2020. Many new businesses, users, and product categories have been added to online shopping due to this development. While online shopping was formerly limited to a few select commodities, it has now grown to cover a broader range of necessities and new market segments in the wake of the epidemic.

3.2. New Trends

The Agenda Digital Argentina (DA) is a framework for Argentina's digital transformation consistent with the United Nations' 2030 Sustainable Development Goals. The DA promotes educational innovation and digital alphabetization by teaching computer science ideas like programming and robotics to kindergarten, elementary and high school students. Plan Industry 4.0 is a cross-ministerial initiative aiming to boost the industrial sector's competitiveness via digital technology. Local governments contribute to the modernization of public administration, the improvement of service quality, and the promotion of openness, digital inclusion, and innovation as part of the Programa Pas Digital.

Argentina and the EU are collaborating with Colombia on an Adelante-supported biometric data program. Rather than that, they chose to continue building the underlying conditions necessary to guarantee that cooperation in research and innovation are treated equitably. Argentina and the European Union collaborate on the International Digital Cooperation project on data security and data flows to simplify building a secure and rights-based international digital domain.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

In terms of Network Infrastructure Preparedness, Argentina was placed 48th in the Waseda rankings in 2021, with a score of 5.871. The country has 36.32 million internet users as of January 2021, an increase of 3.5 percent over the previous year. Eighty percent of Argentine citizens have access to the Internet. There were 36 million social media users at the beginning of 2021, a rise of 2 million from 2020. Moreover, 121.6 percent of the country's population has a mobile phone subscription during that period.

Argentina has made tremendous progress in its efforts to prepare for and invest in the country's digitalization. Since Argentina's government considers television, the internet, and mobile phones essential public services, no carriers are allowed to increase their prices. The Ministry of Public Innovation has enacted laws allowing for the sharing of passive infrastructure. The Federal

Communications Commission (FCC) has initiated a public consultation on using and distributing the 6GHz Wi-Fi spectrum. In addition, the Open RAN protocol has been successfully implemented in Puerto Madryn by Movistar and IBM.

4.2. Management Optimization [MO]

The Argentine government presented their OECD Action Plan to the OECD as part of Argentina's G20 Finance Ministers and Central Bank Governors Meeting in Baden-Baden, Germany, on March 17-18, 2017. In March 2017, Argentina applied to join the OECD's Recommendation on Digital Government Strategies. This shows Argentina's willingness to apply OECD principles and best practices in digital governance by adopting the above OECD Recommendation. This bolsters the Argentine government's comprehensive attempts to implement public sector reforms. The prior evaluations are part of the country's more extensive reform plan, including open government and public sector accountability. The OECD Directorate of Public Governance oversees several studies in Argentina, including this one. Its Open Government Reviews, Regulatory Policy Reviews, and Public Sector Integrity Reviews are only some of the research included in this category.

4.3. Online Service [OS]

A standard tool that can be used across sectors and levels of government is facilitated by the availability of digital identification technologies, which are crucial to digital governance. To encourage the use of digital identification systems, Argentina is creating two approaches. The system, which makes considerable use of data from both the National Identity Document and the RENAPER, was launched by the SGM in July 2018. Biometric facial recognition data collected by RENAPER7 is to be utilized with the underlying Biometric Identification System.

The usage of digital identity apps can currently be seen in developing the citizens' wallets on the Mi Argentina web and mobile platforms. Additionally, the wallet is expected to incorporate a digital driver's license and other credentials such as an ID card and immunization records shortly. Expanding the breadth of services for which the eID can be utilized is essential to understanding the eID's value to people and its strategic relevance.

4.4. National Portal [NPR]

Argentina's official website is Argentina.gob.ar. Open Government and Digital Country Undersecretariat, which reports to the Secretary-General of the Cabinet of Ministers' Secretariat of Public Innovation, is behind Argentina.gob.ar.

Using the national portal, users can search the information about the government's services and benefits, as well as how to get them; policies and programs developed by the national state's agencies to address people's needs, as well as who is responsible for them; rules and regulations of the nation's government. The government wants to enhance its relationship with public institutions to ensure that all obligations are satisfied swiftly, and all concerns are handled.

4.5. Government CIO [GCIO]

As Argentina recovers, the country's economy has a lot of potential for expansion. The Oficina Nacional de Tecnologías de Información (ONTI) plan has key CIO characteristics in mind. Argentine CIO strategies are the most excellent way to implement corporate innovation and digital innovation management. There are, however, few degree programs related to Argentina's government's Chief Information Officer to be found.

4.6. E-Government Promotion [EPRO]

Within the Argentine Association of Advertising Agency, management consultants and the country's major advertising companies form a cohesive voice. Argentina's Cristal Government Initiative is attempting to reach as many people as possible with the content of the national portal by enlisting the help of journalists, who can get a significantly larger audience than traditional media outlets such as newspapers and television to promote and spread it.

4.7. E-Participation [EPAR]

The United Nations E-Government Index put Argentina fifth out of 35 countries in the Americas, behind the United States, Canada, Uruguay, and Chile. Human capital (measured by adult literacy, anticipated and mean years of education, and gross enrollment ratio) and telecommunications infrastructure are superior in Argentina compared to its regional neighbors (as measured by access to the Internet, fixed and mobile broadband, and telephone). However, in terms of e-participation (e.g., proactive or on-demand broadcast of public sector information, citizen deliberative engagement, and co-creation of policy solutions) and online services, it lags behind the competition (including, for instance, the implementation of citizen-centric approaches for public service design and delivery)

4.8. Open Government Data [OGD]

As of late 2015, Argentina's central government has been in charge of the nation and is aware of the present situation. They target to build a forward-thinking data plan in the public sector to increase data generation and sharing inside and across public institutions and external players. A data-driven public sector that emphasizes data governance as the foundation for digital transformation and cohesion and trust is still possible, though.

The government has developed a wide range of regulations to govern data management, sharing, and interoperability. These include the following:

- 2000 Data Protection Law
- 2016 Decree on Register Simplification
- 2016 Freedom of Information Law
- 2016 Decree on Data Opening Plans
- Resolution 19/2018

4.9. Cyber Security [CYB]

In 2021, the nation came in 22nd in the Waseda rankings regarding the Cyber Security indicator, scoring 9.400. Argentine firms spent \$108 million on cybersecurity in 2019, an 8 percent increase over the previous year that is expected to continue for the foreseeable future. People in Argentina are

well-educated and tech-savvy. The local cybersecurity industry is still in its infancy, despite recent growth. As a result of Argentine peso devaluation and economic instability, the adoption of cybersecurity and related technologies has decreased.

However, the Argentine populace tend to be more anxious about economic instability and physical security, which are more directly tied to personal and family dangers. Despite CEOs' recognition of the importance of cybersecurity, it does not rank among their top five worries, except in the financial sector, namely among banks.

More robust security measures will help the government better protect itself against and react to cyber threats and occurrences. Fortunately, compared to other Latin American economies, cyber-attacks in Argentina are less frequent (Brazil, Mexico, Chile). In Argentina, banking, energy (oil and gas), telecommunications, manufacturing, and retail are among the top sectors for cybersecurity investments. A company's level of technology and cyber maturity differs based on its size and location, as well as whether it's a subsidiary of a global corporation.

4.10. The use of Emerging ICT [EMG]

The National Office of Information Technologies (ONTI) has created a strategy to set standards for using and adopting new technologies by public sector enterprises. The goal is to speed up digital innovation in the public sector and encourage cross-sector sharing of best practices and use cases.

Moreover, in March 2019, ONTI published a Code of Good Practices for the Development of Public Software to assist the long-term development of public sector software. This year will see more information on blockchain technology, smart contracts, and artificial intelligence.

As part of the Blockchain Federal Argentina (BFA) initiative, the government of Argentina is adopting blockchain technology. The BFA is an open and participatory multi-service platform that enables players from both the government and the private sector to establish blockchain-based services and applications. The findings of ONTI's analysis show the benefits of a hybrid cloud computing approach for the government. To meet these needs and facilitate the acquisition of private cloud systems, ONTI and the National Acquisition Office have established a framework agreement with the state-owned enterprise ARSAT. The framework agreement is expected to be in place by the middle of 2019.

Australia

1. General Information

Area: 7,692,024 km²

Population: 25,846,664

Government Type: Federal parliamentary constitutional monarchy

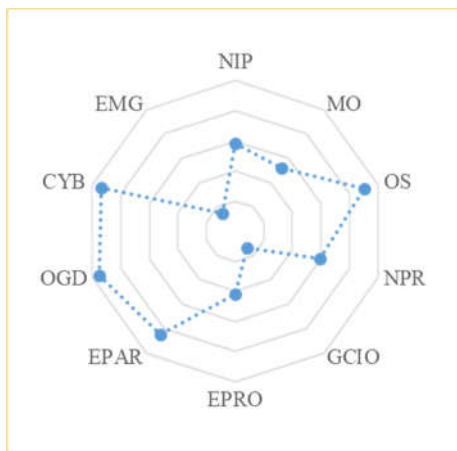
GDP: \$62,720

Internet Users: 86.55

Wired (Fixed Broadband Users): 35.05

Wireless Broadband Users: 126.46

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. Digital Government Development

While COVID-19 has expedited the digital transformation, the Australian Government has an effective strategy to expand on it. The government has strengthened the power of the Digital Transformation Agency (DTA) to assist it in delivering on its objectives. The DTA is now a valued adviser to the government on strategic planning, investment, and assurance. From July 1, 2021, the DTA will be the government's Chief Digital Advisor, providing strategic policy leadership on whole-of-government, and shared ICT investments and digital service delivery.

Success in delivering the Digital Government objectives enabled the Government to react to the COVID-19 situation. The government implemented a Cruise Ship Tracking service for Australians aboard cruise ships if they needed extra medical help after their trip. The government worked hard to keep operations and essential services running smoothly. To do so, they rapidly mobilized public employees throughout the government. This includes processing Economic Support Payment (ESA) claims and JobSeeker and JobKeeper payments, with many employees working from home.

3.2. New trends

The Australian government's goal is to have a leading digital economy and society by 2030, driving the digital revolution that will bring benefits to all Australians. Over the next four years, two strategic priority areas will be focused on accomplishing this mission, which are "Direction Setting" (to drive strategic whole-of-government digital policy and advice) and "Implementation Oversight" (ensuring alignment to digital strategies and simplifying digital procurement to reduce costs and increase reuse.)

The Australian Government is collecting input from stakeholders in government, industry, and beyond to provide vision and leadership for the government's digital transformation in 2021. Australia must invest in proven and innovative technology to achieve a top 3 global digital government by 2025. So the government can better comprehend the technological environment and map current digital capabilities across agencies. In 2021, the Government will review the Australian Public Service's digital qualifications: policy, people, process, technology, and alliances. The review's findings will help the government decide where to spend based on needs and existing capacity shortages.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

According to the IDC Press, Australia's 2020 losses owing to the COVID-19 pandemic have begun to be recouped. In the first quarter of 2021, the market grew 16.9% year on year, adding US\$ 230.7 million. Despite remaining below pre-COVID levels, this growth is a good sign of market recovery. This quarter, Telecom Service Providers increased their expenditure on 5G core networks, leading to the highest annual rise so far (28.6%).

4.2. Management Optimization [MO]

The Digital Transformation Strategy has changed how government services are delivered by focusing on easy, smart, personalized, and transparent customer service. The Government has been successfully bringing people together quickly and efficiently where 95,000 public servants are now connecting, collaborating, and creating communities through GovTeams; and increased digital access to government services, with IP Australia conducting more than 99% of user transactions digitally. In response to COVID-19, the Australia.gov.au website was changed within 24 hours to a cross-jurisdictional information platform delivering vital messages from Government and National Cabinet. Over 17 million Aussies had visited Australia.gov.au by October 2020.

In reaction to the devastating 2019 and 2020 bushfires, cross-jurisdictional initiatives were undertaken to identify whole-of-government possibilities for reform. Concentrating on the individuals affected by disasters allows the authorities to better coordinate services and react quicker.

The government keeps investing in data and digital technology to support the Digital Transformation Strategy. In 2020, over 3 billion was invested in digital technology, including the Digital Identity and Welfare Payment Infrastructure Program, which improved the user experience.

4.3. Online Service [OS]

The sub-dimensions of Online Services include:

- E-Procurement.
- E-Tax.
- E-Customs.
- E-Health.
- The One-Stop Service for Citizens Service.

The services are examined using three criteria: the complexity of each service, the level of security, and the level of convenience.

In Australia, all of the online services have been converted to electronic transactions. AusTender (www.tenders.gov.au) is the primary point for accessing Australian government business opportunities, yearly procurement plans, and contracts. With MyGov, the Australian government intends to replace australia.gov.au accounts, which connect all government services into a single location. By creating a MyGov account, each citizen can access many services like Medicare, Australia Taxation Office, Personal Controlled eHealth Record, and Child Support. The version of MyGov that was developed using the 2.0 method enabled more straightforward content, greater accessibility, and quicker response across mobile devices.

4.4. National Portal [NPR]

The National Portal's score is determined by information (content), technology, and functionality. Australia's national portal is accessible at www.australia.gov.au. It consolidates a variety of information resources and online services from different government departments into a single location. Google PageSpeed[™] Insights revealed that the website performs effectively on both PCs and mobile devices in terms of technical performance. Additionally, the portal integrates with different social media platforms such as Facebook, Twitter, YouTube, and Flickr and has a function that allows users to get updates through email notification. In terms of accessibility, Australia.gov.au presently adheres to Level A of the Web Content Accessibility Guidelines version 2.0 (WCAG 2.0).

4.5. Government CIO [GCIO]

With the reorganization of the tremendous digital government, Australia had several great headlines of innovation and leadership in recent years, focusing on how chief information officers and other IT executives reacted to the catastrophic worldwide COVID-19 epidemic.

This year has been very tough for Australia as a whole. With COVID-19, it's predictable that the healthcare, government, retail, and education sectors have given some of the most compelling examples of leadership and perseverance. Collaboration, artificial intelligence and machine learning,

data analytics, automation, and robotics technologies are supporting many organizations in improving their services to internal and external customers to accomplish their strategic goals this year. Businesses in a variety of sectors are facing some of the most difficult economic circumstances in many years. Despite this, their technology executives have shown true leadership and provided technological solutions that will assist their organizations in meeting future business problems.

4.6. E-Government Promotion [EPRO]

The Australian Government is targeting recruiting, developing, and retaining digital talent. In 2019, the Emerging Talent Program had 96 digital apprentices, cadets, and graduates. Also, the Women in IT Executive Mentoring program has helped 120 mentees build leadership abilities and advance their careers. The Leading Digital Transformation initiative has educated about 10% of the Senior Executive Service to lead change in our fast-changing digital environment. The first Australian Government Digital Summit and Digital Awards in October 2019 drew over 730 attendees and strengthened agency and industry relationships.

On the digital transformation journey, the Australian government collaborates with businesses and institutions to maximize the benefits of technology, i.e., ‘Services Australia Augmented Intelligence Centre of Excellence, to help develop and implement innovative technologies and methods of working. The administrative procedures have been more straightforward for SMEs to compete for government contracts through platforms like the Digital Marketplace. Since 2016, SMEs have received 70% of approximately \$870 million in government contracts. Furthermore, Australia is increasing value by partnering with key suppliers like Microsoft, IBM, Amazon Web Services, SAP, and Concur.

4.7. E-Participation [EPAR]

The rate of citizens engaging with the government has risen due to well-established e-Government channels: two-thirds of Australians used e-Government services for their most recent interaction with the federal government (AGIMO, 2011). The national portal of Australia provides an excellent platform for encouraging people to participate in various activities and conversations with the government of the country. People and communities may be actively engaged in the creation and development of policy and services via consultation procedures supported by various technologies and methods.

4.8. Open Government Data [OGD]

The Roadmap provides guidelines for the Australian government to digital transformation with 119 projects across all service categories and 73 projects across government departments to be executed to serve Australians better.

The Government has been improving open data systems like data.gov.au, which currently has over 84,571 datasets. People and companies may now access data from federal, state, and municipal governments. Business owners may save time and money by registering their company online. This

is a good step towards a more accessible government. In 2019–20, the Roadmap had 12 new projects, establishing a new information exchange system to enhance elderly care quality; or the testing system of digital self-management for job seekers to allow job searchers to easily access employment resources.

4.9. Cyber Security [CYB]

In 2020, the threat posed by cyber-attacks increased. According to the Australian Cyber Security Centre (ACSC), cybercrime complaints and cyber security events have risen. The ACSC has also seen a rise in the number and complexity of attacks by state-based actors and cybercriminal syndicates.

Due to cyber security across Australia, Commonwealth institutions must work together to address the changing cyber threat environment. The Australian government's Cyber Security Strategy 2020 allocates \$1.67 billion over a decade to improve Australia's cyber security, including \$1.35 billion for the Cyber Enhanced Situational Awareness and Response (CESAR) program. The CESAR package will maintain the ACSC's cyber security capabilities and help Australians over the next ten years. In addition to protecting more Australians, the CESAR package will help the ACSC detect and disrupt international hackers. Thanks to the ACSC's improved capabilities and situational awareness, Commonwealth organizations will be better protected online.

4.10. The use of Emerging ICT [EMG]

The governance and operation of Commonwealth's Information and Communications Technology (ICT) systems assist in enhancing the government's cyber security posture and increasing cyber resilience. Throughout 2020, the Australian Cyber Security Centre (ACSC) has strengthened the technical direction, verification, openness, and accountability of the initial Cyber Uplift initiative. The Commonwealth has improved its cyber security via the following programs:

- The Cyber Maturity Measurement Program (CMMP) allows ACSC teams to evaluate ICT systems or Commonwealth organizations.
- The ACSC Cyber Security Uplift Services for Government (ACSUSG) is financed by the Cyber Enhanced Situational Awareness and Response (CESAR) package and assists Commonwealth institutions in adopting ACSC recommendations.
- The ACSC's Cyber Security Aftercare Program (CSAP) keeps in touch with Commonwealth organizations to help them improve their cyber security posture.

Austria

1. General Information

Area: 83,871 km²

Population: 9,050,697

Government Type: Federal parliamentary republic

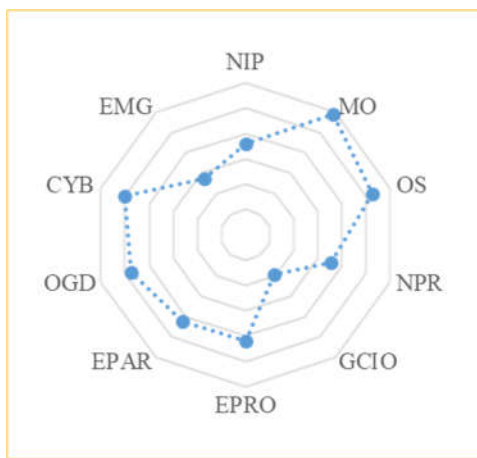
GDP: \$53,860

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

Austria's Ministry of Digital and Economic Affairs is now creating a new, even more ambitious Digitization Strategy for Austria to position Austria as a digital leader in Europe. The plan's timeline, objectives, and implementation are developed within the context of Digital Austria's strategic framework, in close cooperation with the Chief Digital Officer Taskforce and the newly constituted digitization agency.

On August 20, 2018, the new Federal Procurement Act (BVerG 2018) went into effect, replacing the Federal Procurement Act of 2002 and the procurement Regulation 2004. Eventually, the new Federal Procurement Act of 2018 codified all EU public procurement rules, including procurement obligations.

The Austria federal government has underlined the critical nature of digital transformation for industry, society, and government. On 30 May 2018, the Federal Government created the Digitalisation Agency, marking another significant milestone in Austria's digital transition. The Agency prioritizes SMEs, implements targeted programs, and provides expertise and know-how in innovation, digitization, and networking.

3.2. New Trends

Austria's public administration is experiencing significant modernization and digitalization to de-bureaucratize everyday life and work in the nation. Apart from increasing internet and 5G availability, the focus is on enhancing the usability of digital services for citizens and businesses. The Federal Ministry for Digital and Economic Affairs develops, promotes, and supports state-of-the-art e-Government to provide secure and timely management solutions.

All administrative organizations are encouraged to improve efficiency by using publicly accessible data, simplifying processes, and increasing mobility. Consequently, best practices from across the spectrum of digital transformation and favorable legal framework conditions for digitalization will benefit the economy. Additionally, appropriate financial support programs will be created to help Austria market itself as an attractive and technologically sophisticated business location.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

It was reported in July 2020 that Austria's 5G deployment was stalled owing to exorbitant leasing costs for mobile towers and a lack of governmental incentives. Despite a low population of 8.9 million, Austria has become a 5G pioneer. Austrian carriers aim to deliver 5G services along significant highways by 2023 and nationally by 2025. Austrian 5G deployments accelerated in 2020 and will continue in 2021. A1 claims to have 5G coverage for 3.8 million Austrians in over 1500 sites, 1,000 added this year. It also claims to have significantly invested in fiber-optic infrastructure to support both its fixed internet service and the 5G network. On top of that, A1 has hired Nokia to offer 5G radio access and core network services, including the commercial launch of 4G and 5G network splicing.

4.2. Management Optimization [MO]

While the Federal Ministry for Digital and Economic Affairs has the more significant focus for eGovernment policies and activities, the federal ministries and agencies execute their initiatives. The eGovernment Innovations Zentrum (EGIZ) was established in fall 2005 to converge ICT and eGovernment organizations. It is a research organization that studies new eGovernment technology and solutions. Both EGIZ and the ICT Strategy Unit concentrate on their respective responsibilities. It also facilitates tighter research-application collaboration. The EGIZ is a platform and network for eGovernment research.

The Austrian Federal Computing Centre (BRZ) develops eGovernment solutions for all areas of public administration, including Oesterreich.gov.at - the eGovernment site. It also provides technical assistance and hosting to government agencies and administrations. There's ELAK, MOA Services, eDemocracy, and eDK. It has also created an ASP service for its government clients.

4.3. Online Service [OS]

Austria has always led the way in Europe when it comes to eGovernment. Australian individuals and companies can engage with government departments and complete processes online via modern information and communication technology. Austria substantially outperforms the EU average in the EU's eGovernment benchmark report. Oesterreich.gv.at functions as the first primary contact for all eGovernment issues. This website serves as a "one-stop market" for online services. The USP of the corporate service portal is customized to the needs of the corporate sector. Businesses may utilize this platform to report taxes, social security, and other paperwork electronically.

Since 2005, the coordination and strategy committee for eGovernment has operated through the portal Digital Austria. This platform, based in Austria's Federal Chancellery, integrates all eGovernment efforts for corporations and governments. Simultaneously, the EGIZ was established in 2005 to help public entities advance Austria's ICT strategy and technical research advancements in eGovernment.

4.4. National Portal [NPR]

Oesterreich.gv.at is a state internet site. It provides information on all necessary interactions with Austrian authorities in everyday life events, e.g., pregnancy, delivery, marriage, and housing, and allows the completion of most of these procedures online. The portal facilitates communication between authorities and people, prioritizing availability, usability, and information clarity. The site is accessible 24 hours a day and contains advice on engaging with multiple organizations in over 200 situations. It enables the completion of many administrative procedures online through the Oesterreich.gv.at website.

This website has been redesigned as Oesterreich.gv.at and expanded to include more citizen services. Austrian citizens' eGovernment website was also updated in March 2019 with a chatbot named "Mona" and a dedicated mobile app. The Digital Office App was developed to provide individuals instant access to administrative services, enabling them to participate in eGovernment whenever and wherever they need.

4.5. Government CIO [GCIO]

The federal government established the position of Chief Information Officer (CIO) in 2001 to offer strategic and technical assistance to the federal government and develop its eGovernment initiatives. Additionally, the CIO leads Digital Austria and advocates for Austrian eGovernment solutions on a European and worldwide level. Regularly, the CIO reports to the Minister in charge of Digital and Economic Affairs on current activities.

4.6. E-Government Promotion [EPRO]

Since 2019, the Ministry of Digital and Economic Affairs has been working on a project dubbed "Digital Austria in 2050." The mission establishes a framework for the Digitalization Strategy, which will consist of many strategic action plans tackling critical priority issues. The strategy seeks to consolidate and replace some existing programs (e.g., Digital Roadmap). Developing user-centric and creative eGovernment services is a crucial component of future strategic action plans.

Each action plan will contain specific and actionable measures (statistics, art/culture, and climate change). The federal government's Chief Digital Officer (CDO) group and academics collaboratively grow digital strategic plans (experts from universities). Austria aims to strengthen and expand its position as a leading digital nation and its long-term prosperity, job opportunities, and quality of life.

4.7. E-Participation [EPAR]

Several Austrian businesses were unprepared for the digital needs imposed by the covid-19 pandemic, even when they used the available e-government technologies. At the moment, just 25% of Austrian companies offer their products and services online. The majority of small and medium-sized businesses lack expertise with online sales, including marketing and cybersecurity. Non-users of online sales channels either think their product is incompatible with online sales or have chosen to ignore the issue.

Austria is ranked 13th overall in the European Commission's Digital Economy and Society Index for providing digital public services to businesses, far behind innovative countries like Luxembourg and Denmark.

According to research conducted by the Austrian Institute of Economic Research in May 2021, although digital public services for citizens remain a strength of Austria, businesses continue to lag. However, according to the research, over 90% of Austrian distance selling activity is conducted online (€8,7 billion, up 7% from 2020). Even while foreign businesses account for 54% of distance retail sales, store loyalty in Austria is increasing (by 3 percent compared with 2020). Austrian enterprises are expanding their online services and investing in digital skills to stay competitive. One reason domestic firms are increasing their online competitiveness is due to public funding.

4.8. Open Government Data [OGD]

One of the critical components of the newly released Austrian Government strategies is promoting Open Government Data (OGD) to improve transparency and generate new possibilities for businesses. Additionally, the data concern will be handled in one of the Government's digital strategic action plans.

4.9. Cyber Security [CYB]

The National Cybersecurity Strategy (NCS), launched in 2013, was developed utilizing the Austrian Security Strategy and the Critical Infrastructure Protection Program. Austria's Cybersecurity Strategy (SCS) is a comprehensive and proactive approach to cyberspace and human security that respects

human rights. It aims to strengthen the safety of Austria's cyberinfrastructures and services. The Cybersecurity Steering Group released its annual cybersecurity report for Austria in 2014 to overview cyber threats and national and global trends. The latest Cybersecurity Study incorporates international and operational advances since the previous year's report. The observation period runs from 2018 to 2019, with specific occurrences occurring in 2019. Austria is currently reviewing its 2013 Cybersecurity Strategy to ensure it remains current with new threats.

4.10. The use of Emerging ICT

All federal contracting partners, including international partners, must provide structured electronic invoices to the federal government upon delivery of goods and services. Except in a few limited circumstances, the federal government is required to use eInvoicing. All invoices must be submitted through Austria's leading eInvoicing site, the Federal Service Site (USP).

In 2001, as part of the eGovernment Offensive, the ICT Board created the former eGovernment Platform. Following the federal government's 2003 eGovernment Offensive, the coordinating framework for eGovernment was reinforced in 2005 by creating the Digital Austria Platform. All levels of government are encouraged to take an active role in Digital Austria. It incorporates the federal government, states, cities, municipalities, and other public and private organizations. The platform's primary duties include strategic decision-making, prioritization, coordination, and monitoring many cross-cutting eGovernment initiatives. The website www.onlinesicherheit.gv.at offers information on information and communication technologies. The ICT security website seeks to educate and help influential Austrian target groups. It educates these groups on the importance of information technology security and demonstrates the consequences of their activities.

Bahrain

1. General Information

Area: 765 km²

Population: 1,757,537

Government Type: Unitary Islamic Constitutional Monarchy

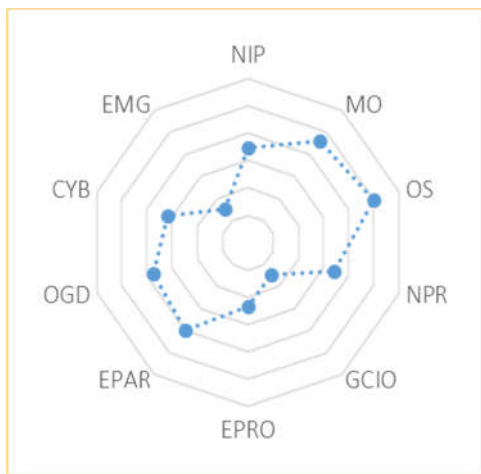
GDP: \$24,290

Internet User: 99.54

Wired (Fixed Broadband User): 8.73

Wireless Broadband User: 109.37

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Even though Bahrain was placed fifty-first out of 64 nations with a score of 67.3004, the Bahraini government continues to be a pioneer in implementing contemporary technology for people, communities, and businesses. As in the past, King Salman is actively encouraging digital transformation in the public sector, with a particular focus on service-oriented and citizen-centered operating models. Bahrain's government has embraced modern digital technologies while being governed by the Kingdom. The Supreme Council for Information and Communication Technology (SCICT), chaired by Deputy Prime Minister H.H. Shaikh Mohammed bin Mubarak Al Khalifa, and the National ICT Governance Committee (ICTGC), oversees the coordination and implementation of the Kingdom's strategic digital initiatives, are paving the way.

The country has been able to broaden the breadth of its national digital transformation initiatives and electronic services due to the Covid-19 outbreak, along with showing its capacity to deal with conventional disasters and pandemics. The government realized the benefits of technology in extending public access to information and services quite rapidly. This resulted in establishing a fully equipped National Data Datacenter, a secure National Data Network, and citizen and residential Smart ID Cards.

To accelerate the formation of an appropriate environment for a digital economy through improved digital infrastructure, regulations, legislation, and advanced technologies, the Government, has speeded up establishing a proper setting by assisting public sector organizations with their digital transformation initiatives.

3.2. New Trends

The Government of Bahrain is accelerating the use of new and mature technologies via its Digital Government Strategy 2022 to allow a more transparent, responsive, and efficient government, as stated in its Government Action Plan. The government intends to tailor services to residents' preferences and requirements and instantly accessible on their preferred devices.

The government organizations will develop an inclusive approach for providing digital services to all citizens, focusing on strategies that meet individual requirements to the extent possible.

- Encourage the government to interact with a broader demographic of people through digital media. An Assisted Digital method is accessible for persons who are unable to utilize the internet.
- Develop public services utilizing a 'Digital First' strategy, emphasizing digitizing the whole chain of operations to maximize value for residents.
- Consider re-engineering some government operations to be delivered digitally.
- Establish policies requiring people and corporations to reveal specific categories of data to a government agency only once.
- Utilize current technology to produce more accurate estimates and make more informed judgments by evaluating massive volumes of data.
- Increase transparency and community involvement by unifying and making available public government data.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 6.942, Bahrain is in the middle of 64 nations in terms of Network Infrastructure Preparedness. By January 2021, the total number of internet users had risen to 1.71 million, increasing 3.6 percent year over year. At the start of 2021, the percentage of the population with Internet connections remained astonishingly high at 99 percent. Simultaneously, 1.5 million individuals, or 84.9 percent of the entire population, used social media. According to statistics, mobile connections represented 87 percent of the whole population in the nation. Mobile connection numbers also grew by 21 thousand, accounting for 128.9 percent of the overall population.

There were significant advancements in Bahrain's digitization. STC, Batelco, and Zain Bahrain have begun expanding their 5G networks. Batelco obtained an Open Banking license and is exploring listing on both Bahrain and Saudi stock exchanges. Batelco and Zain renewed their mobile permits.

4.2. Management Optimization [MO]

The government intends to utilize digital technology to improve citizens' services, operations, decision-making, and data sharing. The government's priority was to enable a digital workforce, foster analytical platforms, and establish effective cyber security measures. In addition, the government has accelerated creating a favorable environment encouraging the development of a digital economy by strengthening digital network infrastructure, policies, regulations, technology platforms, and assisting public sector entities.

504 e-services were provided by the end of 2020, including 391 through the national portal, Bahrain.bh, 16 via self-service e-kiosks, and 97 via smartphone applications. They have helped the government save 82% on operational costs by allowing users to complete transactions online 76% faster and 69% more efficiently than traditional methods, all without visiting service centers.

4.3. Online Service [OS]

To achieve the country's goals by 2030 to become a cashless society, Bahrain offers multiple electronic payment methods, eWallet, which help all payment transactions be taken quickly and safely. A few standard eWallet methods in Bahrain are b-wallet, stcPay, Benefit Pay, and Max Wallet. E-Wallet methods are planned to be taken as one of the official payment methods on the National Port.

Besides e-Wallet, the government has been using digital ID cards in public, which is used to identify an individual's identity, for voting in the parliamentary elections, passport, public services, travel document and access through airports. The passport renewal enables the citizens to register to their new ones via the Passport Renewal eService. With digitalization, online services have brought enormous benefits to every individual, encouraging them to use more public services and minimize the administrative burden.

4.4. National Portal [NPR]

The Bahraini government is improving its Open Data Portal (www.data.gov.bh) and electronic participation tool (Tawasul) to improve public-private interaction. The Open Data Portal promotes Bahrain's image by highlighting the country's competitive advantages. As a result, it will boost local entrepreneurship, innovation, create value from data, and increase company success rates. Meanwhile, the Bahraini government promotes better data quality via data standards and data ownership. The Government is on track to achieve its data and AI goals via effective cross-government data sharing, defined data ownership and responsibilities, and improved data skills and standards.

The government is also pushing the use of high-quality data from several sources to facilitate evidence-based decision-making, encourage investment, foster a robust research and innovation industry, and provide the basis for AI. Citizens' and residents' access to information, empowerment,

participation in public service improvement, and citizen involvement in decision-making are all priorities for the Government.

4.5. Government CIO [GCIO]

The Kingdom of Bahrain has established a national D-Government Authority, known as the IGA, to serve as a GCIO Office (Information and e-Government Authority). The e-Government Authority and the Central Informatics Agency were combined to establish the IGA, which stands for Information and Governance Authority. The duties of the Head of IGA, or previously, the Head of EGA, are similar to those of the GCIO. There are formal GCIO at the national and ministerial levels, but their existence at the official level and any indication of their presence is scarce. When it comes to educational opportunities, the University of Bahrain provides a Master's degree program that is specifically geared at the position of the GCIO.

4.6. E-Government Promotion [EPRO]

Apart from the COVID-19 epidemic, the Government has encountered further social and economic roadblocks in improving its digital infrastructure and institutional capacity to respond to national calamities and pandemics. Pandemic preparation and technology were used to resolve the challenges in this situation. As a consequence of this possibility, the government entities were directed to explore projects aimed at digital empowerment. The government realigned its resources to more effectively handle disasters and pandemics.

Travel restrictions and business and government closures were imposed in response to the COVID-19 epidemic, increasing internet demand. The government encouraged projects such as work-from-home, e-banking, e-learning, and e-health. Bahrain was compelled to reassess digital initiatives and prepare for the 'new normal' after the outbreak. Numerous scenarios have been developed to assess the effect of a pandemic on the Strategy Roadmap's activities. Thus, the Government Action Plan, the Economic Vision 2030, and the United Nations Sustainable Development Goals were all aligned.

4.7. E-Participation [EPAR]

The iGA's efforts to reform government service processes and complete national digital transformation plans have contributed to the acceleration of digital transformation in 2020. The figures showed that 82 services were redesigned to be more contemporary and efficient. The government has assisted the public sector, particularly the judiciary, by simplifying procedures using modern processes, technology and artificial intelligence (AI). Judicial services include online filing of civil and commercial lawsuits. Modern technology-enabled remote learning was enabled by moving the Educational Gateway, EDUNET, to the cloud. These technologies also helped create the BeAware Bahrain app, which helped stop the spread of COVID-19. The app's rapid development has made it a national success story.

Over 500 eServices have been launched since the eGovernment project began. Six industry and 15 government organizations offered 82 eServices in 2020. The government also obtained seven new operating systems, and the National Portal and app stores got a 30% capacity boost and a 50% service quality improvement.

4.8. Open Government Data [OGD]

Open Data establishes the foundation for governments to share machine-readable data with the rest of society. Individuals, organizations, and government agencies may all benefit from government data by doing research, generating new solutions, and making better decisions. Bahrain Open Data Portal allows government data from many sectors to be freely reusable, analyzable, and shareable while conforming to all personal data protection regulations under Bahrain's Personal Data Protection law.

Bahrain has used big data to complete various projects that need the analysis of massive amounts of data, such as the population census and other administrative records of state institutions, procedure technology while saving effort, time, and money. The Monthly Consumer Price Index report summarizes collecting data from many sources and then electronically processing it to produce reliable indicators of inflation rates in the Kingdom.

Bahrain's tourism business depends on online government data to provide the public with reliable and timely information, such as incoming visitor numbers, Bahraini tourism destinations visited, and hotel and restaurant occupancy.

4.9. Cyber Security [CYB]

The government created the National ICT Governance Committee (ICTGC) to set strict eGovernment standards for government institutions. The National Center for Cyber Security was also established to protect the Kingdom's cyberspace. The ICTGC is charged with assessing plans, monitoring ICT expenditures, and reporting to the Supreme Committee on Information and Communication Technology (SCICT). Aside from that, the ICTGC sets norms and standards for all government entities, such as the "Cloud First" policy and "Printing Policy." As part of the Government Strategy 2022, this helps produce a single set of standards that are compatible with current government usage and developing technology trends.

The Personal Data Protection Law (PDPL) (PDF, 304KB, 40 pages, Arabic only) is the government's sole codified data protection law. Personal Data Protection Law (PDPL) infractions are punishable by restraining orders, fines, and compensation to data owners who have incurred damages due to PDPL violations. With a renewed focus on cybersecurity, the Bahraini government established the National Centre for Cyber Security, which was tasked with enhancing national response and protection, promoting widespread adoption of cyber security policies, and increasing Bahraini competitiveness.

4.10. The use of Emerging ICT

Bahrain was the first GCC country to create IoT connection standards and advocate their usage in international mobile networks. It also contributed to an ITU proposal for a new working paper on narrowband IoT applications. For smart cities, IoT, and M2M connectivity, the iGA provides frequency bands to government entities. On-the-go IoT and M2M services are available in Bahrain. Its wireless and fiber networks now support 5G, boosting Internet connectivity and speed. This technology is used by several Bahraini government and private entities.

Using Blockchain technology has increased transparency, security, traceability, transaction efficiency, speed, and cost savings for businesses. According to the Economic Development Board and the iGA, this national policy would provide comprehensive guidelines for using Blockchain technology in both public and private sectors.

Bahrain was one of the first GCC countries to implement a government-wide digitization program. In addition to improving government IT capabilities, Bahrain is setting an example. Technology-enabled government to reduce costs, increase security and efficiency while delivering world-class public services. Following Bahrain's Cloud-First policy, which outlines a defined road map and criteria for public sector cloud adoption, this regulation mandates public bodies to include Cloud Computing in their IT planning and operations.

Bahrain's innovative leadership has enhanced government services and helped digital success utilizing AI (AI). The Kingdom also provides training and development. It was designed by Tamkeen, Bahrain Polytechnic, and Microsoft to stimulate student innovation and creativity. This academy's mission is to educate and train students and instructors from all across Bahrain.

Belgium

1. General Information

Area: 30,528 km²

Population: 11,641,201

Government Type: Federal Parliamentary Constitutional Monarchy

GDP: \$50,100

Internet Users: 91.52

Wired (Fixed Broadband Users): 40.85

Wireless Broadband Users: 89.20

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Belgian eGovernment is based on government-issued ID cards. While safeguarding users' privacy, the country's eGovernment strategy takes into account the unique characteristics and capabilities of all government entities and administrative levels. Its main objective is to make public services more accessible and convenient for individuals and businesses. Additionally, the ID card serves as a form of identification and electronic signature for public servants. As of March 2019, all 589 national registries and 102 consulate offices provide birth and marriage certificates or extracts using electronic signatures using Brussels electronic desk (eDesk).

The initiative is a component of the Belgian government's plan for administrative simplification. Operators take active measures to protect privacy, control traffic flows, and define regional borders. This basic pragmatism has resulted in significant cost savings associated with the maintenance and

use of secure eID cards. The success of this initiative was contingent upon pragmatism and cooperation of all parties. The most unexpected aspect is that Belgium immediately became embroiled in ideological debates over data security. The debate cannot improve the security of the past or ensure a more secure future. Not data itself, but instead the data flow is protected, since people are aware that such flows must be free of misuse from start to end.

3.2. New Trends

The digital strategy of Belgium's Wallonia region will run from 2019 to 2024. Wallonia's digital transformation serves as the foundation for all of the Walloon government's activities. Its main objective is to accelerate Wallonia's digital transformation through five major pillars: the digital sector, digital business, education and training, administration, and territory.

The Strategy's educational pillar, which is focused on the educational demands and requirements of the Walloon people, seeks to equip each citizen with strong technical skills and an entrepreneurial mentality in order to contribute to the region's digital transformation. There are many critical efforts in the area of education and digital skills, each of which is defined and supported by the following projects:

- WallCode initiative acts as a bridge between interested parties in order to improve the digital literacy of both Walloon youngsters, as well as the general public, particularly in the fields of programming, logic, and robotics.
- Citizens' digital maturity to empower individuals to participate more actively in the digital revolution, strengthening their basic digital skills.
- The digital Wallonians are the official representatives of Digital Wallonia. They have three main objectives: to raise awareness of Wallonia's digital activity, to promote digital technology, and to draw attention to Wallonia's digital activity.
- The Online School utilizes high-quality technology and a fast internet connection to improve digital learning for elementary and secondary school students. It teaches students digital skills, complements traditional forms of education, and equips them with specific, essential digital talents.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

According to the World Bank, internet usage in Belgium was at 87.23 percent in 2021. According to estimates, the proportion of individuals who use the internet is projected to grow year on year throughout this time period. By 2026, it is estimated that almost 94 percent of the population will have an internet connection. In 2021, Belgium's internet user population is projected to reach 10.14 million. According to estimates, the number of internet users will reach 10.96 million by 2026. The following statistics show the significant growth of Belgium Network Infrastructure:

- There were 10.57 million internet users in Belgium in January 2021, an increase of 1.5% compared to 2020.

- There were 8.83 million social media users in Belgium in January 2021, which increased by 11% compared to the same point in 2020. The numbers accounted for 76.0% of the total Belgium population at the same time.
- There were 10.81 million mobile connections in Belgium in January 2021, which increased by 0.3% compared to 2020. The numbers accounted for 93.1% of the total population at the same time.

4.2. Management Optimization [MO]

Belgian eGovernment efforts are built on an intimate system in which federal government departments deal with their own database management, which contain data provided by individuals, businesses, and public servants, among others. Other government authorities in need of this kind of information may use these databases, dubbed authentic sources. As a result, individuals and businesses will only need to transmit data once. For instance, the National Registry, which the Interior Ministry administers, collects basic information on all Belgian citizens; the Crossroads Bank for Enterprises (CBE), which the Economy Ministry administers, is an integrated business registry that contains all authentic sources for all Belgian enterprises, such as corporations; and the National Registry, which collects basic information on all Belgian citizens.

At the regional level, comparable infrastructure components to those mentioned before have been implemented. In May 2013, Wallonia and the Walloon-Brussels Federation created a Crossroads Bank for Data Sharing (BCED - Banque Carrefour d'échange de données) to enable data exchange between the two regions. WBF and Wallonia have partnered to develop an exchange platform to facilitate data sharing between the two areas. The Bank complies with relevant laws and regulations on privacy protection and computer security in general. Personnel are drawn from the eWBS, Etnic, and DTIC organizations. The Brussels Region has also developed a similar trading site, called Fidus, accessible to all capital inhabitants. Fidus is a regional services integrator and legal administrator for electronic data transfers inside and across companies, concentrating on the Brussels-Capital Region (provided the data comes from authentic sources).

4.3. Online Service [OS]

Almost all basic information on work conditions and terms of employment, as well as news, legislation, publications, and online services are served via FedWeb's newsletter - FedWeb Light, which provides frequent updates on personnel and organizational problems.

The Brussels-Capital Region's eGovernment website, which is accessible in both Dutch and French, provides information in Dutch, English, French, German, and Spanish, as well as regional online services organized by topic. Numerous online forms and processes are available for completion and submission via the Irisbox one-stop-shop.

In Belgium, the eID card includes the same information as conventional identification cards, but it also serves as a travel document. Utilizing a card with two certificates, one for authentication and another for creating digital signatures is analogous to using a smart card (both of which are included). The Belgian eID system does this by providing an electronic means of identity, the ability to submit official documents, and other associated services. Belgian residents' eID cards and the microchip

holding it both have a national registration number. The certificate has the eID card's unique identification number.

Citizens and companies may access securely to a variety of platforms and websites by using CSAM-provided Digital Keys. The CSAM-supplied digital keys are safe for use as login credentials for government websites. Along with these services, CSAM is responsible for the following: While FAS is in charge of management access, BTB is in charge of the conditions that users put on other organizations in order for other entities to act on their behalf.

4.4. National Portal [NPR]

The Federal website was launched in November 2002 with the main purpose to serve as an e-government portal, providing access to a broad variety of federal government services for government workers, people, and businesses. In early 2021, a new version of the site was released after a review of the whole system. The objective was to assist individuals and businesses in communicating and engaging with authorities and agencies at all levels of government. The information is presented in four languages and is organized around the most significant life events. A redesigned user-friendly interface coupled with a robust search engine allows users to conduct searches both on and outside the site. A significant portion of the new portal is dedicated to enabling users to access all of the internet's public services directly from the site. (eServices). Users may further refine their search by selecting a subject, a target audience, and/or the level of government involved. Due to the fact that many of these eServices must be secured, authentication is needed. The Federal Government's Department of Information and Communication Technology (DICT) was in charge of project management (Fedict). Additionally, the content was created in collaboration with other federal government departments by the Chancellery of the Prime Minister's external communication service.

4.5. Government CIO [GCIO]

Belgium does not have a formal legislation or mandate prescribing the CIO role. CIONET was discovered in Belgium by the Waseda Institute of Digital Government Ranking, which ranked it first in 2009. It is a network of chief information officers, chief technology officers, and chief information officers with European operations.

As an exclusive interest organization for Belgian companies, the CIO Forum is wholly relevant to their community. To offer an open and trustworthy environment for IT professionals to network, a forum for IT executives was established inside the Belgian IT community.

www.belgium.be is a central tool that individuals may use in the areas of family life, justice, mobility, health, the environment, housing, employment, taxes, education, and economy.

4.6. E-Government Promotion [EPRO]

Wallonia's administrative contract for public services is structured and managed globally. This is the first time in the area's history that a detailed master plan has been developed. To obtain the best possible results, a multi-channel approach is coupled with a worldwide user satisfaction strategy. This collection of government initiatives, which includes digitizing environmental and pollution licensing services, digitizing tax services, managing local officers' mandate declarations online, developing

environmental data reference databases, and developing geospatial information, is all part of the new digital government strategy.

4.7. E-Participation [EPAR]

Currently, Belgium's legislation does not contain any provisions for e-participation. While it is often recommended for young people to get involved in society and public policy via technological engagement, there are exceptions. Municipalities engaged in extensive public outreach in 2017.

The necessary tools and equipment for Bataljong are mentioned on the website's Bataljong page. The second type of business applications comprises those that may be used for a variety of reasons, such as online interaction, as well as others. They are not specifically designed to spur action in e-focus areas.

Cultuurconnect, Mediawijs, and Linc have collaborated to offer the Inspiration Package: E-participation and active citizenship during Digital Week 2017. E-participation has more information. Even while the site is not specifically targeted towards young people, age-specific information is given, as is a plethora of tools to assist young people in getting started in the online marketplace. E-participation was formerly available in Flanders but is no longer available.

4.8. Open Government Data [OGD]

The Belgian government effort, dubbed the "new open data policy," was launched in July 2015 by Deputy Prime Minister and Minister of the Digital Agenda and Telecommunications, Alexander De Croo. The strategy's overarching objective was to guarantee that all government data was set to default settings, with the exception of any information that presented a security or privacy risk to the public.

4.9. Cyber Security [CYB]

The EU Directive 2016/1148 has been repealed under federal law as a consequence of the new federal legislation that took effect on April 7, 2019. A paradigm for developing general-purpose information systems in the public interest (National Institute of Standards and Technology Directive.) It implements best practices and evaluates its methods in order to assist public and private sector organizations in enhancing their current cyber security processes. Compliance with ISO/IEC 27001 is required of service providers in order to prevent incidents and mitigate their impact. They include, legally, the designation of a contact person to give information and act as a liaison with appropriate authorities.

4.10. The use of Emerging ICT [EMG]

The G-Cloud platform was developed via cooperation between federal government agencies, social security administrations, and the health care sector. The Cloud Governance Board is responsible for ensuring that the project stays on track and providing appropriate recommendations. The concept of a shared community cloud that includes data from both the federal and state governments is now accessible to the public. G-Cloud provides four different services, each with a particular emphasis, all of which are accessible. The products must evolve to suit the institutions' evolving requirements. All of these services have a key feature: they are associated with an Infrastructure as a Service (IaaS),

Platform as a Service (PAAS), or Software as a Service (SaaS) offering (SAAS). While the G-Cloud idea incorporates complementary government initiatives in conventional information and communications technology, it also incorporates complementary government activities in unconventional information and communications technology. The webpage will be regularly updated when new services become available.

DG Digital Transformation is in charge of implementing the eGovernment plan, which comprises components of shared infrastructure (e.g. federal portal Belgium.be, FedMAN network, Universal Messaging Engine middleware). Any public sector entity undertaking an ICT initiative may seek assistance from the Directorate-General for Digital Transformation (DG Digit).

In Belgium, the Court of Audit is a court of second instance. The federal government, regions, towns, and provinces are all subject to external inspection under this financial accounting system (but not on municipalities). Thus, it is possible to conduct assessments of information and communication technology (ICT) and eGovernment initiatives.

Brazil

1. General Information

Area: 8,515,767 km²

Population: 214,280,309

Government Type: Federal Presidential Constitutional Republic

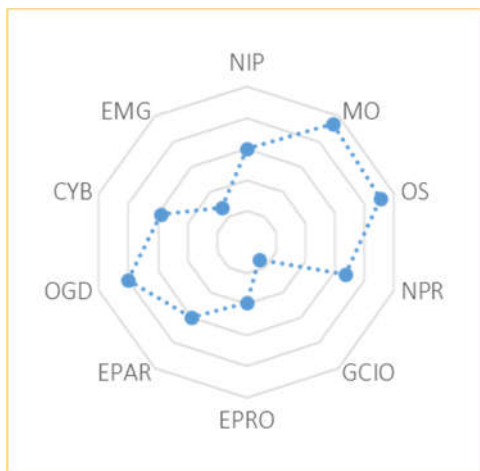
GDP: \$ 7,010

Internet Users: 73.91

Wired (Fixed Broadband Users): 17.10

Wireless Broadband Users: 89.73

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Brazil is presently in the same position as other nations across the world when it comes to technology. In metropolitan settings, digital technology is everywhere. With 58.9361 points, Brazil was rated 58th in the Waseda International digital government rankings 2021. Brazilian policymakers have been creative and collaborative in their attempts to support digitalization in both business and society. In 1995, Brazil was the first country to develop and deploy digital networking as part of a coordinated effort. The Internet Steering Committee was formed in 1995 to define strategic guidelines for the usage and growth of Brazil's Internet, including processes for domain name registration, protocol allocation, and top-level domain management.

In the previous decade, the Brazilian economy, like that of many other rising economies had very rapid ICT development. Annual growth rates for the Brazilian ICT industry ranged from 12 to 13% between 2008 and 2012 and were only marginally lower in 2009 than in prior years. As demonstrated in Figure 1.7, the proportion of Brazilians who use the internet has steadily increased from 34% of the population in 2000 to over 60% in 2016. Internet use in Latin America and the Caribbean continues to outperform that of the rest of the OECD.

By monitoring communications, addressing citizens' problems, and overcoming language obstacles, governments were able to react to COVID-19 requests more swiftly because of the deployment of AI-powered virtual assistants, chatbots, and "virtual physicians." The AlloCovid service in France used artificial intelligence to link patients with coronavirus symptoms to trained health care specialists. While in Brazil, artificial intelligence-enabled robots were used to aid in the tracking of connections.

3.2. New Trends

The COVID-19 crisis compelled Brazilian corporations to alter their development strategy in favor of one focused on long-term viability and cost containment. In the future, it will be critical to have automation, resilience, and virtual collaboration. Digital business solutions and services are a must for most companies looking to embrace new technologies and working techniques. Many Brazilian companies were reluctant to implement digital supply chain transformation until the pandemic threatened them. After a quick shift to increasing e-commerce, Brazilian firms were obliged to seek digital transformation assistance in customer experience, product lifecycle, and supply chains.

Brazilian citizens reacted by increasing their marketing and introducing new service offerings more often. To cope with the issue, service providers have been pushed to speed up the implementation of DevOps and other agile development approaches. Despite this, the country is still developing its blockchain, a potentially helpful digital business tool. Brazil's largest digitization project was the integration of the banking system to give financial assistance to people. It just took a few weeks for millions of people to be added to the database. E-commerce initiatives were ramped up while brick and mortar companies were put on hold in the aftermath of the economic crisis.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Brazil was rated 46th in the Waseda rankings in terms of network infrastructure preparedness, with an overall score of 6.025. As of January 2021, there were 160 million internet users in Brazil, an increase of 6.4 percent from the same month last year. At the time, Brazil had a 75 percent Internet penetration rate. The number of people using social media grew by 10 million in January 2021, increasing to 150 million people. However, in the first quarter of 2021, mobile connection penetration fell by 1.3 percent. 96.3 percent of Uruguay's population were connected to a mobile phone, with 105.4 million active connections.

In the country's digitalization route, Brazil made significant progress in the following ways:

- BTG Pactual purchased 58 percent of Oi's fiber subsidiary Infraco for \$2.3 billion;
- The regulator permits authorized MVNOs to enter into access agreements with several MNOs and prepares for a multi-spectrum 5G auction;
- Algar Telecom purchased Vogel Telecom and gained 3,400 corporate customers;
- Nextel Brazil rebranded as Claro-nxt; the regulator extended the concessions of operators;
- The regulator extended the concessions of operators.
- 5G services are being offered on a limited basis by operators in Brazil and Argentina.

4.2. Management Optimization [MO]

Management Optimization was placed 43rd in the Waseda rankings in 2021. Data is becoming more difficult for the government to use effectively and coherently across all levels of government as the country's digital transformation continues. Digital technologies are rapidly being used to improve internal efficiency and agility in the Brazilian public sector. The government's ability to engage with the public has been enhanced through the use of digital services. Brazilian officials can anticipate and accelerate digital transformation thanks to these public initiatives.

To promote a critical and systemic mindset in the face of complex institutional and technological possibilities, the Brazilian public administration must be leveraged, and capacity-building mechanisms must be implemented throughout the public sector as a whole. The Brazilian government invited the OECD to assess its policies and programs to strengthen digital governance.

4.3. Online Service [OS]

Almost half of all online purchases in Brazil are made using cards, which has been the case for some time. Consumer credit is prevalent in the Brazil, where there are 1.06 credit cards per inhabitant. Credit card companies in Brazil will be more inclined to lend money if Brazilian consumers and the economy are more confident. As a result, financial institutions may offer their customers a greater variety of goods.

However, there are several other payment methods in Brazil, and digital wallets, in particular, are gaining in popularity. This strategy accounts for more than two-thirds of all e-commerce transactions. In Brazil, the usage of digital wallets is more widespread than in any other Latin American nation. In 2021, most online payments were probably using digital wallets instead of credit or debit cards.

4.4. National Portal [NPR]

The portal gov.br is a federal government endeavor to improve public access to the Public Administration. " User needs and interests are taken into consideration while designing and developing new features for the Portal. The Portal has a unique organizational structure when compared to other government sites. The Portal's most important feature is the service it provides to its users.

4.5. Government CIO [GCIO]

No one in the Brazilian government has the position of Government Chief Information Officer (GCIO). To some extent, these functions are carried out by the CIO's Brazilian counterpart: the Ministry of Planning, Budget, and Management.

4.6. E-Government Promotion [EPRO]

The Brazilian government sees a return on digital literacy efforts and incentives for population Internet use as more Brazilians utilize digital services. For six years, from 2010 to 2015, the number of Brazilians accessing government services through the internet quadrupled, reaching 24% in 2015.

The Brazilian government is implementing several digital initiatives to improve public service delivery. Just a few of the recent digital identity initiatives that have been completed in Brazil include driver's licenses, voter identification cards, worker identification cards, and electronic versions of the National ID Card and Registry. Government digital service delivery has also been substantially enhanced after developing a services portal that aggregates information from most federal departments in Brazil.

Brazilians' expectations and the technologies they utilized to connect with them seem to have resulted in highly excellent outcomes. As a result of legislation and regulations, the government has laid the groundwork for individuals to engage with the public sector and the digital economy. People, businesses, and governments all have a role in creating an interconnected and cohesive digital environment.

The Brazilian government is transforming the public sector digitally. New digital technologies are being used to reimagine services and streamline company procedures to meet the demands of digital economies and societies. The government seeks to ensure that it implements the plan uniformly to minimize infrastructure and data redundancy during the transformation process by avoiding silo-based activities and agency thinking. Alternatively, a citizen-driven policy viewpoint should be included in the model to incorporate the whole ecosystem of services.

4.7. E-Participation [EPAR]

The Government Secretariat, which also comprises the republic's president, has the institutional ability to carry out public engagement in federal decisions. Individuals and the government must communicate directly for "social engagement" to be defined as a broad term. Because of this, the federal government created Participa + Brasil, a website meant to promote and enhance civic involvement and raise the degree of openness in government decision-making processes. Participa+Brazil is a digital platform that provides modules for the distribution of surveys and research and the promotion of best practices to support and verify the process of social participation.

4.8. Open Government Data [OGD]

The Open Government Data program provides government data in reusable forms to stimulate the creation of a wide variety of collaboratively produced apps to foster increased openness and public engagement in politics. Open Data, which was developed in 2009, now allows English-speaking citizens worldwide to request government information. Because of this, citizens will be able to participate in government and socially monitor policies.

Citizens in Brazil may now follow the consequences of government acts thanks to the release of reports and balance sheets online by several public administration institutions. Because open government data on public policy is supplied in a simple and accessible standardized form, anybody may update it using any software tool. All stakeholders must have access to transparent and accessible information from the public sector. Governments' ability to achieve policy objectives can be seen from various perspectives by integrating open data sources.

4.9. Cyber Security [CYB]

Cybercrime is a primary concern in Brazil. As preparations for the 2016 Olympic Games in Rio de Janeiro ramped up, the Brazilian government stepped up its cybersecurity measures. An ever-increasing number of individuals use the internet, which raises cyber dangers. For the government to spend more on cybersecurity, several cybersecurity talks were held in Brazil in 2017. Volunteer programmers may now utilize their abilities to create visually attractive representations of legislative data via the "HackerLab" project.

4.10. The use of Emerging ICT [EMG]

In Brazil, Congress has passed legislation outlining the rules and regulations governing the country's use of AI. In the Senate, the issue will now be debated. Commercial and public sector organizations must follow the plan's standards while building artificial intelligence (AI) technologies. Platforms that employ supervised, unsupervised, or reinforcement learning are known as machine learning systems.

The Brazilian government has developed an IoT, robotics, and 5G technology research center. Ministry of Science, Technology, and Innovation (MCTI) said the center is the first government research organization to employ the quintuple innovation helix framework, which describes the linkages between academic institutions, business, government, and the public sector in a knowledge-based economy.

Located in Sorocaba, 103 miles from So Paulo, the facility is expected to produce new jobs and skilled workers in the area of so-called "4.0 technologies" and their use in a range of businesses and product manufacturing. Operating the facility will be directed by the national plans for the Internet of Things and digital transformation, which will be managed in partnership with the municipal authority of Sorocaba. According to the Waseda rankings regarding Emerging ICT, Brazil stood at the 40th position with 2.750 points.

Brunei

1. General Information

Area: 5,765 km²

Population: 442,339

Government Type: Unitary Islamic Absolute Monarchy

GDP: \$33,100

Internet Users: 95.00

Wired (Fixed Broadband Users): 16.25

Wireless Broadband Users: 120.19

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

The e-Government National Center, a government institution, is officially in charge of Brunei's digital government (EGNC). EGNC, among other things, offers a broad variety of services to both government institutions and government employees. Government organizations may use the One Government Network and One Government Cloud to reduce their capital expenditure on information and communications technology infrastructure. To enable government employees to benefit from online collaboration, the EGNC provides ONEPASS, a secure Digital Identity.

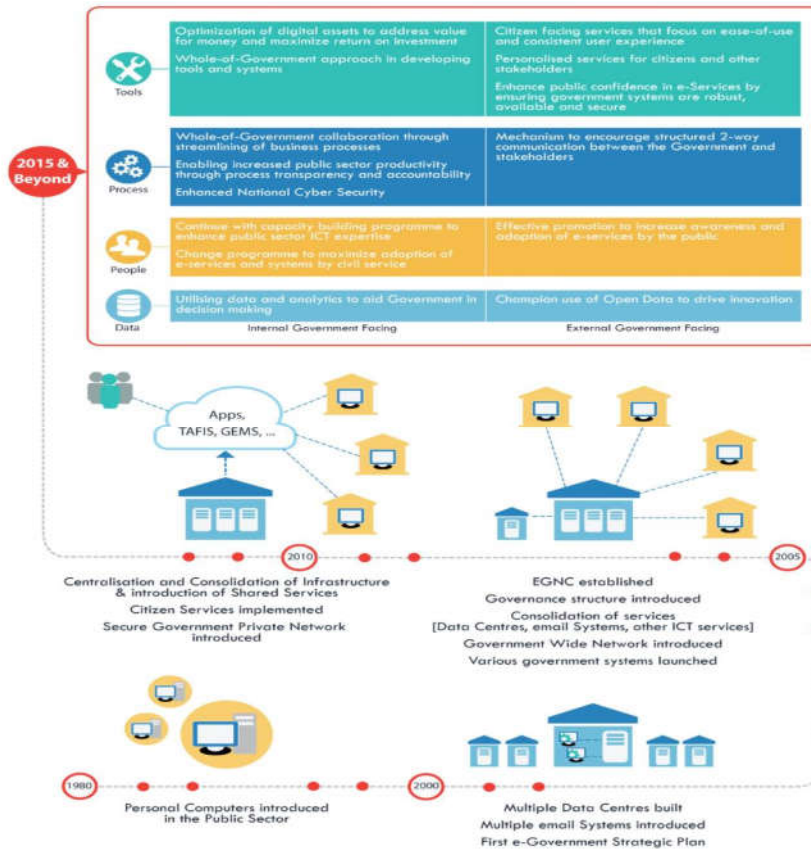
The Chief Information Officer (CIO) of the government is widely regarded as a critical component in e-Government's development.

The Brunei government established the e-Government Leadership Forum (EGLF) to strengthen the country's leadership in the area of e-government development. The event is presided over by a Deputy

Minister in the Prime Minister's Office, demonstrating the government's strong commitment to e-Government development. This is the highest level of power in terms of approving and monitoring the growth of e-government. All Chief Information Officers (CIOs) in government organizations are invited to attend. The Prime Minister's Office's Co-Deputy Chairman has been appointed Chief Information Officer for the whole eGovernment system (Government CIO).

3.2. New Trends

The graph below illustrates what Brunei intends to do prior to 2035 to accomplish the government's digitalization missions.



The government strives to adapt to six core values in order to accomplish those missions.



Service Innovation & Security

Brunei's government recognizes the need for new and innovative ways to provide convenient and reliable services to residents and businesses in an era of competitiveness and dynamic economic growth. Continuing with the strategic plan 2009-2014, security will always be a top priority. The government recognizes the critical nature of network infrastructure and the environment over time. Appropriate measures will be taken to avoid risks and reintroduce opportunities associated with cyber-incidents.

Capability & Mind-set

Everyone understands how critical it is for the successful implementation of high-tech and digitalization to consider the perspectives of others. It is necessary to cultivate a forward-thinking mindset and collaborative culture. This helps to develop new governance systems and government authorities.

Enterprise Information Management

Information is critical in propelling a country forward. The government prioritizes data growth by restructuring and building the information asset that supports government administration.

Optimization, Collaboration & Integration

Numerous technological advancements have been made to aid the country's economic development. The government leverages digitalization to maximize efficiency, minimize risk, and maximize profit. In an era of competition and challenges, it is critical for the entire country to unite and work cooperatively to resolve all existing issues. To live up to that expectation, the government will require close collaboration and integration across all sectors and stakeholders.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Brunei has a score of 7.042 for Network Infrastructure Preparedness, according to publicly accessible data and research, placing it at the top of the Asian countries in terms of network infrastructure preparedness. By January 2021, the overall number of internet users had increased by 1% to 417.5

thousand. At the start of 2021, the Internet penetration rate remained stable at 95%. As a result of this, there was also a significant shift in the number of people who used social media. At the time, 435 thousand people were expected to be utilizing social media, which equated to 99 percent of the total population. According to the data, the number of mobile connections in Brunei was equivalent to 129.3 percent of the country's total population at the time.

The government has invested large resources in constructing a national telecom infrastructure via the Kacific-1 satellite, anticipating the deployment of 5G in the public sector, and establishing Number Portability services, among other projects.

4.2. Management Optimization [MO]



Brunei's six core programs were identified to achieve Digital Government Strategy 2015-2020.

Brunei has made significant investments in digitalization to remove barriers to public service delivery, resulting in more convenient, agreeable, and successful interactions between the government and stakeholders. When it came to delivering desired results, the administration kept its promises to its constituents. The collection of government revenue is managed electronically, with "Key Services" accessible at any time and from any location. Additionally, the government established the ID system to facilitate the access of individuals and businesses to government services. Additionally, this internationally recognized identification would enable the government to gain a manageable view of citizens and businesses, allowing it to more effectively forecast their needs and requirements.

The National Cyber Security Framework was developed to address cyber-risks and to build a robust and trusted digital platform capable of fully exploiting the potential of the digital space. The platform and methods for two-way communication between the government and its stakeholders were developed with the objective of improving government services, assisting in the formulation of new initiatives, and also addressing public concerns.

To ensure the Government's efficiency, digital assets have been effectively exploited and managed to accomplish their stated objectives. The government established policies, procedures, and capabilities for coordinating and managing data generation, storage, use, and processing. The amount of data generated is growing at an exponential rate. The government may gain a better understanding of the

state of our business operations and the effectiveness of the decisions and actions we take by improving data and information lifecycle management.

4.3. Online Service [OS]

IT Central Procurement obtains the government's participation in the consumption and leasing of assets. Enterprise software agreements are used to reduce the time required to procure IT equipment and related services from an average of six months to just thirty days. The Government entered into a Microsoft Enterprise Agreement with Microsoft for the purpose of procuring licenses and associated services.

The E-Government National Centre (EGNC) provides the National Authentication Module, which enables government agencies to leverage a centralized authentication capability for public access to their respective e-services. As a result, the government established avenues for e-Darussalam to gain access to management and public service. This module is available to government agencies and government-connected businesses.

4.4. National Portal [NPR]

Residents, stakeholders, businesses, and tourists in Brunei Darussalam have access to the national portal (www.gov.bn) as the most convenient way to access online public services. The portal acquires the government's centralized data and establishes a single method of authentication. All participants have unlimited access to the portal at any time, which has a significant impact on increasing the efficiency of government public services and reducing the risk of information and procedure duplication.

4.5. Government CIO [GCIO]

To empower leaders in the area of e-government development, the Brunei government created the e-Government Leadership Forum (EGLF). At the Prime Minister's Office, the forum is chaired by the Deputy Minister. The event is open to all Chief Information Officers (CIOs) in government organizations. The Co-Deputy Chairman of the Prime Minister's Office has been appointed Chief Information Officer for the whole e-Government system (Government CIO).

The GCIOs convene quarterly to share their experiences with the e-Government Program/Projects. The EGLF will debate the conference's findings. The Permanent Secretary presided over the CIO Dialog Meeting on a regular basis.

4.6. E-Government Promotion [EPRO]

Brunei's E-Government Promotion is ranked relatively high (6,774) among Asian regions, indicating that substantial progress has been made toward advancing Digital Services. The government views public services as the primary means of delivering and promoting projected profits. E-Government Promotion aided in the establishment of a convenient, transparent, and beneficial link between the government and its constituents. All participants in the program have access to core services at any

time and from any location. Additionally, digitalization enables the government to easily manage and monitor revenue and outcomes. The country aspires to an audacious goal of increasing living standards, international-ranking infrastructure, and significant development, productivity, and investment through the Wawasan 2035.

The E-Government National Center's (EGNC) Government Intranet service is available to all public sectors. These services aided agencies and stakeholders in reducing costs and increasing productivity and effectiveness when developing their IT inputs while also reducing capital expenditures and registration procedures.

4.7. E-Participation [EPAR]

The Government acquires the One Government Network (OGN) as dedicated and highly-guaranteed network infrastructure for connecting all participants to e-public services and the Internet via the national gateway. The network reintroduces a collaborative environment in which all participants cooperate and benefit from shared interests. It is managed and monitored to ensure current communication and tools that assist authorities by efficiently sharing their workload. The standards for facilities and inputs are established to ensure that the government receives efficient and effective information communication and technology resources.

The Business Partner Link (BPL) was used to connect Government Link Company (GLC) and One Government Network (OGN) in order to facilitate integration with government agencies and authorities. Additionally, the National Education Network provided a stable and consistent connection to all ICT education systems. All government agencies, schools, and Government Link Companies are welcome to join this network (GLCs).

4.8. Open Government Data [OGD]

By supplying accurate data, the National Centralized Database (NCD) laid the groundwork for e-government projects. Among other things, it offers information about software licensing, backup services, and disaster recovery services. NCD is deemed required and useful due to its capacity to reduce expenses through resource pooling, cut maintenance costs, and provide centralized database of knowledge. Additionally, it simplifies data sharing and integration by utilizing a Single Database Platform. All government departments and agencies are able to use this database system.

The National Information Hub (NIH) makes use of the capabilities of the National Centralized Database (NCD) system to store personal information like addresses, identification cards, and names. This tool assists in the reduction of data duplication and any human-caused inaccuracies.

4.9. Cyber Security [CYB]

Brunei's key objective for attaining outcomes by 2035 is to build cyber security, which involves establishing and implementing a framework for identifying cyber-risks, as well as providing a digital platform to promote the usage of digital space. To boost the country's security output and achieve the Wawasan 2035 Desired Outcome of maintaining sovereignty and stability, all sectors have taken an

integrated approach to national cybersecurity. One of the goals of Wawasan 2035 is the transformation into one of the world's safest countries.

The use of Emerging ICT [EMG]

Brunei ranks thirty-second (2.500) in the world on the EMG indicator, out of sixty-four countries. The indicator remains elevated even when compared to other countries in the Asia-Pacific region. Brunei is well-known as a country that is riding the wave of digital technology, is continually confronted with a variety of difficulties, and is at the forefront of regional rising trends.

Brunei has seen significant development in data-driven technologies such as database networks, artificial intelligence (AI), 5G, cybersecurity, and the Internet of Things (IoT), and they are also a top priority for the government, which has established a plan for the country's digital and sustainable governance. As stated by the Minister of Transport and Information Communications on World Telecommunication and Information Society Day (WTISD) 2021, cybersecurity has evolved in lockstep with the advancement of digital transformation, emerging as one of the most critical strategic enablers on the path toward digital transformation.

Canada

1. General Information

Area: 9,984,670 km²

Population: 38,133,703

Government Type: Federal Parliamentary Constitutional Monarchy

GDP: \$49,220

Internet User: 96.50

Wired (Fixed Broadband User): 41.80

Wireless Broadband User: 84.14

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

The past few years have seen great progress in meeting Canada's transformation and development requirements. To better serve Canadians, the Canadian government has invested heavily in digital technology. Almost all measures are in the top 10, showing strong digital progress. The country has set a vision: emerging technologies help governments better serve Canadians. The state has always emphasized people's needs. Current Canadian digital government is attempting to be open, collaborative, and accessible, which adapts government services to citizens' needs and shares open government practices and solutions.

To guarantee the success of digital government, Canada adopted the Government of Canada Digital Standards. Moreover, by creating Canada's first public sector Digital Academy, they are preparing their employees to provide the digital government services Canadians expect. The government is even

developing an overarching digital strategy to help all departments and agencies improve their digital offerings to Canadians.

The Canadian Digital Service (CDS) was formed in 2017 to help the federal government provide simple digital services. Since then, CDS has been busy. One of the most important has been the creation of a digital citizenship test. By providing new Canadians with a more adaptive and consumer-friendly system, the government helped them achieve full citizenship and maximize their chances of success. It also relieves employees' administrative burden.

3.2. New Trends

On the following pathway to succeed in digitalization, Canada aims to stick along the four strategies in the next three years until 2024.

a. Modernize legacy IT systems

Providing the programs and services that Canadians rely on everyday needs reliable information technology and accurate data. Canadian institutions need modern IT infrastructure and systems to provide excellent digital offerings. Despite progress toward application reduction, GC departments and agencies still maintain over 7,000 business applications (down from 8,900 in 2018), some of which are critical to service delivery. The health of GC applications varies, as does the infrastructure. The public's faith may be eroded by a single system failure.

b. Improve services

People and businesses want easier online access to GC services. Long service center waiting lists, phone hold periods, and confusing websites diminish Canadians' trust in their government both at home and abroad. Duplication of effort across departments leads to inconsistency, inefficiency, and reliance on the most expensive routes. The public expects government services to be as reliable and easy to use as private sector ones. They also expect the government to protect their privacy.

c. Implement enterprise

Certain departments continue to work in silos, causing duplication of effort and costly failures. It is becoming more difficult for departments to cooperate and produce cross-government goods, which may result in a poor user experience. The need for smart, secure, and reliable data is growing. To meet these demands, the GC needs a workforce with digital skills and technology, as well as visionary leaders and governance structures.

A more digital government will mean breaking down silos and addressing information management, data stewardship, and IT operations, tools, and assets. Collaboration may speed up developments and discoveries. The authorities will continue to improve enterprise governance and incorporate it into government operations to ensure that decisions are based on evidence and address both organizational and functional issues.

d. Transform the institution

Antiquated approaches, complex processes, and governance structures inhibit departments' ability to serve the public and the GC's ability to adapt quickly. As a result, performance and security concerns

have increased. To stay responsive, resilient, and most importantly, relevant in a continuously changing environment, digital government compels the Canadian Government to upgrade and adapt their operations.

The country's digital capabilities are important to providing all services and implementing all policies. But it's not only about technology; it's about people, procedures, and culture. Transformative leaders must be able to adapt and collaborate to change public service culture and practices. This includes ineffective governance structures and procurement techniques, as well as a lack of digital skills.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Canada ranks on the top list of 64 countries in terms of Network Infrastructure Preparedness, with a score of 7.415. By January 2021, the overall number of internet users had increased by 0.9 percent year over year to 35.63 million. At the start of 2021, the proportion of the population with access to the Internet remained stable at 94 percent. According to estimates made at the time, 32.20 million people use social media, accounting for 84.9 percent of the total population. According to statistics, mobile connections accounted for 98 percent of the country's total population at the time.

4.2. Management Optimization [MO]

The Canadian government has invested significantly in the creation of a comprehensive digital policy framework from 2018. Everything that is altered in information management (IM) and information technology (IT) policies is coordinated with Treasury Board policies on public services, assisting the country's transition to a digital government. The promoting user-centered design initiative was launched to recognize the administrative constraints that users face, as well as to assist and motivate government agencies in their efforts to incorporate user research principles and activities into the design and creation of services and administrative procedures, among other things.

The Access to Information and Privacy Online Request Services website was created to help individuals quickly get the information they need. Additionally, the site enables electronic payment and transfer of money to and from government agencies, thus reducing administrative burden, improving service quality, and accelerating efforts to automate information access procedures by the end of this year.

TBS and related departments performed a horizontal evaluation of information sharing and user privacy in the two years before and including 2021 in order to identify issues and provide suggestions and corrections. The research laid the groundwork for a range of future policy changes.

4.3. Online Service [OS]

Canada's government launched "My Service Canada Account" to allow all residents to update all of their personal information, including information about passports, personal access codes, the status of immigration and/or citizenship application(s), wage earner protection program, pension plan, employment insurance, and long-term care. Furthermore, a broad range of apps, accounts, and various

services that are accessible for online transactions have been made publicly available. All of these public services are reasonably beneficial in terms of reducing administrative load, which is particularly important during a pandemic.

4.4. National Portal [NPR]

The Canadian national portal is placed in the top five of the 64-country list, showing a significant rise in the number of channels being created to support digital progress. The development and maintenance of a data inventory is the primary focus of work when identifying sources of data appropriate for distribution. The establishment of Open.Canada.ca as the national gateway for the collection of citizen data has proved very helpful for the government in organizing and using data received from a number of sources. Another consideration for the data inventory is the problem of privacy. The departments responsible for data inventory and information protection are responsible for identifying and protecting datasets that include information that should not be made public.

4.5. Government CIO [GCIO]

The indicator for the Chief Information Officer of the Canadian Government is 8.182, which places it seventh on the list. The pandemic has resulted in significant changes to global internet services and the trend toward remote employment. The Covid Alert app was developed by the government to help citizens in obtaining information and compiling the most accurate counts of covid occurrences, which resulted in timely actions being implemented. Shared Services Canada collaborated with authorities to ensure the continued secure and on-time delivery of critical frontline services.

Canada is among the countries with a successful anti-covid track record. However, the economic recovery process needed much more time and effort than ever before, and the search for digital governance was stronger than ever. Canada desired a more transparent, flexible, and collaborative government that prioritized digitization and user-centered services. As a result, the government's technology management and adjustment procedures must be updated to ensure that all administrative operations are adaptive, responsive, and reliable, and that they meet the needs and expectations of the nation's residents and businesses. Between 2018 and 2022, Canada has been working to improve the country's digital governance and processes in order to provide a solid basis for the digitization process across all ministries. The OneGC platform was designed to enable individuals and companies to access public services through the gateway Canada.ca by using their identification and password. In addition to the many lessons and experiences acquired from the CoVID-19 pandemic, the Canadian government has been working diligently to remove time-consuming barriers to digital integration and technological innovation in line with the Government Digital Standard.

4.6. E-Government Promotion [EPRO]

The EPRO indicator decreased significantly, falling to 8.387 and ranking twentieth out of sixty-four nations examined. Canada was formerly renowned for having one of the most remarkable electronic government systems in the world. Even though Canada is no longer at the top of the list of countries with successful digitalization, the country continues to prioritize technology and e-governance, for

example, by accelerating their adoption, fostering innovation, and laying out a vision for the future in which every resident of Canada is digitally connected and distance is no longer a barrier to access to public services, opportunities, and other programs.

The country has benefitted from digitization in sectors like research and health data management, as well as in establishing jurisdictional autonomy and varying the degree of cooperation with other levels of government. When it comes to collecting and distributing vaccines in an equal way to all people, the network assists the government. The government was able to manage lockdowns and internal barriers, which aided in keeping the country secure from a number of other vulnerable nations in the immediate vicinity.

4.7. E-Participation [EPAR]

A score of 9.000 placed the Canadian E-Participation indicator in the top 20 of all countries evaluated. Canadian e-services, online information, and online citizen involvement are organized by category rather than by department, making them more user-friendly and responsive to the demands of the general public. In order to measure the success of its services, the government applies a unique Canadian outcomes analysis approach known as 'Citizens First' in the case of individuals and families and 'Taking Care of Business' in the case of enterprises, both of which are developed in Canada. Everyone will be able to access electronic services in record time as a result. The Government of Canada offers a variety of programs, accounts, tools, and services to help Canadians in performing work online.

4.8. Open Government Data [OGD]

To live up to the expectations of the general public for transparency, reliability, and involvement with public services, the Canadian government's open government projects and initiatives must place a premium on individuals. The more people who understand and engage in their government's duties, the more lasting and stable open government's social and economic potential will be over time.

The Government of Canada has taken efforts to promote the openness of federal government data by updating the open.canada.ca site and assisting individuals in learning more about how open government work is being done in local areas. Additionally, they expended much effort to expand the Open by Default pilot project and to provide opportunities for cooperation between the government and citizens. All of these activities are overseen and controlled by Employment and Social Development Canada (ESDC), the Canada School of Public Service (CSPS), and a variety of other government departments and agencies.

4.9. Cyber Security [CYB]

As the nerve center of Canada's cyber operation, the Communication Security Establishment (CSE) safeguards the federal government's most sensitive information and data while also offering permitted operations and technological capabilities to assist federal law enforcement and security agencies.

The Canadian Centre for Cyber Security (Cyber Centre) at CSE includes trusted cyber security specialists who engage with government, industry, and academia to make Canada a safer place to

conduct business online. The Cyber Centre is a division of CSE with a basic, focused mandate: to partner with government, industry, and academia to make Canada a safer environment to conduct business online. Canada's security, stability, and prosperity are enhanced as a result of the work of CSE and its Cyber Centre, which plays a critical role in protecting Canada and Canadians from foreign-based terrorism, foreign espionage, cyber threat activity, kidnapping of Canadians abroad, and attacks on Canadian embassies.

4.10. The use of Emerging ICT [EMG]

Artificial intelligence (AI) technologies have the potential to drastically alter the way the Canadian government interacts with its constituents and provides services. The government as well as Canadian citizens are dedicated to ensuring that the use of artificial intelligence in government programs and services is governed by clearly defined principles, ethics, and standards as research progresses.

A public cloud is a commercially available service that has been bought and security vetted for use by a single government agency before being made available to the public. Under the terms of this deployment paradigm, a single organization will share tenancy with commercial corporations, non-profit organizations, and individual users. Meanwhile, a private cloud is a non-commercial cloud service that is specifically built for the government. Under this deployment architecture, the General Contractor (GC) will be the sole tenant in the cloud. In certain cases, the cloud may be produced and managed fully by GC resources, while in others it may be created and administered with aid from the private sector.

Non-Cloud Computing Environment is known as a computing environment that is used to host applications that cannot be deployed in a cloud computing environment. It is in this area that the great majority of the present GC application portfolio can be found.

For many years, the Government of Canada has included Open Source Software into its information technology ecosystem and has grown to rely on it for the efficient delivery of services. Part of its objective of becoming a digital government is to contribute to other projects and make its own source code accessible under Open Source Licenses, which it must do in order to achieve this goal. The government is committed to doing so in a manner that is compatible with core administrative law principles such as accountability, transparency, legality, and procedural fairness, among others.

Chile

1. General Information

Area: 756,102 km²

Population: 19,233,859

Government Type: Unitary Presidential Constitutional Republic

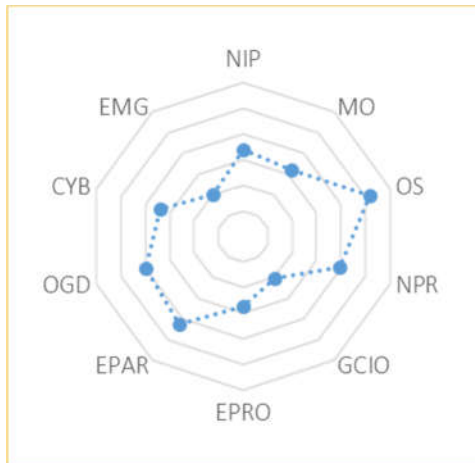
GDP: \$ 15,620

Internet Users: 82.33

Wired (Fixed Broadband Users): 19.62

Wireless Broadband Users: 101.15

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

In the Waseda International digital government rankings 2021, Chile ranked 46th with 68.2531 points in total. In the wake of the COVID-19 outbreak, Chile has experienced an increase in e-learning, streaming, online shopping, and marketing, as well as teleworking. With adoption obstacles and transition costs, the digital revolution has the potential to improve productivity and inclusivity. With increasing connectivity, the nation is now ahead of the rest of the continent.

Communications infrastructure development would speed up if entry obstacles and regulations in the industry were reduced. SME-targeted policies, such as the introduction of sources of finance or particular programs for adopting digital tools, would assist SMEs in getting access to and utilizing

digital technologies, resulting in increased productivity. The innovation environment, competitiveness, and regulatory framework must also be improved. Quality foundational skills, adult and lifetime learning, and highly-skilled ICT professionals must continue to be invested in to enjoy the advantages of digitalization for everybody.

Chile is one of few countries involved in the development of an effective coronavirus vaccine. In addition, an ozone generator prototype developed by electrical engineering students at the Universidad Católica is quick and effective in sanitizing facilities like ambulances, operating theaters, and medical and dental treatment rooms. It is possible to disinfect an area with ozone, removing any remaining coronavirus. While Monarch is recognized for its socks and underwear, the Chilean textile firm paused production in early March to focus on developing reusable face masks and helping those affected by the current health crisis. Additionally, this effort was designed to keep Monarch's copper-colored apparel style alive. When these copper fiber masks are exposed to heat and humidity, the copper ions they produce destroy 99.9% of bacteria and mold.

3.2. New Trends

Digital Transformation Strategy public consultation is part of Sebastian Piera's new government (2018-2022), taking significant steps toward digital-first public administration. The strategy was set under the current circumstance of the nation's economy and the worldwide pandemic. It also includes a proposal for a Digital Transformation Law², the recent approval of a Presidential Instructive on the Administration's Digital Transformation, and a new State-wide Digital Transformation Strategy. As part of this program, 80% of government services will be available online by the end of 2021 and 100% by 2023.

Another law on State Digital Transformation stipulates that government services would default to digital, with paper-based transactions only viable in extreme cases owing to a lack of digital access and experience. For the sake of improving the government's digital integration, the proposed law changes the legal and regulatory framework for e-government. New administrative efforts have altered government's focus toward shared services and platform-based solutions as a result.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Chile was ranked 35th in terms of Network Infrastructure Preparedness in the Waseda rankings 2021, with a score of 6.732. According to January 2021 figures, Chile had 15.78 million internet users, an increase of 0.7 percent over the previous year. Chile also had an internet penetration rate of 82.3 percent. At the time, Chile had 16.00 million social media users, which equated to 83.5 percent of the entire population. Chile's mobile subscriber base climbed by 1.1 million to 25.31 million, accounting for 132.1 percent of the total population.

There were many significant advancements in Chile's attempts to prepare for the country's digitization, including the following:

- The Chilean regulator completed a multi-band 5G spectrum auction;
- Chile advanced with the development of its ten-satellite National Satellite System;
- América Móvil authorized proposal to split off Latin America's towers and passive infrastructure;
- Telefónica Empresas has been hired to complete the nation's National Fibre Optic project; the regulator has contracted for 398 free Wi-Fi zones in various country sections.
- Over 8,300 schools now have free internet as part of the 'Connectivity for Education 2030' initiative.
- Chile, together with Argentina, have jointly removed roaming costs.

4.2. Management Optimization [MO]

According to the OECD, Chile needs a digital government to meet the needs of the public rather than those of government officials. Inaction will cost Chile productivity gains, social well-being, public sector performance, and ultimately public trust in government, the organization warns. This is the next step in a government's technological advancement. Strategy, not technology, is what has the power to effect change. The only way to digitally modernize Chile's public administration is to include all of the country's key actors in a series of coordinated efforts.

Strong political leadership is not enough to ensure such coordination; the public sector must also understand its role in the digital age. Time will tell if Chile has the strategic institutional frameworks required for good decision-making, ICT investments, and returns that fully benefit the country from digitalization. In the future, the government will examine several different areas and to help contribute to the development of solutions to this problem. Strong political leadership is not enough to ensure such coordination; the public sector must also understand its role in the digital age and how technology might help it achieve that aim.

4.3. Online Service [OS]

With operations in 26 countries throughout Latin America and the Caribbean, Evertec has made a substantial contribution by using its regional expertise and acquirer processing solutions. Gettingnet, a subsidiary of Banco Santander Chile, used Evertec's knowledge, technology, and infrastructure to facilitate this shift by making a significant and new commitment to the way payments are made and received in Chile.

Using Evertec's acquiring processing, products, and platforms, Gettingnet Chile will provide merchants with digital payment acquiring services that take advantage of Santander Chile's position as one of the country's largest banks and Evertec's position as one of Latin America's most essential processors.

Achieving widespread acceptance of all payment methods across the country would benefit all parties involved, including Gettingnet's affiliated firms and the cardholders who visit them. Furthermore, the company will play a key role in providing a safe and effective solution that is compliant with both local and international laws and Mastercard and Visa.

4.4. National Portal [NPR]

Chile placed in the top ten of Waseda's National Portal indicator in 2021, denoting significant effort and progress created. The national website (<http://www.gob.cl/>) provides access to government news and documents. The government has social media profiles on Facebook, Instagram, Twitter, Telegram, and YouTube, to name just a few. Over a hundred million Twitter followers, yet just a few thousand Instagram and YouTube subscribers. The government has done a great job releasing information and engaging in public discourse through its official social media channels. Those who want to keep up with the government's latest activities and give comments can do so by subscribing to these accounts. When English is selected as the language, all information is displayed in English. Users are able to access other ministries' websites by clicking on the links. To the public, it is merely a source of information and not a service.

4.5. Government CIO [GCIO]

Chile does not appear to be engaging in any CIO-related action. To improve public services, the government's Chief Information Officer (CIO) can use emerging technologies to improve efficiency, and boost cross-departmental cooperation. Several developed countries have passed laws creating a government CIO. Their service delivery has improved significantly over time. Government CIO is projected to have a role in the future of Chile's administration.

4.6. E-Government Promotion [EPRO]

Chile is the most agile government in Latin America and the Caribbean. ChileAtiende, the government's multichannel approach to service delivery, handles up to 67 million interactions each year. Significant institutional advancements have been accomplished, most notably the strengthening of digital government governance. Sebastian Piera's new Administration is taking substantial moves toward a digital-first public administration. This includes an ambitious proposal for a Digital Transformation Law² and the adoption of a Presidential Instructive on the Administration's Digital Transformation. Eighty percent of government services will be offered online by 2021 and 100 percent by 2023 as part of this initiative.

4.7. E-Participation [EPAR]

The availability of accessible public data is directly tied to the level of e-participation. The government has made information accessible on its official websites and created social media accounts to facilitate contacts between the government and the public. Checking their mobile phones can provide information to the public about the government's intentions and operations, among other things. Additionally, kids can participate in online discussions and express their opinions.

4.8. Open Government Data [OGD]

Thanks to ICT usage, improved transparency, and openness in government activities can help restore or rebuild trust in public institutions. The use of intentional and coordinated technology can also encourage public participation and engagement, crowdsourcing of ideas and data, and new forms of collaboration between the public, private, and third sectors. The Open Government Declaration, the Open Government Partnership (OGP), emphasizes the importance of information and communication technology in allowing more open governance through its foundational statement of intent.

Public organizations are increasingly linking their digital and open government agendas to preserve consistency in their use of technology as a facilitator of open government. In this work's comparative comparison, the entity or organization in charge of digital government in Canada, Denmark, Portugal, and Uruguay has been charged with organizing and directing open government initiatives. Many reference countries have a separate open government unit or task force at the heart of government that develops and oversees available government plans in collaborations with businesses and civil society organizations. Despite its cross-cutting nature, this approach is the most common in reference countries. Many countries in the reference group still rely on digital government institutions, even if they aren't leading or coordinating their efforts. The Open Government Data Strategy (OGDS) was developed and implemented by eight reference group states. ICT is critical in today's culture to promote open government, as is a coordinated approach based on similar objectives, such as unfettered access to information and "open by default" standards for government information.

4.9. Cyber Security [CYB]

Digital transformations in banking and government have been accelerated by COVID-19, resulting in an even greater dependence on digital infrastructure. When it came to protecting mission-essential companies and agencies against cyberattacks during the 2020 pandemic, cybersecurity had never been more crucial. Additionally, the national policy specifies precise goals and requirements intended to promote and protect an open, free, secure, and resilient cyberspace. The Digital Agenda and the Productivity, Innovation, and Growth Agenda, among other initiatives, have shown that the nation can decrease the access gap, increase awareness about safe ICT use, and preserve the country's technological leadership.

4.10. The use of Emerging ICT [EMG]

One of the first national policies on artificial intelligence has been announced in Chile. Even in their daily lives, individuals use simple artificial intelligence (AI) to decide what movies and music to watch and where to go. Chile was the first country in Latin America to use blockchain technology in the energy sector. The Ethereum-based platform for energy system data was released by the country's first public agency, the national energy regulator (CNE), in 2018.

A national innovation award has been given to this 'Open Energy' (Energía Abierta) platform, which has been updated to include more public data sources in Chile. RENOVA was, however, the country's only publicly stated application in the energy sector before its formation. The need to account for low carbon output is becoming more urgent as governments are under growing pressure to reach their 2050 climate goals. Energy Web is leading different attempts to monitor renewable energy or credit using this technology.

China

1. General Information

Area: 9,706,961 km²

Population: 1,445,189,819

Government Type: Unitary Marxist–Leninist One-party Socialist Republic

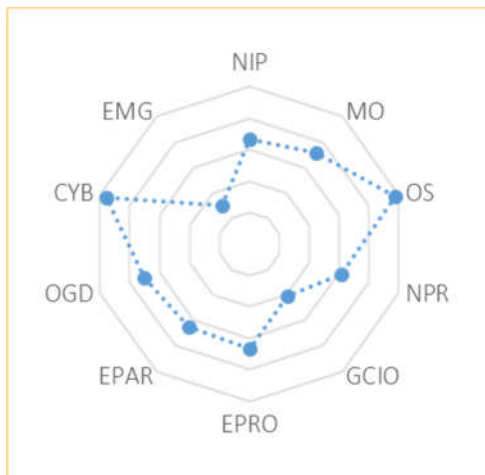
GDP:\$ 11,820

Internet Users: 70.64

Wired (Fixed Broadband Users): 33.60

Wireless Broadband Users: 96.32

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

China is experiencing a great impact from the pandemic, and was ranked 49th in the Waseda International digital government rankings 2021 with an overall score of 69.6266 points. Robots and artificial intelligence were used extensively in China to restrict the spread of the epidemic. Guangzhou Gosuncn has introduced 5G-powered robots that can simultaneously monitor the temperature of up to 10 people in public locations like airports and train stations. These robots could also tell whether people were wearing masks or not. Ping An's intelligent image technology, which provides CT scan results in 15 seconds rather than the usual 15 minutes, was a significant factor in the acceleration of COVID-19 diagnosis. By March, 1,500 medical institutions throughout China had adopted similar technologies, starting in Hubei province.

3.2. New Trends

China's government agencies have been actively promoting online government services, which has resulted in a massive increase in the type of services and overall consumption. Digital Government development is at a low point in the northeast and west. In addition, the study found a strong association between GDP growth and the index of Digital Government. To keep up with the rapid expansion of major cities, the installation of digital government infrastructure might spread to suburban and rural regions. As a result, it will serve as a model for other municipalities to follow.

To create a Digital Government in mind, China must focus on its Application Innovation business. When new technology is launched, developers will have to pay greater attention to platform compatibility to meet the needs of local governments. Competition among manufacturers of security and secrecy products increases as new software and hardware breakthroughs and the widespread use of specialist computers to support security and secrecy goods increases. There will be more investment alternatives available throughout establishing Digital Government as a result of increased industry support and a better application ecosystem.

Big data, artificial intelligence, blockchain, and other information technologies will shift government service from one of depth to one of accuracy in the future. It is inevitable that service providers from all sectors of the economy will have to work together to meet the growing demand for digital government services. The government-industry partnership is evolving along with technology. As government services and commercial activities merge, new business and collaboration models will be introduced to the market.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

In the Waseda rankings of 2021, China's Network Infrastructure Preparedness was placed 37th with 6.685 points. In January 2021, China had 939.8 million internet users, representing an 85 million increase from the previous year. In January 2021, 65. percent of Chinese households have access to the internet. At the same time, China had 930.8 million social media users, or 64.6 percent of the country's entire population. In early 2021, China had 1.61 billion mobile connections, accounting for 111.8 percent of the country's total population.

China was expected to devote a significant amount of time and money to improve its infrastructure in 2021, which are as follows:

- Fixed-line penetration in China has been steadily declining; nonetheless, the market for data centers in China continues to overgrow.
- To support economic development, China's telcos are making significant progress with 5G network deployments; the government has strengthened IoT rules;
- The deployment of 5G networks in China is proceeding at a fast pace;

4.2. Management Optimization [MO]

According to the document, the aim of the 13th Five-Year Plan (2016–2020) is "a more IT-based government," according to the paper. The National Big Data Strategy, aims to make "Big Data" a vital strategic resource to help transform, update, and innovate businesses and governing social systems. The 2017 19th National Congress of the Chinese Communist Party reaffirmed these aspirations, resulting in significant phrases such as 'Great Cyber Country,' 'Digital China,' and 'Smart Society,' among others. The central government is now implementing data-driven governance programs. This national digital project relies heavily on big data as a vital resource for integrating digital platforms.

4.3. Online Service [OS]

In 2020, 92.7 percent of China's population used Tenpay, making it the most popular payment method in the country. WeChat Pay, created by Tenpay, is China's most popular mobile payment option. In 2020, Alipay had over a billion users, 711 million monthly active users, and 80 million active merchants. There were 118 trillion yuan in 12-month digital payment transactions. They created escrow and quick payment to overcome the trust problem and grow the market.

Thirty percent of the world's credit and debit cards are issued by China Union Pay, the world's biggest payment card company (CUP). Foreign firms must pay a one-time setup fee of USD 1,000 to use this platform. There is no establishment charge for Chinese enterprises, and they simply need to pay 0.7-1.2 percent.

4.4. National Portal [NPR]

The State Council of the People's Republic of China uses the China Government Network (www.gov.cn) as a comprehensive platform for publishing government information and providing online services. The "State Council, Premier, News, Policy, Interaction, Services, Data, National Conditions" and other sections were added to the Chinese government website.

4.5. Government CIO [GCIO]

When it comes to CIOs in China, the duty has traditionally fallen to the departments in charge of the CIO's work. Many 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, are responsible for these various departments. Central and municipal governments each have several departments that have CIO duties.

Most of the public sector does not have a GCIO, such as the General Administration of Customs and the State Administration for Taxation. On February 27, 2014, China's President Xi Jinping convened the Central Leading Group on Cyberspace Affairs.

4.6. E-Government Promotion [EPRO]

China has to concentrate on its IT application innovation business to go ahead with the building of a Digital Government. When new technology is introduced, developers must pay more attention to platform compatibility since local governments are increasing their platform creation. Companies that supply security and secrecy goods confront rising competition as new software, and hardware

advances emerge and as these products become more backed by specialized computers. Due to increasing industry backing and a more robust application ecosystem, there will be more investment opportunities accessible throughout developing Digital Government.

A transition in government service from depth to accuracy will be brought about by big data, artificial intelligence, blockchain, and other information technologies. As people's demand for digital government services grows, service providers will have little choice but to develop environmentally responsible collaborations to satisfy their needs. There has been a shift in the relationship between government and business in tandem with technological advances. They anticipate new business and cooperative models to emerge due to convergence between government service delivery and private sector operations.

4.7. E-Participation [EPAR]

E-participation in China, despite remarkable growth, is still a restricted method for engaging Chinese individuals as essential stakeholders in the evolution of ICT in China. Even if China's e-Government offers blogs and other means of involvement, internet users will not have an equal say in national decisions under China's e-Government.

4.8. Open Government Data [OGD]

Freedom-of-information laws in China provide the backbone of this project. The Open Government Information (OGI) Regulations China's government released over 72 million documents and received 3.8 million requests for disclosure by the end of 2018. According to the view, government transparency, regulated public participation, and accountability to the public are critical components of achieving law-based governance, stimulating economic and social development, promoting social innovation, addressing social concerns, and enhancing the party's credibility, according to the CCP's view. Regarding Open Government Data, China came in 54th in the Waseda rankings 2021 with 7.000 points.

4.9. Cyber Security [CYB]

The Ministry of Public Security produced a Practical Guide to the Multi-Level Protection Scheme and Critical Information Infrastructure Security Protection System. Important networks, critical information infrastructure (CII), and data security are highlighted in the handbook. In the State Council's Legislation Work Plan for 2020, CII protection is also included. Multiple regulatory agencies, including the CAC, MPS, MIIT, and the Department of Education, were in charge of dynamic cyber security law enforcement activities in the country.

4.10. The use of Emerging ICT [EMG]

The government funds nearly two-thirds of all IT spending in China. With Huawei's aid, government clients can move away from purchasing IT items and toward cloud-based subscriptions. As of this writing, Huawei has completed more than 350 successful e-Government cloud projects in China.

Huawei's 'Platform + Ecosystem' approach will help the whole sector transition to a digital future. The ICT business benefits significantly from China's massive market.

China's AI initiatives are robust, but its privacy laws are poor. Because of the absence of defined norms and regulations in privacy, specific AI applications have caught up so quickly. Various AI stakeholders are encouraged by the government's support of AI and its value as an investment. The policy environment is the last pillar.

Colombia

1. General Information

Area: 1,141,748 km²

Population: 51,347,271

Government Type: Unitary Presidential Constitutional Republic

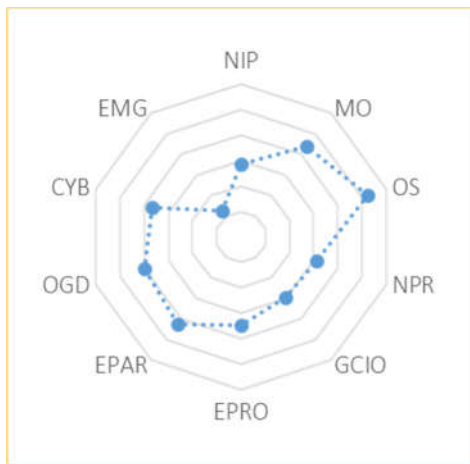
GDP: \$ 5,750

Internet Users: 65.01

Wired (Fixed Broadband Users): 15.26

Wireless Broadband Users: 61.82

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Colombia was ranked 39th in the Waseda International digital government rankings 2021, with an overall score of 70.5028. The development of Colombia's digital ecosystem has been facilitated through Covid-19. Resilient companies used e-commerce right away to deal with the social isolation imposed by the government. Electronic trade must follow safety and hygiene regulations as an exception to the general prohibition on commercial operations. For the most part, it is limited to websites and platforms and essential enterprises like pharmacies and restaurants. The Colombian government has provided tax incentives for e-commerce, such as a temporary VAT exemption.

From 2011 to the present, the OEC and Development's rules have explicitly protected consumers of electronic goods. Increased responsibilities for online retailers, including the right to a refund and electronic payment reversal, have been implemented. The return time for client withdrawals has been

extended in light of the Covid-19 pandemic. It has been extended to a year from the original month for returning aircraft tickets and tourism services.

Using the Covid-19 measures, the Colombian government pushed through a decree on digital citizen services that allowed for developments in "digital identity" and created a digital repository for citizen data. This will allow for the collection of information on taxes, health, and government contacts. For more than a decade, Colombia has had Latin America's leading teleworking policy, outlining corporations' responsibility to provide proper tools for remote workers and the stated criteria that should be followed. As a result of the pandemic's urgency, many firms have turned to small labor as a temporary, less regulated alternative to comply with these strict limitations. When social isolation persists, firms will have to impose more stringent terms and conditions on their customers.

3.2. New Trends

It has been common practice in Colombia for publishers and broadcasters to have close ties to its political and financial elite. New actors and social media undeniably change consumer habits, even though this influence seems to be migrating to the digital sphere. While web and television news consumption surged dramatically as people sought information on the outbreak, this enthusiasm has not converted into advertising income because of the economic slump.

More than eight out of 10 Colombians rely on their mobile devices to get their news. Specialized digital native media sites, such as El Paciente Colombiano, Conversemos de Salud, and La Silla Vaca, have taken use of the opportunity to provide complete coverage of health and scientific issues in Colombian culture. On the other hand, many generalist media sources did not cover COVID-19 at all due to a shortage of qualified journalists in their news departments. Both the politicization of public issues and the politicization of the general problems were detrimental.

Social media users have expressed concern about false information about COVID-19 and immunizations. With the help of traditional media organizations, they have taken steps to counteract the spread of misinformation. For example, a radio commercial titled 'Vera, the Voice of Truth' was created to dispel misinformation by a network of stations (and embodies the social responsibility of traditional radio stations). The epidemic's misinformation was boosted by agreements with local digital media sources such as La Silla Vaca and Colombiacheck. To prevent fraudulent COVID-19 news, Facebook and the World Health Organization (WHO) agreed to link official Ministry of Health information in Colombians' newsfeeds.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 5.736, Colombia was placed 50th for the Network Infrastructure Preparedness indicator in the Waseda International digital government rankings 2021. In January 2021, Colombia had 34.73 million internet users, a 4% increase from the previous year. The country has an internet penetration rate of 68%. Thirty-nine million people were using social media, or 76.4 percent of the total population.

There were 60.83 million mobile connections in the country, accounting for around 119 percent of the total population, up by 1.1 million from the previous year.

A few of Colombia's most significant investments in the country's digitalization have included the following:

- Movistar and Claro have each been given 3.5GHz spectrum blocks to begin six-month 5G testing.
- There are 2.3 million consumers in Novator Partners' acquisition of Avantel;
- MVNO Virgin Mobile was fined COP131.67 million for failing to comply with SIC administrative regulations protecting customers' rights.
- In 2020, fixed-line internet download speeds were estimated to double due to the rollout of fiber roughly.
- MVNO Setroc used Movistar's infrastructure to launch a new company.

4.2. Management Optimization [MO]

Colombia's improved regulatory environment has reduced the costs of starting and managing companies and shortened the time to file for bankruptcy, pay taxes, and get a company license. Nearly half of the Columbia's product market regulation features are now at the level for OECD membership. Product-market limitations remain above the OECD average in critical areas such as the state's engagement in firm operations and industry regulation.

Colombia's innovation framework has grown dramatically during the previous several years. Even so, there's always room for growth. To increase the effectiveness and efficiency of innovation, it is necessary to strengthen the routes through which knowledge is distributed. Consequently, corporations, academic institutions, and government agencies in Colombia must coordinate their efforts more often. The government has put policies in place to encourage new ideas and research, particularly in information and communication technologies (ICTs). Some of the programs seem to have redundant aims and resource, which is an issue.

4.3. Online Service [OS]

France and Colombia were tied for 30th in the Waseda International digital government rankings in 2021, with a score of 10.500 points each. During the past decade, Colombia has developed an online payment system integrated into government and commercial websites, enabling businesses and consumers to authorize electronic payments directly from their bank accounts. Interviews with ACH Colombia's management and stakeholders, and users of PSE formed the basis of this case study. There are several examples of how organizations and people are essential payers in the Better Than Cash Alliance case studies.

Colombia's National Coffee Growers Federation saved nearly \$15.5 million over seven years by converting from cash to payment cards for coffee planter payments. Paying coffee producers using a credit card instead of money resulted in significant cost reductions. It also provided a chance to

enhance financial inclusion, which is especially difficult in rural communities. This kind of research has never been done previously in large-scale rural business-to-business settings. Federación and banks conducted focus groups and in-depth interviews with coffee producers as part of the research.

4.4. National Portal [NPR]

Consolidating the provision of processes, services, participation exercises, and institutional information is the primary goal of GOV.CO. The capacity to adjust swiftly to changing circumstances while keeping an eye on the demands of the end-user is critical to GOV.CO's success." Residents formerly used more than 8,000 websites to access processes, services, information, and participation activities. GOV.CO is a public service accessible 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.

4.5. Government CIO [GCIO]

Minister of Information Technology and Communications (MICITC) of Colombia says that the deputy minister of IT acts as the government's senior information officer. There is no more information on the Government CIO.

4.6. E-Government Promotion [EPRO]

Throughout the last two decades, Colombia's national government has worked to build a technologically productive, open, and dynamic state. Federal governments and other public entities have undertaken policies on three fronts: the transformation of government entities, the transformation of public service delivery, and the transformation of private sector digital.

Online Government Strategy, in place since 2015, was renamed the Digital Government Policy in 2018, which outlined the rules of engagement between the state and society. The National Data Exploitation Policy was also approved in the same year (Big Data). This kind of initiative aims to promote the value of Colombian data as a social and commercial asset.

A 2019 Presidential Directive 2 intends to enhance the quality and integrity of digital services by making interactions between individuals, companies, and the government more efficient and transparent. Law 195512 mandated apps and platforms to strengthen social security supply as part of the National Development Plan 2018-2022.

On January 1, 2019, Mexico's federal government released an official document defining the country's digital transformation, and an artificial intelligence policy was also issued by CONPES 3975. This strategy aims to increase social and economic value generation and establish cross-enablers for digital transformation across industries by strategically employing digital technology in public and commercial sectors.

4.7. E-Participation [EPAR]

Colombia ranked 27th in a United Nations D-Government Report on e-participation in 2016. Urna de Cristal, or Crystal Urn, is the name of the government website at <http://www.urnadecristal.gov.co/> This website gives access to a variety of government departments in Colombia, as well as information on current topics and opportunities for citizens to engage with their government. Citizens are encouraged to engage with the administration through social media and this website, which allows them to do so.

4.8. Open Government Data [OGD]

For both social and economic benefit, open government data is a must-have. Open Data Portal in Colombia has experienced a substantial increase in the number of datasets that are accessible and a significant improvement in their accessibility over the past few years. Still, Colombia's most important value comes from investing in projects that stimulate OGD reuse, including hackathons held by the Digital Public Innovation Center and the growth of data journalism in Tamalemeque, which have already proved effective. Contacting prospective open data users to learn about their use criteria is also vital. These examples should be included in every institution's OGD policy to optimize OGD's economic, social, and governance effect. Open data users aren't simply outside the government; they're both creators and consumers of the data that's made accessible to the general public. In this situation, this is critical. The public sector must adopt a strategy for using open data since it is such a valuable resource.

4.9. Cyber Security [CYB]

In Colombia, data privacy laws are being changed. The administration has often stressed the need to update and improve data security rules. Many regulatory barriers to the digital economy are expected to be reduced while ensuring adequate protection for individuals. The DataBase Registry, which has been disbanded in the EU, is still in place in Colombia's data security system. Thus, the country's data transmission and movement regulations are unique in the world. Laws are supposed to stabilize this system while also strengthening the rights of the people.

Legal reforms are also underway in Colombia in this area. A public policy on cyber security for public institutions was initially published by the government in 2016, paving the way for creating a reporting system for incidents at various levels. Despite this, the structure currently in place is insufficient. The government, corporations, and the construction of a registry of critical infrastructure are working together to increase cybersecurity awareness and digital literacy in the country. The norms and regulations governing data protection and compliance have also evolved.

Colombia has built a comprehensive regulatory framework to safeguard financial institutions against cybercrime. Circular 005" was issued by Colombia's Financial Superintendence in early 2019 to regulate cloud computing services for financial institutions. In addition, the Ministry of Information and Communication Technologies has issued standards on cloud computing services and cloud security, which necessitates boundaries and exceptional innovation.

4.10. The use of Emerging ICT [EMG]

Developing Colombia's ethical framework for artificial intelligence development is a main priority of the Colombian government, which will apply to both the public and private sectors. It's necessary to

create a framework that can accommodate the different interests and viewpoints of all parties. On the other hand, the discussion about AI ethics has existed for decades and isn't new. This subject has been studied extensively by philosophers since the mid-twentieth century, and maybe even earlier.

Costa Rica

1. General Information

Area: 51,100 km²

Population: 5,148,002

Government Type: Unitary Presidential Constitutional Republic

GDP: \$11,810

Internet Users: 80.53

Wired (Fixed Broadband Users): 19.49

Wireless Broadband Users: 91.12

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

In the fields of information and communications technology (ICT) and the environment, Costa Rica has long been a leader in Central America; nevertheless, it does not have a well-developed public policy initiative in this area. However, private initiatives such as "Smart and Green Costa Rica," which is hosted by the Costa Rican Chamber of Information and Communication Technologies, advocate for and promote environmentally friendly information technologies in the country.

The ICT and Environment Commission was established in 2016 as a subcommittee of the Presidential Social Council (Consejo Presidential Social) with two primary responsibilities: collaboration on the implementation of the environmental and ICT goals outlined in the 2015-2021 National Telecommunications Development Plan (PNDDT), and analysis and proposal of a national roadmap in

this domain. The initiative is still in its early stages, and making predictions about future policy revisions is premature at this point.

3.2. New Trends

Costa Rica aims to completely digitize the government and establish standards for Industry 4.0 growth in critical industries such as agriculture and tourism. Additionally, it creates a timeline for the construction of 5G wireless networks in accordance with the country's digital transformation agenda. According to a statement issued this week by Costa Rica's science, technology, and telecommunications ministry, the Central American government is also trying to build new digital accountability and governance systems and strengthen its response to cyber-attacks.

The new digital strategy aims to improve digital government by implementing a plan called "Pura Vida Digital" that will see Costa Rica unify its catalog of citizen services on a single website, as well as create a single national patient record for the health system and a national "intelligent" transportation network that accepts electronic payments. This proposal calls for the creation of a digital ID for citizens that incorporates biometrics and steps to ensure the interoperability of ID checking equipment. Additionally, the government will explore methods to integrate Industry 4.0 technology into critical areas like agriculture and tourism, such as creating digital agricultural production maps and digital entrepreneurial clusters.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

On the test of Network Infrastructure Preparedness, Costa Rica has the lowest score of 6.371. By January 2021, the overall number of internet users had increased by 11% year over year to 4.15 million. The proportion of persons having Internet access stayed unchanged at 81.2 percent at the start of 2021. It was projected that 3.9 million people used social media, accounting for 76.2 percent of the total population. There was over a 383 thousand additional mobile connections between January 2020 and January 2021, accounting for 174.4 percent of the total population.

Costa Rica's NIP had made significant progress in terms of fundamental objectives. Liberty Latin America gained approval to purchase Telefónica Costa Rica for \$500 million or 146 percent year-on-year growth in the length of the national fiber network to 193 thousand kilometers. Mobile broadband penetration has surpassed 100%, and regulators prepared for a 700MHz auction in July 2021.

4.2. Management Optimization [MO]

Costa Rica acknowledged the importance of ICTs in public sector transformation in the 2000s. The country has progressively advanced its ICT agenda to improve public sector performance, increase access to public services, and increase citizen participation in decision-making. The legal and regulatory framework has been modified to promote ICT services, reduce administrative expenses, simplify digital transactions, and improve public service delivery. Along with the executive body for digital government, high-level strategic dialogue and policy development units and committees were formed.

Since 2006, Costa Rica's government sector's strategic use of digital technology has advanced. The Master Plan for Digital Government in Costa Rica 2011-2014 (Plan Maestro de Gobierno Digital en Costa Rica 2011-2014) established several important initiatives and measures to promote the public sector's digital transformation. The new National Telecommunications Development Plan 2015-2021 includes a component on digital governance and relates to the National Development Plan. With the OECD's Council on Digital Government Strategies Recommendation as a guide, this plan outlines the aim and path for achieving digital transformation in government.

Costa Rica's efforts over the last decade have helped it solidify its position as a regional leader in digital governance, moving closer to OECD norms (see Figure 44). Costa Rica has reached the same degree of digital maturity as OECD countries in LAC, with the same score as Georgia (9.600).

4.3. Online Service [OS]

Digitally enabled openness assesses how the government uses digital technology to enhance transparency, involvement, and inclusiveness for the first pillar of the OECD Recommendation, which relates to the Constitution's digital technology initiative to promote more transparency, openness, and inclusivity in government processes. Costa Rica has a strong democratic Constitution; the Constitution to understand better guarantees transparency and public access to information. Deliberations are underway on a new legal and regulatory framework for openness and public access to information.

The Presidency Ministry chairs the National Commission for Open Government (Comisión Nacional de Gobierno Abierto), which oversees transparency in government (Ministerio de la Presidencia). The National Commission has five sub-commissions: Support Systems, Participation, Training, Transparency, and Territorial Collaboration. Given the dispersal of digital services, facilitating access is critical. Indeed, authorities are working to better understand the needs of all stakeholders in the open data ecosystem, including data producers and consumers.

Compartmentalized approaches make it harder for residents to find and utilize public services and data and for governments to respond holistically and integrate citizens' needs. To help overcome this barrier, OECD countries have created centralized government services based on life events rather than government structure. Costa Rica's efforts are new. Currently, only 5% of public services are delivered through platforms, and only 50% of those platforms provide fully transactional online services using digital signatures.

4.4. National Portal [NPR]

Since 2012, Costa Rica has maintained an open government data portal with a variety of information. However, open government data lacks the guidelines and legal framework required for adoption. That is one of the reasons why the country's NPR indicator is still ranked at the final position of the 64-country list. The public sector, in particular, has to learn more about data sharing since many companies do not perceive the value in doing so. According to the Open Government Data website, the number of public datasets is low compared to OECD countries, and the number of entities providing datasets is also typical. As a result, the country's open government data performance is weak.

This aligns with the OECD's OURdata Index, which assesses countries' efforts to encourage open government data availability, accessibility, and reuse.

A new federal data policy is now available for public feedback. It advances a definition of open government data, establishes a governance framework for the national open government data policy, establishes a mechanism for prioritizing datasets for publication, establishes guidelines for data release, and establishes mechanisms for engaging and ensuring effective participation by the data consumer community in the implementation of open data policy.

4.5. Government CIO [GCIO]

Since 2009, Alicia Avendao Rivera has held the position of Director of Digital Government, the closest Costa Rican counterpart to the work of Chief Information Officer. The Director is responsible for the three departments of Digital Government: Projects, Technology, and Digital Inclusion. They report to the Minister of Digital Government.

4.6. E-Government Promotion [EPRO]

Costa Rica has been developing a three-pillared national policy for information and communications technology (ICT) and the environment.

The primary priority is intended to promote research and is carried out in partnership with academic community members. The second project is a capacity-building program that is being carried out in conjunction with the National Learning Institute, also known as INA. Third, the MICITT, the MINAE, municipalities, and other stakeholders educate the general public and consumers about the use of technology and its potential to improve its environmental performance. Under the PNDD, each of the 18 Ministries is obliged to implement an ICT use and/or environmentally beneficial innovation program.

With the help of its laws, economic practices, and citizen behavior, Costa Rica has also established a culture of sustainable development. The formation of voluntary programs to aid companies and organizations in improving their environmental performance has been one technique used in recent years.

4.7. E-Participation [EPAR]

Another OECD Recommendation underlines the need to use digital technologies to foster public participation in policymaking, service design, and delivery. Costa Rica's democratic institutions promote citizen participation following the Constitution's essential ideals. A legal framework controlling public involvement in policymaking reinforces these objectives. For legislation, service design, and delivery, Costa Rica has achieved considerable advances. National initiatives are significant. In addition to the decrees on information freedom and open government data, the National Commission for Open Government is working on new legislation on urban renewal.

As part of its administrative simplification efforts, the Ministry of Economy, Industry, and Commerce (MEIC) currently leads the most significant national projects to involve user input into service design and delivery. Involving users and other stakeholders in the most vital administrative tasks is essential

to more user-centered and user-driven services. Aside from that, numerous initiatives (including hackathons and outreach to the data user community) also promote data reuse to reimagine public services. For example, innumerable towns have created participatory budgeting systems, accessible data on public assistance to encourage new public services, and online feedback on municipal activities.

4.8. Open Government Data [OGD]

With an OECD-compliant and open local government legislative framework, Costa Rica's legal and administrative system favors open local governance. Ensuring active, conscientious, and democratic public participation in local government decisions, the Municipal Code emphasizes popular initiatives, referendums, and town hall meetings. Public sector excellence clusters abound in Costa Rica. Examples of new institutional interaction channels include digital platforms and open data portals produced by municipalities. The President's goals for openness and engagement have trickled down to cities, although scattered and episodically, according to the 2016 OECD Open Government Review. As seen by current efforts, municipalities recognize the need to improve municipal websites and social media usage. The federal government has helped cities meet OECD requirements. In March 2017, Curridabat and Montes de Oca signed Memorandums of Understanding (Cartas de Entendimiento), promising the federal and local governments to improve transparency, accountability, and participation.

4.9. Cyber Security [CYB]

Costa Rica's National Cybersecurity Strategy was prepared with assistance from the Organization of American States (OAS) by the Vice Minister of Science, telecommunications, technology, and Telecommunications. The e-government initiative and the National Telecommunications Development Plan 2015-2021 aspire to convert Costa Rica into an inclusive Internet nation. Numerous governmental, commercial, academic, civil society, and telecommunications regulators participated in the consultation process for the National Cybersecurity Strategy. The Vice Ministry of Telecommunications sponsored three-panel discussions, four sectoral seminars, and two online consultations in March 2015 with technical assistance from the Organization of American States. Around 120 public and commercial sectors attended, with a strong presence from telecommunications, critical infrastructure, and civil society. It places a premium on economic growth and overall capacity development. Its objective is to ensure that the nation has adequate cybersecurity and cyber resilience to enable its digital economy and economic and social success. With ICT exports accounting for 50% of international trade in 2013, it encapsulates Costa Rica's economic and social context and the country's primary public policy objectives of improving connectivity and establishing e-government. The strategy's development and execution will be governed by adaptable processes and institutions.

4.10. The use of Emerging ICT [EMG]

It is self-evident that Artificial Intelligence (AI) is inherently disruptive. Costa Rica seems to be adjusting to AI potential more quickly than most of the region's other nations. Costa Rica's position in the next generation of service delivery will be harmed as a consequence. Central America's

technical epicenter, with a population of over five million, has been regarded as such since Intel selected it in 1997 to develop the region's largest microprocessor factory, with an initial investment of \$800 million. Thus far, nothing has slowed.

GBT Technologies, a Costa Rica-based Internet of Things (IoT) and artificial intelligence (AI) networking and monitoring company, has begun testing its Avant! AI Virtual Agent solution throughout the country. The technique might be utilized in various applications, including healthcare counseling, engineering design, customer support, and financial analytics.

The Internet of Things (IoT) can link nearly anything to the Internet, increasing the efficiency of data-driven operations. Everyday things may now transmit, receive, analyze, and store data, enabling them to participate in event-driven logistics that is self-managing. The Internet of Things (IoT) may give actionable data that stimulates the development of new ideas and solutions. In the logistics business, IoT devices and data have increased productivity and service quality over the last few years. Sensors and IoT systems have become more appealing to logistics operators than ever before due to increased investment and demand. Additionally, as current technology gets more affordable, IoT devices shrink in size. Innovative sensor placement techniques using millimeter-sized sensors have resulted in the collection of an unparalleled quantity of data.

Czech Republic

1. General Information

Area: 78,865 km²

Population: 10,727,416

Government Type: Unitary Parliamentary Constitutional Republic

GDP: \$25,730

Internet Users: 81.34

Wired (Fixed Broadband Users): 35.51

Wireless Broadband Users: 94.40

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

According to a recent survey, the Czech Republic ranks 28th worldwide in terms of the quality of its digital environment. The Czech Republic advanced four places in a worldwide evaluation of digital environments from the previous year. The quality of Czech digital environment is anticipated to improve as a result of significant spending from the EU's pandemic recovery fund. The Czech Republic's outstanding rating will be bolstered by significant investments in digital transformation from the EU's pandemic recovery fund. The country plans to invest in high-capacity networks, eGovernment services, and digitization of healthcare.

While digitization is widely seen as a positive development in the Czech Republic, a perceived lack of financial resources is hindering private sector efforts to embrace new technologies. Financial constraints are cited as a barrier to digital innovation by 61% of Czech companies and 74% of SME's.

In 2019, the ruling ANO government announced a national investment plan that placed a strong emphasis on digitization. The Czech Pirate Party has promised to boost digital development in the run-up to the October elections. The party pledges substantial digital change across the country, financed by a trillion-pound private sector investment and EU funding.

3.2. New Trends

In recent years, the Czech Republic has implemented over 700 public internet solutions. However, the Czech Republic's present level of digitization is in shambles, with unconnected public information systems and online tools that provide neither comfort nor time and cost savings to businesses or individuals. Industry 4.0 is a social and economic phenomenon that defines the Czech Republic's future role in the global community as a highly industrialized country. The present government developed a new Digital Czech Republic strategy that comprises the following components: The Czech Republic in a Digital Europe, a Czech Republic Information Concept (Digital Public Administration), and Digital Economy and Society. The digital agenda's long-standing sectoral and thematic fragmentation has been overcome with the following goals for the next decade:

- Ensure citizens and businesses have access to online services and update the state's contact point network.
- Establish a centralized information technology system that is coordinated with all ministries by the RVIS.
- Establish an interconnected data fund (data just once) for the purpose of using all data previously provided to the state by a citizen or company.
- Prepare society for the Internet of Things, artificial intelligence, big data, and novel human-machine interactions.
- Promote the practical application of disruptive technology research.
- Promote the use of digital business tools.
- Facilitate dialogue on current issues and the EU's Digital Agenda.
- Establish measurable Industry 4.0 implementation levels and standards to accompany them.
- Implement Industry 4.0 ideas in the energy sector, focusing on smart grids, cities, and regions.
- Develop a system to aid in resource optimization and environmental protection throughout the implementation of Industry 4.0 in factories and services.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

By coordinating the efforts of all governmental agencies, a nationwide network of Czech's public administration networks has been created. This site provides access to data and phone connections, as well as a pool of shared information resources. Additionally, it gives access to communal amenities.

Government agencies in the Czech Republic are connected to the EU's infrastructure through the national network's central services point, enabling information to be exchanged across national borders.

Users may access a range of eGovernment data and services via the Czech POINT system, a network of websites that connects and assists them in a single place. Individuals who have access to all public records may submit POINTs to the relevant government agency to lawfully obtain transcripts or extracts from the nation's registers. Numerous Czech POINTS will be maintained by a variety of organizations, including postal and municipal administrations, registration authority offices, and Czech embassies located around the globe. This network connects 7,322 physical nodes in the local and regional regions. The Czech POINT Finder simplifies the process of discovering places of interest on the internet in the Czech Republic by providing an interactive map. A total of 23,361,203 extracts have been authorized up to the most recent time.

4.2. Management Optimization [MO]

Authorities in the Czech Republic have ensured the interoperability of public administration systems through a number of laws and regulations, including the Act on Public Administration Information Systems, the Act on Base Registries, the Act on Free Access to Information, and the Act on Archiving and Records Management. Additionally, strategy papers define the objectives and objectives of eGovernment projects. Central government organizations are tasked with the responsibility of enforcing sectoral laws to guarantee system interoperability. The Ministry of the Interior and the National Registers Authority are the last two participating entities. Both of these groups are responsible for monitoring and assisting with the usage of shared services. As the Single Digital Gateway Regulation, the supply of digital services across international borders, and the recently approved national Act on the Right to Digital Services take effect, the legal framework governing interoperability will be updated to reflect these changes.

Individuals and towns within a certain geographic area may have an impact on policy. As is the situation across the European Union, the Czech public administration and public sector management are decentralized. Six thousand and two hundred fifty-eight municipalities distributed over 14 regions use the centralized eGovernment platform in addition to providing their own digital services to the public. While each region and municipality is responsible for developing their own eGovernment policies and initiatives, the eGovernment Strategy provides a recommended national approach to eGovernment. Additionally, the national Association of Regions and the Union of Towns and Municipalities help regions and towns in developing different strategies for regional cooperation and putting these strategies into practice via cooperative regional cooperation initiatives.

4.3. Online Service [OS]

All Czech citizens and employers dealing with the Czech Social Security Administration have access to the Administration's databases and may search, request information, and get responses through email or other electronic means. Customers may choose from a range of internet services to suit their needs. Customers may now obtain information on unpaid absences throughout their careers, self-employed health insurance payments, and even calculate their retirement pension online. Paper-based methods will be phased out starting January 2020 in favor of eSick.

The Czech Republic has established a centralized electronic procurement system administered by the Ministry of Regional Development's Public Procurement and Public-Private Partnership Department. Contracts costing at least EUR 76,000 must be advertised. Buying IT products and services on the national platform is also important. The Ministry of Regional Development's Public Procurement and Public-Private Partnerships webpage offers extensive information on public procurement and public-private partnerships. The program helps users learn about national and European laws, norms, and administrative procedures that regulate public contracts and concessions. The new integrated eProcurement feature helps with procurement information at both the national and European levels.

On July 1, 2018, the NEN became operational as part of the government's plan authorized in June 2018 with Resolution No 408, requiring the use of the NEN for public procurement for designated agencies. The National Computerized Network (NEN) is a sophisticated computerized technology that helps governmental procurement and concession contracting companies (National Electronic Network). Until now, 600 public entities were obliged to use NEN, but 900 others, including regions and municipalities, did so freely. The implementation of NEN as a single eProcurement system has increased public procurement transparency while saving the government money.

4.4. National Portal [NPR]

The Public Administration Portal is a specialized digital platform that connects government agencies with their citizens, as well as with business and charity organizations. To utilize the Portal, enter a search phrase, which will lead people to a website connected to government or daily services. A digital identity is needed to use the Citizen's Portal; this includes the ability to extract data from state base registers, establish if citizen contributions have been received, and see documents in their personal archive from their time in public administration. The NIA Portal explains how people may create a state-backed digital identity, including how to acquire digital security measures. Along with describing all procedures and providing forms and advice to promote openness and confidence in digital services, the Portal walks clients through each stage, so they understand precisely what to anticipate.

Citizens and employers who interact with the Czech Social Security Administration have online access to pertinent data, which they use to submit claims and get responses. A diverse array of internet services are available to a diverse spectrum of consumers. Individual-benefit services may include online access to information regarding paid sick leave while at work, insurance payments for self-employed people, and ways for calculating retirement pensions for those who have finished their insurance periods. Additionally, beginning in January 2020, eSick will use a more efficient method of communication than the paper-based one.

Citizens of the Czech Republic have access to the eTax Portal, which contains tax information and electronic forms for the national government. The product enables people to upload tax returns and other documents electronically. By checking VAT payers in the 'VAT Payers Register' software, you may discover more about their trustworthiness and registered bank accounts.

The ePUSA Portal maintains an up-to-date listing of all Czech self-governing organizations. The system's search function looks for information based on specified parameters. This portal's primary objective is to facilitate communication between local governments and the general public by

maintaining an up-to-date list of government administrative bodies throughout the nation. The Ministry of the Interior manages the ePUSA Portal.

4.5. Government CIO [GCIO]

E-government issues are within the responsibility of the Ministry of the Interior, which makes it responsible for them. The Department of e-jurisdiction Government is managed by the Department of Information and Communication Technologies, which is a sub-department of the Department of Information and Communication Technologies. Individual ministries are responsible for managing information and communications technology (ICT) via the appointment of a Chief Information Officer (CIO) who is responsible for administering that role for that ministry.

4.6. E-Government Promotion [EPRO]

The Ministry of Interior coordinates e-government, with a particular emphasis on government central administrative information systems with the contributions to advance the information society as a whole.

The eGovernment Department is a division of the Ministry of the Interior. It collaborates with other divisions to create and implement the eGovernment Strategy, with the aim of advancing digital government for the benefit of the people. The Department is responsible for the administration of a number of critical information systems. Additionally, it participates in the formulation of national eGovernment legislation. Along with its control duties under many significant eGovernment laws, this Department oversees various elements of several significant eGovernment statutes, including the Act on Web Accessibility, which took effect in January 2020.

4.7. E-Participation [EPAR]

The Czech Republic's Government Resolution No. 680/2014 on the development of public administration establishes four objectives: implementing a process management approach to public administration; increasing service availability via eGovernment tools; increasing the effectiveness of public administration at the regional and local levels; and continuing to develop the capabilities of public servants.

Given that the Strategic Framework for Public Administration Development 2014–2020 only covered the period from 2014 to 2020, a new concept for public administration development, dubbed Client-Oriented Public Administration 2030, has been created to account for the following time. The eGovernment plan makes no reference to eGovernment satisfaction or processes in the program's primary objectives. However, the two studies complement one another. The Public Administration Concerned with Citizen Happiness and Administrative Efficiency seeks to increase people's overall satisfaction with the administration and its services, while also increasing administrative efficiency. The strategy included a variety of initiatives, including improved communication with citizens, a greater emphasis on evidence-based policymaking, and more support for innovation. The government started to implement the Client-Oriented Public Administration 2030 strategy in 2020.

4.8. Open Government Data [OGD]

Following Government Decision 629/2018, the Chief Architect of the eGovernment Office made a number of critical suggestions to ensure the interoperability of public administration systems. The Czech Republic's information concept (i.e. the public ICT strategy – Informan koncepcce eské republiky) consists of a public ICT governance, an e-government terminology dictionary, a national architecture plan, a national architecture framework, and an example of a framework for public administration ICT strategy.

The country's goal is to improve the accessibility of public information. The Czech Republic 2030 plan prioritizes the country's long-term development, which includes open data. Numerous attempts have been made to enhance the National Open Data Catalogue and to connect public databases as part of the initiative. In 2019, the Chief Architect of eGovernment outlined the national plan for connected data pools in the public sector while speaking about this Program. Cross-border interoperability is now a requirement of information access plans after the adoption of Regulation (EU) 2018/1724, a single digital gateway.

4.9. Cyber Security [CYB]

The National Security Authority has developed the country's most recent National Cybersecurity Strategy, which was planned to present to the government by November 2020. The Action Plan for the present Strategy specifies the actions that should be performed, their related deadlines, the overall supervision, and everything else. Taking priority structures, processes, and collaboration in the field of cybersecurity and international cooperation; primary objectives included ensuring the quality and efficiency of all cybersecurity structures, processes, and partnerships; collaborating with industry; and ensuring the security of critical information infrastructure and important information mechanisms.

The Cybersecurity Act (Act No. 181/2014 Coll.) includes provisions defining the procedures for private sector collaboration with the governmental sector in order to adequately handle cybersecurity issues. This Act is intended to protect the nation's vital infrastructure. This is important because without it, the nation would cease to operate, resulting in negative consequences.

4.10. The use of Emerging ICT [EMG]

The Ministry of Industry and Trade is responsible for the National Innovation Strategy and the Digital Economy and Society component of the Digital Czech Republic Program. The authorities are developing broad cooperation platforms that will include public, academic, and commercial partners. The government has a number of strategies in place to help it achieve its strategic goals. While discussions about new technologies are not usually focused on government administration, their potential to enhance digital services and create more transparent, effective governments is carefully considered.

As part of its Innovation Strategy, the Czech government adopted the National Artificial Intelligence Strategy in 2019. Along with outlining key objectives, the document identifies the Ministries and Agencies charged with executing the Strategy. The government established a legislative and regulatory framework for the development and use of artificial intelligence, as well as criteria and conditions for its use in the public sector, such as health and transportation, while adhering to personal

data protection laws and ethical standards. Additionally, a list of national academic institutes doing AI research is provided.

In 2019, the Chief Digital Officer of the country, the Government Office, and the Ministry of Industry and Trade signed a Memorandum of Cooperation. The administration signed a Memorandum of Cooperation with the Blockchain Republic a year ago.

Denmark

1. General Information

Area: 43,094 km²

Population: 5,817,553

Government Type: Unitary Parliamentary Constitutional Monarchy

GDP: \$67,220

Internet Users: 96.55

Wired (Fixed Broadband Users): 44.40

Wireless Broadband Users: 136.81

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Denmark's digital transformation has been a success. Denmark was ranked number one in the Waseda International digital government rankings 2021, with the highest overall score of 94.2748. Additionally, Denmark led the remaining 63 countries in six indicators: Management Optimization, Online Services, National Portals, E-Participations, Open Government Data, and Cyber Security.

The Danish government has introduced new digital technologies to provide safe and controlled reopening following COVID-19. People can contribute information about symptoms related to COVID-19 using the COVID meter, which measures COVID-19 prevalence. The Danish Serum Institute uses this information to monitor the spread of disease in the population. Denmark's emergency status can be lifted with the use of the Mobile Proximity App. In addition, authorities can use this to see whether the public is adhering to the government's general advice of keeping a safe

distance after gradually opening up society. This is a huge benefit. Consequently, the app is thought to have a positive influence on responsible conduct. As an additional benefit, the program can be used to monitor Coronavirus outbreaks in the community.

Data analysis, artificial intelligence, and machine learning are becoming more prevalent in Danish public digitalization. Professionals now have more time to provide value-creating services that enhance their work satisfaction and results, thanks to new intelligent decision-support technology. Employees will always be expected to make sound judgments based on expert opinions. Bots that never tire, never make errors, and are constantly available for new tasks are increasingly required to handle routine operations. Denmark's key steppingstones are the shared public digital infrastructure and a high level of trust between citizens, companies, and governmental actors. KMD will continue to play a leading position in Denmark's public digitization in the following years, using significant insights into the public sector and a global perspective gained via NEC's collaboration, a worldwide leader in biometrics and artificial intelligence.

3.2. New Trends

Digitalization is a vital component of the Danish government's reform strategy, which aims to guide Denmark through COVID19 and accelerate the country's transition to a more modern and digital welfare society. A new digital strategy is part of a tremendous reform effort that aims to increase welfare and equity, growth and employment, the green transition, and the relaunch of the Danish economy following the COVID-19 crisis, all while reducing greenhouse gas emissions.

For a country that is one of the world's most advanced digital economies, constant change requires careful consideration. To qualify and submit ideas for the new plan, the government has formed a digital partnership. With a broad spectrum of partners, Denmark intends to establish the framework for a robust digital infrastructure. As part of the digital transition, Denmark is proposing improvements in broadband infrastructure, which would enable more citizens to access and utilize digital services.

The Danish strategy's primary goal is to contribute favorably to national digital transformation efforts while also assisting in creating a highly trained workforce of certified professionals. From an early age, efforts will be made to improve children's and adults' digital abilities, which will be achieved by including a new technology-based topic in the primary and lower secondary school curriculum. Numerous efforts have been undertaken in this area to increase employment and happiness and promote the development of additional digital skills.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Denmark was placed second in the Waseda rankings on the Network Infrastructure Preparedness indicator, just after Norway. Compared to the previous year, Internet usage in Denmark increased by 23,000 in January 2021 to 5,69 million users. In January 2021, 98.1 percent of the population has access to the Internet. During the first week of January 2021, 83.6 percent of Denmark's population

was on social media. As of January 2021, there were 8.78 million registered mobile connections in Denmark, representing 151.4 percent of the country's population.

Public digital services are all simplified, accelerated, and protected by the Danish government. The construction of digital infrastructure is now underway. Digital services can be accessed by both consumers and businesses thanks to a wide range of infrastructure. Some of the essential elements of the infrastructure are the eID, the Digital Post, and the citizen website known as borger.dk. User journeys and customized surveys, for example, have been more critical in these solutions in recent years. Data transport, data security, and registry foundations must be constantly coordinated as infrastructure grows.

4.2. Management Optimization [MO]

In November 2017, the Central Government launched a Strategy for Information and Communications Technology Management intending to improve the operational efficacy of ICT systems. The 13 concrete initiatives in place to ensure enhanced ICT system management, including the mandate to adhere to the central government's ICT system management model and the requirement for periodic national ICT Council reviews, address issues such as mandatory compliance with the government's ICT system management model and regular reviews of each ministry's ICT system management.

The post-pandemic recovery effort in Denmark included a digitalization partnership comprised of corporate leaders and specialists from the country's municipalities and regions and academics and nonprofit organizations. Participants from all around society can help define digital elements and needs for individuals, enterprises, and the welfare state while also helping to create proposals for a brand-new strategy for the digital age.

Everyone, including residents and businesses, should access efficient, coordinated, simple, and tailored to their specific needs. Danish local, regional, and federal administrations have established a Common Framework for a Federal Digital Architecture (FDA) to facilitate data sharing and cross-organizational activities. The Framework incorporates general architectural ideas, rules, and guidelines for architecture description and communication. Educational programs, architectural insights, and project evaluations all contribute to the Framework's success. The Federal Digital Architecture is a set of reference architectures for data sharing, self-service user experiences, citizen and business-relevant information, and authentication and rights management.

4.3. Online Service [OS]

The Danish public sector's digitalisation is predicated on close and binding collaboration between the government, the five regions, and the 98 governmental municipalities. Three parties agreed on a digital strategy that enables the public sector to invest together in particularly challenging and interconnected areas across many agencies and industries. Denmark has also developed a series of policy statements on various topics, including healthcare, security, public ICT management, and new technologies.

Most activities relating to citizenship services, including social services, childcare, elder care, healthcare, employment, culture, the environment, and planning, are conducted in 98 municipalities. The five regions are mainly responsible for the health industry, as shown through hospitals. Municipal

and regional governments carry out the action plans previously established at the intergovernmental, departmental, and domain levels under the overall national eGovernment Strategy.

4.4. National Portal [NPR]

Businesses, governments, and individuals rely on the network provider for vital data. A data distributor is a single technology that replaces many public distribution alternatives for governments and businesses. In addition to civil identification numbers, a supplier now collects property data such as addresses and administrative divisions. The essential data program must improve, update, and optimize the Danish public sector's administration. Better data gathering and distribution promote company innovation and growth. It will keep importing data from the Data Distributor.

The citizen portal is a single point of access to online public sector information and eServices. The portal is run and funded by governments at all levels. The site also provides general information, statistics, and eServices. The site also offers self-service sections to assist people in keeping their government connections, which is the ability to get information and services from different agencies without logging in several times. Resident-owned portal site allows users to access information on taxes, pensions, health, and housing. Aiming to enhance transparency and quality of digital services is a political objective. The goal is to gather and provide valuable people data. It contains information on each person's case status, social benefits, and potential agreements with government entities. Because the overview is customized, only the citizen can access the data. The portal allows users to customize the content as well as provide location-related information.

4.5. Government CIO [GCIO]

The public does not have access to information on Chief Information Officers at lower levels of government. In Denmark, the Chief Information Officer (CIO) is not a particular cabinet post. On the other hand, Steering Committee for Joint-Government Cooperation (STS) comprises representatives from various levels of government. It serves as a clearinghouse for public sector e-government projects. The committee's conclusions are made public every two years. Currently, no specific law governs the Chief Information Officer's job in government.

4.6. E-Government Promotion [EPRO]

On May 12, 2016, the Danish government, Local Government Denmark, and the Danish Regions approved the Common Public Sector Digitization Strategy (2016–2020). The Strategy's objective is to contribute to developing a future digital Denmark and ensure that the public sector is prepared to profit from future technological advancements while increasing efficiency. The Strategy covers a range of issues, including automating general administrative procedures, enhancing the user experience for individuals and businesses, digital welfare, and data sharing. The Strategy seeks to strengthen public services and make starting and running a company in Denmark more straightforward and more appealing. Additionally, it guarantees that all Strategy-related initiatives take data security for people and companies into consideration.

The government published a White Paper on a Common Public-Sector Digital Architecture in June 2017. The design must facilitate cross-organizational collaboration and data sharing across the public

and private sectors. The goal is for individuals and businesses to get efficient, coherent, transparent, and customized to their own needs while promoting social innovation, growth, and progress. Additional Information can be found at <https://arkitektur.digst.dk/>.

4.7. E-Participation [EPAR]

The Danish government's web portals demonstrate a comprehensive understanding of participation, especially when including the many stakeholders. interactive access to online information and services intended at enhancing social interaction. For instance, the public site (borger.dk) serves as a national debate and voting portal, allowing citizens from all walks of life to engage in the national discussion. Additionally, it promotes the hosting of blog services. By commenting on the nation, anybody from anywhere globally can become a part of the Danish lifestyle.

ROSTRA is an online forum for public debate, expressing ideas, and presenting individual viewpoints. The Danish National Information Technology and Telecommunications Agency established a citizens' website. It serves as the establishment of a national "debate and voting gateway" that allows individuals, businesses, politicians, and other groups to participate in debates and votes tailored to certain levels of government, topics, and so forth. It is capable of facilitating discussion and voting at the local, regional, and national levels.

4.8. Open Government Data [OGD]

Denmark is now implementing the EU Directive on open data and the re-use of public sector information by taking existing open data initiatives into account (Open Data Directive, 2019). Furthermore, the Directive emphasizes the importance of high-value datasets held by the public sector and their quality and openness. The overarching objective is to increase the accessibility and use of critical public sector information to benefit the European economy and society. Numerous administrations across the nation, most notably the federal, regional, and municipal governments, rely on data sources with high intrinsic value.

Directive 37/2013/EU of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information was implemented on 2 June 2014 via the Act Amending the Law on the Re-use of Public Sector Information. Thus, Denmark declared the complete transposition of the Directive. Later, Directive 2019/1024 on open data and the re-use of public sector information was reviewed to put it into reality.

4.9. Cyber Security [CYB]

The National Strategy for Cyber and Information Security 2018–2021 addresses cyber and information security. The Strategy contributes to government security, population competence, and improved coordination of operations and efforts across agencies via 25 particular measures. The necessary technical security requirements for the digital government took effect on January 1, 2020, and all government entities are implementing the ISO 27001 standard for information security management.

The Agency for Digitisation has a unique combination of strategic, professional, and technical capabilities, which has the primary responsibility of managing the public digitalization process from conception to completion. The Agency contributes to and participates in a variety of public sector initiatives. For instance, the Agency and the Centre for Cybersecurity co-chair the National Steering Committee for Cyber and Information Security. Additionally, the Agency oversees public digitalization at all levels of government.

4.10. The use of Emerging ICT [EMG]

The Central Danish Government announced its ICT management plan on 21 November 2017 to enhance ICT operations. For example, the National ICT Committee reviews the management of each ministry's ICT system regularly.

The newest Danish emerging technology initiatives are centered on artificial intelligence (AI). On 14 March 2019, the National Artificial Intelligence Strategy was published to advance and enhance AI research and development and encourage the responsible use of AI in public and commercial sectors. Additionally, the plan seeks to expand the application of artificial intelligence in four critical sectors: health, energy and utilities, agriculture, and transportation. The Strategy aims to achieve these goals via twenty projects spanning four major areas: a solid AI foundation, improved information, concrete skills and new knowledge, and more significant investment in AI. Six ethical guidelines are given for the use of AI, greater public data access, and the creation of a single Danish language resource to aid and expedite the development of DK technology solutions. Denmark has also established a new investment fund to assist in testing, implementing, and developing innovative public-sector technologies. The Foundation, for example, sponsors 15 cross-sector initiatives testing artificial intelligence in the healthcare, social, and employment sectors. The fund will also make annual efforts in areas such as welfare, climate change, and administration. Annually, the Strategy is evaluated and, if required, modified.

The Government of Denmark, the Local Government of Denmark, and the Danish Regions have developed a Digital Welfare Strategy for the period 2013-2020. The plan seeks to increase information and communication technologies (ICT) and social services in frontline public services such as healthcare, aged care, social services, and education. Additionally, the plan seeks to educate the public sector on the impacts of digital technology. Thus, the plan contains a method for evaluating new technologies to determine their applicability in Denmark. The strategy's overarching objective is to modernize, reflect, and improve the production and distribution of public goods. The aim is to enhance general welfare services while reducing operating costs. The federal government's Digital Projects Division consults and educates public entities on major ICT initiatives. The division is responsible for developing and maintaining the state IT project's standard model.

Egypt

1. General Information

Area: 1,002,450 km²

Population: 104,643,849

Government Type: Unitary Semi-Presidential Republic

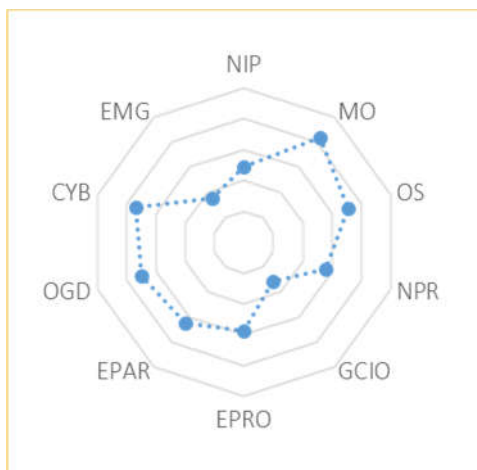
GDP: \$3,830

Internet Users: 71.91

Wired (Fixed Broadband Users): 9.14

Wireless Broadband Users: 64.76

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

In June 2020, the Egyptian government announced a plan to enhance the internet infrastructure, to increase the average internet speed to 50 Mbps. By April 2021, the average internet speed had climbed to 39.6 megabits per second (Mbps), up from 6.5 megabits per second in January of this year. Mobile networks were invested in upgrading Egypt's main roads and metropolitan areas, with an estimated cost of around 1 billion Egyptian pounds (\$63 million). In addition, mobile network operators were allocated new frequencies for a total of \$1.17 billion in value. The National Center for ICT Service Quality Control and Monitoring has been established to regulate and safeguard mobile phone service.

Because of the Covid-19 virus outbreak, Egypt's digital transformation plan has been hastened to some extent. Peak internet use hours have increased from 7 to 15 per day, and the amount of data sent has increased by 99 percent. Cell phone internet usage has surged by 35%, while international calls have increased by 19% in the same period. There was a significant increase in the use of several applications, notably Zoom (346 percent), Telegram (1100 percent), and YouTube (115 percent).

The National Telecommunications Regulatory Authority (NTRA) announced that the Mobile Number Portability (MNP) service would be launched in June 2020. This service will enable mobile telephone customers to keep their phone numbers even if they switch network service providers. As a consequence, efficiency and competitiveness will both improve in the long run. The Ministry of Communications and Information Technology is constantly interested in hearing about innovative ideas, technologies, and business practices. Tenders are made available on the websites of the decision-making body in which they are submitted. There is a level of competition, and the procurement system is based on open bids. Decision-makers evaluate ideas based on their technical and commercial merits, among other factors.

3.2. New Trends

The Egyptian government is upgrading infrastructure and digital government services as part of its ICT 2030 agenda. On capacity development, electronics design and production, and technology parks are emphasized in the plan. Education, healthcare, and government services are among the sectors where the strategy calls for digital transformation. On-demand ICT skills such as website design, data analysis, and digital marketing are highly sought after by employers.

Deployment into the New Administrative Capital (NAC), which will be a “Smart City,” is underway, with the government actively investing in its telecommunications and IT infrastructure. Knowledge City, situated within the NAC, has finished its first phase. Technical training, software and application development, and data design will be possible via applied research centers. One billion Egyptian Pounds (\$750 million) is anticipated to be spent on Knowledge City. As a way to stimulate innovation and entrepreneurship, the city plans to construct Creative Innovation Hubs. The Ministry also establishes six technological parks in Minya, Menoufia, Mansoura, Sohag, Qena, and Aswan, respectively. With hardware design laboratories, startup incubators, and training institutions, these parks will help foster entrepreneurship and innovation.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 4.860, Egypt is ranked 57th out of 64 countries in terms of network infrastructure preparedness. The overall number of Internet users had risen to 59.19 million in January 2021, up 4.5 percent from the previous year. The proportion of persons having access to the Internet remained constant at 57.3 percent of the population at the start of 2021. According to estimates, social media use would be widespread among 49 million people, accounting for 47.4 percent. Mobile phone connections accounted for 92.7 percent of the total population at the time.

Egypt has achieved notable accomplishments through the beginning of 2021, in addition to the statistics, including the following:

- The SEA-ME-WE 5 cable was already operational, tripling the global Internet capacity; by the end of 2020, 95 percent of copper infrastructure was expected to be replaced by fiber.
- Telecom Egypt and Liquid Telecom have agreed to increase the pace at which fiber optic networks are built in North Africa.
- Saudi Telecom made a bid to buy the majority of Vodafone Egypt's stock.
- An agreement between Orange Egypt, Vodafone Egypt, and Telecom Egypt resulted in implementing a \$2 billion infrastructure project.
- Telecom Egypt hired Nokia to create a 5G network, which was made possible by the partnership of Telecom Egypt and Nokia.

4.2. Management Optimization [MO]

The Egyptian Ministry of Communications and Information Technology (MCIT) was committed to establishing a "Digital Egypt" in which technology is welcomed and integrated into almost every area of life. As a result, MCIT's mission is to accelerate the development of ICT infrastructure and digital services within government agencies, increase the effectiveness of departments and other government entities, improve the work environment, provide decision-making support, and address significant societal issues.

The government has executed its Strategic Initiative for Digital Transformation by enhancing residents' living circumstances and delivering e-services across accessible digital and non-digital channels. Government digital systems are integrated to increase the administrative system's efficiency and effectiveness. Additionally, e-governance and the ideals of openness, accountability, and oversight are promoted via contact and involvement with individuals.

4.3. Online Service [OS]

The unified card system is intended to make it easier to provide services and subsidies to individuals who qualify. Each card will be connected to a bank account or an Egypt Post account to increase financial inclusion for the country's 28 million residents who rely on government services.

The health and communications ministries agreed to work together to automate Egypt's universal health insurance system. According to sources, the new technique would first consider the population's geographic distribution and the first locations to adopt the new health insurance law. Under the cooperative agreement, the government issued all citizens unified smart cards, including medical data. After the Health Committee reported on the legislation, Parliament enacted the government's comprehensive health insurance bill.

4.4. National Portal [NPR]

The University Enrollment Project tansik.egypt.gov.eg received the 2009 Public Service Award in Preventing and Combating Public Sector Corruption. The initiative removed the need for 400 thousand students to submit paperwork to the university's enrollment office, lowering the amount of time, effort, and money spent on hand delivery to enrolling offices. The project significantly simplified the process by enabling automated submission, revision, and follow-up of university selections, thereby lowering expenses and increasing efficiency.

www.etenders.gov.eg also achieved the 2011 UNPAN Public Service Award category for Preventing and Combating Corruption in the Public Sector. The site was created in collaboration with the Government Services Authority of the Ministry of Finance.

For the third year in a row, the Governorate of Monofeya's Portal www.monofeya.gov.eg has been awarded the e-first India Award for IT-Municipalities. The site outperformed eleven competitors in 2009, 2010, and 2011. (Vietnam, Bahrain, Jordan, the Netherlands, Sudan, India, Malaysia, Singapore, Sri Lanka, and Bangladesh).

4.5. Government CIO [GCIO]

The Minister of Communications and Information Technology in Sherif Ismail's cabinet, Yasser Elkady, was appointed to the position on the 19th of September, 2015. He has over 25 years of experience in the information technology and telecommunications sectors, emphasizing strategic planning, technology integration, and company development. Elkady is a member of the American Society of Information Technology and Telecommunications (ASITT).

Although the Egyptian public administration does not create explicit chief information officers or other positions of similar significance under its legal framework, it does so both at the national and local levels.

4.6. E-Government Promotion [EPRO]

Egypt Post won the "Best Arab Postal Institution in Digital Transformation" award. The award recognizes the company's postal, financial, and government services, financial inclusion, and digital transformation across all work processes and infrastructure development. It also highlights Egypt's regional and global leadership in postal services.

Attending the "Compliance Challenges and Strengthening Correspondent Banking Relationships" Forum is part of Egypt Post's commitment to helping the government achieve financial inclusion and keeping up with international and regional concerns. With the advent of the De-Risking phenomena, the Venue serves as a critical forum for debate between Arab banks and regulatory bodies.

The Chairman of Egypt Post and his counterpart in Lebanon discussed possible partnership and knowledge sharing areas to help increase postal services, provide new offerings to postal users, and extend international alliances.

4.7. E-Participation [EPAR]

Egypt's administration has managed a successful transition in response to the new globalization era's developments. Egypt's involvement in international accords necessitates that the government function

at a level comparable to other governmental systems globally. The e-government initiative will aid with the transition by offering and integrating the most advanced technologies available.

Government expenditures are intended to be reduced by implementing a new structure for government procurement, enterprise resource planning (ERP), and effective resource allocation. The executives get accurate, up-to-date information and provide accurate and up-to-date information to stakeholders to aid in their decision-making process and allow continuous monitoring of the development projects' progress.

The legislation governing e-signature and network transactions was just published, along with standard E-payment settings. Additionally, the nation encourages all residents and businesses to use the critical public infrastructure. IT professionals are polarized in their desire to work for the government to execute the incentive plan. The government created and maintained national databases, as well as built applications and expanded existing systems.

4.8. Open Government Data [OGD]

Recently, the Egyptian government has emphasized anti-corruption initiatives as part of a broader development program. The industry's goal is to use information technology capabilities to give authorities company indications and reports to assist them in the fight against corruption. The goal is to deploy a data warehouse equipped with analytical tools for detecting crime inside different government entities, highlighting inconsistencies that will need more inquiry. Despite this, there is still a lot of potential for the government to improve data transparency while also doing so quickly.

4.9. Cyber Security [CYB]

Egypt's national cybersecurity strategy was constrained to a 2012 National Information and Communications Technology (ICT) plan, reintroduced under the country's "revolutionary conditions." In December 2018, the United States government released its National Cybersecurity Strategy. Many of the ambiguities from the previous ICT strategy were resurrected with this new policy, which strongly emphasized the vague concerns of cyberterrorism and cyberwarfare.

This setback did not prevent the establishment of cybersecurity organizations and legislation, which had already started to take form. Egyptian government established a committee responsible for monitoring cyberspace for any potentially serious-issue material in 2014 as part of the establishment of the Supreme Cybersecurity Council. The Supreme Cybersecurity Council also intervened in traditional cybersecurity issues, responding to global ransomware strains that affected Egypt in 2017 and playing a central role in Decree 994, which was issued that year and mandated that government organizations take additional cybersecurity measures.

This rule has been used with long-established legislative tools prohibiting protests, media restriction, fake news, and a state of perpetual emergency to repress political activity. Particularly notable is that the 2018 media legislation, called "the Facebook Law," stipulates that any popular social media account with over 5,000 followers may be suspended for spreading "false news."

4.10. The use of Emerging ICT [EMG]

Egypt's goal to keep current with the digital world is reflected in the ai.gov.eg platform, strengthening Egypt's position as a regional and global leader in artificial intelligence. The new digital platform saves employees and anybody interested in AI time and effort while also assisting the state in using technology and achieving digital transformation. Egyptian authorities have made significant attempts to execute their national AI policy, which intends to develop an industry.

For digital security, over 6,000 Honeywell wireless cameras will be installed across the smart city. Cameras in intelligent cities aid in detecting and preventing crime are monitoring unusual behavior. Utilizing high-definition cameras that feed directly into police headquarters might help reduce violent crime by enabling officers to monitor the area more effectively and react more quickly.

Between 2017 and 2019, Egypt's video surveillance systems market expanded modestly, owing to the growing construction industry, new projects in the hotel, government, and tourism sectors, and foreign direct investment in commercial and retail. A regulatory framework governing the installation of video surveillance systems in retail establishments and public spaces will also contribute to market growth in the coming years. However, in 2020, the global coronavirus epidemic began to affect market sales. The abrupt cessation of economic activity in different sectors of the Egyptian economy, from building to tourism, resulted in decreased investment in numerous sectors of the Egyptian economy.

Estonia

1. General Information

Area: 45,227 km²

Population: 1,324,891

Government Type: Unitary Parliamentary Republic

GDP: \$26,470

Internet Users: 89.06

Wired (Fixed Broadband Users): 31.33

Wireless Broadband Users: 165.06

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

□ Estonia's government, which operates via a high-tech e-government system, has garnered renown in the twenty-first century for its forward-thinking attitude. Estonia is a member of the group of nations recognized by the United Nations' E-Government Development Index (EDGI), which means that its citizens and public employees have complete online access to a wide variety of services, including making payments, viewing their complete health records, and voting.

While Estonia won independence from the Soviet Union in 1991, the country's e-government infrastructure was built only in the mid-1990s. Numerous bold new digital initiatives, such as Estonia's e-residency scheme, continue to garner notice and are covered by various news sources around the

globe. Almost all government services, including those provided by state and municipal governments, are accessible 24 hours a day, seven days a week, and about 30% of the population participates in Estonia's i-Voting. While bureaucratic rules have been reduced, the nation believes that these regulations have resulted in an overall savings of 800 years of working time.

Due to the early success of e-commerce and e-banking in the country, the concept of online services has grown in popularity over time. Estonia has already set the bar for e-government. Other nations have since overtaken it in certain areas, and the country was ranked 16th in the United Nations' 2018 global e-government rating. Estonia's government embraces the digital era. Prior to the security incident, the cabinet could have digital meetings using members' electronic IDs. Electronic voting accounted for 43.8 percent of votes cast in the 2019 parliamentary elections. The government organized a global online hackathon to solve COVID-related problems during the lockdown. Among the results were a pandemic-related automated enquiry service and a platform that linked volunteers with people in need.

3.2. New Trends

To prevent the spread of COVID-19, an emergency declaration and border restrictions were announced in early March. Unlike other countries, Estonia simply continued to rely on the strong, durable digital infrastructure it had built over decades. There were already online classrooms, educational resources, and public services accessible. More significantly, Estonians had an understanding of how to use them.

Estonia's success is not only due to technology. Trust in government institutions and people's belief that technology progress would benefit everyone are at the heart of its transformation. This broad support has spawned a digital revolution that may encourage other countries to rethink their public services in the sake of ensuring a more resilient future. During the closure, 99 percent of Estonian government services were operational. Daily activities such as business and property registration, as well as benefit applications, already had online options. Certain benefits, particularly family benefits, are activated automatically in response to certain circumstances, such as the birth and registration of a child. Estonian doctors, nurses, and administrators were able to fight the pandemic due to the availability of e-prescription services. Alternatives to contactless payments are already accessible in everyday life, even at border crossings.

Estonia was a pioneer in the use of digital identity, which enabled the delivery of seamless online services. Official decisions are digitally stamped, and anyone may sign electronically. These digital counterparts have the same legal standing as stamps or signatures.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

According to Estonian data, the nation had 1.21 million internet users in January 2021, which increased by 1.1% compared to the previous year. The Internet penetration in Estonia was 91 percent in January 2021.

The number of social media users reached 986 thousand in January 2021. According to the most recent available statistics, social media users in Estonia accounted for 74.4 percent of the total population in January 2021.

According to the most recent available statistics, Estonia had 1.79 million mobile connections in January 2021, which decreased by 27 thousand compared to the same period of the previous year.

From September 2019, the Estonian Tax and Customs Board's (ETCB) eServices are available in the newly redesigned e-MTA environment. The portal's objective is to simplify tax and customs compliance for both casual and regular users, such as accountants and tax preparers.

4.2. Management Optimization [MO]

All eGovernment standards are met by the Estonian Interoperability Framework, which is based on the administrative simplicity of basic registries and the only-once principle in particular. When database documentation is organized in the State Information System's Management System (RIHA), the purposefulness of data collection and adherence to the idea of a single request for data are checked.

The Principles for Managing Services and Governing Information were published by the Ministry of Economic Affairs and Communications in 2017. The Principles explicitly forbade providing data that was already in a government database. SIS is the Estonian inventory of public sector information systems, encompassing systems, components and services. The RIHA ensures a balanced flow of information and transparent management of public sector information systems. To facilitate database interoperability, system lifecycle management and data reuse, the RIHA maintains comprehensive metadata on all Estonian public sector information systems. RIHA requires registration of public databases and information systems.

4.3. Online Service [OS]

Estonia introduced national eID cards in January 2002, which were designed to serve as the primary form of identification for all public and private activities. The electronic identification card may be used to register a business, authenticate financial transactions, get access to medical data (since 2010), and as a valid EU travel document. By January 2020, 98 percent of Estonians planned to obtain an ID card. Secure authentication and digital signatures are provided by the card for public and private online services by a microprocessor integrated circuit. Here, you may store personal data files, digital signing certificates, and PIN-protected private keys, apart from the owner's name and PIN (national ID code).

Estonian mobile phone users may authenticate their identities using their ID cards. A phone application will act as a secure signing device. Additionally, it may be used to digitally authenticate and sign documents. Rather than relying on mobile ID, Smart-ID stores users' credentials. The smart-ID may be used to sign documents and authenticate users when logging into eServices. They are legal, accepted across the European Union, and have the same effect as handwritten signatures.

The Dokobit Portal is accessible to certain countries, including Estonia, Iceland, and Lithuania. Smart-ID is available to Estonian, Latvian, and Lithuanian users. Digital signatures, digital signature validation, and document exchange amongst Portal users are all supported by the Portal. The Dokobit Portal enables service providers to legally bind any data produced inside their service, enabling them to rapidly and effectively enhance their online business's security. As a result, the Portal is enforceable in all EU courts. Finally, the Portal gathers digital signatures from businesses, government agencies, and individuals.

The Public Procurement Register is a self-service website for buyers (agencies responsible for contracting) and tenderers (economic operators), which is administered by the Ministry of Finance.

Since November 2018, commercial banks in Estonia have been able to join TARGET Instant Payment Settlement (TIPS) through Eesti Pank (Bank of Estonia). TIPS is a fast payment mechanism operated by the euro zone's central banks. TIPS, as well as other pan-European fast payment systems, are available 24 hours a day, seven days a week to customers. In 2012, Estonia processed 99.3 percent of payments online.

4.4. National Portal [NPR]

Estonia's eGovernment Portal was launched in March 2003 as a follow-up to the 2002 eCitizen initiative. Since then, it has been constantly upgraded. The portal consolidates information and services provided by many state departments, ensuring a safe internet for engaging with the state and delivering accurate information and eSolutions to individuals, companies, and authorities. Access to information and eServices on the Portal will vary according to whether the user is a citizen, a businessperson, or a government official. The State Portal environment enables users to authenticate their personal data using national eID cards, conduct transactions with municipal and governmental bodies, complete and submit online forms and applications, digitally sign documents, create email addresses with the @eesti.ee suffix, and receive notifications via email or text message. Additionally, the Portal provides access to over 20 national databases for additional registration services.

Since June 2014, all ministry websites have been similarly structured and arranged to improve visitors' access to information and to provide a clear image of the government, its goals, and activities. The government, government office, and 11 ministry websites are now integrated into a unified online environment known as the government portal. Additionally, each government portal website provides links to the websites of other ministries.

4.5. Government CIO [GCIO]

Estonia's information society is being built by the Ministry of Economic Affairs and Communications' Office of the State Information System Department (formerly known as the State Information System Department, or SISD). The Government Chief Information Officer (CIO) 's Office promotes information society initiatives in the field of information technology, as well as drafts legislation in pertinent areas. More precisely, the government CIO's office is responsible for coordinating all of the state's information technology policies and strategies, including budgets, legislation, projects, audits, standards, procurement processes, and international cooperation in the area of state administrative

information systems (IS). The CIO's office is organized into six different teams: Digital Service Excellence, Legal, Finance, ICT Skills, Cybersecurity Policy, and International Affairs.

The Department of State Information Systems (RISO), which was recently renamed the Office of the Government CIO, is the primary player in managing the government's ICT and information society efforts. RISO is responsible for state information policy and the development of sustainable energy initiatives, including information technology standards and execution.

4.6. E-Government Promotion [EPRO]

Estonian Association of Information Technology and Telecommunications (ITL) is a non-profit organization established to act as a representative body and advocate for the needs of Estonian information technology and telecommunications firms, to foster cooperation in the area of developing Estonia toward an information society, and to support and defend member firms' interests. The Association's primary mission is to popularize information and communication technology (ICT) and to promote vocational education.

The Nordic Institute for Interoperability Solutions (NIIS)'s main goal is to ensure the strategic management and development of cross-border components of eGovernment infrastructure, such as X-Road. Prior to entering into a formal collaboration agreement, the Finnish Population Register Centre (VRK) and the Estonian Information System Authority (RIA) agreed to establish a contractual cooperation platform to which both parties would participate by establishing the X-Road system. NIIS, based on the X-Road project in Finland, then assumed primary responsibility for the project's development from the Population Register Centre and the Republic of Estonia's Information System Authority, starting with chairing the Working Group. Iceland joined the NIIS as a partner in September 2018. The NIIS can function as a network and a platform for cooperation, as well as a provider of IT innovations that benefit the community as a whole. The Institute's objectives include practical collaboration, experience sharing, and innovation development. The existence of an operational model of this Institute is globally unique.

4.7. E-Participation [EPAR]

On June 1, 2011, the Estonian Information System Authority was restructured as the Estonian Informatics Centre (RIA). The Authority's aim is to provide the best possible service to the public via its management and development information system. Additionally, RIA handles all public key infrastructures, including the government portal, the middleware system X-tee, and other backbones such as the State Information System Management System (RIHA), which assists in the coordination of all aspects of the ICT and information technology sector (DVK). Additionally, the Authority is responsible for supervising state information system development projects, as well as project coordination and participation in international efforts. Additionally, RIA analyzes the legislative process with respect to management information system needs.

In February 2011, the Estonian government created the Rural Municipality Portal with the aim of increasing transparency and public participation. This business is based on an innovative concept and utilizes an open source content management platform. The developed strategy includes a preset website architecture that is well-suited for local governments, administrative site administration capabilities, and built-in connectivity with public registers.

4.8. Open Government Data [OGD]

The open data portal enables simple access to public sector data for everyone, from individuals to companies, while also allowing re-use and redistribution for commercial and non-commercial purposes. The Open Data Portal was created to aid in the distribution of public sector data and to enable anyone to search for and get it. Construction is underway. Users may utilize the Open Data Portal to search for and download open data, as well as contribute new open data. While open data may be uploaded, new data must be registered prior to publication.

4.9. Cyber Security [CYB]

Estonia's cybersecurity strategy for 2019-2022 lays out the country's long-term goals and the critical measures necessary to accomplish them. The military and academia are two lesser-known sectors of Estonia's digital economy. The Action Plan for E-residency 2.0 was approved, which includes enhanced security and commercial incentives. A comprehensive action plan would involve the development of an intuitive online platform that would enable customers to access a variety of government services. Through a marketplace, businesses from Estonia and across the world may provide services to eResidents. The nation's AI strategy for the period 2019-2021 was announced in June 2019 with the objective of decreasing the burden on government employees while improving decision-making processes. By 2020, the goal was to have at least 50 government initiatives using artificial intelligence. There were 27 AI-based public sector solutions available in February 2020.

The Cybersecurity Strategy for the Period 2019–2022 expands on the Cybersecurity Strategies for the Periods 2008–2013 and 2014–2017. The purpose of this document is to kick-start talks on a sector-wide strategy. The Strategy serves as a road map for planning and resource allocation. The Cybersecurity Approach is a cross-sectoral approach including the public and commercial sectors, critical service providers, field companies, higher education institutions, and research organizations.

The Cybersecurity Act, which took effect in May 2018, aims to strengthen the security of digital systems critical to people's everyday lives, as well as those used to deliver social and other critical services. The Act establishes standards for society and state maintenance, as well as for local government networks and information systems. The legislation establishes responsibility and oversight obligations, as well as a framework for addressing cyber incidents.

4.10. The use of Emerging ICT [EMG]

The X-Road connects various government databases, and the data exchange in the public sector requires X-tee. Law enforcement and government organizations may conduct nationwide database searches via a centralized user interface with privacy controls. The technology has been improved to enable the creation of eServices that can connect to a variety of databases. The X-tee system now supports database and data transfer applications, as well as web-based service portals and sequential querying of many data sheets. Authentication, authorization, a MISP (mini-portal system), and the ability to register basic inquiries are required for registration systems (WSDL mode).

One of the main goals of eGovernment is to increase the availability of high-wage jobs. Estonia developed its National Artificial Intelligence Strategy in 2019, as part of its Digital Agenda 2020. The country's mission is to create a national plan for artificial intelligence in public services. The National

Strategy seeks to enhance decision-making by automating government procedures. AI could be used to match job seekers with available jobs via the Estonian Unemployment Insurance Fund. Additionally, the updated Estonian Digital Agenda 2020 encouraged the use of new technologies such as artificial intelligence (AI), blockchain, and the Internet of Things (IoT) to create pilot projects for the state information system and essential components. Estonia's Parliament has implemented a new artificial intelligence system named HANS (Human Assistance for Legislators and Employees).

Fiji

1. General Information

Area: 18,272 km²

Population: 904,153

Government Type: Unitary Parliamentary Representative Democratic Republic

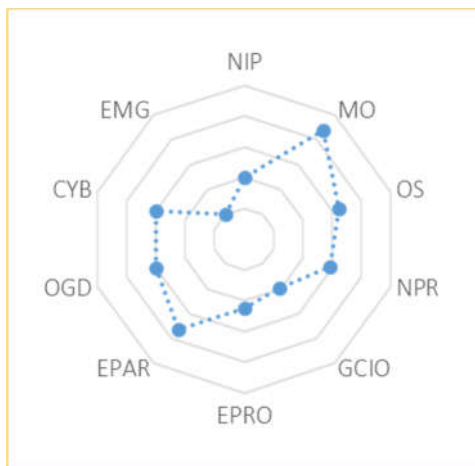
GDP: \$5,070

Internet Users: 49.97

Wired (Fixed Broadband Users): 1.48

Wireless Broadband Users: 147.52

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

With the agreement signed by the Fiji Competition and Consumer Commission (FCCC) and the Pacific Office of the United Nations Development Program (UNDP) in Fiji, UNDP is supporting the enhancement and development of the FCCC's online platforms, as well as the development of a customized mobile application that allows consumers and vendors to access pricing, market information, and complaint filing systems. An app (the App) is also being developed for UNDP-provided tablets and e-kiosks and will be available for download by consumers and businesses on cell phones. It will run on these devices. To name a few items, the App will include self-guided legal and rights information on corporate obligations, current access to the Fiji Universal Price List, consumer rights and responsibilities, and data on landlord and tenant regulations.

The digital transformation centered on the user will enable Fijians to take part in fair market practices as consumers and business operators, contributing to the establishment of a compliance culture in Fiji and ensuring market stability. Australian and United Nations Development Program funds are available to help with the digital switchover process. Australian High Commissioner to Fiji, His Imperial Majesty John Feakes, stated Australia supports institutions that encourage and facilitate sustainable economic growth in Fiji.

3.2. New Trends

Universal access to education at all levels must be maintained, with a focus on educational quality. This will increase the supply of highly trained, world-class workers ready for global employment opportunities. In addition, investments will be made in existing and new educational facilities, the purchase of new equipment and resources, digital learning, and the enhancement of teacher performance. Increased employment and in-service teacher training will raise and sustain teacher-to-student ratios, as will teacher quality.

High-speed internet networks and broadband access will improve digital connectivity, and all sections of Fiji will be connected digitally. Investments will be made to increase digital connectivity, and new and better technologies will promote productivity and service delivery. The ICT sector will be leveraged to generate employment, increase efficiency, and enhance the overall quality of life.

The administration intends to expand existing telecentres and build new ones around the country. The overall degree of digital literacy will be raised. This improved connectivity will expand work opportunities for all Fijians living in rural and distant areas and jobs in information technology support services. These modifications will encourage greater commerce and development while also attracting new sources of investment and growth.

Through 2022, there will be a stronger focus on developing financial literacy, financial inclusion, access to finance, integrated digital payment systems, access to insurance services, capital market growth, and the implementation of a legislative framework for credit unions and moneylender regulation.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Fiji ranks 55th out of 64 countries regarding network infrastructure adequacy, with a score of 5.048. In January 2021, the total number of Internet users had increased to 634.1 thousand, an 8.2 percent over the previous year. At the start of 2021, the percentage of people with Internet connections remained unchanged at 70.5 percent of the population. According to projections at the time, social media usage would be shared among 610 thousand individuals or 67.8 percent of the people. At the time, mobile phone connections represented 138.6 percent of the entire population.

Fiji has one of the Pacific Islands' most advanced communications infrastructures, with the highest mobile and internet usage rates. It is the market to watch for both LTE and 5G growth in this region. Fiji's mobile providers, Digicel Fiji and Vodafone Fiji, have continued to invest in LTE and LTE-A

technologies, which now account for most mobile connections. Concentrating on densely populated regions, operators are preparing for the next growth sector in mobile data. Additionally, operators are evaluating 5G and preparing their networks to support it.

4.2. Management Optimization [MO]

Four strategic objectives were identified in the following e-government Master Plan, which was published in 2007:

- Incorporate cost-effective forms of service delivery into government operations
- Rebuild service delivery to focus on citizens;
- Increase operational efficiency inside and across federal departments;
- Boost government officials' ICT competencies at all levels.

Users can provide feedback on government services via DigitalFIJI, a new platform and mobile app launched in June 2018. It includes a directory service that contains contact information for government departments and entities and a feedback system that allows users to provide feedback on government services, with the ability to attach documents and photos and track their responses.

4.3. Online Service [OS]

Civil papers, including the Births, Deaths, and Marriages Registry, the Companies Registry, and the Titles, Deeds, and Partnerships Register, have been digitized in Fiji as part of a larger initiative digitize the country's civil records. An e-profile provides access to these services and information on taxes and superannuation, all of which are now available online.

DigitalFIJI's effort includes myFeedback, a mobile app that allows users to submit immediate feedback to the government in addition to an online government directory. Additionally, e-services are offered for the registration of births and the establishment of enterprises.

The Ministry of Economy is in charge of the administration of TenderLink, the e-tendering platform. Residents of Fiji may watch free digital television programs throughout the nation by connecting to Wales (a state-owned enterprise) via aerial or satellite connections. The federal government maintains a variety of informative portals and websites.

4.4. National Portal [NPR]

The Fiji National Provident Fund (FNPF) must collect compulsory employer contributions for all Fijian employees' retirement funds. Employers pay 18%, and employees pay 8%. Employers must report monthly to the FNPF. Previously, these monthly contribution schedules (CS) were sent to members manually. This method offered several challenges to the FNPF. Employer Online Portal accepts and distributes donations electronically. Employers may submit the CS online, which quickly changes member accounts. In December 2016, 4,059 employers utilized the platform, accounting for almost 95% of contributions. In 2017, 6,109 businesses registered and paid 98% of fees. The employer portal also benefits members by boosting contribution compliance, staff efficiency, and data accuracy.

4.5. Government CIO [GCIO]

The position of Chief Information Officer (CIO) was given to the Ministry of Information. This structure consists of a CIO Council, which reports directly to the eGovernment Steering Committee on all eGovernment topics and is responsible for the agency-level implementation of the eGovernment Master Plan. The CIO Council is composed of representatives from the government, industry, and academia. On the other hand, other conditions must be satisfied before the CIO concept may be implemented entirely by the federal government.

4.6. E-Government Promotion [EPRO]

DigitalFIJI is a four-year initiative to install government applications and improve general ICT infrastructure. It also establishes and improves digital transformation skills. Towards that objective, Fiji's National Development Plans for the next five and twenty years call for improving government services continually. Assuring that digitalFIJI has a long-term and sustainable impact on every Fijian is the job of a Program Management Office (PMO).

Fiji's DIGITAL ECONOMY will benefit significantly from the digitalFIJI program's goal of accelerating growth in critical areas. There is also the creation of a solid IT infrastructure to enable an effective solution architecture in information technology. The program will increase the general competency of public officials in ICT and their ICT abilities via training programs; and encourage public engagement in developing Fiji's IT industry and community so that it is strong, inclusive, and sustainable.

4.7. E-Participation [EPAR]

Communication, education, banking, health, online shopping, and national identity are just a few types of data that can be input into a system. Having an email, social media, or mobile phone account creates a digital identity. For educational purposes, personal data must be collected and stored in databases. Everything mentioned above helps to establish digital identity.

All bank accounts and cards (M-paisa etc.), online shopping, house loans, hire purchase agreements, and NPF accounts are offered by internet banking services. Patient records must be kept on the cloud, even at public hospitals. Bus riders may purchase e-tickets using a card reader. A digitized Fiji is made possible through voter ID cards, birth certificates, and the FijiCare app for contact tracking during the COVID19 epidemic.

4.8. Open Government Data [OGD]

The official government website of Fiji contains information about departments and ministries and news briefs and press releases, among other things. It acts as a conduit for exchanging information concerning e-health and e-tendering, but it does not include any publicly available government data. That must be why the country Open Government Data indicator placed in the middle of the list, with a score of 5.909.

4.9. Cyber Security [CYB]

The Fijian government's Information Technology and Communications Department is currently coping with a cyberattack. The government's cyber specialists work closely with its cybersecurity

partners to quickly identify and resolve the problem. After recommendations were circulated across the government to protect network integrity, the nationwide network, including GovNet, had a brief outage. The ITC Department is progressively upgrading the network's security requirements. Government services may be inaccessible for days until the situation calms.

Forensic evidence points to a non-ITC Department government server as the culprit. We anticipate the current forensic investigation to provide light on the incident's scope in the coming days. Globally, the number and complexity of cyber-based threats are increasing. Attacks against nations including the UK, US, Australia, Singapore, and global companies have increased. Fiji's cyber security architecture was created using worldwide best practices to react promptly to previous cyber threats. The cybersecurity measures will be adjusted to remain ahead of future cyber threats based on the investigation's results.

4.10. The use of Emerging ICT [EMG]

The reproduction of human intelligence by computers intended to replicate human behaviors such as learning and problem-solving is known as Applied Artificial Intellect (A.I.). Artificial intelligence (AI)-driven machines are critical in the twenty-first century, and they have had a significant impact on academics, legislators, and innovators. Artificial intelligence has had a short and long-term influence on a range of industries due to its development. To mention a few, they include global productivity, equality, and environmental preservation. On the other hand, the alleged prospective effects of artificial intelligence on people are both beneficial and harmful. Artificial intelligence is both an opportunity and a hazard, according to 55.3 percent of respondents, while it is essentially a benefit for 20.2 percent. However, 18.1 percent of those surveyed said it was a potential danger. 3.2 percent chose neither danger nor opportunity in the case of artificial intelligence, and the same was true for the final choice. This scenario might have been exacerbated by a lack of understanding of artificial intelligence.

Finland

1. General Information

Area: 338,424 km²

Population: 5,549,978

Government Type: Unitary Parliamentary Republic

GDP: \$54,330

Internet Users: 92.17

Wired (Fixed Broadband Users): 33.32

Wireless Broadband Users: 155.76

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Finland is a digital governance pioneer in Europe (eGovernment). Furthermore, it is a market leader in this field on a global scale. For a long time, Finland's public sector has used information technology. In 1958, the Social Security Administration (using punched cards) and Postbank (using printed cards) developed the first computers. The government founded a computer facility in 1965. Since then, a continuous stream of policies and initiatives has sought to maximize the use of information technology in both the front and back offices. Finland's government agencies increasingly use artificial intelligence (AI) and other new technology to bolster public services and government support operations and simplify administrative processes.

The government has granted permission for the digitization of services. Participants from all walks of life will be welcome. Numerous government efforts have been launched to help those who are unable to use digital services. The government is constantly adjusting to changing circumstances via both private and public sector collaboration. Along with developing service ecosystems centered on life events and business life cycles, the government is accelerating better services by integrating them into people's lives. Governments, corporations, non-governmental organizations, and other groups comprise these ecosystems. The government of Finland is also developing customer-centric cross-sectoral service models for people and companies.

Trust in governments is necessary for successful digital governance. In Finland, people and businesses trust authorities to provide services on time, correctly, and without prejudice. Governments inspire confidence in citizens and companies. Finland's public sector is often regarded as one of the cleanest in the world.

3.2. New Trends

Finland aspires to be a global leader in digitization and help Finnish companies effectively use the digital economy to increase competitiveness. The Real-Time Economy effort was established to further these goals. The project is administered by the Finnish Patent and Registration Office, which is responsible for distributing and promoting innovation in Finland (PRH).

Each transaction is carried out utilizing digitized, structured (machine-readable) data and processing. In a digital economy, all services are available online and may communicate with one another. The company's business data is sent electronically in real-time, and the authorities are notified immediately. Automatic data processing leads to time and money savings for companies. Businesses take ownership of their data and use it strategically to their advantage. Business data enables government employees to offer better services. The project aims to advance digitalization and the real-time economy via the Finnish government's national digitalization and real-time economy promotion initiative. People are now more aware of how prepared individuals are to adjust digitally due to the coronavirus epidemic.

Only through collaboration can the digital revolution be realized. To guarantee the initiative's success, all key stakeholders, including businesses, government institutions, and financial administration service providers, must be committed to the change and work together. The work completed on this project will provide the foundation for the future growth of the digital economy.

The National Death Registration and Reporting System is a side project that is not directly related to the public relations or human resources departments. Additionally, the project is being supported by several other organizations, including the Confederation of Finnish Industries (EK), Finance Finland, the Finnish Commerce Federation, the Federation of Finnish Enterprises, the Association of Finnish Accounting Firms, and Technology Industries of Finland, as well as the Ministries of Transport and Communications and Finance.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

According to the most recent data, Finland's internet users rose by 0.1 percent to 5.27 million people in January 2021.

Additionally, there was a 6.1 percent increase in the number of individuals who utilized social media platforms during the same time. According to estimates, Finland will have over 9.9 million mobile connections by 2021.

By 2021, 178.3 percent of the population will have access to mobile devices, even though the number of people with such connections has dropped by 59,000 since 2010.

4.2. Management Optimization [MO]

Digitalization is one of the government's primary goals, as mentioned in Prime Minister Sanna Marin's Programme. The strategy expects that the public sector will provide digital services to people and companies by 2023. Increasing the digitalization of the public and commercial sectors requires open government data, the creation and maintenance of digital identities, and the development of cyber security capabilities. On February 6, 2020, the AuroraAI national artificial intelligence project was established to enhance the interaction between people and services.

The revised Public Administration Information Management Act (906/2019) became effective on January 1, 2020. The new general legislation has specified the duration of the public administration's information. The reform aimed to consolidate and standardize each institution's data sets to guarantee uniform administration and safe data processing. This project was launched to raise awareness about the essential need for improved information management to serve the people more effectively and efficiently. Furthermore, the objective was to improve data sharing. Throughout the reform process, about thirty pieces of legislation were modified. The newly formed Public Administration Information Management Board, self-governing and accountable to the Minister of Finance, was one of the reforms.

4.3. Online Service [OS]

Occupational Safety Finland is the country's only employment agency. Individuals may use the site to conduct job and career searches.

The Finnish Digital Agency is responsible for establishing digital credentials and identities. Finns may use a personal identity code (PIN) to access electronic identification to retain an online identity (eID). Finland is presently the only nation in the world where you may protect your data and keep an accurate identification with the assistance of the Finnish Digital Agency. Finland's national eIDs have a good IDAS score. Only the eID cards issued by the Finnish Digital Agency are compatible with eIDAS High in Finland. The Finnish Digital Agency has negotiated effectively with government departments to provide banking and mobile certificate services.

The Population Register Centre's certificate system combines public, organizational, and server certificates with PKI to provide credentials to people, businesses, and servers. Protecting the privacy and security of personal data is a fundamental human right and is required of Internet service providers. The client's name, initials, and a unique customer ID number are stored in FINdID. It is capable of

recognizing and scrambling emails. Additionally, this gadget supports eSignatures and may be linked to your ID card. The certificate safeguards electronic transactions. Electronic signatures are equivalent to handwritten signatures in legal terms. Each individual is issued a digital agency card.

Hansel eProcurement is a wholly state-owned enterprise that specializes in eProcurement technology and services. Through its online procurement service, it maintains an up-to-date public bid database. To get access to this database, you must utilize current public bids. An eInvoicing platform powers the notification database. Users may elect to get an email notice followed by an in-person follow-up.

4.4. National Portal [NPR]

People and companies may use Suomi.fi nationwide, in which their information is centralized. All the services, emails, and e-authorizations are included on the site.

In the Finnish Service Catalog, people and companies throughout the nation may post public information and service channels. Online service Suomi.fi provides information and assistance for various business events. The Finnish Service Catalog is a public and corporate database that includes information about public utilities and channels. The Service Catalog enables private and third-party businesses to update their service details. Electronic Authorization (EA) Myregister data is collected from various authority registries; Messages is a safe route for electronic communications, decisions, and messages between the government, people, and enterprises. Affirmative action allows people and companies to view their data in registers such as population, property, and vehicles. Suomi.fi Maps includes public service places and enables navigation. Suomi.fi Payments are easy to use and connect with a broad range of eServices.

Paikkatietoikkuna is a national website dedicated to the production and use of geographical information in Finland. It is built on open-source software and allows users to explore hundreds of map layers created by diverse organizations on various topics, such as geography, land use, and a map window. Individuals, businesses, and public agencies all make use of the site on a need-to-know basis.

4.5. Government CIO [GCIO]

The Government has appointed Jarkko Levasma (MSc) as Head of Government Information in the Ministry of Finance for a period ranging from 1 August 2021 to 31 July 2026.

Each ministry and government agency's Chief Information Officer may have a unique formal title and job description. The presence of CIOs in each Ministry and government agency is not mandated by law; instead, the CIO position is filled under each institution's internal procedures.

The mandate and role of CIOs are changing, particularly at the ministerial level. Previously, they were responsible for all information technology inside an organization. Today, since the Government ICT Center Valtori (established in 2014) offers infrastructure services (or sector-independent ICT-services), the CIO's operational responsibilities have diminished, and the job has become more strategic. The primary duties of this new job include the development and administration of business architecture, ICT strategy, and information and cybersecurity strategy.

4.6. E-Government Promotion [EPRO]

The Population Register Centre, the Local Register Offices, and the Steering and Development Unit for the Local Register Offices were merged into the Digital and Population Data Services Agency (the Finnish Digital Agency) on January 1, 2020. The Agency is responsible for developing e-government services, ensuring the accessibility of people's data, and meeting the requirements of citizens throughout life events. The state-run information technology facility The Valtori Corporation is a ministry of finance administrative entity, which offers the central government data and information communications and integration services. The Ministry of Finance has proposed dissolving Valtori's board of directors to better reach the company's strategy with consumer expectations and governance.

Authorities and security operators rely on Virve, a Tetra-based administrative security radio network, for situational awareness and cooperation. Virve substantially facilitates cross-organizational collaboration. The Next Generation Virve 2.0 enables future communication and collaboration between authorities and other parties. Because video, pictures, and data have been intended to be sent to consumers through broadband in 2022, we may anticipate an increase in service quality. In 2020-21, Finland and Estonia planned to enhance their X-Road 7 data exchange. The Nordic Institute for Interoperability Solutions is in charge of this website's management (NIIS).

The Fourth Finnish Open Government Action Plan (2019–2023) addresses openness and inclusion in three dimensions: shared values, long-term security, and healthy growth. The Open Government Strategy will set long-term goals and objectives that will serve as the basis for future action plans. It will result in the creation of a Transparency Register that will provide these advantages. These commitments will be reviewed and appraised during and after the strategy's implementation.

4.7. E-Participation [EPAR]

Demokratia.fi, the Finnish government democratic information portal, aggregates numerous websites that provide pertinent information on democratic decision-making, including news articles. The site assists people in identifying more meaningful ways to participate while also making it more straightforward for the government to be transparent and engaged. Lausuntopalvelu.fi highlights the eDemocracy online services offered by the Ministry of Justice, including Parliamentvelu.fi, otakantaa.fi, nuortenideatinsteadParliamente.fi, and kansalaisaloite.fi. Demokratia.fi provides connections to different public authority websites that describe current projects or developments, including its own. Additionally, it contains up-to-date information about politics and administration. The webpage includes links to government organizations that provide services to the general population.

4.8. Open Government Data [OGD]

There have been three sites for the locals to access to digital administrative producers, as follows:

- Opendata.fi, a service that enables public administrative bodies to share open data, allows them to do so. Opendata.fi is a free site that anybody may use to get open public data. Users,

including businesses and individuals, may continue to use the service. The service describes and recommends available data sets and interoperability solutions.

- Lounaistieto.fi, the Southwest Finland Regional Information Service provides accessible public information in texts, images, and statistical data to residents and businesses in the region.
- Avoinsatakunta.fi, the Open Satakunta website, has projects centered on data and open education and initiatives aimed at both people and companies.

4.9. Cyber Security [CYB]

The Finnish government published the most current version of the country's Cyber Security Strategy in October 2019 by introducing a bill in parliament. The Security Committee monitors the security environment and general development via proactive security preparation management. The most recent version of Finland's cybersecurity strategy published in 2019 sets goals and creates strategies for ensuring the safety and security of critical national systems and services. International cooperation is emphasized, as is enhanced coordination of cyber security activities, cyber security skills, and increased strategic planning. Additionally, the government has committed to creating a new cyber security development strategy to boost government resources dedicated to cyber security. Cyber security policies and plans for cyber security research and development are more advanced, which helps to clarify the complete picture of cyber security initiatives, programs, and projects.

4.10. The use of Emerging ICT [EMG]

Prime Minister Juha Sipilä's administration (2015–2019) prioritized artificial intelligence as a significant government objective. Finland's Minister of Economics, Employment, and Communications, Mika Lintilä, inaugurated Finland's AI Initiative on May 18th, 2017. The Artificial Intelligence Program convenes a diverse group of experts and influencers from various areas, including business and industry. The group used a "network of networks" strategy to effectively involve a diverse range of organizations in planning and preparatory work flexibly.

Between September 15, 2018, to February 28, 2019, the Ministry of Finance initiated a research project dubbed the National AuroraAI Programme. AuroraAI was born out of the early study into how and what service improvements AI-based services need. The AuroraAI network, as mentioned in the 2017 AI Program report, is designed to allow seamless connection across services and platforms. The government planned to protect and preserve the AuroraAI network's ethical and sustainable growth to simplify life and business. AuroraAI was announced on February 6, 2020. Although the project is not expected to be completed until 2022, it sets the groundwork for utilizing AI to improve service and human relationships. The AuroraAI service model enables public sector entities to collaborate with private sector entities to fulfill the needs of individuals and organizations. It is built on the principle of cross-sector and open networking. Everyone is welcome to apply, regardless of their employment status in the public, private, or third sectors. The Finance Ministry is responsible for strategy, resource allocation, and program implementation. The AuroraAI network is based on the foundations established by the Digital and Population Data Services Agency.

France

1. General Information

Area: 551,695 km²

Population: 65,458,303

Government Type: Unitary Semi-Presidential Constitutional Republic

GDP: \$ 45,000

Internet Users: 83.34

Wired (Fixed Broadband Users): 46.92

Wireless Broadband Users: 99.26

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

France has long aimed to become a 'digital republic' by investing heavily in digital innovation in all government areas. With an aggregate score of 81.7544, the country was ranked 22nd in the Waseda International Digital Government Rankings in 2021. Hyper innovation in France is supported by the government, which provides the necessary infrastructure. However, as a global technology player, France is not on pace with Japan, the UK, the US, or Switzerland when it comes to digitally driven economic activity. DESI, a measure of digital performance and competitiveness among EU member states, placed France 16th overall on the list. Also, France ranks 24th in RFID use, 20th in social media, 16th in cloud computing, 15th in online selling, and 15th in cross-border online selling.

As a result of the pandemic and COVID-19, many previously reluctant French companies have accelerated their efforts to understand and implement digital transformation. By digitizing, permitting remote work, increasing internet penetration, and growing their online company, several of these organizations overcame the obstacles they faced. However, France and French businesses still have a long way to go to become real leaders in digital technology and digital innovation in the medium to long term.

The "Chèque France Num," a 500€ check meant to help companies impacted by Covid-19 start their digital transition, including selling online, was formally announced by the French government earlier this year. There is a special welcome offer for new French eBay sellers that ends on June 30, 2021, but the check might be a helpful boost for individuals who want to expand their online company. Around 110,000 assessments will be distributed on a first-come-first-served basis.

3.2. New Trends

To achieve digital transformation, the French Recovery and Resilience Plan (RRP) will contribute EUR 8.4 billion (21.32 percent) in funding, above the 20% target. A EUR 2 billion investment will be made in the digitalization of health to boost medical data exchange, build a digital health platform, and guarantee interoperability among software produced by public and private sector partners.

Additionally, France plans to invest an additional EUR 1.8 billion in developing and implementing vital digital technologies (such as cybersecurity, quantum computation, and cloud computing) to promote innovation and broader usage of these areas under EU objectives. Additionally, France will participate in two IPCEIs in cloud and edge computing, microelectronics, and communications technologies.

In the coming years, education and training systems are expected to become increasingly more computerized. In 2022, 45,000 classrooms should be equipped with cutting-edge digital technology, and 1.4 million students in higher education should have access to hybrid learning. It is part of the investment in skills that digital skills training for students and workers will be supported. France Num, the government's initiative to assist 200,000 small and medium-sized enterprises (SMEs) with their digital transformation, will also be implemented.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

In 2021, France ranked 11th in the metric of network infrastructure preparedness. France had 59.47 million internet users in January 2021, an increase of 1.4 million over the previous year. France also had a 91% penetration rate at that time. During the first quarter of 2021, France had 49.60 million social media users, accounting for 75.9 percent of the population. 67.21 million people, or 102.8 percent of the country's total population, were connected to mobile networks.

The French have made considerable strides in their investment in France's digital transformation path. ARCEP is in charge of distributing press releases and implementing activities to support the transition from copper to fiber infrastructure. French citizens will be able to access the internet thanks to a

service provided by SpaceX. Furthermore, with the help of local governments, Orange Concessions manages the deployment of fiber optic networks. A piece of Iliad's French tower property is being sold to raise money for the introduction of 5G. Significantly, decommissioning of the PSTN will begin in 2023, and regulators have approved 5G testing in the 26GHz spectrum.

4.2. Management Optimization [MO]

1.5 million individuals will be taught digital literacy as part of the National Strategy for an Inclusive Digital Society, announced in 2018 to minimize inequities and guarantee that everyone in the nation has the same opportunity to succeed. An estimated 13.3 million French people live without access to the internet, making it impossible for their government to implement digital transformation efforts.

Prime Minister Édouard Philippe launched Public Action 2022 in September 2017 as part of his modernization initiative for the French government. Public service delivery, staff well-being, and financial management are the project's key objectives. An Inter-ministerial Committee on Public Transformation was convened in October 2018 to create a National Strategy for the Transformation of Public Action. The program's progress can be measured and reported using the metrics stated in the plan. Consequently, French people will be able to track changes over time. Reforms must meet people's demands, and full disclosure of all expenditures is a sure sign of reform success.

4.3. Online Service [OS]

The FranceConnect sign can be seen on the websites of several public agencies, including impots.gouv.fr (taxes), AMELI (social security), La Poste (the postal service), and MobileConnect et moi. The FranceConnect logo has been shown on FranceConnect login pages since January 23, 2018. Thanks to the site's new connection method, customers can now use [Impots.gouv.fr](https://impots.gouv.fr) for all of their online purchases.

Since the middle of October of last year, the General Directorate of Public Finance (DGFIP) has begun providing public institutions and customers with better, safe, and current online payment services under the PayFiP brand. To pay municipal and public sector invoices through bank deposits, PayFiP was created.

4.4. National Portal [NPR]

The Interministerial Directorate for Digital Affairs has established an API gateway (DINUM). Administrations frequently use several APIs from various sources to develop a teleservice or a novel approach. DINUM has created a bespoke application called 'Signup' to assist data providers in the process of gaining access to their data. Providers can easily promote their APIs using the catalog. France's efforts are underway to centralize personal data held by administrations (such as the National Family Allowance Fund or the Directorate General of Public Finance) and help administrative service providers (administrative departments and cities, among others) develop more efficient online processes.

The Interministerial Directorate is developing the FranceConnect Platform for Digital Affairs. Public service providers just need to maintain one account and one point of contact to offer online public services. No new public identity providers will be created due to FranceConnect; instead, the current user accounts will be linked together. After its launch in June 2016, FranceConnect was planned to be used by 15 million individuals by the end of 2020.

4.5. Government CIO [GCIO]

E-Government policies and initiatives are formulated and coordinated by several established organizations, including the Council for the Modernization of Public Policies (CMPP) and the Directorate-General for State Modernization (DGME). It is up to the council and directorates to oversee their respective industries' and departments' e-Government duties. All three positions are held by one agency: the Interdepartmental Agency for Digital Projects (Direction in terms ministérielle du numérique and the system of information and communication of the State), which is also the Government Chief Information Officer, Government Chief Digital Officer, and a member of the Cabinet's Data Management Committee.

4.6. E-Government Promotion [EPRO]

In 2018, the State Secretary for Digital Affairs established the Coordination of Territorial Digital Transformation (DCANT). Programs developed together by elected officials and state agency representatives aim to alter the region's economy via digital technology. The objective is to provide a wide range of digital public services that are both complementary and efficient.

When the Digital Bill was brought into law on October 7, 2016, it paved the way for an entirely digital economy and its accompanying issues. Innovation and the digital economy can help create an open and trustworthy digital society while protecting people's rights. Additionally, it aspires to guarantee that everyone has access to all digital technology options no matter where they are. In an innovative approach, internet users were encouraged to contribute to a document before it was submitted for assessment.

EC 2000/31/EC on internet commerce was implemented on June 21, 2004, by the Law for Trust in the Digital Economy, passed by the European Parliament. As a result of this legislation, eCommerce services in France were given legal protection. As of Dec. 12, 2018, a new piece of law has been implemented. Finally, this law was codified as part of the codification process that concluded in Ordinance No. 2014-697 on the Development of Electronic Invoicing on June 26, 2014. The Ordinance mandates that electronic invoicing be accepted by all governmental entities engaged in acquiring goods and services. Invoices must be sent electronically until January 1, 2020, for all companies. As of January 1, 2025, if a firm is big enough and engages in industry, electronic invoicing will be necessary, regardless of its size or sector.

4.7. E-Participation [EPAR]

A score of 9.800 earned France 7th place in the Waseda rankings in 2021. The government's interministerial network facilitates data exchange between and within Ministries. eGovernment data exchanges are eased and guaranteed by this essential element of the modernization of the state's information system and, by extension, public activity in France. A goal of 14,000 locations is set for 2022 as the French army prepares to deploy, with more than 13,000 linked as of January 1, 2020. When it comes to safe Internet surfing, the Network will have more features by 2022.

Because of the Secure Interministerial Intranet for Governmental Synergies, government personnel could discuss and share top-secret information since November 2007. The National Agency for System and Network Security is in charge of protecting the country's electronic infrastructure against cybercrime and other threats. The Trans European Services for Telematics Between Administration (TESTA) allowed the EU's agencies, institutions, and member states to communicate digitally.

4.8. Open Government Data [OGD]

Public data reuse is encouraged by legislation governing the repurposing of public sector information for non-commercial purposes. General information can now be accessed and reused in a relaxed way thanks to this rule. This idea might be beneficial to both state and municipal administrations. When a government agency must give up its resources to open access, there is an exception for digitalized cultural financing and made accessible online.

There is an open data portal for the French government at data.gouv.fr. The site can access data created by governments, enterprises, individuals, and non-profit organizations. Anyone can post a dataset, make comments, or publish for reuse on data.gouv.fr.

Since June of this year, DINUM has been studying the usability and user experience of France's 250 most frequently used public services. One of the project's key roles is prioritizing those services' product roadmap and cooperating with other government entities. According to DINUM, the sole notion of responsiveness, user delight, and speed and performance are used to assess the quality of the user experience. Every three months, the data is updated as open data, making it available to everyone on the site.

4.9. Cyber Security [CYB]

As part of a nationwide awareness effort, all French people must understand and do all administrative tasks in an entirely secure manner. Affirmatively, even though legitimate state and local government websites provide the same services free of charge, fake official websites charge for the most basic administrative duties (accessible from the website www.service-public.fr). Individuals who utilize these services are subject to intrusions into their private life since they are offered the privilege of accessing their most confidential data.

As of February 26, 2018, President Macron signed a new security law into the law. As of July 6, 2016, European Parliament and Council Directive 2016/1148 specify measures to ensure a high degree of security for EU networks and information systems.

With the Personal Data Protection Act's entry into force on June 20, 2018, the 6 January 1978 Law on Informatics and Liberties was brought into compliance with the information security requirements of the European Union (EU). The General Data Protection Rule (GDPR), which went into effect on April 27, 2016, and the Police Directive, which oversees criminal records, went into effect on May 25, 2018, respectively, in all EU member states.

4.10. The use of Emerging ICT [EMG]

During the AI for Humanity Summit in 2018, the government presented a National AI Strategy in response to the Villani AI Report.

On November 28th, 2018, the National AI Research Strategy's core components were unveiled. 665 million € will be invested in the strategy by the end of 2022. Research is the foundation upon which advances in artificial intelligence (AI) are constructed. French math and computer science institutes have already made the country a global leader in this field.

There have been two requests for expressions of interest from the Interministerial Directorate for Digital Affairs (DINUM) and the Interministerial Directorate for Public Transformation (DITP) since the release of the National Strategy for Artificial Intelligence. Two of them were in 2018 and had six projects each; the other was in 2019 and included fifteen projects each. A group of judges selected the most acceptable proposals from various administrations, including the federal and state governments and non-profit organizations. For the next ten months, the AI Lab sponsored by DINUM and DITP evaluated and developed the selected concepts.

Georgia

1. General Information

Area: 69,700 km²

Population: 3,977,776

Government Type: Unitary Parliamentary Constitutional Republic

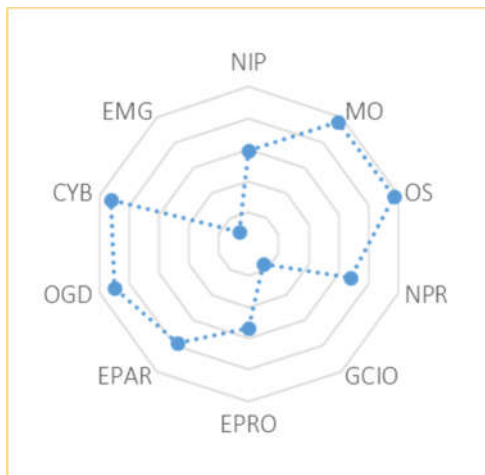
GDP: \$ 4,360

Internet Users: 72.53

Wired (Fixed Broadband Users): 25.01

Wireless Broadband Users: 81.60

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

In the Waseda International Digital Government Rankings 2021, Georgia has placed 51st with a total score of 65.9696. Many more Georgians and businesses found my.gov.ge helpful after the state declared a pandemic lockdown in March 2020. The Unified Portal of Electronic Services, or [My.gov.ge](https://my.gov.ge), is Georgia's most frequently visited government website. Daily visits surged to 30,000 in 2020 and the website's services were used 40 percent more often. [My.gov.ge](https://my.gov.ge) provides people and businesses with much-needed access to electronic services, such as obtaining IDs and passports, forming a new organization, or transferring real estate ownership.

Georgia was a pioneer in using digital methods to provide user-friendly public services even before the epidemic. To improve service delivery and e-governance, the Government launched the Unified Portal of Electronic Services in 2012. Because of Georgia's systemic changes in public service and

the rising number of Internet users in urban and rural areas alike, the need for a one-stop-shop marketplace for all services has grown significantly in recent years.

Between October and December of 2020, Georgians used 122,000 e-public services, a 30% increase from January to March of the same year. A more comprehensive range of products and services became available as demand grew. As of 2019, there were 468 e-services public on My.gov.ge, which has grown to 700 presently. More than 133 new features were added thanks to the support of the United Nations Development Program, which included an innovative e-Apostille verification process. The UNDP's assistance is part of a broader UK-funded project to help Georgia advance public administration reform at all levels of the state. This support was aimed at increasing electronic services for people and government personnel, which allowed the public sector to adapt to changing conditions.

3.2. New Trends

By employing digital services, the Georgian health system has been able to keep up with the pandemic's challenges, according to Tamar Gabunia, Georgia's deputy health minister. After the pandemic, Georgia was required to speed the development of digital health solutions to manage the efficient supply of health care, assist epidemiological planning, and effectively protect people. Everything from the first COVID-19 case to today has been based on the coronavirus monitoring system. Tamar Gabunia believes that the early efforts of the health care system to offer the necessary platforms for the development of remote virtual services are of critical relevance.

According to Tamar Gabunia, an online consultation between a doctor and a patient is already possible in Georgia, with the support of the European Union. As in the spring of 2021, this model was planned to be in use in Georgia. All of these parameters may be measured using the latest telemedicine technology: BMI (body mass index), weight (in kilograms), height (in feet), glucose (blood sugar), uric acid (blood uric acid), and cholesterol (cholesterol). The fundus of the eye, the throat, the ear, and the oral cavity may all be studied by large and portable equipment with robust characteristics and the ability to examine a wide range of organs. ECG and ultrasound tests may be performed. Use of the digital stethoscope may identify cardiovascular and respiratory issues. Exam results are forwarded to a centralized database for review and analysis.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Georgia's Network Infrastructure Preparedness was placed 47th with 5.971 points in the Waseda rankings for 2021. Georgia had 2.74 million internet users in January 2021, up 9.5 percent from the previous year. Georgia has a 68.9 percent internet penetration rate. In 2021, Georgia had 3.10 million social media users, accounting for 77 percent of the entire population. Georgia has a total of 5.46 million mobile phone connections. Simultaneously, the number of mobile connections in Georgia declined by 101 thousand. In Georgia, mobile connections accounted for 137 percent of the entire population.

Georgia made a significant effort in 2021 to create input for the country's long-term digitization. Several of them include the following: the fixed-broadband sector would continue to move from copper to fiber, and MVNOs were permitted to establish services beginning in February 2021.

4.2. Management Optimization [MO]

The state of Georgia has shown that re-engineering a nation's technology, processes, and organizations while simultaneously reducing administrative burdens. Despite its limited resources, Georgia's public sector has become more efficient and open since November 2003, allowing more people to benefit from public services even in remote areas, reducing administrative burdens, and virtually eliminating corruption in the provision of public services in all forms. Because of the rise in accessibility, government and central services have become more necessary.

A political objective and a series of initiatives were taken to reform the public sector, namely between 2004 and 2014. Georgia has an excellent legislative framework and ICT infrastructure, thanks to the backing of the government. To promote accountability, openness, efficiency, and effectiveness in public service, efforts have been undertaken. Understanding the role of ICT in Georgia's eGovernment accomplishments and the Georgian environment is critical. Two distinct eGovernment phases in Georgia existed from 2004 to 2014 when ICT usage was dispersed and disorganized; from 2014 onwards, a planned strategy was adopted.

Decentralizing service delivery and local capacity building have recently become increasingly essential in Georgia Global and regional leaders in ease of doing business and cybersecurity. The nation surpasses its area and income level on every metric. Georgia was ranked 65th in the UNDESA 2020 EGDI for overall quality, with an OSI score of 0.5882, a TII score of 0.6923, and an HCI score of 0.8171. Georgia placed 80th in the EPI with a score of 0.6429. EGDI/EPI rankings in Georgia have progressively climbed since 2014, signaling that the country's public sector's ICT usage in its public administration requires a new approach.

4.3. Online Service [OS]

In Georgia, there has been limited development in the provision of D-Government services. It's all done via static websites for government services like e-tendering and social security benefits, as well as consular and labor-related activities. Neither electronic payment nor electronic voting is available at this time. The Georgian Telemedicine Union is vigorously promoting electronic health (GTU). In addition to telemedicine, teaching, and creating legislation for particular circumstances, such as e-consultations in combat zones, the organization's operations include all three. Georgia's e-health strategy was also devised as part of the plan. However, this hasn't yet been put into practice. This indicator received no new information this year. Georgia's government can better serve its inhabitants by shifting the focus from traditional mail, phone, and written correspondence to digital ones like social media platforms. This strategy is supply-side focused, guaranteeing that all Georgians and the rest of the world have access to user-friendly and accessible technological services.

Life events like marriage or divorce or adopting a new name or surname are increasingly the focus of digital passport, identification, and residency services. For example, the government created e-Notifications, e-Tendering, Catalogs and Qualification Profiles, e-Orders and e-Invoices, and e-Payment. The government's "digital customs" system, which is now being contested, has only provided a few specifics.

4.4. National Portal [NPR]

User privacy is a top priority for Georgia's government websites. In terms of traffic, My.gov.ge is Georgia's most popular government website. Forty percent more people used the website's services in 2020, and 30,000 people visited each day. To apply for IDs, passports, new businesses, and real estate ownership titles, citizens or businesses may utilize My gov age.

For this purpose, the government established the Unified Portal of Electronic Services in 2012. Due to Georgia's significant public sector reforms and the increasing number of Internet users in urban and rural areas, the need for a one-stop-shop marketplace has grown in recent years. When Georgia issued a pandemic lockdown in March 2020, the site assisted thousands of individuals and businesses.

4.5. Government CIO [GCIO]

The Georgian government does not have a CIO. The Telecommunications and Information Technology Department of the Ministry of Economic Development is developing an ICT policy. The Ministry's strategic plan does not emphasize industrial growth.

4.6. E-Government Promotion [EPRO]

As part of the EU's efforts to help Georgia's digital economy and society, EU4Digital is one of the numerous bilateral initiatives. EU4Digital helps Georgia cut roaming prices and bring them in line with EU tariffs and build and deploy high-speed internet to enhance the economy and unify digital framework initiatives throughout society. As part of the EU4Georgia initiative, the Georgian National Communications Commission implemented EU-compliant electronic communication legislation and operational capabilities.

4.7. E-Participation [EPAR]

Georgians accessed 122,000 electronic public services between October and December 2020, a 30% increase from January to March. Since there was an increase in demand, there were more options to choose from. A rise from 468 e-services in 2019 to 700 now exists on My.gov.ge. As a consequence of UNDP funding, the website now offers 133 new features, including an e-Apostille, a cutting-edge method of certifying official documents.

4.8. Open Government Data [OGD]

With the OGP's incorporation into the Georgian political landscape, the country's national and municipal governments have become more transparent. The Municipality of Akhaltsikhe vowed to promote public engagement in municipal expenditures as one of the first five municipalities to join the 2016-2018 National Action Plan (NAP). As a part of its 2018-2019 budget, Akhaltsikhe

Municipality pledged to develop a strategy and action plan to increase transparency and integrity and open data policies and include individuals with disabilities. Akhaltsikhe, a member of the OGP Forum, has built a framework for formulating, implementing, and monitoring NAPs with the aid of government institutions and CSOs.

Georgia's 2019-2020 National Anti-Corruption Strategy and 2020-2025 Decentralization Strategy emphasize anti-corruption and democratic governance reforms at the local level, following the OGP process. Another emphasis is on creating evidence-based policies and raising the level of public engagement in decision-making. As a member of the OGP Local cohort, we demonstrate our willingness to support Georgia's strategic aims. As outlined in our two strategy papers on combating local corruption and enhancing the openness and integrity of municipal government, our 2021 OGP Local Action Plan commitments reflect these goals. For the OGP Local Action Plan for 2021, Akhaltsikhe and its partners worked with other sectors to monitor the plan.

4.9. Cyber Security [CYB]

The Waseda rankings 2021 rated Georgia's Cyber Security 29th with a score of 9.200. A wide variety of difficulties may be overcome by digital technology, ensuring that services are accessible whenever and wherever both individuals and corporations require them. However, the widespread use of digital technologies raises concerns about data privacy and personal information.

UNDP and the UK assisted the PSDA in assessing and upgrading its cyber security procedures to enable Georgia to better protect its electronic data. The Georgia Public Sector Data Authority is developing new criteria for data collecting and management. To help public employees, university professors, and students learn more about cyber and information security, the Digital Governance Agency has developed an educational website that offers online training courses in the areas of cyber hygiene, risk management, and information security audits.

4.10. The use of Emerging ICT [EMG]

Artificial intelligence has had a significant influence on today's trading. The application of artificial intelligence has resulted in more efficient completion of routine jobs. AI has ushered in a new way of doing business, one that differs from the tried-and-true practices of the past. As the need for AI grows and the market becomes more crowded, it becomes increasingly challenging to choose the top AI businesses.

IoT (the "internet of things") has sparked a digital revolution. Market competition in the IoT sector is fierce. In GoodFirms' opinion, it's a good idea to lead from the front. IoT firms that give end-to-end solutions to their customers are among the finest. Quality, Reliability, and Capabilities are some of the criteria used to evaluate Georgia's most good internet of things companies.

Germany

1. General Information

Area: 357,114 km²

Population: 83,926,187

Government Type: Federal Parliamentary Republic

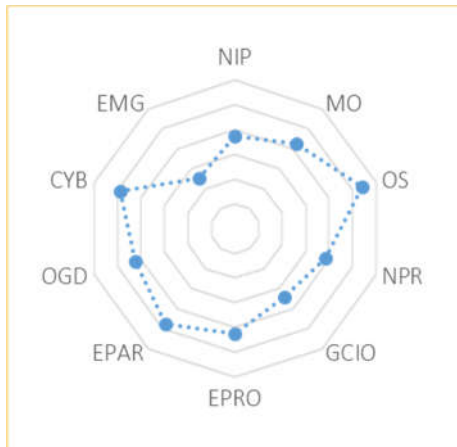
GDP: \$51,860

Internet Users: 89.81

Wired (Fixed Broadband Users): 43.02

Wireless Broadband Users: 90.69

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Germany ranked in 20th place this year with a total score of 82.6809. There has been an increase in corporate digitization in Germany as a result of the coronavirus pandemic. German firms reported that following the COVID-19 pandemic, digitalization became increasingly crucial to their daily operations. As a result of the pandemic, digitization creates efficiency and competitiveness in day-to-day operations and functions as a highly effective crisis precaution.

In the COVID-19 outbreak, telemedicine approaches like video consultations saw a rise in utilization and effectiveness. Several health insurance funds and the National Association of Statutory Health Insurance Physicians have increased their capacity to provide video consultations in response to the virus's widespread distribution. "Kassenärztliche Bundesvereinigung" and "National Association of

Statutory Health Insurance Funds" The use of video consultation by doctors is now unlimited; however, psychotherapists may only use video consultation for specific services and may only conduct telehealth after an in-person consultation that involves a preliminary diagnosis, indication, and submission of appropriate data. Doctors and psychotherapists must use one of more than 30 certified video service providers and usually inform their Association of Statutory Health Insurance Physicians of this fact to charge for telehealth consultations.

Critics and opponents alike have raised concerns about the nation's ability to motivate and encourage patients to utilize digital health technology in their care and treatment. Despite this, the law is widely seen as a game-changer in the medical community. There have been significant revisions made to the German Digital Care Act (DVG) and a description of the payment for digital health solutions in the United States during the COVID-19 pandemic.

3.2. New Trends

In light of the COVID-19 problem, German firms are looking for methods to increase their competitiveness, operate more efficiently from a distance, and secure company continuity via digital transformations. Several German firms have been forced to reconsider their operations, user engagement, supply chain management, and product and service development in the wake of the epidemic, according to the 2020 ISG Provider Lens™ Digital Business – Solutions and Service Partners study. Businesses of all sizes engage with digital business solutions and service providers to develop new organizational structures and ways of working.

Customers, product development, supply chain management, and blockchain applications are all areas in which global and local digital business suppliers advise and assist German companies.

According to ISG, COVID-19 has stressed the need for new systems and processes in supply chain management more than before. Real-time supply chain monitoring and the ability to make on-the-fly modifications through a single pane of glass have been highlighted by recent supply chain lockdowns and spikes in demand for commodities. According to the analysis, these rules are expected to remain in place for the foreseeable future.

According to the poll, while blockchain is becoming more popular with businesses throughout the world, it is becoming more popular particularly in Germany. It's not only banking, financial services, and insurance that use distributed ledger technology; it can also be used for supply chain management, payment services, retail and industrial sectors. With an emphasis on banking, supply chain, and logistics, several notable blockchain businesses have begun active implementations in Germany.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

On the Waseda Index of Network Infrastructure Preparedness, Germany placed 17th. Germany had 78.81 million internet users in January 2021, an increase of 1.0 million over the previous year. Germany had a 94 percent internet penetration rate at the time. Germany had 66.00 million social

media users at the beginning of 2021, equivalent to 78 percent of the total population. There were 112.9 million mobile connections in Germany, an increase of 1.8 million from 2020 to 2021. 134.7 percent of the German population had a mobile connection by January 2021.

As Germany moves toward complete digitalization, the following are important developments:

- Work has commenced on a 50,000-kilometer wholesale fiber access network; the regulator permits four-year termination rates through 2023 and specifies reduced MTRs until 2022;
- Telefónica Germany reported LTE coverage to be 98 percent;
- 5G network components are subjected to enhanced security processes by Telekom Deutschland.
- To reach 25 million places by the end of 2022, Vodafone Germany wants to extend its 1Gb/s service.
- EWE plans to invest more than €1 billion in fiber-optic infrastructure between now and 2026;
- NetCologne has announced a 1Gb/s service in Cologne.

4.2. Management Optimization [MO]

The "Shaping Digitalization" implementation plan was approved in November 2018 and intends to influence Germany's digital transformation in the future. Germany's constitution stresses the importance of liberal democratic ideals and the benefits of digitalization for people, according to which the preservation of these values is vital. The plan's primary objective is to continue improving the standard of living for all Germans to boost economic and ecological potential and preserve social cohesion.

This strategy, which the IT Planning Council authorized on September 24, 2010, is reviewed and updated every few months. In the country's current system, e-Government will be the emphasis of future development. From government, politics, research, and industry, a broad range of players was involved in developing the plan. With the National eGovernment Strategy, the federal, state, and local governments will work together to create an appealing eGovernment and IT strategy for residents and companies alike.

4.3. Online Service [OS]

For the first time in November 2005, electronic passports were put into use in Germany. (ePass). An individual's name and surname and their birth date are included in this document, which was compiled under Council Regulation (EC) No. 2252/2004. The microchip also included a digitized representation of the owner's face. In June 2007, the Federal Council approved changes to the Passport Act that provided the groundwork for producing electronic passports. In addition to the computerized picture of the bearer's face. The microchip on the passport's microchip was designed to record fingerprints, not any other central database, such as those kept by issuing organizations.

A cross-platform eTendering communication standards development project, XVergabe, was established in July 2011. Document and data sharing standards between bidders and eTendering platforms will be developed for the project's aim. In addition to basic project information, the

xvergabe.org website now gives an overview of the project's activity and a list of the most significant articles that have been published.

ePayBL (ePayment des Bundes und der Länder) is an essential information technology component mandated by law for German government entities. EPayBL is a software component developed by federal (Bund) and state (Länder) authorities. Users can choose from a variety of payment choices.

4.4. National Portal [NPR]

Each of Germany's three levels of government collaborated on a single digital platform. A network of administrative portals at the federal and state level was used to create this platform. EGovernment services are comparable to consumer accounts in online commerce, making them accessible and safe to use. The portal network expands on current solutions to save time and money. The German Federal government established a new site in 2018 that gives access to federal government eGovernment services through a national service account. Because consumers no longer need to know which federal jurisdiction is accountable for the appropriate process, these eGovernment services have become more straightforward and quicker to locate on the web.

The “Online Access Act” was passed by the German parliament in August 2017 to encourage the digitization of public administration. An administrative portal will provide access to processes and services for federal states and municipalities as part of a more extensive portal network. In September of this year, a test version of the new site went live. The IT Planning Council has a digitalization program in support of the digitalization goal.

4.5. Government CIO [GCIO]

A new federal agency was created on January 1, 2008, when the Federal IT-Steering Strategy was implemented. Under the Cabinet's decision, the Commissioner is in charge of formulating federal eGovernment and IT security policy, creating national IT architecture and standards, and overseeing the central IT infrastructure of the federal government.

The Federal Government Commissioner for Information Technology has been replaced with a Chief Information Officer for every federal agency (CIO). All federal government IT executives are part of a group called the CIO Conference, responsible for deciding on laws and regulations about information technology in the federal government. In addition to chairing the CIO Conference, they are in charge of coordinating cross-governmental eGovernment activities involving both the federal and state governments.

4.6. E-Government Promotion [EPRO]

On June 17, 2013, the Bundestag passed a bill promoting electronic governance, and it became law. On August 1, 2013, Germany's eGovernment statute, the Electronic Governance Act (EGovG), entered. Thus, eGovernment facilitated the administration's electronic connection with the public and made it more convenient for citizens to utilize.

On July 15, 2017, Chancellor Merkel signed into law the Electronic Identification Promotion Act. It aimed to make the German eID card a more popular and generally accepted means of online identification. eID cards were launched in 2010 as an electronic form of identification. This feature allows people, governments, and corporations to identify themselves on the internet accurately. However, the use of EID was lower than expected. Starting on July 15, 2017, all new identification cards will have an electronic ID capability that may be used immediately. Additional provisions were incorporated in the Electronic Identification Promotion Act to encourage the use of the national eID function. Competent data protection agencies are responsible for enforcing data protection laws.

4.7. E-Participation [EPAR]

According to the Waseda rankings of 2021, Germany's E-Participation was rated 13th with 9.500 points. It was created in the 1990s when the German parliament and the federal government moved from Bonn to Berlin. Until July 2006, the IVBB also provided access to the IVBB intranet, which the Federal Intranet replaced in July 2006. (Intranet des Bundes). The long-term objective is to build a federal government infrastructure that is cohesive. The IVBV and the Federal Administration's Information Network have been replaced by the Federal Networks (Netze des Bundes - NdB). The IP-based network that incorporates a firewall system, robust data encryption, and constant monitoring of connected users and formed connections is the result of the IVBB architecture. In addition to a search engine for people and government organizations, a trip management system, and access to information and document databases, the intranet portal offers various services.

4.8. Open Government Data [OGD]

The Open Data and Reuse of Public Sector Information Directive on July 16th, 2019, and is now in effect. Replacement for Public Sector Information Directive, which was updated by Directive 2013/37/EU (Directive 2003/98 EC) By July 16, 2021, Member States must implement Directive (EU) 2019/1024. In the long run, this policy will encourage the re-use of all public sector material that is in principle free of charge. Open access to publicly sponsored research and high-value datasets and real-time data accessible through Application Programming Interfaces (APIs) will drive innovation and benefit society and the economy. The German Bundestag voted to alter the eGovernment Act bypassing the draft Federal Open Data Act.

The legislation stipulates that open data must be provided free of charge and accessible to the public. However, privacy laws ensure that only publishable information is shared. To make it easier to find the open data offered by the various authorities, the national metadata web GovData was built.

4.9. Cyber Security [CYB]

On November 9, 2016, the German federal cabinet approved the country's cybersecurity strategy. This was achieved by drawing on the lessons learned and adhering to the 2011 Cybersecurity Strategy. Cross-departmental coordination has been established for the federal government's cybersecurity initiatives. This technique was developed to preserve networked information infrastructures while allowing for the full potential and advantages of cyberspace.

A new agency, the Agency for Innovation in Cyber Security, will be founded to safeguard digital sovereignty. The agency's primary purpose is to award contracts for innovative, high-risk research projects in cybersecurity and associated critical technologies to satisfy the State's internal and external security needs. We'll focus on projects that have the potential to change the market with major technical innovation.

4.10. The use of Emerging ICT [EMG]

Both the Federal Ministry of Education and Research and the Federal Ministry of Economics and Energy proposed an Artificial Intelligence (AI) Strategy in November 2018, which was accepted by both ministries. The German government's artificial intelligence policy established the framework for the country's artificial intelligence research and implementation efforts.

Hong Kong

1. General Information

Area: 1,104 km²

Population: 7,564,080

Government Type: Devolved executive-led system within a unitary one-party socialist republic

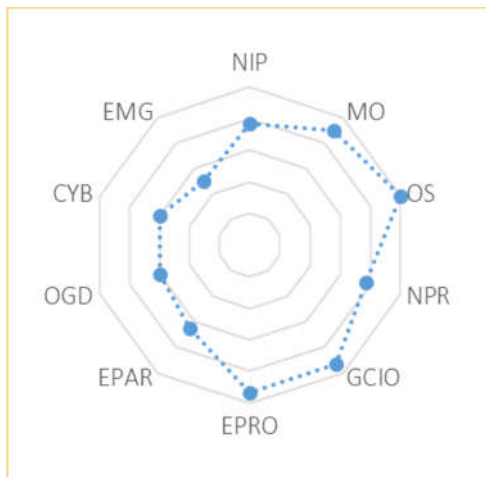
GDP: \$ 49,040

Internet User: 92.41

Wired (Fixed Broadband User): 38.30

Wireless Broadband User: 140.43

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Waseda Digital government rankings for 2021 put Hong Kong 28th with 76.5967 points among another 63 countries. Digital technologies aid this epidemic in several places throughout the world, such as Africa and Asia. In the event of a public health crisis, the government of Hong Kong, China, was able to respond quickly and adapt to a dynamic scenario.

For this, OGCIO was entrusted with developing technology-based methods to control and prevent transmission of the infection. Before anything else, it had to ensure that travelers to Hong Kong, China, could complete the mandatory 14-day quarantine at home. A system has to be developed to keep quarantined persons in their homes without violating data privacy rules. The StayHomeSafe app uses

geofencing technology, which is particularly useful for indoor locations, and it also recognizes signatures via mobile phone technology. To protect people's privacy, engineers avoided monitoring their site and behavior and employing GPS technology, which is impossible to use with high accuracy in a city dominated by skyscrapers, as much as possible.

Hong Kong Polytechnic University (PolyU) created a 3D model of a non-reusable face shield was created by Hong Kong Polytechnic University (PolyU) for the Hospital Authority. Queen Elizabeth Hospital made a reusable eye visor for the Hospital Authority. When the quarantine was imposed, popular location-sharing apps WhatsApp and WeChat were used to activate the monitoring system swiftly. Staff and volunteers were able to monitor the event from afar using the location-sharing software, supplemented by surprise home visits and spot-check video calls as needed.

3.2. New Trends

In response to the COVID19 outbreak, several organizations have implemented remote work rules. Virtual workplaces are now being attempted to be set up at the drop of a hat. Virtual offices are an affordable alternative to traditional office space for internet-based businesses that do not need a physical presence. The customs and practices of companies that have been created from the beginning as remote-only have allowed them to exist without the need for a physical presence. These companies were unaffected by the outbreak of the coronavirus. For companies, remote work may save money, enlarge their workforce, and give employees more freedom while still providing a framework for measuring the performance of projects.

Businesses must continue to build a thriving remote work culture, even as technology has made it easier than ever to work remotely. There has been a significant rise in the use of virtual workspaces in the workplace. Company owners will have to decide where they fall on the spectrum between virtual and physical offices in the future. More and more people acknowledge that mixing the material and digital worlds have blurred industry boundaries, linked value chains, and challenged the traditional paradigm of creating value. According to them, efforts like digital transformation, cyber threat mitigation, and consistent customer experience are necessary. Each one of these might be valuable to the company on its own merits.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

For Network Infrastructure Preparedness, Hong Kong scored 10th in the Waseda rankings for 2021, with a score of 7.690. Hong Kong had 6.92 million internet users in January 2021, a rise of 1.9 percent from the previous year. At the time, 92 percent of Hong Kong residents had access to the internet. There were 6.44 million social media users in Hong Kong, accounting for 85.6 percent of the population at the beginning of 2021. On the other hand, there were 13.80 million mobile connections, representing a decrease of 306 thousand from 2020. 183.4 percent of Hong Kong's population was connected to the mobile network in January 2021.

Digital innovations in Hong Kong to include the following by 2021:

- The regulator has granted 5G subsidies for the first time.
- As a first step, HKT has begun rolling out the AirPON network to remote places.
- Reserving 2.5 GHz spectrum for 5G use has initiated a public consultation;
- Using a branch line to link Hong Kong to the Pacific Light cable network is prohibited by the United States.
- SmarTone has announced that 5G services will be available shortly;
- The regulator might auction off an additional 80 MHz of 5G spectrum.
- The government sets up a 5G development subsidy scheme.

4.2. Management Optimization [MO]

The government's chief information officer must establish and execute the organization's information technology policy. The OGCIO is helping government business units plan and implement IT-enabled transformation projects in a more flexible, cost-effective, and coordinated manner than previously possible via cloud computing and other new technologies.

4.3. Online Service [OS]

A one-stop shop for technology-based enterprises and activities, the Hong Kong Science and Technology Parks Corporation was established in May 2001. Its crucial emphasis areas include the biomedical and electronics industries and information and communications technology, and materials and precision engineering. The Hong Kong Science Park, a 22-hectare site in Pak Shek Kok, is an essential I&T center in Hong Kong. It is being erected adjacent to the Science Park to provide a flexible design and ancillary facilities for leasing to Science Park tenants and incubators and their workers and visiting researchers from the mainland and beyond.

4.4. National Portal [NPR]

Since its inception in 2010, MyGovHK has offered a range of e-Government services, including access to government data and e-services. Toward the end of 2019, the Hong Kong government's website underwent a significant overhaul to make it more accessible to the public. As part of the PSI portal, the government provides open data in digital forms, such as a map showing numerous datasets on a single map, to encourage residents and businesses alike to build new applications utilizing available data, benefit citizens and businesses alike. As of the end of 2019, the PSI site has over 4000 datasets. To assist citizens better comprehending municipal data, the OGCIO established four city dashboards in December 2019.

As of October, governments are expected to make every effort to reveal their data, and this policy should be implemented. Around 80 government B/Ds issued their first and second annual open data plans in December 2018 and December 2019, respectively, in compliance with the requirement. The OGCIO offers technology assistance and develops mobile apps for government agencies to utilize together to perform public services.

4.5. Government CIO [GCIO]

Government IT tasks are handled by the Office of the Government Chief Information Officer (OGCIO), which empowers the federal government to advocate for ICT advancements in the local community actively. There are five main goals of the Hong Kong Chief Information Officer's (OCIO) office. These are to provide efficient and secure eGovernment services to Hong Kong citizens, to develop Hong Kong's ICT talent, to improve the competence of Hong Kong's ICT industry, and to transform Hong Kong into a world-class smart city by promoting high-level data centers, cloud computing services, big data, and cyber security awareness. As a consequence, in terms of GCIO, Hong Kong was ranked fifth by Waseda in 2021.

4.6. E-Government Promotion [EPRO]

As of November 2015, Hong Kong has formed the Innovation and Technology Bureau (ITB) to draft a comprehensive I&T policy. There are eight key areas where the government may improve its efforts to support technological innovation and advancement (I&T). The ITB supports R&D and innovation activities by implementing policies and programs. Provide world-class technical infrastructure for firms, research institutes, and universities; provide financial assistance to stakeholders in the industry, academia, and research to commercialize their achievements.

4.7. E-Participation [EPAR]

An ICT Outreach Program for the Elderly to enable the elderly who are institutionalized and "hidden," and those who receive daycare and home care services, learn how ICT may enhance their lives and promote healthy aging. New ICT training programs were launched in February 2019 to encourage older adults with basic ICT skills to use digital technology in their everyday lives. For the elderly, a web-based learning site was created in October 2019 to take advantage of the advancements in digital technology in their daily lives. HK Internet Registry Corporation (HKIRC) is a non-profit and non-statutory organization that maintains and supervises the registration of country-code top-level domains (ccTLD). Inclusion in the digital world: OGCIO's Web/Mobile App Accessibility Campaign was launched in 2011 as part of a multi-pronged strategy of government leadership, fostering awareness, publishing guidelines and tips, cultivating expertise, and implementing recognition schemes to encourage the use of accessibility design.

4.8. Open Government Data [OGD]

The Office of the Chief Information Officer (OGCIO) is developing a government data center complex to integrate numerous existing federal data centers, resulting in increased economies of scale and economic efficiency and more environmentally friendly management of government data center operations.

4.9. Cyber Security [CYB]

The Office of the Chief Information Officer (OGCIO) implements a rigid management structure, a comprehensive set of information security regulations and processes, and frequent audits to improve the overall cyber security of the government. The digital assets of the government are safeguarded at many levels of protection. The Office of the Government Chief Information Officer (OGCIO) has formed a specialized government computer emergency response team responsible for the effective

and coordinated handling of information security problems within the government. By using a variety of channels and approaches, including the Cyber Security Information Portal (www.cybersecurity.hk), seminars, contests, and school visits, the OGCIO hopes to raise awareness of cyber security in both the community and industry. A public-private partnership led by the OGCIO called the Cybersec Infohub, funded by TechConnect (Block Vote) under the ITB and aims to strengthen Hong Kong's overall cyber threat capabilities. The Cybersec Infohub promotes cross-sector collaboration and information sharing in cyber security on a reliable platform.

4.10. The use of Emerging ICT [EMG]

The Hong Kong Cyberport Management Company Limited is in charge of overseeing the port's activities. It is possible to find high-quality information technology and associated enterprises within the Cyberport complex. Over the years, Cyberport has assisted several start-up businesses by providing them with various financial and professional resources. Beyond its technological infrastructure, Cyberport offers internships and incubator programs for ICT students and new start-ups, and it promotes collaboration and cooperation within the ICT industry. The government of Hong Kong spent \$300 million on Cyberport tenants and e-sports in 2018, which helped the whole industry. The public also used the e-sports competition facilities at the Cyberport Arcade starting in July 2019. In addition, an e-sports facilitation program was launched in April of this year. A total of \$5.5 billion has been put aside for the building of Cyberport 5, which is scheduled to open in 2024.

Iceland

1. General Information

Area: 103,000 km²

Population: 343,794

Government Type: Unitary Parliamentary Republic

GDP: \$65,270

Internet Users: 99.00

Wired (Fixed Broadband Users): 41.56

Wireless Broadband Users: 122.85

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Iceland's parliamentary democracy has a long history of protecting citizens' political and civil rights via their elected representatives. Iceland was the world's most effective defender of Internet freedom during the coverage period. Users in this island nation have almost universal access to the Internet, few limitations on online material, and robust safeguards for their online rights. As a reaction to the COVID-19 outbreak, the government was praised for allowing users to control their data. Iceland began adopting the EU Digital COVID-19 Vaccination Passport in early June and completed it on July 1, 2021. The paper was drafted in the case of a pandemic to ensure safe and unhindered travel across the EU.

Almost everything in the Icelandic public sector has been digitized in recent years. People now have access to these services through the Internet and submit complaints and suggestions, reviewed by the appropriate authorities. Government digitization contributes to the development of a democratic system of self-government in which all citizens participate actively while also enhancing and democratizing the overall functioning of government.

In Iceland, websites currently provide the largest share of services, including e-government portals, tax collection and payment, obligatory voter registration, and other critical public service websites. Open-source software has been modified for use in more essential public services, such as healthcare.

3.2. New Trends

The government of Iceland has used cloud computing in its administrative processes. From the very dawn of public cloud computing in 2005, Iceland used a public cloud and has continued to do so to date (IaaS). This had the unexpected effect of significantly affecting Icelandic people's productivity, IT costs, and security. In October 2015, Iceland's government declared that it would move its IT infrastructures to the cloud. From mobile applications to public and private services, everything is covered. Internal migrations facilitated by governments will be enormous and incredibly complicated.

Iceland's government has been extremely forthcoming about the project since announcing its intention to migrate to the cloud and adopt a new decision-making model. They have shown to the public that they are not concealing their actions. Additionally, they offer a webpage where one may analyze each technical problem on their roadmap.

Iceland had previously tried several feature management systems, but none had achieved the same level of success as ConfigCat. While ConfigCat and other feature management systems have addressed issues, none have combined tremendous openness with sound governance in an easy-to-use, install, and update manner. Iceland has migrated from a commonly used feature flagging system to ConfigCat's platform. This system may easily be scaled up at a minimal cost of installation and maintenance.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

According to the most recent data, Iceland's Internet users rose by 0.6 percent to 338.9 thousand people in January 2021.

Additionally, there was a 3.6 percent increase in the number of individuals who utilized social media platforms during the same time. According to estimates, Iceland will have over 479.9 thousand mobile connections by 2021.

By 2021, 84.7 percent of the population will have mobile devices, even though the number of people with such connections has increased by 4,058 since 2010.

4.2. Management Optimization [MO]

While the government manages cybersecurity at the Ministry of Transport and Local Government, all ICT problems belonged to the Ministry of Finance and Economic Affairs in 2018. In 2020, the Ministry of Local and Economic Affairs released a report on Digital Iceland, raising efforts in cooperation with all agencies, municipalities, ministries, and businesses. The plan is a critical component of the government's goal for a more profitable digital communication strategy for the public. The establishment of the service processes for Iceland, in cooperation with agency IT teams, connect agencies to the national data exchange platform Straumurinn, and develop service procedures for both businesses and the general public.

Norway, Sweden, Denmark, Finland, Iceland, the Faroe Islands, Greenland, Estonia, Latvia, and Lithuania signed a Digital North declaration in 2017 in which they pledged to use digital development tools. The declaration supports a policy objective of becoming a digital leader in the Nordic-Baltic area via the following actions:

- Encouraging more international collaboration and advancements in shared infrastructure, including the next generation of mobile communication technologies, dubbed 5G, and the use of artificial intelligence.
- Launching a short-term initiative to offer 100 megabits per second (Mbps) wired Internet connection to 99.9 percent of all households and businesses by the end of 2020. The state planned to contribute financially to the project and seek additional funding based on their efforts. The Telecommunications Fund is the project's supervisor. Fiber network development helped enhance mobile network reliability, coverage, and data transmission speed, which are essential for improving network reliability, scope, and data transmission speed across all mobile networks in the nation.

4.3. Online Service [OS]

Iceland contributes to the Nordic-Baltic cooperation initiative (NOBID) by implementing and using the national eID infrastructure. The declared objective of the NOBID project is to offer people and businesses borderless access to digital services across the Nordic-Baltic region via the use of their own national electronic identity cards (eIDs). The project aims to identify technical and legal barriers to interoperability and establish criteria for enabling interoperability on a national level and in the Nordic and Baltic regions.

TendSign is a Swedish eProcurement platform used by a significant number of Swedish and Norwegian public institutions. This solution enables electronic procurement to be implemented from the eNotice to the eAward stage. Ríkiskaup, Iceland's Central Public Procurement agency for government organizations, has adopted eOrdering based on XML standards at the national level. Ríkiskaup is also considering using this technology on a local level.

The Financial Management Authority (FJS) is a self-contained organization under the Ministry of Finance and Economic Affairs. Financial management and reporting are its responsibilities. According to the organization, the FJS has a contract with three service providers and has been permitted to function as a PEPPOL Authority (PA). The FJS works with the SA Confederation of Icelandic Enterprise and the SA Confederation of Icelandic Enterprise via the IcePro Icelandic Committee on Trade Procedures and eCommerce. IcePro is a forum for government agencies,

businesses, and individuals interested in optimizing commerce and trade processes via the use of EDI (Electronic Data Interchange), ebXML, and other standardized electronic commerce technologies.

4.4. National Portal [NPR]

The government portal offers information on all of Iceland's ministries to the general public and business enterprises. The Internet connects and provides information to all levels of government agencies.

Island.is is the primary portal for public digital services. It refers to the websites of all Icelandic public institutions that provide digital services. Each service is highlighted as an information box on the site's homepage. Apart from the default search options, customers have extra explicit search options to help them locate the services they need. It has an easy-to-navigate connection to public digital services, as well as fillable digital forms.

Additionally, the site serves as a toolbox, including information beneficial to all public agencies. All of them are centralized authentication approaches, central authentication, digital document delivery (C2G and B2G), and digital document dissemination (G2C and G2B). There is also a unique portal for all Icelanders called MyPages, which provides public information about people in public records and digital documents. E-mail can be sent to all individuals and is routed via a digital mailbox accessible to all public entities. To get access to MyPages and the digital mailbox, users must choose one of two authentication methods.

4.5. Government CIO [GCIO]

Since Iceland lacks a dedicated head of information technology, the Ministry of the Interior is responsible for the country's whole information technology development. Nordal Löf was named Minister of the Interior on December 4, 2014, and she is now responsible for building ICT infrastructure and e-Services throughout the nation.

4.6. E-Government Promotion [EPRO]

The Administrative Procedures Act was released in 2003 to add a new chapter on electronic operations conducted by the Public Administration. Still, it was not officially implemented until almost two years later, on July 11, 2005. This modification eliminated many significant impediments to the growth of electronic administration. The relevant committee addressed two distinct issues during the amendment's committee debate. First, the committee attempted to establish a fair value that would be similar across amendment provisions. Second, the committee made a particular effort to maintain the process's technical neutrality. The changes made it clear that the government is not required to utilize paper for administrative tasks completed online.

4.7. E-Participation [EPAR]

The government passed the Information Act in the spring of 2012, and it went into effect on January 1, 2013. It is critical to protect the right to information and freedom of expression, participation in a democratic society, and the media's and the general public's ability to act as checks and balances on the power of government.

In addition to all federal government activities, this law also applies to all private businesses that the federal government governs. Since Act No. 140/2012, the Information Act has been limited to municipalities with less than 1,000 inhabitants. This restriction was lifted on January 1, 2016.

4.8. Open Government Data [OGD]

Iceland is falling behind the rest of the globe in terms of open data availability. Iceland has not yet developed an official strategy in this field. There is a minor source on data use, and the value created by the Service Portal OPingogn.is. Meanwhile, it is critical to highlight that Iceland currently lacks legal difficulties to distribute open data for its implementation. A data exchange layer (dubbed Straumurinn (X-Road)) and an API gateway service portal dubbed Data Pool will be developed to disseminate data and ease contact between businesses and the general public. The government's efforts in this area will be concentrated on the national strategy in developing open government data.

4.9. Cyber Security [CYB]

The eIDAS Regulation has been translated into Icelandic legislation via Act 55/2019 and related regulations 100/2020 and 310/2020. In June 2019, the EU directive on national identification cards in criminal investigations became law. The new legislation, which took effect on September 1, 2020, reinterpreted Iceland's 2015 cyber security strategy.

In June, the Icelandic Parliament passed the Cyber Security Act No. 78/2019, which had strong support from the NIS. The new law modified Iceland's 2015 cyber security law, which took effect on September 1, 2020. The Cyber Security Council planned to have a legal foundation for implementing the new strategy and action plan.

In 2015, the Minister of the Interior presented the cabinet and parliament with Iceland's first cyber security strategy. The plan was designed to last from 2015 through 2026. The Cyber Security Council was charged with implementing the policy and developing an accompanying action plan (CSC). A new organization has been established by ministers and officials working in the field of cyber security. It's an excellent tool for collaborating and exchanging information.

Additionally, the program created a Cyber Security Forum to facilitate cooperation between the commercial and public sectors. The new rules contain additional restrictions covering cyber security, communication, postal, and registry Iceland initiatives. The government's goal was to create a plan for protecting its computer networks. This new cyber security strategy will replace the previous one, and will run from 2019 until 2033. Parliament similarly passed a similar resolution with a timeline attached.

The Cyber Security Council was established in 2015 to supervise the implementation of the strategy and action plan. Numerous ministries and organizations are engaged in cyber issues, and they all play a critical role in resolving these issues. This program is an incredible tool for collaboration and information sharing. A third group, the Cyber Security Forum, was established to foster cooperation between the public and commercial sectors.

4.10. The use of Emerging ICT [EMG]

The status reports and suggested action plans for the Fourth Industrial Revolution were published in February 2019 by a government committee established by the Prime Minister. According to the report, Iceland is well-positioned to deal with artificial intelligence development and application.

According to the status report, the government must develop an artificial intelligence policy that respects people's human rights and liberties while also advancing the country's economic interests. To best serve the Icelandic people, the government should adhere to the following principles: While adhering to societal values such as human rights and democracy, the development and use of artificial intelligence should also ensure fairness and openness in communication and decision-making. Inspectors are expected as part of their responsibilities to monitor the operation of systems that include artificial intelligence to ensure that accountability and trustworthiness are maintained. This is critical for developing, operating, and controlling such systems.

India

1. General Information

Area: 3,287,590 km²

Population: 1,396,104,956

Government Type: Federal Parliamentary Constitutional Republic

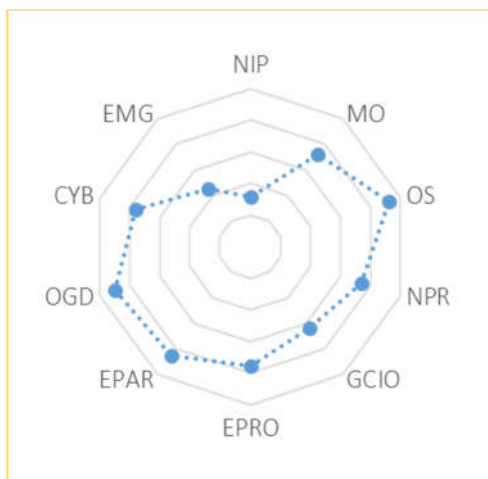
GDP: \$2,190

Internet Users: 41.00

Wired (Fixed Broadband Users): 1.62

Wireless Broadband Users: 52.54

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

On 1 July 2015, the Indian government set the country's primary and ambitious initiative to convert India into a digitally empowered economy. Only 19% of the population was online, and only 15% had access to mobile phones. However, the programme documented a distinct change in popular perceptions of India's global role—optimism about the country's future orientation was running high after a couple of years of "deepening economic uncertainties."

Six years later, India's digital journey has come across a lot of barriers, ranging from multiple petitions challenging the constitutionality of Aadhaar, the biometric identification system intended to control

access to government programs, to an apparent data security flaw in Aarogya Setu, the contact tracing app intended to serve as the government's digital backbone in response to COVID.

The country's USD 200 billion digital economy also plays a big part in the country's worldwide outreach as well as the permutations and combinations of new regional and international collaborations to which it has lately been accepted. As India struggles to recover from the effects of a devastating pandemic, its digital growth story, with all of its ups and downs, will continue to be an important part of the country's global standing.

3.2. New Trends



- a. Infrastructure is seen as a public utility by all citizens.

Providing access via fixed-line broadband, mobile connectivity, or Wi-Fi hotspots is the goal of the effort. Every citizen would be issued with a unique identification that would have a lifetime validity and could be linked to a mobile phone number and a bank account in order to facilitate online banking. In addition, shared cloud space on public cloud servers and enhanced access to the Common Service Center (CSC) are being planned for the future.

- b. On-demand governance and services are provided.

The initiative aims to establish seamless integration across various government departments and jurisdictions, as well as future accessibility of services through both online and mobile platforms. Financial transactions would be purely electronic and devoid of physical cash, while entitlements would be available through the cloud. The ease with which one may do business in India would be enhanced.

- c. Citizens' digital empowerment

The initiative would promote universal digital literacy in order to equip citizens with the skills necessary to use digital platforms/devices. Universal access to digital resources would be offered, with all papers stored on the cloud. Government services would be given in indigenous languages, and residents would have access to a platform for participatory government.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

India ranks 61st out of 64 nations in terms of network infrastructure readiness, with a score of 3.172. According to the most recent figures, internet users totaled 624 million in January 2021, a growth of 8.2 percent over the previous year. At the start of 2021, 45 percent of the population had Internet connection. Social media usage was prevalent among 448 million individuals, or 32.3 percent of the population, in January 2021, according to forecasts. At the time, mobile phone connections accounted for 79 percent of all connections made by the whole population. India's vast population necessitates a greater investment in the infrastructure network required for the country's digital transformation.

India has made major strides in the years preceding up to the start of 2021. India has taken further efforts to conclude the postponed 5G spectrum auction. BSNL collaborated with Ciena to conduct 5G trials, and the underwater cable connecting the mainland to the Andaman & Nicobar Islands was built.

4.2. Management Optimization [MO]

E-Government has been adopted by several state and federal administrations in the last few years. Many efforts have been undertaken to enhance the delivery and accessibility of public services. Indian e-Government now includes citizen centricity, service orientation, and transparency as well as computerizing government organizations. A former e-Government effort was analyzed while creating the country's current progressive e-Government policy. e-Government deployment must be accelerated via a methodical manner guided by a shared vision and strategy at the national, state, and local levels. Via the infrastructure support, interoperability may be made possible through standards, and people will have a unified view of their government.

There are many different e-Gov efforts in the nation, but the NeGP unifies them all under a unified vision and aim. As a result of this strategy, a statewide infrastructure is being built, as well as a massive digitization of records to make the internet more accessible and dependable for everyone. NeGP's overarching goal is to make government services more accessible to the people.

4.3. Online Service [OS]

India is well-known for its technological advancements and online service development, with several online platforms and systems, including the following:

- MyGov.in provides a forum for citizens to voice their opinions on public policy and governance. Additionally, it is used to facilitate public engagement.
- The Indian government built UMANG (Unified Mobile Application for New-age Governance) as an Android, iOS, Windows, and USSD (feature phone) software. Tax evasion and Aadhaar services are also available. The Aadhaar e-Sign framework enables users to electronically sign documents.
- Online registration, fee payment, appointment scheduling, diagnostic results, and blood availability enquiries are all possible via the e-Hospital service. Attendance of government personnel in real time.

- The Digital Locker feature enables users to securely store critical documents such as PAN cards, passports, mark sheets, and diplomas online. Secure access to government documents is made possible via the Digital Locker. It makes use of Aadhaar's authentication services and aims to lessen reliance on paper by encouraging electronic document interchange between government institutions.
- The Indian government ordered Gmail, Office, and Rediff to generate regional language email accounts in order to link rural India to Digital India. The email provider companies have reacted positively and are proceeding in a similar manner. Data Xgen Technologies Pvt Ltd, an Indian firm, has established the world's first free multilingual email account, dubbed 'DATAMAIL'. Eventually, Data XGen Technologies will provide email in 22 languages.

4.4. National Portal [NPR]

The Official Portal of the Government of India, india.gov.in, was founded, constructed, and hosted by NIC, a significant ICT organization of the Indian government under the supervision of the Ministry of Electronics and Information Technology (the national portal of India). The Portal was built as a Mission Mode Project, according to the government's National E-Governance Plan. The facility was opened to the public in November of 2005.

The Portal's purpose is to provide citizens and other stakeholders with a single point of access to Indian government information and services. This site was built in an attempt to provide thorough, reliable, credible, and all-in-one information about India. The present portal is a metadata-driven portal that is connected to the most up-to-date information from other Indian government portals and websites.

The National Portal Content Management Team is in charge of the portal's content and is part of the National Portal Secretariat. The content coverage, design, and technology of this Portal will be upgraded on a regular basis, and that is our goal in the future.

4.5. Government CIO [GCIO]

India's Department of Electronic and Information Technology (DEITY), a section of the Ministry of Communication and Information, has been instrumental in sponsoring and leading digital government activities in the country. It is also considered a national GCIO (Government Chief Information Officer) center, since the head of DEITY performs comparable functions to those of a Chief Information Officer (CIO) in other nations. In collaboration with the Indian CIO Association, the Srini Raju Centre for Information Technology and Networked Economy (SRITNE) and the Indian School of Business (ISB) provide a CIO Academy as an add-on to their respective CIO development programs.

4.6. E-Government Promotion [EPRO]

Multiple state governments and national ministries have taken steps in recent years to implement e-Government. Numerous efforts have been undertaken to enhance the delivery and accessibility of public services. In India, e-Government has gone beyond the computerization of government offices to incorporate citizen-centric initiatives, service orientation, and transparency. Prior e-Government

endeavors were analyzed in order to establish the country's progressive e-Government plan. To accelerate the deployment of e-Government across numerous government departments at the national, state, and local levels, a methodical approach guided by a shared vision and plan has been taken. This concept has the potential to save money by pooling critical and supporting infrastructure, facilitating interoperability via standards, and providing people with a unified view of government.

The National e-Governance Plan (NeGP) unifies the country's e-Government activities under a common vision and objective. This strategy is resulting in the development of a statewide infrastructure and the massive digitization of documents in order to give quick, dependable internet access. The ultimate goal of the NeGP is to make government services more accessible to people.

Numerous legislative measures and programs have been launched to enhance the e-core Government's and supporting infrastructure. The key components of the basic infrastructure are the National e-Government Service Delivery Gateway (NSDG), the State e-Government Service Delivery Gateway (SSDG), and the Mobile e-Government Service Delivery Gateway (MEGSDG) (MSDG). Among the critical support components are metadata standards, interoperability, business architecture, and information security. The G-I cloud will use cloud computing to support e-Government efforts.

4.7. E-Participation [EPAR]

Since the early 1990s, India's culture and society have been classified as a high-tech adoption society, with both government officials and people benefiting from information and communications technology (ICT) for mission and business support. Members of Parliament maintain a website that serves as a way of contact with the public at large. Nonetheless, the absence of an eParticipation site dedicated to eliciting public opinion has resulted in a reduction in the overall quality of e-Participation in India to date." The presence of a GCIO and an organization, as well as development activities, are the primary reasons why India receives high marks in this category.

4.8. Open Government Data [OGD]

The Open Government Data Platform India facilitates increased access to and use of government-owned data, therefore maximizing its potential for national growth. The program is a component of Pillar 6 of Digital India's Open Source Stack. The Indian and American governments collaborated on the Open Government Data Platform India. Additionally, the Open Government Data Platform India has been packaged as a product and given open source for international use. The whole product is available through "GitHub", which is the external website that opens in a new window. The Open Government Data Platform India enables many government agencies to submit data catalogs for inclusion on the front end website, subject to approval through a workflow procedure.

4.9. Cyber Security [CYB]

The last 18 months' cyber threat data coming out of India is frightening. India's Computer Emergency Response Team CERT-In recorded over 600,000 cyberattacks in the first half of 2021. According to Kaspersky, remote desktop protocol (RDP) attacks jumped from 1.3 million in February to 3.3 million

in March 2020. For the month of July 2020, India experienced 4.5 million attacks. 9 million assaults by February 2021.

In a recent assessment by the International Institute for Strategic Studies of India's cybersecurity guidelines, in the early this year, 4.5 million passengers of an Indian airline were victimized by massive hack. A fast-food chain in India discovered 13TB of dark web data. A payments company suffered a data breach that exposed 3.5 million people's personal data on the dark web.

Orange Cyberdefense combines all the emerging and highest technology to solve all the existing issues. Orange Cyber Security Operations Center (CyberSOC) in India is also available 24/7 to help consumers. Cloud computing has helped businesses negotiate COVID-19. Orange Cyberdefense provides a complete cybersecurity portfolio to assist enterprises safeguard access to cloud and container environments.

4.10. The use of Emerging ICT [EMG]

India's objective is to establish itself as a competent nation to whom the rest of the world can search for AI-related work. India's AI achievements will benefit the rest of the world. The government is currently drafting legislation to preserve Indian residents' personal data. Legislation is being pushed because the objective is to create a safe and ethical supercomputer with artificial intelligence. Indians would gain from a data-rich and data-driven society, as well as from lower business costs.

Digital India and the Smart Cities Mission have been using technology to give the Indian people a diverse variety of efficient, sustainable, accessible, and cost-effective smart services. Intelligent transportation, intelligent infrastructure, intelligent energy, intelligent communications, and intelligent lighting are all enabled by IoT, cloud computing, and artificial intelligence technologies. Governments, people, and organizations can benefit from these solutions since they allow for significant cost savings and labor savings. The Internet of Things (IoT) is rapidly gaining traction as a significant business and industrial application area. Everything will be networked, from power grids to autos, towns, and manufacturing floors. IoT India will focus on IoT infrastructure for mobile devices.

Indonesia

1. General Information

Area: 1,904,569 km²

Population: 276,933,453

Government Type: Unitary Presidential Constitutional Republic

GDP: \$4,260

Internet Users: 53.73

Wired (Fixed Broadband Users): 3.92

Wireless Broadband Users: 89.07

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Indonesia's digital transformation is a result of the government and private sector's significant efforts. With their strong commitment to digitization, the Indonesian government, in particular, plays a critical role in this fast expansion. The Indonesian government has made a significant effort to incorporate Internet of Things (IoT) technology into one of the country's most well-known smart towns – Bandung. The local government has developed over a hundred applications to assist citizens while increasing government efficiency and productivity.

As a combination of multiple success stories and greater firm efficiency and top-line revenue growth, the digital transformation movement is gaining traction and accelerating in Indonesia. Emtek,

Telkomsel, Lippo Group, Bank Mandiri, and GO-JEK are just a few of the very successful businesses that have made use of digital opportunities.

Emtek is an Indonesian media and technology company known for owning television networks and turning BlackBerry Messenger into a mobile payment platform with 63 million users. Telkomsel is a significant participant in the mobile communications market, allowing customers to make payments and purchases using their phones. And, speaking of Lippo Group, their foray into the digital transformation game has resulted in phenomenal growth. Lippo Group has evolved to become Indonesia's biggest online retailer, with a sales goal of US\$1 billion in two years, thanks to a US\$500 million investment in its e-commerce.

3.2. New Trends

While the increased adoption of internet-enabled services during the pandemic is expected to boost the digital economy's development, the benefits of this expansion may be unequally distributed. If Indonesia intends to utilize digital technology for greater inclusion, it must emphasize three policy aims.

- The primary goal is to improve digital connectivity and give universal access to high-quality internet via actions including clarifying telecom infrastructure sharing regulations.
- The second goal is to make sure that the digital economy benefits everyone. Improved logistics and more investment in digital-era-relevant skills might help.
- The third goal is to employ digital technology to improve public services, citizen-state interactions, and confidence in the digital realm.

Despite substantial progress in improving internet access over the previous decade, Indonesia's core connectivity gap continues to be a significant roadblock. Almost half of the adult population still doesn't have access, and the gap between urban and rural connectivity hasn't narrowed. Indonesians are beginning to notice how technology is transforming their lives and economic activities, resulting in improved customer service. However, opportunities are generally limited to a segment of the population with a higher level of competence. While digital gig work is more valued than other forms of casual work, it is concentrated disproportionately among urban male workers in the transportation, storage, and communications sectors.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 4.890, Indonesia is ranked 51st out of 64 countries in terms of network infrastructure preparedness. According to the latest estimates, there were 202.6 million Internet users in January 2021, a 16% percent increase over the previous year. 73.3 percent of the population has Internet access at the start of 2021. According to statistics, everyday social media use was above 170 million people, or 61.8 percent of the population, in January 2021. Mobile phone connections made up 125.6 percent of all connections made by the whole population at the time.

Indonesia has made significant progress toward national digitalization and achieved several achievements. Telkomsel signed a lease-back agreement for \$950 million on about 6,050 mobile towers. Additionally, the nation is expected to have steady growth in mobile broadband through 2025, aided by high smartphone adoption. Smartfren picked ZTE to assist in the development of 5G.

4.2. Management Optimization [MO]

For Indonesia to effectively adopt digital transformation, Information, Communication & Technology (ICT) development is a prerequisite. The Ministry of Communications and Informatics has the responsibility to ensure that Indonesians have fair access to high-quality, low-cost ICT services. National digital transformation necessitates the deployment of cutting-edge technologies, such as 5G, together with the expansion of ICT infrastructure. In terms of Indonesia's connectivity, the network will be transformative, serving as the backbone of digital transformation and the critical driver of economic growth. While working on an Indonesian 5G implementation policy roadmap, the Ministry of Communications and Informatics is also forming a 5G Task Force to ensure a well-rounded strategy.

4.3. Online Service [OS]

Indonesia has a low percentage of credit card usage compared to other countries, even though digital payments are relatively more popular.

According to Ipsos' February 2020 study, GoPAY has the largest market share in e-wallets, followed by Ovo, Dana, and LinkAja. E-wallets are most often used for payments such as online transportation, online food and beverage, and offline food and beverage. The use of promotions to reward participants with points and money is quite prevalent nowadays.

In Indonesia, Tokopedia is the most popular online marketplace, enabling people and companies to create and operate their online storefronts in a short period. In addition, Shopee is a significant player in the area, particularly in nations where "mobile first" is the norm. In terms of functionality, it is essentially a mobile-first, varied online store with a traditional web purchase experience.

Besides Shopee, Bukalapak also provides companies and individuals with an e-commerce platform for acquiring and selling items over the internet. Bukalapak places a high value on the convenience and dependability of online trading, and it strives to provide its consumers with an additional layer of financial security.

4.4. National Portal [NPR]

The National Portal of the Republic of Indonesia serves as the official government website for Indonesia (Indonesia.go.id). A general overview of the country is provided, along with information on government leaders, legislative and regulatory agencies, public service announcements, announcements of new initiatives, and news and statistics. Indonesian is the only language supported.

4.5. Government CIO [GCIO]

The chief information officer CIO in Indonesia is appointed as a consequence of a presidential mandate. Government CIOs collaborate with ministries, businesses, and other IT c-level executives to ensure the success of national digital programs. All government departments hire a Chief

Information Officer (CIO) to coordinate technical agendas across several administrations, according to a presidential mandate issued by Indonesian President Joko Widodo.

Government CIOs collaborate with other CIOs, companies, and ministries to guarantee that digital initiatives are carried out at the national level, according to PANRB Deputy Assistant of Policy Formulation and Coordination for Administrative System and e-Government Implementation Imam Mahdi. The presidential order's purpose was to bring together different technology systems from various ministries and agencies. It requires that government organizations share and utilize the same electronic services for a new e-governance system at the national level.

4.6. E-Government Promotion [EPRO]

The Ministry of Communications and Informatics has been increasing efforts to build considerable information and communication technology infrastructure in Indonesia, both on the ground and in space. Providers of information and communications technology infrastructure (ICT infrastructure) are a means of enhancing Indonesia's territorial integrity to the point where ICT infrastructure becomes a societal requirement. Technology has improved to the point that using information and communication networks is no longer considered a luxury or privilege. The Ministry of Communications and Informatics will expedite the construction of ICT infrastructure by at least ten years compared to the previous plan, which was initially scheduled to begin and end in 2032.

4.7. Open Government Data [OGD]

The National Action Plan (NAP), which describes the country's strategy to open government implementation, is important in Indonesian politics. Resources have been promised to the National Action Plan by government ministries and agencies and civil society organizations (CSOs). Certain milestones have been established for each member to guarantee that all promises are maintained. The Open Government Indonesia National Action Plan promotes political stability while also modernizing public services, which is in line with the 8th president's vision of "Clean, Effective, and Reliable Government Management." It's part of the country's long-term development strategy. The plan is also an essential aspect of the government's attempts to advance the global agenda, particularly the Sustainable Development Goals.

The Open Government Indonesia National Action Plan was created in response to the spread of the COVID-19 virus in Indonesia. Since then, the focus has shifted to post-epidemic COVID-19 recovery and how to expedite Indonesia's recovery. Various strategic goals, such as boosting public services, decreasing corruption, promoting budgetary transparency, expanding access to justice, and supporting gender-sensitive public policies, will also be enabled.

4.8. Cyber Security [CYB]

Recent policy developments in Indonesia show a growing awareness of critical national infrastructure vulnerabilities to cyber-attacks and the need for comprehensive regulatory and legislative solutions. Australia's security services may be able to help Indonesia enhance its cyber security basis.

On April 13th, Indonesian President Joko Widodo issued an executive order to enhance the National Cyber and Crypto Agency, also known as the "State Cyber and Signal Agency," abbreviated as BSSN. Under Presidential Decree 28/2021, BSSN is directly responsible to the president, allowing additional

flexible space and influence outside the usual ministry structure. Concerning the organization, activities, duties, and financial foundations of the agency. The BSSN's efficiency and effectiveness will be increased, and rules governing "national security, sovereignty, and data protection" will be reinforced.

Following the BSSN order, three further decrees will be published, including 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. Indonesia intends to utilize these instructions to improve the country's geopolitical and economic competitiveness and develop, secure, and deploy cyberspace for national goals.

4.9. The use of Emerging ICT [EMG]

Indonesia's digital innovation business is rapidly expanding. With a population of 264.2 million people, Indonesia is the world's fourth most populous country. The "digital economy" is predicted to generate US\$133 billion in yearly income by 2025, with Internet penetration at 64.8 percent. Smartphones are the most popular platform, with 96 percent of internet users using them.

Indonesia has one of the most diverse and extensive start-up ecosystems in the ASEAN region, thanks to the country's 215 million internet users and largest economy. Within the more extensive economy, Google/Temasek estimates Indonesia's "internet economy" to be worth US\$40 billion in 2019, after growing at a 49 percent annualized rate since 2015 and is expected to reach US\$130 billion by 2025. This amounts to almost 45 percent of ASEAN's total projected.

Entrepreneurship is essential in the fast-growing "digital economy" e-commerce, digital health, finance, and education technology industries. It is also a driving factor for modernization in traditional banking, telecommunications, agriculture, logistics, retail, natural resources, and public services. A wide range of accelerator/incubator programs, co-working spaces, and venture investors helped make this possible.

Israel

1. General Information

Area: 20,770 km²

Population: 8,816,691

Government Type: Unitary Parliamentary Constitutional Republic

GDP: \$47,600

Internet Users: 86.79

Wired (Fixed Broadband Users): 30.06

Wireless Broadband Users: 115.53

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

In recent years, Israel has achieved significant progress in terms of online government services. Furthermore, the government maintains a map of all available services. According to Government Resolution No. 20974 of October 10, 2014, the most valued government services to the public will be digitized by 2019. To accomplish this, all government services were mapped, assessed for usefulness, and other criteria. Government agencies devised a strategy for digitizing the most beneficial services to make their services available digitally to consumers and companies to decrease bureaucracy and enhance government services. All government services, information, and websites are centralized on the website gov.il. The website is also mobile-friendly, including Arabic and English sections.

The E-Government Unit of the Government ICT Authority collaborates with government departments to digitize paper forms and remove red tape. The documents revised a standard template and are

accessible and cross-browser compatible. Online transactions are far less expensive than phone transactions, let alone dealing with a government clerk in person. Customers' reliance on government service offices is reduced due to digital services, which reduces expenses. Citizens may pay government agencies and organizations online utilizing an e-commerce system with a single responsive interface compatible with all browsers. You may pay with a credit card or with a bank transfer. This channel provides access to services such as printing government papers (such as a driver's license, automobile registration, and ID card supplement) and other available services via a home computer.

Individuals or organizations may be securely identified, allowing for more customized services. A secure identification infrastructure assures that the person who requests a digital service is authorized to get it. In line with Government Resolution 29605 of August 6, 2017, the Government Information and Communications Technology Authority developed a comprehensive identification system. The system enables quick and easy, safe identification from any device.

3.2. New Trends

Times of Israel reports that NIS 500 million (\$154 million) would be spent by the government over five years to increase high-tech and scientific activities among the Jewish people of Israel. Incubators and business accelerators and science museums, and educational programs are all part of the strategy. This initiative is believed to be part of the funding Ra'am received during coalition discussions that included Arab-Israeli businesses, even though the budget has not yet been decided. The campaign will get underway as soon as the state budget is passed. Science and high-tech activities will be funded with a total of NIS 628 million over the next five years (\$193 million).

By agreeing on an approach that incorporated high-tech educational initiatives, Abbas and Farkash Hacoen of Blue and White came up with a plan to create 30 technology centers in Arab countries. According to the report, a cooperative space initiative with the United Arab Emirates might include Arab Israeli students. Incubators, entrepreneurial centers, and angel investor programs are all part of the plan, which calls for creating two R&D facilities in northern Israel and the Negev. The Innovation Authority will give initiatives that assist the Arab community priority, and programs that help researchers and developers advance their careers will be supported.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 7.228, Israel is ranked 24th out of 64 countries in terms of network infrastructure readiness. The overall number of Internet users climbed to 7.68 million in January 2021, up 6.7 percent from the previous year. The proportion of persons having access to the Internet remained steady at 88 percent of the population at the start of 2021. Social media use is predicted to be used among 6.81 million people, or 78.1 percent. Mobile phone connections accounted for 116.9% of the population at the time.

In addition to the statistics, Israel has accomplished tremendous feats up to the start of 2021. The telecom regulator has completed the 5G auction, suggested abolishing all interconnection fees, and set a deadline for GSM and 3G networks to be decommissioned by 2025. Bezeq unveils its fiber network, which will provide data transmission rates of up to 2.5 gigabits per second. The Research Committee awards second-round funding to innovative companies developing 5G technology. The Universal Service Obligations of Bezeq and HOT Telecom contribute to broadband supply to 99 percent of residences.

4.2. Management Optimization [MO]

The Israeli government acknowledged the need for a national digital strategy in 2013. At the same time, the government established the "Digital Israel National Initiative," which aims to design and execute a national digital plan for ICT usage. In its strategic socio-economic review, the National Economic Council listed "Digital Israel" as one of six significant challenges the State should solve. With the National Initiative and its goals in mind, the government formed the Digital Israel Bureau inside the Ministry for Social Equality. The Bureau was given the mission of creating a National Digital Program, executing intra- and inter-ministerial digital projects, and supporting cross-government cooperation by the government.

Israel has progressed through time to become a worldwide high-tech powerhouse, thanks partly to the Israeli people's entrepreneurial spirit and rapid adoption of new technology and services. Now is the moment to make a long-term investment in Israel's leadership ambitions. Some of the Ministry for Social Equality's goals are to reduce disparities between demographic groups, close the "gap" between the periphery and the center, and promote equal opportunity. Promoting technological advancement and innovation in Israel's digital sector can be a significant engine of economic development, job creation, and improved public services. There is also the potential to enhance digital infrastructures and public access to state and local government services.

4.3. Online Service [OS]

In terms of Online Services, the rules controlling electronic signatures, data transfer, and anti-spam remain to ensure that Digital Government applications are used fairly and securely. The site www.gov.il, a new one-stop government website, provides people with easy access to various services ranging from electronic tax and payment processing to form downloads and license registration. Despite the presence of a national portal, the proliferation of government websites makes information access more difficult. Transfers between the portal site and the applicable department and between English and Hebrew locations have not been optimized in some instances, resulting in error pages. Furthermore, no completely optimized online transaction experience has been built since some applications need users to download forms and email or send them to the appropriate agencies.

4.4. National Portal [NPR]

In 2010, a Ministerial Committee resolution created a revamped website gov.il/data to deliver accurate and authorized government information for the general public. The report provides open-source access to government datasets, enabling users to build applications and systems at will. The government ICT Authority inaugurated the new consolidated website gov.il, based on the open code of the British

gov.uk website. The website was established to provide the public with easy and rapid access to all government information and services. The most commonly used services have been redone in the website's style.

4.5. Government CIO [GCIO]

Ms. Carmela Avner, at the time of her appointment as the country's first national chief information officer, was a director in the Finance Ministry. There has been no mention of a replacement in the English-language news media since Avner's departure at the end of 2013. Currently, there is little to no emphasis on CIOs in the country's educational system; nonetheless, CIO jobs and CIO panels and forums are still accessible in the private sector.

4.6. E-Government Promotion [EPRO]

The construction of digital human capital infrastructure for Israeli local administrations is the first component of the Digitization of Local Government and Advancement of "Smart Cities" plan. As a result, two critical training programs have been designed to assist participants in learning about the advantages and prospects of shifting to a digital-based economy, providing them with vital knowledge and skills and allowing them to start and complete digital initiatives. The initiative also encourages building a network of digital transformation leaders to foster shared learning and cooperation for the sector's success.

Additionally, digitization gives Israeli local governments horizontal municipal digital platform options. This component aims to provide local governments a standard minimum foundation for enhancing and increasing access to services for individuals and businesses, with a particular emphasis on those that cannot establish or buy the necessary systems. The third component helps local governments achieve the Smart City goal by supporting advanced digital activities. Local governments will benefit from digital solutions tailored to their specific requirements and demonstrations of how the digital age can aid them in achieving their strategic objectives.

4.7. E-Participation [EPAR]

Free expression and public involvement are promoted across all government agencies in Israel, a foundation of open government. By continuing to expand public sector data accessibility, the administration hopes to increase citizen engagement in decision-making. As a result, ministers' contact information may be obtained on the official website of Israel's Knesset, www.knesset.gov.il. Both Israel's Prime Minister and President have official websites with connections to their respective social media platforms such as Twitter and Facebook. There is, however, no standard or agency in place to assess public satisfaction with D-Govt. services.

4.8. Open Government Data [OGD]

The Internet's improved platform allows for unprecedented cross-entity communication, as well as increased openness and accessibility. The foundation for creative democracy is built on open government ideals of transparency and accountability, and public participation. Government agencies

devised a strategy for digitizing the most beneficial service station and new technologies in public-private interactions. The International Open Government Partnership, a partnership between governments and civil society organizations in over 70 countries, including Israel, supports these ideas.

Promoting data-driven innovation, where the government is an information supplier, and public access to government databases provides economic and social advantages is possible with Open Government. This opens up the vast amount of data collected by the government and allows for new services that benefit individuals and the economy. In 2012, the Ministry of Transportation launched the Public Transportation Database, which collects trip data from buses. Many applications based on data were created quickly to provide excellent and up-to-date information to public transport passengers.

The Government ICT Authority promotes actions that align with the Open Government Partnership's goals. The government departments take measures to allow public access to government databases, and efforts to improve public engagement in decision-making processes will be promoted. The Government ICT Authority is also working on an open code policy with the Accountant General Division and government departments. The government will also open and make accessible the necessary infrastructure to ensure the success of these measures, such as portals for current and reliable government information and public participation platforms.

4.9. Cyber Security [CYB]

Israel, after the United States, is the second most favored nation for organizing InfoSec events. Israel has traditionally maintained a formidable military due to its political context, which includes Offensive and Defensive Cybersecurity capabilities. Israel's Security Services and leadership benefited from the United Kingdom's blunders after World War II.

On the other hand, the Israelis did the exact opposite of what the British did in 1945. Their government has long recognized the value of reusing and recycling top Cybersecurity specialists who obtained essential expertise and knowledge while serving on both the offensive and defensive sides of the military and applying those talents in a business context. Israel fulfilled a target set by Benjamin Netanyahu in 2015 of becoming one of the world's Top Five Cyber Security Powers. Israel accounts for about one-fifth of all private cybersecurity investments worldwide. Unit 8200, akin to GCHQ or the NSA, specializes in recycling its military Cyber Warfare ingenuity into the business realm.

4.10. The use of Emerging ICT [EMG]

Israel's government aspires to be one of the world's top five artificial intelligence developers. The government anticipates investing \$300-600 million to accomplish this aim. To further examine this concept, a coalition of academic, industry, and government leaders were created. On the other hand, Israel continues to be the leader in terms of talent and AI startups, with a sector ecosystem totaling over 1500 firms.

Numerous information and communication technology (ICT) businesses are software-based. Israel's primary supply of software, information technology equipment, and services is in the United States. Israel is a critical player in the digital world, particularly in information technology, software, and the internet has grown 400 percent in the previous decade. Globally, Israeli software is used in a wide variety of corporate, consumer, and technical applications. Over a hundred Israeli software businesses are involved in cloud computing, widely viewed as the next information technology revolution.

Priority was given to communication infrastructure by the Ministry of Communications in 2020. In June 2021, the Ministry deemed the fiber optic infrastructure plan effective. The Ministry of Communications has advocated for subsidized fiber-optic infrastructure expansion in economically depressed regions. Americans may immediately contribute to the 5G ecosystem, beginning with components that communicate with 5G infrastructure, such as mobile chipsets, modems, data center equipment, and IoT devices. The network will also allow smart cities, improved transportation, digital healthcare, and increased industrial output and manufacturing.

Italy

1. General Information

Area: 301,336 km²

Population: 60,351,444

Government Type: Unitary Parliamentary Constitutional Republic

GDP: \$35,000

Internet Users: 76.10

Wired (Fixed Broadband Users): 29.53

Wireless Broadband Users: 94.09

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

The digitalization of the Italian government has progressed at a remarkable pace in recent years. TIM is being sued for €1.1 billion by Vodafone Italy and Fastweb for abusing its dominant position in the fixed broadband market. An official website dedicated to coronavirus preparedness has been launched by the Italian Ministry of Technological Innovation and Digitisation (MID) to showcase the efforts being made by operators, businesses, and organizations across the country to reduce the impact of the outbreak on the general public. Companies may sign up on the government's Digital Solidarity website to provide free online publications, high-speed Internet, and e-learning platforms.

Italy has launched a campaign to convince Internet companies and publishers to provide free services that allow people to work and study from the comfort of their own homes. Following the call for digital solidarity issued by Paola Pisano, Italy's Minister for Technological Innovation and

Digitisation, all of the country's leading telecom providers have already announced several incentives for residential and business customers. Additional data allowances, access to cloud computing platforms, online meeting services, and free magazine subscriptions are just a few of the benefits available via the Digital Solidarity website. Other countries that may be forced to put substantial restrictions (such as pandemic measures) on their citizens may emulate this public sector initiative.

3.2. New Trends

The National Innovation Plan 2025 calls on the government to step up efforts in three critical areas: digitalization, innovation, and long-term sustainability. In light of the present state of the pandemic, it is essential to develop new methods of operating collaborating beyond national borders. The National Innovation Plan 2025 emphasized the need for speeding digital transformation, rethinking public service administration and delivery systems, and increasing the use of artificial intelligence to achieve the stated goal of improving public service delivery. Developing personal assistant skills, advising on small and innovative start-ups, preventing the use of inexperienced or obsolete technology, and monitoring outcomes are all examples of what may be done. The local governments must take an active role in citizenship promotion efforts to ensure that people are digitally included and competent by helping them gain access to digital services and resources. This is essential. Initiatives such as Bread and Internet Points, Assisted Access Points, and Roma Easy Points have been established in this respect.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

It was estimated that 50.54 million people in Italy used the internet in January 2021, a rise of 1.1 million people over the same month the previous year.

In January 2021, the percentage of Italians who used the internet was 83.7 percent. At the same time, the number of social media users in Italy reached 41.00 million, equal to 67.9 percent of the country's entire population.

In early 2021, there were 77.71 million mobile connections in Italy, equal to 128.6 percent of the country's entire population.

4.2. Management Optimization [MO]

The Council approved the National Broadband Strategy and the Ultra-Wideband Plan of Ministers on March 3, 2015. Digital Italy and the Ministry of Economic Development had a collaboration in the plan's implementation. Individuals and governments alike may invest beyond the European minimum. The Italian Ultra-Wideband Strategy seeks to bridge the gap between fixed and mobile telecommunications infrastructure.

The Three-Year Plan for Public Sector IT concentrates public sector ICT investments on government standards and European goals and initiatives. The plan proposes new digital technology management and use paradigm. The Plan requires a balance of innovative technologies, flexible management, and an effective governance model. In addition to executing the Plan, the Agency for Digital Italy coordinates federal and municipal support. In March 2019, former Simplification and Public Administration Minister Giulia Bongiorno approved the 2019-2022 Three-Year Plan for Information Technology in Public Administration. The new approach will enable individuals and businesses to be active innovators.

4.3. Online Service [OS]

SPID is a method for verifying a person's or business's digital identification. SPID allows consumers to access all PA online services through a single digital title from any device (username and password). It enables people to access public services throughout the EU. Collaboration between the public and commercial sectors is needed to develop national systems. There were 5,736,164 SPID IDs active in January 2020.

After two trial runs, all citizens over 15 were granted access to the Italian electronic ID card (CIE). It contains users' tax identification numbers, blood type, and fingerprint scans. A unique identifier, a biometric key, and a digital signature are all included. The microchip stores the cardholder's fingerprint template. Additionally, the microchip allows electronic payments between people and vendors. Italians may now travel across the EU and utilize public services thanks to CIE.

A few websites have been established to provide online services. Buyers and sellers may utilize an eCatalogue to place direct orders or get quotations from the platform's certified suppliers. Also, Buy Smart, the national website, provides free green purchasing advice and educational materials. Agencia Nacional de Nuevas Tecnologías, E (ENEA).

The public sector has made tremendous strides in terms of digitalization. Through an IT exchange platform, electronic invoices are transferred between public administration entities. By January 2020, 150 million e-bills will have been issued. Individuals and companies may make electronic payments to government agencies by following the regulations, standards, and technologies established by AgID (payment service providers - PSPs). Numerous cities have signed on to the platform. PagoPA is a standard method of paying waste taxes in Milan.

4.4. National Portal [NPR]

In March 2005, the eGovernment Portal for Businesses was created for businesses and entrepreneurs. This contains data from the federal government, regions, provinces, and municipalities with a population of more than 25,000 and mountain and health authorities and chambers of commerce. The National Services Card (CNS) or a smart card that complies with the CNS's criteria is required to access the integrated services area, which enables simplified procedures, unique data transmission, and coordinated procedure result communication.

The website serves as a one-stop-shop for free access to Italian legislation. As of March 2010, the site includes all laws passed since 1981; in 2014, the site included Italian government legislation (about

75 000 pages). On October 22, 2010, this page was accessed. It was a new website created by the Ministry of Labour and Social Programs to strengthen ties between business, education, training, and social programs. Its main objective was to facilitate and expedite access to a comprehensive catalog of detailed employment information and services via the use of a shared and collaborative information system.

The National Tourism Portal of the government provides information about the country's main cities. Tourists may get travel ideas, articles, and movies about Italy's main attractions on the web. Additionally, a calendar of activities is included to ensure that all thrilling experiences are maximized.

4.5. Government CIO [GCIO]

The positions of General Counsel and Chief Information Officer are not specified. In Italy, no formal rules or standards govern the chief information officer job. AGID is the primary organization in charge of Digital Italy, and it is housed inside the Prime Minister's Office. The AGID team supports and advises Italian public sector organizations as well as the Italian government. Additionally, the Director of AGID makes a passing reference to the GCIO function in his comments.

4.6. E-Government Promotion [EPRO]

By allocating EUR 5 million for two years between 2020 and 2021, Law 160/2019 seeks to bolster the Italian Digital Agenda. Additionally, the Law establishes a new function for the Department of the Presidency of the Council of Ministers in identifying, promoting and managing initiatives involving innovation, technology, and digital transformation. Finally, the Law calls for the establishment of a platform for digital notifications. All government agencies will utilize this platform. The Legislature adopted Legislative Decree No. 133 on 12 September 2014 to boost the national economy and eliminate bureaucracy.

On 5 September 2019, the Ministry of Innovation, Technology, and Digitalisation were established to develop a coherent plan for Italy's modernization according to the rest of the European Union. The Ministry's objective is to allow Italy to close the technological gap with other EU member states and to develop new business models to complete the country's digital transformation and make up for the deficit in compliance with international standards identified by the European Commission. The Digital Transformation Department (DTD) is responsible for implementing the Digital Agenda (2017-2019) and inherits the former Innovation Technology Department's competencies within the Ministry. The Digital Transformation Department was established to assist the Prime Minister in promoting and coordinating government initiatives to develop a unified strategy for digital transformation and country modernization via digital technology. Since January 2020, the department has been operational.

4.7. E-Participation [EPAR]

The 2025 National Innovation Plan was introduced in February 2020 by the Ministry of Innovation, Technology, and Digitalisation. A digital infrastructure, public services, and public-private

partnerships are promoted. The Plan aims to encourage high-tech industries such as robots, smart mobility, artificial intelligence, and cybersecurity inside the Italian economy and solve all human-related problems presented by the fourth industrial revolution. The Plan will foster inclusive, transparent, and long-term innovation that benefits the whole community.

With the help of the Agency for Digital Italy, public and EU-wide information systems planned to have interoperation. Complete European integration ensures the technical consistency of public information systems intended to serve people and companies. The Agency also promotes Italian involvement in European and national digital agenda projects. The new measures of open government culture, corruption prevention, simplification, digital services, digital citizenship, and skills demonstrate the maturity of available government processes while improving action convergence and resource optimization.

The third Action Plan enhances and extends initiatives to promote government investment transparency, including Soldipubblici, OpenCoesione, ItaliaSicura, and Opencantieri. Local governments also help fight corruption and safeguard digital rights.

4.8. Open Government Data [OGD]

The Fourth Open Government Partnership Action Plan, released in June 2019, aims to transform how citizens engage with the government. The Plan includes new measures on consultation processes, the beneficial ownership register, and stakeholder guidelines. It contains twenty significant digitization initiatives that must be completed by 2025 to promote better democracy, ethics, and inclusion.

Directive 2003/98/EC on the re-use of public sector information was incorporated into Italian law in January 2006 by Legislative Decree 36. Following a discussion about the appropriate implementation of Directive 2003/98/EC on the re-use of public sector information in Italy, the Italian government suggested amending Legislative Decree 36 of 24 January 2006 to re-use public sector documents. In 2015, Italy enacted Legislative Decree No. 102/2015 to bring national legislation into compliance with Directive 2013/37/EU. It set new requirements for electronic access to and re-use of government data. Additionally, it set the standard for Open Data.

Italy's open data standard is established by the eGovernment Open Data Portal which provides access to and descriptions of about 150 publicly accessible databases. The data is made available in a comprehensive, timely, and accessible way to anybody interested in developing applications for analysis or study. Open data is a term that refers to publicly available information that must be readily reusable. Access trusted to applications and licensing are critical in this context. Each administrative entity must publish open data following international and nationally relaxed trusted data laws to contribute to the public information heritage. There are 27 911 datasets as of January 2020.

4.9. Cyber Security [CYB]

On November 18, 2019, the Official Gazette published new legislation on urgent cybersecurity measures. The Law was enacted to guarantee that nationally public and private information systems that provide critical public services are secure. Legislative Decree 65/2018 established the Italian Computer Emergency Response Team (CSIRT) by transposing NIS Directive EU 2016/1148.

The AgID created beneficial techniques for enhancing the resilience of the public administration's national IT infrastructure. The goal was to increase the responsiveness and efficiency of public sector cybersecurity systems to prevent events such as accidents or hostile activity that jeopardized expected service delivery. In 2018, a risk management strategy was developed based on solutions previously utilized in the commercial and governmental sectors on a national and international level. PAC and PAL have begun testing AgID's self-assessment tool for cyber risk.

The Law 133/2019 on Immediate Measures to Strengthen National Cybersecurity aims to guarantee a high degree of security for public and private information systems that provide critical public services. Within four months of the law's passage, the President of the Council of Ministers is required to issue a decree specifying the entities impacted by the law. Additionally, the Cybersecurity Portal provides tools for evaluating and controlling cyber risk.

4.10. The use of Emerging ICT [EMG]

The first White Paper on Artificial Intelligence at the Service of Citizens was delivered in Rome in March 2018 by the IA Task Force of the Agency for Digital Italy. The White Paper illustrated the guidelines and recommendations for the sustainable and responsible use of Artificial Intelligence in public administration. As described in the previous section, it represented the first step in establishing a link between public administration bodies and the private sector. The goal was to find a way to match the supply and demand for new services in the marketplace. These expert groups were convened in January 2019 to develop national strategies, which included defining each group's goals, schedule, and working procedures. The discussions focused on artificial intelligence, blockchain technology, and distributed registers.

The ideas of distributed ledger technology and smart contracts were first brought into Italian law by Decree-Law No 135 of December 14, 2018, modified by Law No 12 of February 11, 2019. They were then codified in Law No 12 of February 11, 2019. These definitions reflect the first official effort by the Italian government to define and incorporate blockchain technology within the country's legal frameworks. Furthermore, the Law may serve as a starting point for more comprehensive national regulation of blockchain technology in the future.

Ireland

1. General Information

Area: 70,273 km²

Population: 4,991,658

Government Type: Parliamentary Democracy

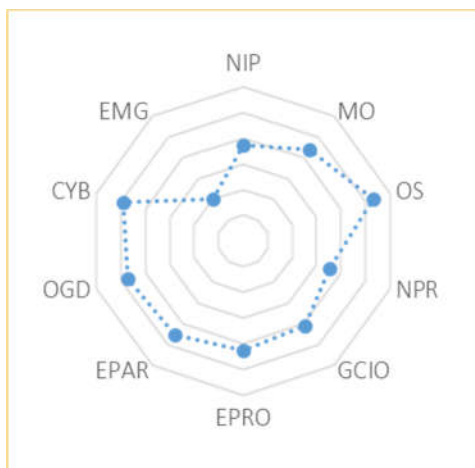
GDP: \$94,560

Internet Users: 92.00

Wired (Fixed Broadband Users): 30.71

Wireless Broadband Users: 103.82

2. Digital Government Overview in Country

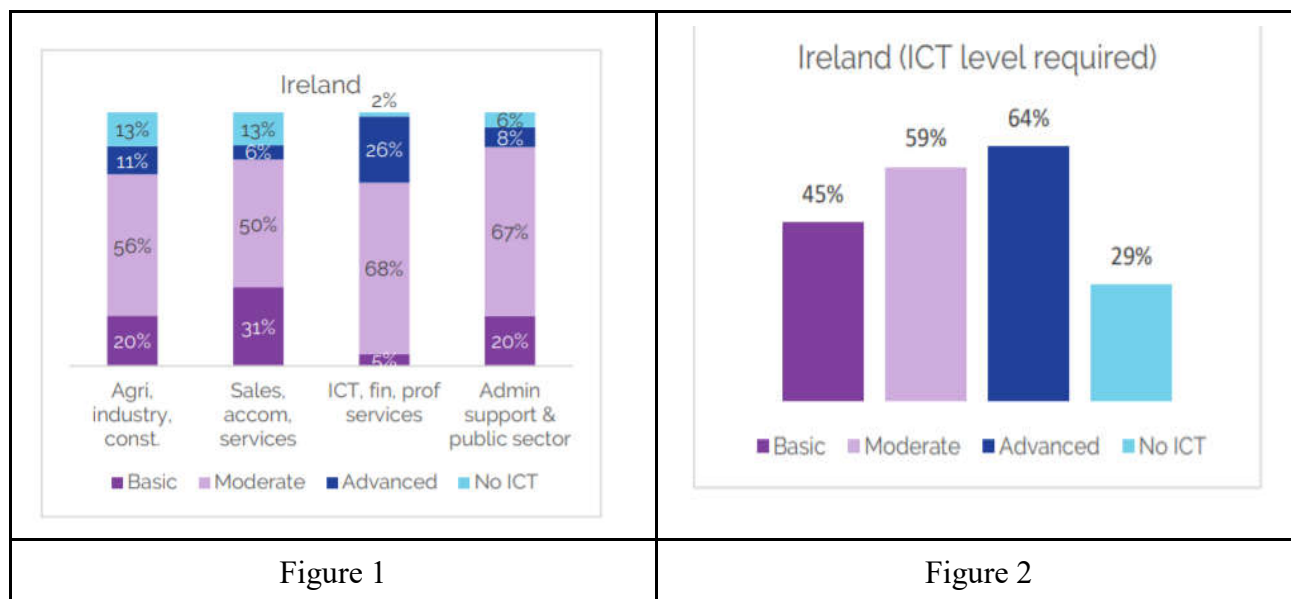


3. Digital Government Development and new trends

3.1. The development

The Covid-19 outbreak has altered Ireland, as well as the rest of the world, ushering in a new era of development. Ireland needed to make a larger effort to integrate technology into its economic and social life in order to overcome the pandemic and recession. Digital governance is considered as the catalyst that will lift Ireland from its downward spiral. The government made actions to close the digital skills gap and build an education and training system supporting adults to acquire digital skills. Additionally, the government has made major investments in the country's workforce's digital transformation. Prior to obtaining any work, all labor forces must meet critical skill and knowledge

standards. This is followed by an aim of producing citizen-developed technology to meet the next era's expectations.



Figures 1 and 2 illustrate the level of technology required to meet Irish job standards. Practically all large sectors require moderate talents, which include the use of a word processor and/or the generation of papers and/or spreadsheets.

Ireland's immigration and business registration processes have been streamlined and resourced to meet international standards. To develop their infrastructure and public services, the government harmonized policies and programs across Departments. They advocate for free international data flows and work with the European Commission to advance practical and legislative initiatives in the data management and artificial intelligence sectors

3.2. New Trends

To educate and encourage the use of new technologies, the Irish government actively advertises, interacts, and consults with the general public. In 2018, they conducted an exercise that included meetings and face-to-face contacts with members of the public, which was attended by Minister for eGovernment Patrick O'Donovan TD. The government wants to encourage innovation by increasing the participation of start-ups and small and medium-sized enterprises (SMEs) in the creation of government solutions. This is accomplished via the usage of GovTech.

To push all five components of its Public Service ICT Strategy, the Irish government devised an 18-step program that includes eighteen major projects. Each of the eighteen initiatives has been programmed to take advantage of the standards in their respective fields. The development of the

Gov.ie website, the passage of legislation, the creation of a Government Private Cloud, and the introduction of an ICT Apprenticeship program are all examples of these efforts.

The government wants to increase the number of people who use MyGovID as well as the service's value and capabilities. Mobile-based authentication, for example, will be a good example of this. They want to transition their private cloud to a hybrid cloud environment so that they may take use of the advantages of public cloud services while keeping costs down. They also want to redouble their efforts in the future in the area of open data.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Ireland had 4.51 million internet users in January 2021, a 242 thousand increase from 2020 to 2021. The Internet penetration rate of Ireland as of January 2021 was at 91 percent.

The number of social media users in Ireland increased by 3.1 percent in January 2021 compared to January 2020. By the beginning of 2021, social media users in Ireland would account for 76.4 percent of the total population. Ireland had 4.69 million mobile connections in January 2021, which showed a decrease of 192 thousand from January 2020 to January 2021. The statistics accounted 94.6 percent of the total population.

2021 witnessed some significant development in Ireland' digital government, which include:

- National Broadband: Ireland advances the national broadband network;
- Starlink begins satellite broadband trials;
- eir expands 5G services to 57% of the population;
- regulator directs eir to make fiber networks available to altnets;
- Vodafone launches a commercial NB-IoT service and expands 5G services to additional cities.
- SIRO's Gigabit Hub Initiative continues to expand its retail client base.

4.2. Management Optimization [MO]

Ireland has been creating an eHealth strategy to demonstrate the value of eHealth to both individuals and the Irish healthcare delivery system. Electronic prescription, online referrals and scheduling, Telehealth, and the creation of summary patient data are just a few examples. The Health Service Executive (HSE) released the Knowledge and Information Strategy in May 2015, highlighting the advantages of eHealth in Ireland. The Strategy's goal is to offer integrated care that is patient-centered, safe, and high quality. The Strategy, which builds on Ireland's eHealth Vision, is designed to fulfill the requirements of the population across all patient routes and care settings. Additionally, this Strategy describes how to change the organization's knowledge and information to meet future delivery challenges and promote the HSE Corporate Plan's Vision and goals.

The Irish government released an Action Plan, a strategy for meeting Ireland's need for high-level information technology expertise. The plan aims to improve Ireland's supply performance via targeted measures that will help the country retain its position as a worldwide hub for high-level information

technology talent. The government, business, and education and training sectors are cooperating to achieve this goal.

Local governments carry out their responsibilities in line with national policies and LGA initiatives. The Local Government Management Agency, a state-funded agency that answers to the Housing, Planning, Community, and Local Government Department, assists municipalities in achieving their objectives (LGMA). The LGMA supports the coordinated and cost-effective implementation of municipal services and initiatives within the limits of its legislative mandate. The Government Chief Information Officer's Office (OGCIO) develops and maintains an enterprise-wide business support software portfolio. As a cost-cutting strategy, the Public Service ICT Strategy stressed the need to centralize creating a uniform software suite for all departments.

4.3. Online Service [OS]

Government agencies and other authorized users effectively use the Personal Public Service Number (PPSN) to enable secure access to public services. The Department of Employment Affairs and Social Protection, the Revenue Commissioners, and the Health Service Executive all use PPSNs (HSE). A PPSN is required for child vaccination, public health (including medical cards and a payment system for prescription medications), revenue (including mortgage interest reduction), housing grants, and driving theory and licensing exams. The Public Service Card (PSC) eliminates duplication and provides the highest level of privacy whether receiving public services online, over the phone, or in person.

A typical “Irishman's It” allows citizens to log in to many online government services with a single password. In February 2020, customers intended to access public services more securely and effectively via MyGovID. MyGovID is required to access the following online services.

Irish people may renew their passports or apply for new ones online. The service is available 24/7. It allows Irish people to travel inside the European Union, the European Economic Area, and Switzerland. Any Irish citizen above the age of 18 with a valid passport is eligible to apply. Applications are accepted online or through the free app. Passport holders who obtained their Irish passports recently may now renew online.

4.4. National Portal [NPR]

The gov.ie website acts as a single point of access to online government services, enabling users to search for available services quickly. The Irish Government News Service Portal offers an insider's view of government by reporting on significant events as news. The site's primary aim is to provide objective coverage of a wide variety of events. In other words, the Portal enables people with interest in government issues to stay current on a single website. All government news releases are available through RSS feeds or direct links to the Departments. Additionally, the Portal has an 'Issues' section that contains useful topical information. It was created collaboratively by the Government Information Service, the Government Press, and IT.

Citizens Information is operated by the Citizens Information Board, Ireland's official organization for providing information and advice on social services. The website offers information on employment rights, homeownership, international relocation, and education. The subjects are divided into 14

categories that correspond to significant events and activities in one's life. Case studies, accompanying documentation, and downloadable forms from different service providers and organizations bolster the data.

4.5. Government CIO [GCIO]

The mission of the Irish Government Chief Information Officer (GCIO) is to develop and implement a unified IT strategy for the government that ensures the usage of technology across all departments and agencies. The Health Service Executive (HSE) created the Office of the Chief Information Officer (OCIO) at the second level of the organization to oversee the eHealth Ireland Strategy and guarantee that technological improvements help enhance healthcare.

4.6. E-Government Promotion [EPRO]

The European Commission proposed in April 2018 a proposal to amend the regulation on the use of public sector information after an analysis. The Data Sharing and Governance Act took effect in early 2019. The GDPR and the Data Protection Act 2018 allow public organizations to freely share data without fear of violating the law. The SDG will provide EU members with online access to information, administrative procedures, and support services to help them initiate business operations in another EU member state. EU individuals and companies were able to quickly check the applicability of local laws and assistance while traveling across EU borders by the end of 2022. Within one year, every EU member state is expected to conduct basic activities such as vehicle registration and pension collection without physical documents.

4.7. E-Participation [EPAR]

4.8. Open Government Data [OGD]

The government adopted and released an eGovernment Strategy 2017–2020 in July 2017. A commitment to openness, adaptability, and collaboration with people and companies is reaffirmed in the eGovernment Strategy. The EU's 2016–2020 eGovernment Action Plan and guiding principles are linked to the Strategy's ten key themes. A few of Ireland's most vital activities are as follows:

- Make a Digital Service Gateway
- Set up an eGovernment Minister-led Digital Programme to improve digital identification and digitize the whole administrative process
- Enhance current digital identity strategies to enable business and location identification;
- Expand data-sharing capabilities
- Introduce laws to encourage data sharing
- Update the Open Data Portal

A new Open Data Strategy for 2017–2022 was announced in July 2017. This approach builds on the progress made since the Open Data Initiative began in 2014. The Accessible Data Portal encourages innovation and openness by making public sector data open, accessible, and reusable. The Open Data Maturity Benchmark ranked Ireland first among the EU28 in 2019.

4.9. Cyber Security [CYB]

The National Cyber Security Centre (NCSC) has been running as the department's operational arm for information security. NCSC members are chosen from the state's national/governmental Computer Security Incident Response Team (CSIRT-IE). The project aims to minimize Internet infrastructure and services risks to provide a stable, secure, and trustworthy online environment in which individuals and businesses may conduct social and economic activities. The collaboration with other government agencies, critical industries like energy and telecommunications, and international partners helps protect critical digital assets and the infrastructure that relies on them.

The Minister publicly launched a new National Cybersecurity Strategy for Communications, Climate Action, and the Environment in 2019. The Cruinni GovTech Report was published in November 2019 with Future Jobs Ireland's (FJI) annual Report for 2019. The Report emphasized how new technology could be utilized to develop public service delivery.

4.10. The use of Emerging ICT [EMG]

In 2018, the new Research Priority Areas 2018-2023 were released, allocating most government-funded research. Ireland commits to evaluating essential areas monthly to keep them relevant and update and modify them as needed. Ireland must be prepared to capitalize on global possibilities now and in the future by responding to global trends and challenges that influence the global economy and its position. Since 2012, the themes and areas of emphasis have been changed to reflect changing circumstances.

Ireland established the European Blockchain Partnership in April 2018 to establish a European Blockchain Services Infrastructure (EBSI). Ireland participated extensively in the Partnership's policy, technical, and use case workgroups in 2019, emphasizing the Self-Sovereign Identity case use workgroup. Ireland is a member of the Organization for Economic Cooperation and Development and the Blockchain International Association for Confidence Applications (INABTA). Ireland will join the INABTA government consultative board, adding to the global blockchain conversation. Blockchain Ireland is a public-private partnership in Ireland that brings together the blockchain business and academia.

The EU Social Security Coordination Regulations require the Member States to establish an electronic data exchange system. The system's objective is to make it easier to handle benefits claims under EU regulations. In Ireland, the EESSI Access Point is presently operational.

Project Ireland 2040 is allocating a €500 million Disruptive Technology Innovation Fund (DTIF) to invest in disruptive technology research, development, marketing, and applications. Advanced and intelligent manufacturing and sustainable and intelligent food production and processing are critical areas.

Japan

1. General Information

Area: 377,930 km²

Population: 125,965,924

Government Type: Unitary Parliamentary Constitutional Monarchy

GDP: \$42,930

Internet Users: 92.73

Wired (Fixed Broadband Users): 34.50

Wireless Broadband Users: 206.43

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Japan has done relatively well compared to many of its Western rivals during the COVID-19 crisis, despite its population density and super-aging population. A total of 87.6184 points earned Japan ninth place in the Waseda International digital government rankings for 2021. Former Prime Minister Yoshihide Suga decided to establish the agency early in his tenure as prime minister. It was designed to overcome the “digital war loss” that had previously occurred. Getting rid of the bad taste left behind by the previous digital firm is a daunting undertaking for the new one.

Fax machines transmitted handwritten information among medical institutions, regional public health centers, and local governments. Cash rewards were distributed to Japanese citizens over months, but developed countries like Germany, South Korea, and the United States completed payouts in days.

During the pandemic, system improvements were often unsuccessful. Because medical facilities had to enter more than 100 data points when resources were few, critics have decried the Health Center Real-Time Information Sharing on the COVID-19 system, which the health ministry quickly created to gather real-time patient data. Incompatible with Android OS updates for months, the COVID-19 Contact-Confirming Application was finally fixed. Shortly after it was introduced, an online application system for job adjustment subsidies was shut down. Local governments in Japan need four unique systems to administer immunization programs: the Vaccination Record System, which manages individual data, the Vaccination Allocation System, the Local Government Ledgers, and the Vaccination Distribution System.

3.2. New Trends

The coronavirus outbreak has completely disrupted Japan's economic growth. The time has come for Japan to go forward with its Digital Transformation (DX) plan. The DX policy will be a determining element in the upcoming house elections, is beginning to be recognized by the administration, led by the Liberal Democratic Party (LDP). The Japanese bureaucracy acknowledges that DX has sped things up. Former PM Abe notified the media that he would be attending a web-based conference of the Ministry of Justice in April 2020 to promote the digitalization of legal administration and AI and ICT's use. There will be regular web meetings at the Ministry of Justice, according to the Minister.

It was imperative that a video conference system in use by the Ministry of Justice, which could only be reached from inside the Ministry, be upgraded as soon as possible. As the Minister pointed out, bureaucratic sectors have a troubled history. Perhaps the coronavirus outbreak prompted these bureaucratic organizations to realize that they must become digital. Japan has entered a new era in which the DX process must be accelerated after the coronavirus outbreak.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

The Waseda rankings 2021 placed Japan's Network Infrastructure Preparedness at position 12th, with 7.574 points. Over the year, the number of internet users in Japan increased by 890 thousand to 117.4 million people. At the time, Japan had an internet penetration rate of 93%. More than 74.3 percent of the country's population was on Facebook in January 2021.

There were 201.1 million mobile phone connections in Japan as of the beginning of 2021, an increase of 6.1 million over 2020. 159.3 percent of the population in Japan had a mobile phone in January of 2021.

Japan's digitization strategy includes a tax adjustment to encourage rural 5G networks. It is expected that NTT DoCoMo's 5G service will be available to 55 percent of the population by March 2022 and that the company will have complete control of it by 2023. The shift to FttP in the fixed broadband industry continues as DSL is phased out.

4.2. Management Optimization [MO]

The Japanese government is aware of the need to examine governance model changes. Regulations are reviewed utilizing frameworks and assessments for regulatory changes that combine digital technologies and data in the areas of consumer protection and security linked with credit and other problems. As a result, Japan was in the top 5 countries with the highest score of Management Optimization indicator in the Waseda rankings 2021.

A meeting of the 31st Council on Investments for the Future held in 2019 decided to conduct demonstration projects on the development and implementation of regulations based on the use of digital technology in our societies, with a particular focus on the following three areas: to identify problems and challenges associated with achieving the optimal forms of future regulations, etc.

4.3. Online Service [OS]

The government aims to build a cashless payment platform for joint use by administrative services and private-sector services and enhance cloud services utilizing the individual authentication function of My Number cards from the standpoint of expanding use of My Number cards while rigorously protecting personal information, as a national platform for Society 5.0.

4.4. National Portal [NPR]

e-Gov, the official website of the Japanese government, is run by the Ministry of Internal Affairs and Communications. Projects include online management of administrative procedures, electronic information supply, work, system optimization, enhanced procurement of government information systems, and the Japanese government promoting information security measures. Additionally, this site includes connections based on visitors' goals, as well as Japanese-language resources.

4.5. Government CIO [GCIO]

According to the Waseda rankings, Japan was one of the top three nations for Government CIOs. As part of the Director-General of Administration, each central ministry has a chief information officer (CIO) and an associate information officer (ACIO). Many laws are created by the Federal CIO Council, which is composed of Ministry CIOs. Prefecture-level and municipal-level CIO appointments exceed 90%, respectively. In November 2012, the government created a single point of contact for all Ministry Chief Information Officers. To replace Mr. Endo on the Federal CIO Council, Akihisa Miwa, a former executive vice president of Obayashikumi Construction Company, has been selected.

4.6. E-Government Promotion [EPRO]

In the information society, humans and computers acted as intermediaries, connecting physical space and cyberspace. Vast amounts of data collected in this way are automatically analyzed by highly developed artificial intelligence (AI). The development of AI technology has been remarkable in recent years, particularly the development of technology such as deep learning. "Society 5.0" is what the government of Japan calls its vision of a human-centered society that can promote economic growth and solve social issues.

4.7. E-Participation [EPAR]

Japan has proposed the concepts of "Governance Innovation" and "Data Free Flow with Trust" at the G20 meeting. Japan is in a position to drive the formulation of international digital rules going forward. The establishment of a governance model that promotes digital innovation is the key to economic growth.

4.8. Open Government Data [OGD]

The Open Data program, which has the support of the Japanese government, argues for the release of public data in machine-readable forms and the permission to use that data for commercial benefit or other reasons once it has been made available. It is anticipated that because of this initiative, people's lives will be enhanced, and business activity will be stimulated. Data from the Japanese government's website, <https://www.data.go.jp/>, can be found in a searchable database. Fortunately, the website's search engine is rather broad.

4.9. Cyber Security [CYB]

The construction of a comprehensive and transparent system for data collecting, storage, administration, and distribution in Japan is essential to constructing a framework for global data dissemination. It's not a one-size-fits-all approach. There is a slew of ministries and agencies working on various specific issues, including the development of general-purpose data formats, data cleansing, the promotion of data security, the assurance of privacy and security for data distribution, and a Society 5.0 cybersecurity framework.

Thus, the government proposes to create an expert organization on local and international data exchanges and digital markets based on experts from various ministries and agencies. This institution would be called Digital Market Competition Headquarters (provisional). Data portability and API disclosure will be addressed by this organization, as well as the ability to obtain survey results and other reports under the Act on the Prohibition of Private Monopolization and Maintenance of Fair Trade (the Antimonopoly Act) and other applicable laws and regulations, to establish a framework for defining and measuring the global market.

While the secretariat will assemble a team of experts from the General Secretariat of the Japan Fair Trade Commission, the Ministries of Economy, Trade, and Industry, and International Affairs and Communications to assist with digital-related policymaking, the expert organization will assemble a team of legal, economic, information technology, and systems theory experts. When developing a strategy for a data-driven society, many ministries and organizations will interact with the Digital Market Competition Headquarters (provisional). To execute service changes and bulk requests and bookings of funding for digital government infrastructure in mind, the Cabinet Secretariat should begin operating a government information system throughout the year.

4.10. The use of Emerging ICT [EMG]

Japan is a hotspot market for tech innovation, and 5G is no exception. According to NTT Docomo, in February 2021, a basic agreement was signed to establish a consortium to provide 5G solutions. The new technology will be tested in Thailand, with commercial services being officially launched in 2022. Japan pledged to commit \$2 billion (¥218 billion) to strengthen digital competitiveness in developing 5G and beyond 5G technologies. Quantum computing is a bold new frontier in digital computing power, with particles representing qubits able to take on 0 or 1 valued bits simultaneously.

According to a Japan Times article, the government estimated that Japan's organic food market was worth ¥185 billion based on a consumer survey in 2017. Yano Research Institute estimates that the market will hopefully expand to somewhere around ¥196 million in 2022. Current agricultural policy changes beginning in 2016 have been a driving factor toward innovative strides among ICT companies such as NTT AgriTechnology. As of March 2021, RIKEN, the Research Organization for Information Science and Technology (RIST), and Fujitsu announced the beginning of shared use of an A.I.-driven supercomputer Fugaku. The green energy market in Japan is a sure bet, with the government pledging to take Japan carbon neutral by 2050.

New A.I. supercomputing will also lay the groundwork for developing next-generation electric vehicles, fuel cells, solar batteries, etc. Japan has an excellent opportunity to get back on its feet with its ambitious projects and fill the gaps in the global chip market.

Kazakhstan

1. General Information

Area: 2,724,900 km²

Population: 19,038,796

Government Type: Unitary Dominant-Party Presidential Constitutional Republic

GDP: \$ 9,830

Internet Users: 85.94

Wired (Fixed Broadband Users): 13.93

Wireless Broadband Users: 83.66

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Kazakhstan ranked 31st in the Waseda International digital government rankings for 2021, with an overall score of 75.2545. Because of the COVID-19 outbreak in Kazakhstan, personal data security has become a significant concern. As part of the "Digital Kazakhstan" national digitalization program, facial recognition, artificial intelligence, and biometrics have been applied haphazardly in several public domains, including healthcare. In contrast, despite their optimistic and successful outcomes, technical solutions have disconcerting and far-reaching ramifications for privacy, secrecy, and data security.

Since COVID-19 conflicts with biometric technologies like SmartAstana and Ashyq, the discrepancy between their apparent benefits and the collection of our biological features is likely to linger for

years. With an eye on long-term solutions for collecting, processing, and storing personal data for millions of Kazakhs, technological innovations spurred on by the country's epidemiological situation will continue to develop.

The coronavirus pandemic in Kazakhstan has harmed the protection of personal data, despite a specialist agency. Every facet of everyday life has been transformed into an online format, including commerce, banking, and online shopping. There have been grave violations of universally protected human rights and freedoms such as privacy, freedom of movement, and access to information about infected individuals due to COVID-19. The Kazakh government had anticipated this rapid and shocking change through large-scale digitalization efforts.

3.2. New Trends

Kazakhstan became a member of the World Bank Group in July of 1992. Investing more than \$8 billion in a wide range of policy sectors, from banking and social services to critical infrastructure, the World Bank has grown to be Kazakhstan's most significant development partner during the past 29 years. Under Kazakhstan's comprehensive reform strategy, the Country Partnership Framework for 2020-2025 provides a broad range of financial instruments and analytical tools to help Kazakhstan recover from and mitigate the impacts of the COVID-19 crisis.

One of Kazakhstan's main goals is to make the economy more sustainable and inclusive by adopting a new approach to listening to people's concerns and implementing reforms to achieve this goal. This shift toward a green economy will need significant adjustments in Kazakhstan's energy output, with consequential effects on employment and regional development and the generation of new sources of revenue and growth. An Emission Trading Scheme (ETS) is a market-based tool for helping Kazakhstan fulfill its Nationally Determined Contribution (NDC) goal of limiting global warming, implemented in Kazakhstan. As global green import limits tighten on carbon-intensive goods, this gadget would be necessary for preserving the country's export competitiveness.

An additional focus is on the country's prospects for a rebound once the COVID crisis ends. The Sustainable Livestock Development Program for Results has a loan agreement signed at 460 million euros. The government's long-term goal is to increase beef production and exports while employing cutting-edge agricultural and agri-environmental approaches to safeguard the sustainability of the cattle industry.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

A score of 6.118 rated Kazakhstan 45th for network infrastructure preparation in 2021. Over a year, the number of internet users in Kazakhstan grew by 741 thousand. There was also an 81.9 percent Internet penetration in the nation at that time. Social media users accounted for 63.5 percent of the population at the time of the survey. In the country, 24.44 million mobile connections were found, a decrease of 4.8% from 2020. In January 2021, 129.4 percent of Kazakhstan's population had access to a mobile phone.

For the last several years, Kazakhstan has been preparing for the introduction of 5G. For this purpose, the country has launched its Digital Kazakhstan program. The government supported the ITU-funded GIGA initiative. Investors have come up with a proposal for building the Caspian Digital Hub cable project between Kazakhstan and Azerbaijan. A pilot Internet of Things agricultural service has also been set up by Kcell, which uses its LTE and NB-IoT networks.

4.2. Management Optimization [MO]

By the end of 2009, the government's initiative planned to expand Kazakhstan's population of Internet users by 20%. Internet access costs in Kazakhstan were reduced, and social PCs were made available at low rates as one of the program's key goals. Many publications were issued to residents, "round tables" were held, and individuals were given free training in e-Government. This is the fourth and last stage of development for the Kazakh e-Government system, referred to as the "transformational" stage. Efficiencies will be gained by combining most of the services provided to people.

Kazakhstan's position has risen twice in the last decade, making it one of the fastest-growing countries globally. As a result, Kazakhstan's place in our rankings seems to be deteriorating over the previous four years. In 2018, Kazakhstan's economy was in the same predicament as it was in 2009. The worldwide financial situation has worsened as a result of the coronavirus pandemic in 2020. When faced with an unusual circumstance, the IT system has been forced to assist many individuals with communications, distance learning, remote working, and so on. As a result, users are being compelled to learn and use more e-services.

4.3. Online Service [OS]

Eligible nationals of Kazakhstan can apply for an eVisa from the government of Kazakhstan to accelerate the visa application procedure. For a maximum of 30 days, the Kazakhstan visa online can be used to enter the country. Applicants can fill out the form in a matter of minutes by providing their personal and passport details. Non-tourist, business or medical visitors to Kazakhstan must get a visa from their closest Kazakh embassy or consulate before arriving. In the first six months of 2021, Kazakhstan's total volume of cashless payments was expected to be 29.6 trillion tenge, a 2.4-fold increase over the same period in the previous year.

Nearly three-quarters of all cashless payments in Kazakhstan were done over the Internet and on mobile devices. There were 16 million cellphone customers in the nation having Internet connectivity by July 2021. By the Bureau of National Statistics in Kazakhstan, 21.8 percent of internet users made transactions using mobile payments. People must get a visa from the closest Kazakh Embassy or Consulate if they plan on visiting the country for reasons other than tourism, business, or medical treatment. In Kazakhstan, 83% of all cashless transactions are conducted online.

4.4. National Portal [NPR]

In 2006, the government created the one-stop-shop www.egov.kz website. There are online services in Kazakh, Russian, and English languages. Kazakhstan's D-Government provides access to more than 2,000 online information offerings and 219 interactive and transactional services (www.egov.kz). It is possible to get in contact with any federal government agency using the portal's online counseling

service Additional features, such as "Mail Me," "Simple Scheduling," and e-mail accounts can be available to those that join.

D-Government development initiatives and program implementation outcomes are also accessible on the website. There are no voice-overs or font size modifications on this site, making it inaccessible to people with impairments. Even though more complex functions such as multimedia programming have not yet been implemented, social networking has been incorporated.

4.5. Government CIO [GCIO]

The government does not name a Chief Information Officer. The National ICT Holding Zerde and JSC National Information Technologies share the responsibilities of the Chief Information Officer.

4.6. E-Government Promotion [EPRO]

The government's "Digital Kazakhstan" initiative aims to improve the quality of life for all citizens by using digital technology. The Program's key aims are to accelerate economic growth, improve people's living standards, and provide a fundamentally new route for financial, business, and citizen development.

4.7. E-Participation [EPAR]

Public engagement is encouraged via the website <http://e.gov.kz/>, which includes several features. It consists of a section for public input on government policies and services and an area for formal online conversations between government officials and the public at large. Meeting times for state authorities with the public can be found on their websites as well. An official government blog is available to the public, where residents can post comments, questions, and proposals for the government to implement.

4.8. Open Government Data [OGD]

There are several parts to the Open Government project in the United States. For the Law on Access to Information, "open data" refers to publicly accessible electronic information resources that are machine-readable and can be used for further processing. Kazakhstan's Transition to Open Government There is an option to arrange the published sets by the date they were generated and updated, as well as a sophisticated search engine.

4.9. Cyber Security [CYB]

Kazakhstan's National Security Strategy for 2021-2025 has determined that the selected strategy addresses the most critical national security concerns, including safeguarding the state from various existing and future threats. It is important to stress that Kazakhstan's fundamental national interests are unchanging. All the independence victories made by Kazakhstan in the previous 30 years, including its sovereignty and territorial integrity, must be safeguarded to ensure national security. Public health and maintaining biological safety are two of the most pressing issues in our country, and it is no coincidence.

The plan calls for the creation of a National Security Risk Management Action Plan for Kazakhstan. The government has established a risk management plan for food safety, transportation, logistics, and the financial sector. In recent years, large-scale cyberattacks have shown that the protection of personal data and information infrastructure is becoming more critical to preserving security. Kazakhstan ranked 17th in the Waseda rankings 2021 for the relevant indication, despite its best efforts in Cyber Security.

4.10. The use of Emerging ICT [EMG]

Even if a coronavirus pandemic breaks out in Kazakhstan, the country's IoT industry will continue to develop and expand at a rapid pace. The increase of utilities, innovative home solutions, and the availability of energy will help it flourish. Kazakhstan's M2M business has been active for over a decade, but the country's IoT sector is a direct descendant. In addition to sensors, software, and executive devices, an inter-machine network is a collection of vertically integrated industrial solutions that can be utilized in conjunction with one another.

Astana-based ISSAI was founded in September 2019 to act as a catalyst for AI research and innovation in Kazakhstan's digital sector. At Nazarbayev University's C4 Research Building, it works to tackle real-world challenges in business and society via multidisciplinary research on artificial intelligence. For the sake of American artificial intelligence research, Asian, European, and American perspectives must be included. ISSAI's adaptable platform for research, innovation, and engagement with national and international partners in academia, business, and the government is helping Kazakhstan achieve its digital ecosystem and national development objectives.

Kenya

1. General Information

Area: 580,367 km²

Population: 55,230,681

Government Type: Unitary Presidential Constitutional Republic

GDP: \$2,130

Internet Users: 22.57

Wired (Fixed Broadband Users): 1.25

Wireless Broadband Users: 46.76

2. Digital Government Overview in Country



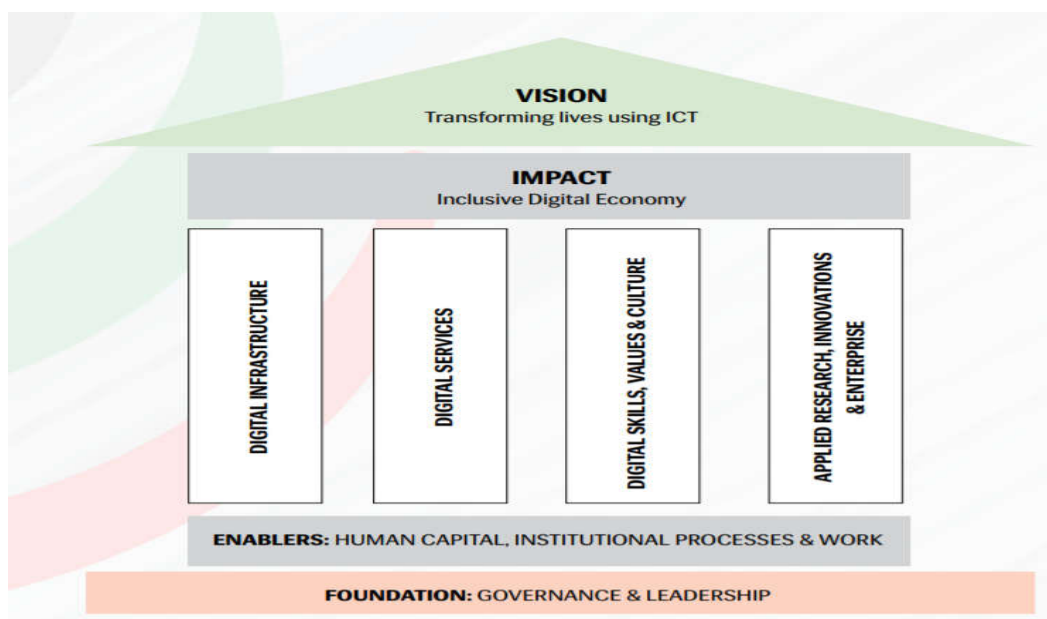
3. Digital Government Development and new trends

3.1. The development

In Kenya, digitalization has functioned as a driver for transformation. Kenya is one of Africa's most technologically sophisticated nations. It creates the conditions for digital engagement, including a solid Internet infrastructure and a well-developed innovation ecosystem with an increasing number of start-up incubators. The nation birthed M-Pesa, the crisis mapping program Ushahidi, and the iHub innovation hub. Kenya is East Africa's most journalist-friendly nation. Since 2010, the constitution has included a provision guaranteeing freedom of expression. The court has lately delivered a slew of decisions confirming fundamental rights. Civil society groups responded angrily, rallying opposition to the amendments via petitions and campaigns. In 2018, many divisive Computer and Cybercrime Bill provisions were placed on hold indefinitely for review.

What distinguishes Kenya from other countries is how its citizens use social media to take control of their lives. Twitter, Facebook, and Instagram have given people formerly ignored by the mainstream media a voice. Kenya has successfully used digital media to engage citizens via educational reforms. The educational system is very well structured and primarily reliant on textbooks. According to experts, critical thinking should be taught to foster the talents essential for individuals to participate in the digital world and produce their ideas.

3.2. New Trends



The Strategic Pillars of the ICTA Strategy for the Fiscal Years 2020-2024 define the strategic emphasis areas in which ICTA must excel to accomplish its mission.

- The Authority's strategy is predicated on the development of the Digital Infrastructure. A strengthened connection and secure information would enable the integration of government systems to provide citizens with high-quality services. The Authority will foster an inventive climate that encourages the development of the assets necessary to fulfill dynamic demand.
- Digital Services is the process of transforming government services and information via the use of digital technology. These upgrades will improve service delivery and contribute to the expansion of the digital economy. ICTA will provide appropriate identification and verification methods that foster transparency and confidence, ultimately enhancing service delivery.
- As seen by emerging digital talents such as artificial intelligence, big data, cloud computing, and mobile robots, the digital revolution has continued to impact people's lives. ICTA will promote a trust-based digital culture to foster good digital skills, attitudes, and culture. Initiatives and activities have been launched to develop a globally trusted and digitally skilled workforce and people for the digital economy.

-Digital inclusion is essential to the success of a developing economy. ICTA will address the threats to user privacy posed by technology, the potential of new technologies, and the unintended consequences of technology in general through research and innovation. ICTA will conduct applied research to acquire further information and experimental development to enhance its goods. Numerous strategic initiatives, programs, and initiatives have been launched to improve company and service performance.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 2.353, Kenya is almost at the bottom of the 64-country list in terms of network infrastructure adequacy. The overall number of Internet customers has risen to 21.75 million in January 2021. The proportion of persons having Internet access stayed steady at 40% of the population at the start of 2021. The use of social media is anticipated to be widespread among 11 million people, or 20.2 percent of the total population. Mobile phone connections accounted for 108.9% of the total population at the time.

In addition to the numbers, Kenya has accomplished notable accomplishments. A few of them are as follows.

- Telkom Kenya and Airtel Kenya have announced that their merger plans have been scrapped.
- The Universal Service Fund improves mobile coverage in northern rural regions.
- The M-PESA Global payment service is now available on Safaricom;
- The government proposes raising the mobile money transfer fee.

4.2. Management Optimization [MO]

On the African continent, digital technology has aided both governments and the private sector in maintaining operational efficiency in the face of the Covid-19 outbreak's disruptions. According to the President, African nations must unify their information and communications technology standards to secure the interoperability of their digital infrastructure to hasten the process of creating a single market.

4.3. Online Service [OS]

President Kenyatta said that the government has made strides in the digital delivery of public services and that the country is relying on technology to modernize its economy. All frequently used systems provide one-stop access to critical services such as applying for passports or national identification cards and registering enterprises, births, and deaths. Kenya is also gradually digitizing essential government services such as tax filing, land registration, judicial proceedings and verdicts, and public service records," the President said.

4.4. National Portal [NPR]

Kenya's digital Government site (<http://www.mygov.go.ke>) provides the public information on countries and government issues, supplemented by data from the government's opendata.go.ke.

On July 8, 2011, President Mwai Kibaki inaugurated the Kenya Open Data Initiative, making critical government data freely accessible to the public through a single internet platform. The website is a simple-to-use platform that enables data visualization and downloading and quick access for software developers. The purpose of opendata.go.ke is to make critical Kenyan government development, demographic, statistical, and spending data accessible in a usable digital format for scholars, policymakers, information technology developers, and the general public.

4.5. Government CIO [GCIO]

Any formal rules or criteria do not govern the post of chief information officer in Kenya. This department, part of the Ministry of Information, Communications, and Technologies, is in charge of information and communication technology (ICT). Its responsibilities include developing national ICT policy, promoting e-government and the use of ICT agencies, and providing technical help in ICT. The ICT and Communications Authority of Kenya is a government-owned organization that reports to the Ministry of Communications and Information Technology.

4.6. E-Government Promotion [EPRO]

To guarantee that all business sectors utilize technology holistically, misuse and abuse must be minimized. The Blueprint for the Digital Economy lays forth a strategy for Kenya (and Africa) to accelerate economic growth. The Big Four Agenda and Kenya Vision 2030 are at the heart of the strategy. ICT is widely acknowledged as a fundamental enabler of economic pillars and a key driver of our country's economic, social, and political development.

The plan emphasizes five critical pillars for the digital economy's development. Some of the cornerstones are innovator-driven entrepreneurship, digital skills, and values. The Blueprint also underlines cross-cutting issues that must be addressed to ensure the long-term viability of the digital economy. According to President Kenyatta, the Blueprint is part of Kenya's support for an African-wide digital economy for all Smart Africa Alliance members.

4.7. E-Participation [EPAR]

Currently, the Kenyan Government has over 200 digitized services offered through Huduma Centres countrywide and an online self-service E-Citizen platform.

4.8. Open Government Data [OGD]

Kenya has become an OGP participant from the program's inception. Kenya is anticipated to make significant progress in reinforcing its commitment to an open and transparent global governance system. International governments are confronted with their world's most serious crisis in decades, endangering development and global collaboration. Each country's health care system, governance norms, and social capital have been harmed by the COVID-19 outbreak.

Global partnership is more critical than ever to safeguard communities from long-term economic and health impacts. To do this, more involvement and transparency in decision-making and a better anti-

corruption ecosystem are essential. The Kenyan Constitution ensures that everyone has fundamental social and economic rights and freedoms. Kenyans are still encouraged to exercise their rights and liberties under the OGP, as shown by the country's third National Action Plan. It aimed to increase corporate transparency via beneficial ownership, anti-corruption measures through open public procurement, and overall open government and OGP sustainability through increased government sector involvement and cooperation.

4.9. Cyber Security [CYB]

The Communications Authority's Quarterly Statistics Report (July–September 2020) showed a 152.9 percent increase in Kenya's cyberthreats between July and September 2020. This was attributed to the expansion of e-commerce, cashless payments through mobile money platforms, and the shift to remote work. The survey also found a rise in online child abuse, cyberbullying, internet trolling, and fraud. Cybersecurity has become a vital priority concern with the spread of COVID-19 and the resulting economic and social disruptions.

Before May 30, 2018, Kenya lacked effective security laws, with weak cybersecurity protections and penalties. The National Kenya Computer Incident Response Team is a multi-agency association framework charged with the national harmonization of cybersecurity reporting and incident response. A thorough regulatory and legal framework was required to address the emotional aspects of cybersecurity in Kenya, which led to adopting the Computer Misuse and Cybercrime Act 2018. This Act became law on 30 May 2018 to protect computer systems, programs, and data from unauthorized access and prosecute cybercrime.

4.10. The use of Emerging ICT [EMG]

As a consequence of the COVID-19 pandemic, more people are embracing tablets and smartphones. As a result, mobile devices manufactured in the United States are now widely available and affordable to individuals in medium and higher income levels. Prices are sensitive in the lower to medium market sectors, resulting in the widespread use of low-cost, frequently counterfeit mobile devices that are readily available and occasionally advertised as genuine. Since most internet users are teenagers and young adults, smartphones and smart gadgets are expected to develop rapidly.

Higher demand for computer hardware and computer systems across a wide variety of businesses will result in increased software adoption. Cybersecurity software will be required to protect public and private data, as well as online applications. Banks and service providers will continue to invest in cyber solutions to tackle cybercrime and security concerns. Kenyans will continue to want telecommunications technology, most notably 3G/4G or mobile data-enabled gadgets that allow machine-to-machine communication. Cellular telephony is the fastest expanding telecommunications subsector. In Kenya, roughly 95% of mobile customers use one or more mobile payment systems. Governments, utilities, and other service providers progressively integrate mobile payments into basic banking programs, making payments more straightforward for end-users.

Lithuania

1. General Information

Area: 65,300 km²

Population: 2,683,316

Government Type: Unitary Semi-Presidential Republic

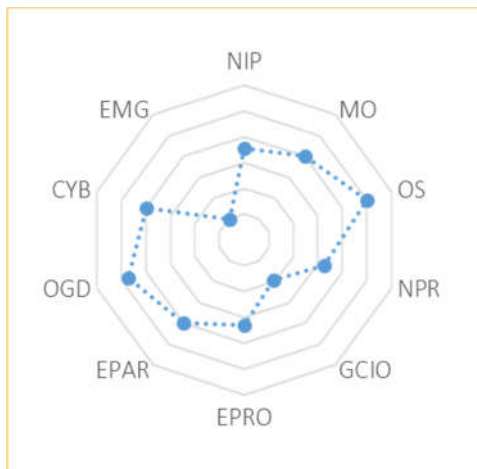
GDP: \$ 22,240

Internet Users: 83.06

Wired (Fixed Broadband Users): 29.27

Wireless Broadband Users: 117.19

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Lithuania has a high proportion of citizens who utilize government services available online. This is directly related to the fact that Lithuanians are among the most technically competent Internet users in the world. On the whole, the proportion of completed forms that are transmitted to government organizations over the Internet is relatively high. The quantity of online services offered in the country is somewhat greater than the average for the EU. Individual ministries' performance has been shown, but the overall efficacy of the concerted effort to develop a widely used entry point to online government services is also demonstrated. The site's success may be partly attributed to the extensive use of the Internet and the broad use of digital signatures.

By embracing innovation reform, Lithuania has helped harness the country's scientific potential for creating specific commodities. Less regulation has enabled start-ups, the country's future, to attract

more investment. The European Commission praised Lithuania's Industry Digitization Roadmap as one of the first among the EU member states to establish a national artificial intelligence strategy. The government has designed and begun executing a life sciences plan in Lithuania, which foresees life sciences accounting for 5% of GDP in 2030.

3.2. New Trends

Lithuania's digitization has advanced significantly in the recent decade. In the 2021-2030 National Plan for Progress (NPP), skills are highly concentrated. Since 2010, Lithuania has improved its skills strategy by supporting formal education, reforming the education network, upgrading teacher education, regulating vocational training, and changing labor laws. The Lithuanian government has identified four critical areas for improving skills.

Priority 1: Providing job and life skills to Lithuanian youth

Children's and adolescents' cognitive, social-emotional, and technical abilities are vital to their personal and future achievement, as well as to national economic and social success. Lithuania's youth enrollment in all levels and forms of education and training continues to rise.

Priority 2: Promoting adult and business education in Lithuania

Professional demands for adults of all skill levels have increased due to technological breakthroughs, job transfers, non-traditional jobs, and longer working lives. Adult education is crucial for adults' skill development because of the COVID-19 issue and its impact on job markets. The systems for assuring the quality and attractiveness of non-formal education and training should be improved.

Priority 3: Increasing talent effectiveness in Lithuanian workplaces

Using skills effectively at work leads to happier and more productive workers, which leads to higher economic and societal benefits.

Priority 4: Improving Lithuania's skills policy governance

Effective governance frameworks are essential for Lithuania to create and use human capital and achieve its medium effectively- and long-term goals. Evidence-based policymaking, skill assessment, and forecasting tools have come a long way in Lithuania, but there is always room for improvement.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Lithuania is placed 27th out of 64 nations in network infrastructure preparation, with a score of 7.078. In January 2021, the total number of Internet users dropped to 2.22 million, a decline of 0.06 percent from the previous year. At the start of 2021, the percentage of people with Internet connections remained unchanged at 82 percent of the population. Social media usage was prevalent among 2.04 million persons or 75.4 percent of the overall population. At the time, mobile phone connections represented 141.2 percent of the entire population.

Lithuania has achieved fantastic progress up to the beginning of 2021, including the following:

- A draft strategy for the development of 5G services throughout the nation has been authorized by the government;
- Preliminary dates for 5G auctions have been announced.
- A trial 5G mobile network has been deployed, securing interim frequency permission.

4.2. Management Optimization [MO]

The Ministry of Economic and Innovation is now responsible for the digitalization policy in collaboration with other government ministries, which premium security, resilience, and interoperability. This effort intends to improve Lithuania's quality of life and corporate efficiency. The State Information Resources Management Law regulates interoperability between registries and State information systems. The purpose of the Law on State Information Resources Management is to guarantee that State information resources are created, managed, disposed of, used, supervised, interacted with, planned, financed, and appropriately protected.

Lithuanian National Audit Office's objective is to help in the administration and use of cash and other resources to assist the legislature in carrying out parliamentary control and to promote efficient public services. The country's legislation created the Lithuanian Population Registry and regulated its administration methods, data types handled, and data policy. The statute established the registration as the primary State registry charged with collecting, preserving, and processing personal data about Lithuanian citizens and residents. Additionally, the legislation defined the types of fundamental personal data that the Registry must handle. The Ministry of Justice administers the Registry.

4.3. Online Service [OS]

Three qualified trust service providers that have been formed and closely overseen in Lithuania are as follows:

- Personalization Centre for Identity Documents to grant suitable electronic signature certifications
- Centre of Registers issued qualified electronic signature and seal certifications and created qualified electronic time stamps.
- SK ID Solutions, an Estonian qualified trust service provider, produces qualified electronic signature certificates utilizing mobile SIM cards and the Smart-ID app.

Lithuania started issuing biometric passports with essential access control on August 8, 2008. The Ministry of the Interior's Personalisation of Identity Papers Centre is in charge of customizing and coordinating the creation of such travel papers. Also, the Central Public Procurement Information System (CPPIS) is Lithuania's official procurement platform, which is the requirement of all public purchases. CPPIS oversees the whole procurement cycle, from tender notifications to contract awards, and serves as a data repository for buyers and economic operators.

4.4. National Portal [NPR]

State Information Resources Interoperability Platform (SIRIP) was created and is presently governed by the Committee on the Development of the Information Society. It is separated into two key sections: a data exchange platform and an eGovernment provider site. Residents and businesses

seeking government information and services would use the eGovernment gateway portal. The eGovernment gateway connects people and businesses to government websites. In 2019, the site provided reached over 603 eServices.

The Network for Interoperability of Information Systems Among Public Administration Institutions (PASIS) enables state and municipal governments' one-stop-shop delivery of electronic public services. It also provides centralized person identification and payment for services through secure inter-institutional data exchange.

4.5. Government CIO [GCIO]

The Advisor of the e-Government Policy Division is the closest Lithuanian counterpart to a GCIO in terms of responsibilities. Dr. Vytautas Krasauskas is the person currently in charge of the GCIO position. He reports to the Interior Minister, who is now Tomas Ilinskas and is responsible to him. They are held accountable for the entire strategy, implementation, and development of eGovernment programs and initiatives.

4.6. E-Government Promotion [EPRO]

Lithuania's primary goal is to encourage secure, technologically advanced public and electronic administrative services by residents and businesses. The government has made a determined effort to digitize as many public and administrative services as possible and improve the operation of those already available. The authorities use ICT to enhance transparency and public involvement.

ICTs have been utilized to promote Lithuanian culture and language through creating digital content (both written and spoken), digital goods, and eServices. As a result, Lithuania has been able to digitize its cultural heritage and generate digital goods and electronic services for the public.

The multi-fund Operational Programme (OP) was launched in 2014 to support Lithuania's economic development while tackling social issues like unemployment and energy security. A strong emphasis on research and innovation, SME competitiveness, the transition to a low-carbon economy, human capital development, especially among young people, and poverty reduction are all part of the strategy's aims.

4.7. E-Participation [EPAR]

The "Bailiff Information System," "The Electronic Enforcement File Portal," and "The Cash Restrictions Information System" have been all developed in parallel with Lithuania's digitalization efforts. The Bailiff Information System facilitates in the creation of an enforcement file, the monitoring of a debtor's financial situation, the result of procedural documents, the validation with eSignature, and their electronic and postal delivery to recipients, as well as the submission of cash restrictions or write-offs to the Cash Restrictions Information System. Citizens and companies can engage in the enforcement process by familiarizing themselves with enforcement files using the Electronic Enforcement File Portal. Bailiffs and bankruptcy administrators can promote forced auctions of property sold online using electronic services. This solution improves public sector solutions and procedures' openness, as well as general accessibility and transparency.

4.8. Open Government Data [OGD]

The Beta version of the Lithuanian Open Data Portal, which serves as a single point of access to all available data sets in Lithuania, was introduced in January 2020 as a pilot project. The site is intended for use by public sector organizations, companies, and any other open data users interested. In addition, it provides a venue for the sharing of best practices, solutions, and use cases related to open data and information. It is possible for users of the data to make comments on current data sets or to submit requests for new data sets, depending on their needs.

City and municipal open data portals will be included in the National Open Data Portal shortly. For the time being, however, it is the responsibility of each municipality to gather and make available data sets available to users and citizens interested in using them. Residents and the broader public may already access open data portals in the Lithuanian cities of Vilnius, Kaunas, and Klaipeda.

For policy creation in digital governance, the Lithuanian Ministry of Economic and Innovation is the key actor in the country. More specifically, it seeks to design rules that will encourage the use of emerging technologies, enhanced service delivery to customers and businesses, and the use of publicly available data.

4.9. Cyber Security [CYB]

The National Cyber Security Strategy sets Lithuania's national cyber security strategy's key aims in the public and private sectors. The plan's implementation seeks to strengthen the state's cybersecurity and promote the development of cyber defense capabilities. The policy also intends to assure the prevention and investigation of cybersecurity-related criminal crimes and the promotion of cyber security culture, all while encouraging innovation and tighter collaboration between the public and commercial sectors and worldwide cooperation.

On July 3, 2019, the Lithuanian government changed the interinstitutional action plan for executing the National Cybersecurity Strategy. The objectives, planned measures, and division of resources and responsibilities among institutional actors were described in the action plan's first appendix.

The Cybersecurity Law of Lithuania, which went into effect in 2014, established the organization, management, and control of the cyber security system, as well as the competence, functions, rights, and obligations of State institutions charged with the formulation and implementation of cyber security policies, as well as the duties and responsibilities of cyber security entities. It also put in place processes for ensuring cyber security. The act concentrated on creating and enforcing cybersecurity policy under one roof: the Ministry of National Defense.

Lithuania has been encouraging people to use electronic identification tools and services that ensure the security of electronic transactions, improve the ICT infrastructure used by national governments, and provide the intuitive interaction of federal information systems and registers. Furthermore, cyber security of critical information infrastructure and State information resources (SIR) has been emphasized to allow the government to carry out its duties.

4.10. The use of Emerging ICT [EMG]

In the first quarter of 2019, the Lithuanian Ministry of Economy and Innovation produced the country's first Artificial Intelligence plan. Among the recommendations in the program, which detailed a vision for the growth of artificial intelligence in Lithuania, were policy recommendations for public administration entities and academics in the nation. The primary focal areas in the strategy are legal and ethical issues, artificial intelligence, research and development, skills, and qualifications.

Macau

1. General Information

Area: 30 km²

Population: 660,309

Government Type: Devolved Executive-Led System within a Socialist Republic

GDP: \$58,000

Internet Users: 86.47

Wired (Fixed Broadband Users): 30.56

Wireless Broadband Users: 345.32

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

The end of January 2020 saw the first verified case of COVID-19 in Macau. As a result of data and research, Macau is leading the way in Guangdong-Hong Kong-Macao Greater Bay Area efforts to reduce incidents to zero. There is a considerable risk of infection due to Macau's peculiar circumstances, which see many people arrive and exit every day. Good data collection will help with contact tracing and clustering and reduce medical staff's effort in screening and monitoring. According to the Waseda International digital government rankings 2021, Macau came in the 50th position with an overall score of 66.2558.

On Friday, February 26, 2020, a system for automated personal health declarations was created. An upgraded version of the private health declaration was brought to Macau on May 3, 2020, under the

auspices of the new Macau Health Code. Enabling closed-loop community entry, the code consolidates and replaces the old health declaration mechanism at the port. Residents can now call a hotline to receive up-to-the-minute information on the epidemic and report any new findings.

To keep Macau's citizens informed about the Covid-19 pandemic situation and response measures, Macau has established a coordination center to provide timely updates on the situation and response measures via textual, visual, and audio information, as well as images, on websites, television, radio, and mainstream social media platforms. With Hong Kong Polytechnic University and several other local institutions, the Macau University of Science and Technology is developing an artificial intelligence (AI) system for rapid case detection using epidemic data. Using regional data, this AI can help detect and forecast COVID-19 in its early stages.

In-depth data and information, such as the most recent pandemic news and announcements, pandemic prevention advice, testing statistics, pandemic prevention facilities, and vaccine information, are available on the Macao Health Bureau's specialized pandemic prevention site. Data on each case is updated daily at 4:00 pm and includes the patient's gender, age, diagnosis date, and current health condition. The website also provides a comprehensive directory of mask retailers in Macau, including their location, contact information, and operating hours.

4.2. New trends

Developing cities have extra challenges because of the COVID-19 outbreak. Creating intelligent cities requires more attention to data collection and application, which should apply to all cities, no matter their population size. Because of the high population density and high mobility of Macau as a medium-sized Chinese city, the pandemic there has been well handled, and this is directly tied to the city's comprehensive data collection and data application practices. The construction of new structures will no longer be the only focus of city planning in the future. Large-scale digital "new infrastructure" development, accurate data collection, and applying different kinds of urban challenges following local conditions are the primary goals of smart city construction.

The new COVID-19 strain continues to spread over the world, evolving into the Delta virus. It's becoming more and more commonplace to collect data about epidemics. Mutated viruses spread faster and offer more significant pandemic risks in medium-sized cities. For cities with a population of 100,000 or more, epidemiological data is hard to come by. To be effective, epidemic prevention methods must nonetheless comply with municipal regulations at the highest levels. Information is more varied and scattered in the post-epidemic era. The development of data collection and application systems in medium-sized cities is not only dependent on the aid of larger cities. Macau has a high degree of resistance to the epidemic because it is a relatively independent city that cooperates with Guangdong's large-scale system and has its data sources and application platforms.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With 6.593 points, Macau's Network Infrastructure Preparedness came in 42nd place in the Waseda rankings for 2021. The number of internet users in Macau grew by 25 thousand during the year, reaching 565.6 thousand persons. 86.5 percent of Macau's population had access to the internet at the time. During the first week of January 2021, more than 64.2 percent of the country's population was on Facebook. At the beginning of 2021, there were 1.77 million mobile phone connections in Macau, a reduction of 18% from the previous year. In January of 2021, 270.1 percent of the nation's population had a mobile phone.

Investment in Macau's digitization advancement was seen as a success. The first phase of CTM's 5G network deployment has been completed, with the debut of a 10Gb/s home broadband service. The deadline for registering a SIM card has gone. Furthermore, Macau's innovative city initiative has received a significant deal of attention.

4.2. Management Optimization [MO]

Law 2/2020 provides the tools for modern, paperless proceedings in Macau. Under the law, if it is possible to execute an entire proceeding and prepare the corresponding final decision electronically, the relevant public bodies can cease any related paper-based processes. Public bodies can now perform the following acts electronically instead of producing paper copies, sending official communications, processing documents, and issuing certificates and titles for any legally permitted purpose.

4.3. Online Service [OS]

One of Macau's five-year goals is to create a "cashless society." It has already been developed by the Macau Monetary Authority (AMCM) as an all-in-one payment instrument for the region. Banking and other financial organizations have started working on integrating payment systems among themselves and with merchants, according to AMCM.

Like Mainland China's success for many years, COVID-19 has pushed for a cashless society in the United States. The area already has a considerable number of international, regional, and local players. It is expected that this corporation sector will become an anchor for IT-innovative enterprises and other businesses shortly.

4.4. National Portal [NPR]

The aim of the Macao SAR Government Portal (www.gov.mo) is to provide an easy-to-use and centralized window for government information and services. The government portal is supported by software applications to allow users to enjoy a variety of services. There are catalogs of job matching, social benefits, vehicles, public libraries, mainly providing documents and searching, applying, and paying. The revamped website will be service-oriented, with improved functionalities and a more comfortable-to-use interface to provide personalized service. With the use of the unified government service account, the user will be able to view ongoing government applications, receive personalized reminders, etc.

4.5. Government CIO [GCIO]

All government agencies have formed a dedicated working team that includes the agency leader, IT head, and personnel of its IT and related business units. SAEP, with its coordination role in the EGOV development of Macao, assumes the role of GCIO for the whole government. Government and agency are divided into two levels: government and agency. Training for IT personnel will be tailored towards the capacity of a modern GCIO.

4.6. E-Government Promotion [EPRO]

This Strategic IT Planning for Public Enterprises project aims to develop a standard for strategic IT planning based on worldwide best practices and the lessons learned from IT planning initiatives in Macao's public sector firms. The purpose of this effort is to allow agencies to integrate their IT plans horizontally and vertically with higher-level, government-wide goals and strategies. The strategic IT planning framework will support Macao's e-Government agenda. Consequently, Macao's government agencies will be better positioned to achieve COBIT Level 3 maturity in IT strategic planning operations due to this initiative. Developing an IT strategic planning policy is necessary to guarantee that all relevant agency workers are aware of and adhere to a systematic approach to IT strategic planning.

4.7. E-Participation [EPAR]

Households with Internet access accounted for 92,3 percent of all local families in 2013, increasing to 6,900 homes. There were 554,000 Internet users aged three and older, an increase of 5% year-over-year. 98.6 percent and 98.0 percent of those 35 to 44 and 25 to 34 years old used the Internet, respectively, while 69% of people 55 and older used the Internet, an increase of 5.3 percentage points. According to a majority of those surveyed, the Internet is used for both personal and professional reasons. To put it another way, the number of internet consumers grew by 30% in 2020.

4.8. Open Government Data [OGD]

A user's personal information will not be collected if they just browse the Macao Special Administrative Region Government Data Open Platform (hereafter known as "this website") without submitting an application or utilizing any of the website's services. Consequently, this website's computer system automatically logs the user's Internet domain name, IP address, and region of origin, together with the dates and times of surfing and the websites the user views. Most of the time, the Administration and Public Service Bureau (hereafter referred to as "this Bureau") will only utilize this information for statistical reasons. A violation of the law (such as an assault on this website) can necessitate providing law enforcement with the recorded data so that they can trace down and punish the perpetrators, for example.

This website's software uses "cookies" technology to keep track of a user's preferences and provide a more personalized experience. Browsers that allow "cookies" display a warning message to users when "cookies" are saved. When a user tries to submit personal data through this website, it is presumed that the user has read and agreed to the terms of this privacy statement and that the collection and use of data on this website are under applicable legislation. Personal information like name, phone number, and postal address can be requested from visitors while using this website's electronic services. For example, the government agency responsible for delivering the service share this information with the service provider to improve the customer experience. Sharing such information

is permissible by law. The administration and Public Service Bureau's policy is to never disclose users' data with non-governmental organizations unless it is allowed by law.

4.9. Cyber Security [CYB]

Public and private critical infrastructure operators from a wide range of enterprises must adhere to the Macau Cybersecurity Law (MCSL) provisions established in 2019 to protect critical infrastructure information networks and computer systems.

The MCSL, like China's Cybersecurity Law, introduces the concept of necessary infrastructure. As defined by the MCSL, critical infrastructure includes systems and networks that, if disrupted, might have a detrimental effect on the health, safety, and order of society. MCSL protects essential operators of infrastructure and Internet service providers against cyberattacks and other threats such as utilities, transportation, banking and finance, insurance, gaming, and medical.

The maximum penalty for private operators that breach the MCSL is MOP 5 million. Other instances include being denied access to government procurement, subsidies, or other advantages, and so on. Long-term damage to a company's public image also can consider.

4.10. The use of Emerging ICT [EMG]

Artificial intelligence (AI) is a subfield of computer science that aims to create robots that can mimic human behavior and responses. There are several benefits to mixing blockchain technology with AI, generating revenue (AI). As a consequence, the inclusion of new data aids the system's development. AI is also becoming better and better at its job as time goes on.

Students, researchers, and industry professionals worldwide who are interested in AI and Blockchain are encouraged to attend AIBC 2021. It would be helpful to get together a varied group of experts from many sectors to assess current advancements and exchange ideas on unsolved issues. Each of the conference's significant sessions will feature a different keynote speaker from across the globe.

Malaysia

1. General Information

Area: 330,803 km²

Population: 32,857,842

Government Type: Federal Parliamentary Constitutional Elective Monarchy

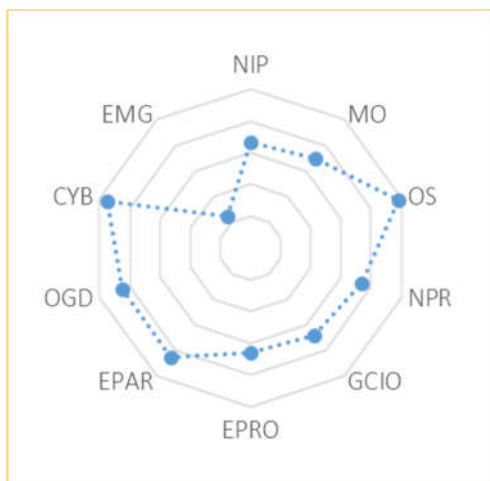
GDP: \$ 11,600

Internet Users: 89.56

Wired (Fixed Broadband Users): 10.38

Wireless Broadband Users: 119.99

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Malaysia is rated 33rd with an overall score of 73.2088. The Malaysian government recognized the potential and challenges of the digital economy as a new economy. Through digital governance, Malaysia can increase productivity, stimulate innovation, and improve lives by providing service to all types of customers, minimizing costs, increasing efficiency for current enterprises and entrepreneurs, and encouraging innovation and scale economies, allowing for the creation of new kinds of business and entrepreneurship.

Malaysia's government has already conducted considerable reforms in several industries, with the profitable market and consumer behavior improvements. Since the end of 2018, regulatory changes have reduced fixed broadband costs by half and doubled speeds. Because of increased competition in

the previously failing fixed broadband market, the number of ultra-fast (>100Mbps) broadband connections more than doubled in 2019.

Malaysia is one of the first developing nations to expand indirect taxes to non-resident digital services, which helps balance the digital economy's expansion while safeguarding public finances. A primary legislative recommendation from the report was adopted by Penang in 2020, mandating broadband Internet to be considered as a utility, like water and electricity, for new infrastructure building.

3.2. New Trends

Malaysia's primary digital transformation agency, MDEC, has revealed its 'Digital Investments Future5 (DIF5) Strategy,' a five-year strategy concentrated on five key initiatives to attract investments and strengthen the country's digital economy. The five-year program, which runs from 2021 to 2025, intends to ensure high-quality digital investments while also enabling new development drivers in the digital economy.

Malaysia intends to spend RM50 billion in the digital economy, focusing on five important sectors, core technologies, emerging technologies, and digital global business services. AgTech, HealthTech, Islamic Digital Economy and FinTech, CleanTech, and EduTech are highlighted as critical features since they are based on the country's vital digital industries and are linked to its priority sectors. The digital revolution in these areas will significantly influence investment, employment, and GDP creation.

Furthermore, the DIF5 Strategy will concentrate on five major emerging technologies to foster innovation and assist Malaysia in becoming a more attractive digital economy. All of the technologies will contribute to the country's economic complexity by aiding in the development of new and existing economic clusters, which will result in the creation of high-wage jobs and the expansion of domestic economic links.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Malaysia is placed 39th in terms of network infrastructure preparation, with a score of 6.664. In January 2021, the total number of Internet users had increased to 27.43 million, a 2.8 percent increase over the previous year. At the start of 2021, the percentage of people with Internet connections remained unchanged at 84.2 percent of the population. Social media usage would be prevalent among 28 million persons or 86 percent of the total population. At the time, mobile phone connections represented 122.8 percent of the entire population.

There have been many significant advancements in Malaysia's NIP progress. Broadband penetration is expected to continue growing gradually over the next several years. Additionally, the government increased its focus on national fiberization. New multi-spectrum auctions will contribute to the commercialization of 5G.

4.2. Management Optimization [MO]

The nation places a high value on providing individuals and companies with innovative, efficient, and high-quality ICT services. The ultimate goal is to create a cross-government public service that is centered on the needs of citizens. Government agencies may use the "1Gov*Net" network architecture to optimize resources and get the most bang for their buck while also improving the quality of government services. Malaysia's Administrative Modernization and Management Planning Unit has also established a government cloud called "1GovCloud" (Mampu).

To improve e-Government program management and development, the Project Monitoring System promotes cross-agency cooperation. On top of that, Malaysia's federal government has created a human resources management information system (HRMIS). There was also the use of GOE by the Malaysian government to enhance communication and cooperation among employees. The government created the "1GovEA" template for enterprise architecture to actively encourage backend business and IT usage in government businesses.

In May 2015, the Malaysian government unveiled its eleventh plan, underscoring its dedication to a vision of development centered on the prosperity and well-being of the rakyat, the country's people. Six Strategic Thrusts were outlined in this vision, each of which represented a fresh approach. Expanding opportunities for social inclusion, general well-being, and human capital development, as well as green growth for long-term resilience.

4.3. Online Service [OS]

Even though Malaysia's e-commerce sector is growing fast, there are several barriers to overcome. Malaysia's efforts to catch up with more established markets regarding product availability, payment choices, delivery, and regulatory requirements on the frontlines of the online shopping revolution. Shopee, Lazada, and PG Mall are Malaysia's top three e-commerce websites in Malaysia's market. Shopee is the most visited, followed by Lazada and PG Mall. eBay and Sephora, both of which are based in the United States.

Following the conclusion of COVID-19, the Malaysian government is promoting the spread of e-commerce. According to the government's national economic recovery strategy, the expansion of e-commerce is a priority. When it comes to government and public services, e-Paying is a cashless mode of payment that accepts a range of different payment methods. The government's primary focus has switched to developing an electronic payment infrastructure compatible with the community's transition to a cashless society.

4.4. National Portal [NPR]

Information (content), technology, and functionality all make up the National Portal's overall performance. Government agencies, legal papers, and current news may all be found on the National Portal, accessible from anywhere in the country. In all, there are sixteen languages available on the website.

For desktop computers and mobile devices, the website is responsive and fast, according to Google PageSpeed™ Insights. Additionally, the portal provides various communication options, such as the ability to get email alerts when new material is posted on Facebook, Twitter, YouTube, and Flickr.

4.5. Government CIO [GCIO]

The Government Chief Information Officer GCIO's role is well defined on the MAMPU webpage. Through the Public Sector CIO Information Systems, ministerial agencies also have CIO-equivalent positions. The Malaysian GCIO's office has always been at the forefront of educating and acculturating CIOs in the most recent technologies and ICT tools for public service delivery via seminars and CIO summits. Concerning establishing and appointing CIO roles, the Malaysian government is considering this. They researched how public officials see, demand, and motivate ICT skills acquisition and mastery.

4.6. E-Government Promotion [EPRO]

e-Government initiatives are currently being used to make significant changes to governance, with the primary goal of increasing the overall productivity of public services. As a result of the E-Government program, states are rethinking how they operate and improve relationships with citizens and companies by strengthening communication, expanding access, providing high-quality services, and streamlining existing systems. In today's digital age, governments all over the globe may make government resources and incentives more easily accessible. By providing rural communities with Internet connectivity and a variety of services like e-Government, telecenters also play an essential role in the administration and development of the area. Most telecenters will eventually offer e-Government services since they have evolved into centers for rural development support services in their metropolitan catchment regions. In 2000, Malaysia established a set of e-government services known as MyEG, which included services from the government to businesses, employees, other governments, and citizens. All Malaysians are included in government-to-citizen communication, creating a broad reach.

4.7. E-Participation [EPAR]

Malaysia stands in the middle range of The EPAR indicator list with a score of 8.5. The Malaysian Government's e-Participation policy is meant to investigate the culture and practice of electronic engagement to encourage transparency and public participation in developing the quality of services offered by the government of Malaysia. Involvement by the Malaysian public is highly valued since it allows authorities to explore a broader perspective, information resources, and alternative ideas to improve results and services. Furthermore, it lays the groundwork for good relationships, increased debate and discussion, and a more ordered political system of administration.

This effort aims to include citizens in the policy-making and decision-making processes via the use of information and communication technologies. Communication strategies that have been used include a portal poll, public participation, portal feedback, a customer satisfaction survey, and social media platforms such as Facebook, Twitter, Instagram, and YouTube, among others.

4.8. Open Government Data [OGD]

The 11th Malaysia Plan strives to enhance service delivery by prioritizing people's needs above other considerations. The government aims to do so by strengthening the function of the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU), a cabinet-level organization entrusted with driving the modernization of Malaysia's government.

A one-stop-shop for government data in Malaysia, the Malaysian Administrative Modernisation & Management Planning Unit (MAMPU) manages the Malaysia Open Data Portal (data.gov.my), which is operated by the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU). As part of its efforts to help all federal, state, and municipal government agencies and local governments, the agency produced a General Circular: Public Sector Open Data Implementation in 2015. The three goals for open government data are as follows:

- To increase the productivity of the country's digital economy via the development of new industries or technological advances that include both the public and private sectors.
- It is necessary to bring Malaysia's digital government initiatives to the same level as those of other countries.

4.9. Cyber Security [CYB]

Until 2013, MyCERT had recognized a total of 10,636 security incidents, which included a wide range of cyber security risks such as fraud, intrusion into systems, spam, and malicious code, among others. It is no doubt that Malaysia's CYB score reached 9,500, raising the country to the top 20 of the OECD list. Malaysia's role in national information security coordination has been strengthened by order of the Ministers of the Federal Government (Vol.53, No.13) dated June 22, 2009, which designates Cybersecurity Malaysia as a national information security coordination center that provides ICT security specialist services and continuously monitors threats to national security. Digital Signature Act, Computer Crimes Act, 1997 Telemedicine Act, 2006 e-Commerce Act, Electronic Government Activities Act, 2010 Personal Data Protection Act are only a few of Malaysia's cyber-legislation highlights.

4.10. The use of Emerging ICT [EMG]

The EMG indicator of Malaysia ranks the 42nd in the 64-country list, with a score of 2,500. The #MyDigitalMaker movement aims to shift Malaysian youth from digital consumers to digital creators in the digital economy. Coding, app development, 3D printing, robotics, embedded systems, and data analytics contribute to today's and future generations' problem-solving and creative abilities.

Focusing on micro, rural, and young entrepreneurs, the eUsahawan app aims to train and equip people with digital entrepreneurship skills. The initiative aims to teach digital entrepreneurship to kids and microbusinesses. So far, the industry has aided around 400,000 Malaysians. As part of the initiative, all public Technical Vocational Education and Training programs and institutions will include digital entrepreneurship.

When the MSC was founded in 1996, it had seven flagship programs. The main application, "Borderless Marketing," was designed for better customer services despite the time zone or the distance differences.

Mexico

1. General Information

Area: 1,964,375 km²

Population: 130,530,046

Government Type: Federal Presidential Constitutional Republic

GDP: \$ 9,250

Internet Users: 71.97

Wired (Fixed Broadband Users): 16.45

Wireless Broadband Users: 77.23

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Mexico was ranked 47th in the Waseda International digital government rankings in 2021, with an overall score of 68.1738. Many Mexican firms have taken advantage of the Covid-19 epidemic to invest in new technologies. According to Dell Technologies' Digital Transformation Index, other companies have difficulties adopting and developing a digital transformation strategy. At least one technology has been hastened in the adoption process in nine out of ten Mexican companies. Four out of 10 companies have expedited the adoption of all technologies they use.

Cybersecurity, remote work, edge computing, service and consumption models, digital experiences for customers and employees, data management evolution, and the expansion of the business's digital domain are the digital transformation programs that have accelerated the most significantly in 2020, mainly due to the pandemic. As a result of the COVID-19 pandemic, Mexican businesses face two

significant obstacles: a lack of IT skills and experience, as well as an immature digital culture, data security and privacy concerns, a lack of resources, a lack of economic growth due to the virus, and an inability to extract value from data.

A growing number of firms are reinventing themselves using Artificial Intelligence to maintain profitability due to the pandemic, which has accelerated Mexico's digital transformation. A clear picture emerges: Mexico is in the midst of a technological revolution, and the industry is benefiting in ways that have never been seen before, including the optimization of supply chains, the acceleration of the implementation of high-value processes, and the recognition of the critical importance of 'human skills' such as creativity and problem-solving.

3.2. New Trends

Mexicans' food purchasing habits can have changed as a result of the outbreak. Similar to other countries, COVID-19 helped to increase online supermarket sales. Online grocery sales are expected to soar in the next two years, maybe by more than 50% year over year, and will account for more than 2% of all grocery sales. Customers' online grocery buying habits are changing, and supermarkets must modify their operations accordingly. The increase in sales is a good indicator that online grocery shopping is becoming more popular with consumers.

During the COVID-19 problem, the number of new digital customers who accessed platforms and applications grew. During the outbreak, one in four consumers who purchased food online were first-time purchasers. About 60% of Mexican households belong to the lower middle class, comprising 50% of all customers. A total of 43% of consumers said that they purchased food online at least once a month before COVID's release. Beer, wine, spirits, and frozen food are the most often out-of-stock items for online customers. There is a new generation of Mexicans that purchase online for their food because of the epidemic. Retailers face these challenges to maintain client trust and grow their online grocery customer base.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 5.522, Mexico came in 53rd place in the Waseda International digital government rankings 2021 regarding network infrastructure preparedness. At the beginning of 2021, Mexico had 92.01 million internet users, an increase of 4% over the previous year. Internet use was 71% of the population in Mexico. At the time, 77.2 percent of the population was using social media, 100 million people. Despite this, the country's 115.4 million mobile subscribers, accounting for 89.1 percent of the people, saw a dropping of 407 thousand.

As a result of Mexico's digitalization initiatives, a few key achievements have been made, comprising of a merger of COFECE, IFT, and CRE by the Senate; the return of 800MHz mobile spectrum by AT&T Mexico; Movistar's complete surrender of its 1900MHz and 2500MHz spectrum holdings; and the acquisition of another 50MHz of 3.5GHz range by Telcel from Axtel by Codi, allowing customers to make NFC and QR payments with their mobile devices.

4.2. Management Optimization [MO]

Data security and technical sovereignty are included in the government's 2021-2024 digital plan to combat poverty and corruption. Despite what it states, the plan does not have specific objectives or measures of success. Program components include federal general administration and social policy. To improve and harmonize the regulatory framework for digital policy, public administration aims to articulate the country's technological guidelines comprehensively and simply; to standardize ICT purchases through transparent, cost-effective actions that generate savings and maximize the responsible use of public resources; and to promote autonomy and technological independence to establish the state's leadership in its digital policy.

Digital plans concentrating on the state-owned energy supplier CFE will use public networks and services in public locations like health centers, hospitals, or community centers to increase capacity and encourage open connection. Internet deployment in rural and underserved regions will be achievable using the country's Red Compartida network and the private sector. To increase the quality of social services, the strategy uses technology to support and enable population-based activities.

4.3. Online Service [OS]

Mexicans with bank accounts prefer debit cards by a large majority. Credit or debit cards are used in around half of all transactions in the nation, resulting in sales of \$10,2 billion. Meanwhile, a JP Morgan research on Mexican e-commerce trends found that the country's debit card penetration rate was 1.12 cards per person, while the credit card penetration rate was 0.25 cards per person. An upward trend in Latin America will be reversed, when card payments would account for half of all internet sales.

The JP Morgan forecast predicts that digital wallets will control the B2C payments sector. Increased internet shopping for home goods is expected in light of the COVID-19 Pandemic. Many people use PayPal, but there are also plenty of people who pay using MercadoPago, Visa Checkout, and Mastercard.

In Mexico, online payments now account for 16% of all transactions. This percentage is anticipated to climb in the coming years as more people use smartphones to make purchases. Soon, the popularity of this way of payment will be determined by two factors: the desire of banks to provide better options for low-income Mexicans and the government's efforts to bring people into banks. As a result, if newer, more creative, and more inclusive opportunities emerge, this one can become obsolete.

4.4. National Portal [NPR]

Gob.mx provides a platform for government innovation and efficiency improvement by providing individuals with information, processes, and a place to be involved. Users can consult and complete jobs fast and effectively without waiting or losing time using this service. With these modifications, clients can now access all of their government-issued papers from a single location. Innovative digital media allows consumers to engage and cooperate in decision-making processes and improve public policies.

4.5. Government CIO [GCIO]

The Mexican government appoints a national CIO. The Director of the Ministry of Public Administration's eGovernment and Information Technology Policy Unit is GCIO's counterpart. This article does not include any reference to CIO associations or organizations. None of Mexico's schools provide CIO certification training.

4.6. E-Government Promotion [EPRO]

New skills are needed in every area and industry as a result of digitalization. The Mexican government has unveiled its new Digital Academy, an online learning tool for federal personnel. The Digital Government Unit of the Ministry of Public Administration also offers information on how to get access to in-person digital government training sessions. Retraining for digital possibilities and using agile or DevOps approaches instead of waterfall project management is possible for project managers and other key positions. The use of open standards, reusable components, digital identities, and interoperability requirements make this more successful.

Increase the number of suppliers who participate in these agreements, reduce concentration, and broaden access to business prospects by streamlining procurement processes. However, the ICT Policy urges project managers to specify service needs and functionality in advance, but it does not provide clear guidance on managing digitalization activities. There is also a software framework agreement that will help the government react to public organizations' software demands.

4.7. E-Participation [EPAR]

For inhabitants of Mexico, the site www.gob.mx provides a one-stop shop for all government services. Participation in Mexico's growth is now possible via various ways, including forums, surveys, and co-edition activities.

4.8. Open Government Data [OGD]

Mexico was ranked 31st in the Waseda rankings in 2021 with 9.000 points. Since OGD makes it possible for the government to serve as a platform for co-creating public value, it is an essential part of the digital revolution. Governments can employ outside expertise to improve government accountability and the public sector's performance, and the development of new social and economic breakthroughs.

The Organization for Economic Co-operation and Development and Mexico collaborated to conduct an Open Government Data Review of Mexico. The evaluation was conducted by the Ministry of Public Administration, the National Digital Strategy Coordination, and the Open Data General Direction. Open government data policy in Mexico was examined using the OECD's open government data framework, and the country's digital transformation possibilities were revealed.

4.9. Cyber Security [CYB]

Digital development has seen an increase in use as a tool for enabling remote work. New cloud-based solutions and significant changes to digital platforms and the software supply chain have resulted in a recent attack surface that is more vulnerable to cyberattacks. The vast majority of remote employees in Mexico have more than six devices linked to their home networks. Many confess to utilizing personal devices to access personal data such as client data, bank records, and other financial information. According to a survey of security executives, six out of ten had no idea what their remote employees were doing to secure themselves at home.

Cloud-based solutions were used extensively by businesses to keep their operations operating smoothly. 77% of Mexican organizations have transferred business-critical services to the cloud, while 90% of non-business-critical activities are now hosted in the cloud. Most of the Mexican organizations updated their digital platforms during pandemics, while 23% built new ones. It is expected that enhancing digital platforms would be a top concern for security and business experts in 2017. There has been a significant rise in software supply for 63 percent of respondents, and another 14 percent intend to install new software over the next year or two.

4.10. The use of Emerging ICT [EMG]

Mexico is using artificial intelligence to transform itself. The epidemic has expedited Mexico's digital transformation, and more and more businesses are retooling using AI to remain competitive. Shortly, Mexicans can expect to see the arrival of artificial intelligence and two other new digital technologies. According to KPMG, cloud (77 percent), artificial intelligence (70 percent), and 5G mobile networks are the three significant digital breakthroughs that will determine the future of Mexican businesses (31 percent).

Expected to be worth \$4 billion in sales by 2022, the Internet of Things (IoT) is taking off in Mexico. Using the Internet of Things, devices can be connected, integrated into a data analysis and security ecosystem, and then automated due to these three aspects. When IoT is combined with AI, augmented reality, and distributed computing, companies can transition from "responding to exceptions" to "predict and prevent. The Internet of Things (IoT) is vital for both cost savings and new income possibilities.

Morocco

1. General Information

Area: 446,550 km²

Population: 37,431,741

Government Type: Unitary Parliamentary Semi-Constitutional Monarchy

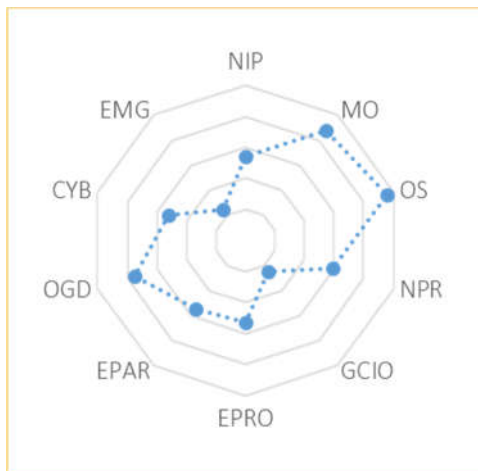
GDP: \$3,410

Internet Users: 84.12

Wired (Fixed Broadband Users): 5.70

Wireless Broadband Users: 75.16

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Morocco has set its goal for all public sectors to be digitally modernized by integrating technology into government operations and service delivery. The government needs strong leadership and a governance framework to enable coordinated implementation of its digital transformation plans. A cost-benefit analysis, business cases, monitoring, and impact assessment mechanisms, as well as the necessary financing policy instruments, are all required to support Morocco's public sector digital transformation and reap the benefits of this resource.

The Covid-19 epidemic inspired technological innovation in various areas, including banking, agriculture, and education, with confinement increasing e-commerce and the habit of contactless payment becoming highly ingrained. As a result, internet payments grew 31.3% in the first half of

2020 compared to the previous year's same period. The governmental and private sectors responded to the outbreak by retaining output while keeping social isolation.

3.2. New Trends

The Innovation Initiative, the National Strategy for Scientific Research Development (Horizon 2025), and Digital Morocco are Morocco's current innovation initiatives. The Innovation Project is a government-led initiative in Morocco that supports research and development. As the government continues on its digitization journey, it places a great emphasis on the following priorities:

The Strategic Plan for the Advancement of Scientific Research in the United States of America:

- A strong emphasis on scientific research has a significant impact on the creation of new technologies.
- Spending on R&D should be raised to enhance GDP by the end of 2025.
- Implementing methods to guarantee that scientific research and development-generated inventions and intellectual breakthroughs are connected to the innovation process.
- Proposing for funding to build a National Award for Science and Technology Innovation and Research
- Tourism, agriculture, and textile manufacture are among the nine industries that should be prioritized.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Morocco is ranked 54th in terms of preparedness for network infrastructure, with a score of 5.423. The overall number of Internet users reached 27.62 million in January 2021, a 9.1 percent raise over the previous year. At the start of 2021, 74.4 percent of the population had Internet access. Social media use would be widespread among 22 million people, over half of the entire population. Mobile phone connections accounted for 117.1 percent of the total population at the time.

Morocco's NIP has made several notable strides. The World Bank's Digital Inclusion Development Policy Financing initiative provides a \$500 million loan to assist Morocco in transforming its economy and increasing economic and social inclusion. A new mobile payment option, MT Cash, was announced, and the Wi-Fi 6E 6MHz spectrum was cleared for usage by telecom authorities.

4.2. Management Optimization [MO]

Morocco's e-governance structures were issued on October 21, 2009, with the three departments to be concentrated, CIGOV, SPGOV, and DPGOV.

The Minister of Industry, Trade, and New Technologies serves as the chairman of the Interministerial e-government Committee (CIGOV). This group is in charge of mapping out the path and evaluating the program's progress toward its objectives.

A group of ministerial departments and public institutions active in e-government activities make up the Steering Structures for E-Government (SPGOV). These are the organizations tasked with

evaluating the execution of e-government projects inside their respective organizations' respective organizations.

The Steering Department of the e-government program (DPGOV), which comprises a variety of specialists, is responsible for assisting CIGOV and SPGOV in implementing the e-government project. It is also responsible for helping CIGOV and SPGOV in executing the e-government priorities.

4.3. Online Service [OS]

Recent technical advancements are also benefiting online shops. In 2019, cash on arrival accounted for more than 90% of online transactions. In November 2018, the National Agency of Telecommunications Regulation ANRT awarded electronic payment licenses to financial firms collaborating with the country's central bank, Bank Al-Maghrib. Since its legalization in 2015, the central bank has only recorded 360,000 e-wallets. Inwi will be the country's first telecom provider, with Inwi Money set to begin late 2019. Inwi Money handled Dh7m (\$730,000) from over 140,000 customers during the year's first quarter.

4.4. National Portal [NPR]

Morocco comes in at 61st place with a score of 5.867. Morocco Numeric 2013 has declared the e-government program as a strategic priority plan and the primary purpose of egov.ma is to educate visitors about that e-government program. The portal egov.ma is one of the most well-known websites dedicated to promoting Morocco's information technology industry and teaching users about online services offered by the Moroccan government. Through access to the roadmap for all services and e-government initiatives, the program gives users a better understanding of its overall development.

Furthermore, it is an interactive environment in which every user has the opportunity to express an opinion or remark on the performance of the site and the relevance of operational and ongoing operations by responding to often updated online surveys. The website acts as a central point of contact for all program participants.

4.5. Government CIO [GCIO]

There is no policy or plan for Morocco's government CIOs. As a result, Morocco received a score of 2.500, placing it among the ten nations with the lowest GCIO indicator ratings.

4.6. E-Government Promotion [EPRO]

The government's ongoing efforts to adopt digital solutions have risen dramatically in recent years. By 2020, it was expected that practically all Ministry of Interior activities and PortNet services would be digital and all Moroccan port operations for international commerce. The country's priority has been to develop human capital and increase population knowledge. The country's court system also improved as a result of new laws and transparency-promoting initiatives.

Additionally, platform interoperability among government agencies has been promoted to foster cross-institutional collaboration. In 2019, the agency proposed legislation to combine digital administration across several public sector agencies to serve customers better.

4.7. E-Participation [EPAR]

The advancement of information and communication technology (ICT) has reshaped social and political life. These technologies provide various benefits, including high speed, cost savings, and the power to reach a greater number of individuals. It is becoming more important for public administration to provide services and interact with the general people more personally. ICT increases public engagement by enabling people to interact with government authorities more effectively. The government prioritized promoting electronic participation to improve access to information and public services while boosting their engagement in shared decision-making.

The two components of e-participation are e-access and e-inclusion. E-Access provides access to public infrastructure and the Internet and training and dissemination of information and communication technology-related activities. In contrast, e-Inclusion is the process by which a targeted audience participates in public decision-making using information and communication technologies.

4.8. Open Government Data [OGD]

Morocco has implemented structural reforms to boost participatory democracy, transparency, and anti-corruption to adopt new government models responsive to the preferences of Moroccan residents. In April 2018, the government, the House of Representatives, and local government, represented by the Tangier-Tetouan-Al Hoceima Regional Council, joined the Open Government Partnership (OGP). As a result, the Moroccan government established www.gouvernement-ouvert.ma, a national open government website, to advertise and monitor the country's aims. This website also has digital sections for submitting recommendations and comments on national open government action plans and a tool for improving public-administration communication. A turnover system and equal representation of civilian society and government agents on the management committee promoted effective and inclusive civil society participation. This strategy emphasized complementarity, collaboration, and interaction among several partners. This exciting collaborative effort yielded open Government initiatives in the first National Action Plan for 2018–2020.

This cocreation area was created alongside the events on the national open government website "www.gouvernement-ouvert.ma" to stimulate interaction and involvement in the preparation of the second national action plan, as well as registration for theme-based cocreation events. It also allowed significant local and regional players to take part in this critical national initiative. Over 800 people and civil society players participated, submitting 230 proposals. These recommendations were sent to each institution and department for processing, study, and inclusion in the draft commitments for 2021-2023.

4.9. Cyber Security [CYB]

Morocco ranks at the bottom list in terms of Cyber Security [CYB] with a score of 5.200. However, the country's attempts to strengthen its cyber security framework were evident. In November 2003, the Moroccan criminal law was maintained by Law 07-03, which defined computer piracy. Legislators addressed privacy protection in February 2009 with Law 09-08. It created a National Commission for

Personal Data Protection (CNDP). Since then, businesses that collect personal data have been required to notify and get permission from persons affected.

The National Defense Administration established a General Directorate of Information Systems Security (DGSSI) to prepare the National Information Systems Security Directive (DNSSI). The House of Representatives enacted Law 05-20 on cyber security in July 2020, authorizing the government to exert control and protection over computer systems and data belonging to both public and commercial entities.

4.10. The use of Emerging ICT [EMG]

The Moroccan government is attempting to transform public perceptions of artificial intelligence as disruptive technology becomes increasingly critical to economic development and business efficiency (AI). According to a recent Microsoft and EY report, the Middle East and Africa's governments spent an estimated \$7 million on artificial intelligence between 2008 and 2018. The Dh50 million (\$5.2 million) attempt will develop an artificial intelligence-based solution for agriculture, tourism, and health.

CIoT'21 is the place to learn more about managing Internet of Things applications across 6G and next-generation data centers. For real-time applications on the next generation of telecommunications networks, more complex terminals such as smartphones, sensors, and other connected devices are needed. 6G will accomplish these goals via artificial intelligence, the cloud, and edge computing. While maintaining QoS and allowing M2M, M2H, and H2M coexistence, the 6G network will be capable of managing billions of flows created by networked items. After being examined by data centers, this information is subsequently utilized by applications. The IoT and Cloud domains will be connected through the 6G network to resolve associated with sensors/machines and end-users connected to the Cloud.

Netherlands

1. General Information

Area: 41,850 km²

Population: 17,180,676

Government Type: Unitary Parliamentary Constitutional Monarchy

GDP: \$58,000

Internet Users: 91.33

Wired (Fixed Broadband Users): 43.92

Wireless Broadband Users: 125.28

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

The Netherlands' digital infrastructure has long been a cornerstone for European progress. Thus, the overall score of the Netherlands is 86.0419, ranking 14th out of 64 countries. The government undertakes the advancement of public sector digitalization while reinforcing digitalization fundamentals, including cybersecurity, privacy, digital skills, and open competition.

The digital infrastructure advancement makes the Netherlands' internet speeds among the world's fastest. AMS-IX is one of the world's largest internet exchanges, enabling Amsterdam to be one of Europe's most digitized cities. For over 25 years, AMS-IX has helped internet service providers, telecom companies, and cloud providers route global traffic effectively, securely, and reliably. The Netherlands' AMS-IX and NL-IX networks support everything from businesses worldwide to daily

lives. A stable digital infrastructure also helps the Netherlands improve AI and quantum technology applications.

The Netherlands is developing a digitally proficient workforce to support major technology-driven enterprises' expansion. A large percentage of Dutch citizens are skilled at using computers and related software. Working from home – or anywhere else – is possible for the Dutch because their network and people are adaptive and adequately equipped.

3.2. New Trends

The Dutch government has proposed a comprehensive digitization plan that would involve almost every area, From e-health to smart transportation, from education to public safety and administration. The government expects the Netherlands to be a leader in advanced technology deployment by:

- Maximizing economic and social potential.

Healthcare, transportation, education, energy, agriculture, and food are all included in this sector. The government's job is to help these industries accelerate and support their digital transitions. This is accomplished, among other things, via targeted projects and collaborations with businesses, institutions of higher learning, and local and regional governments. Stabilizing the essential foundation in five key areas:

- New technologies and science
- Career changes, new skill development, and long term education
- A digitally energized and sophisticated economy:
- Improving individual and organizational resilience
- Fundamental rights and responsibilities in the digital world

In conclusion, the Netherlands are 100% dedicated to the social and economic benefits of digitization.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

The Netherlands ranks 7th in terms of network infrastructure readiness, with a score of 7.842. In January 2021, the total number of Internet users reached 16.47 million, a 1.3 percent increase over the previous year. At the beginning of 2021, 96 percent of the population had access to the Internet. Social media would be used by 15.10 million individuals or 88 percent of the total population. Cell phones were available to 99.2 percent of the population at the time.

In conjunction with the introduction of NL DigiBeter2.0, the policy framework for the future expansion of digital government infrastructure has been revealed. The policy system defines guidelines for developing standards for the fundamental infrastructure of the digital government and improving the general functions of the national infrastructure of the digital government.

4.2. Management Optimization [MO]

The Independent Consulting and Project Management Unit (ICTU) is a government-funded firm. The ICTU is a for-profit corporation that oversees the country's future development on behalf of the Ministry of the Interior and Kingdom Relations.

The 2019 Digital Government Agenda evaluates progress, actual accomplishments, and predicted outcomes for each action line in the next few years. Personal data management empowers people to control how their data is collected and utilized by the government. Individuals must be allowed to inspect, update, and share their data with non-governmental groups digitally. On the other hand, the government has been grappling with the implications and limits of Artificial Intelligence for present and future legislative efforts.

The Personal Identification Number Law was enacted to increase administrative efficiency and citizen services. The Act covers number administration, development, and assignment. Law requires the Court of Audit to undertake performance (or value for money) audits of government administration and activities. Its tasks, powers, and legal status are outlined in the Constitution and the Government Accounts Act.

4.3. Online Service [OS]

The Netherlands ranks 16th in terms of Online Services, with a score of 10.86. The administrative facility for citizen service numbers (BV BSN) is responsible for designing, issuing, managing, and advising concerning citizen service numbers. The BV BSN governs access to the identifying data of the actual underlying registers. It also limits access to records, which are used to prove identity at the counter. Furthermore, eRecognition (eHerkenning) is a Trust Framework that enables government and business authentication. eHerkenning authentication tokens are accepted by government and business websites. Because authentication tokens are technologically neutral, a user may choose from a range of alternatives.

PKIoverheid is a highly secure infrastructure that is based on digital certificates. The Dutch government may securely interact digitally by activating PKI Overheid. PKIoverheid certificates, in addition to safeguarding websites, secure data transfer and give legally recognized electronic signatures.

PIANOO, the Dutch Public Procurement Expertise Centre, was established to increase the efficiency of government procurement and tenders. Professional procurement may assist a policy's implementation while also protecting government cash. PIANOO gathers procurement and tendering specialists to share ideas and best practices.

Tendered is the Dutch government's online procurement platform, making the whole procurement process easier for contractors and suppliers (central, regional, and local). Because it automatically publishes contract notifications that exceed the daily threshold, it is a vital tool for accomplishing the EU's eProcurement objectives.

4.4. National Portal [NPR]

The Netherlands has made remarkable progress in the national portal advancement. The number of sites is getting higher and upgraded year to year, which lifts the governance's quality and eliminates

all administrative burdens. For that reason, Netherland stands at the 10th position in National Portal indicators, with a score of 7.733. Overheid.nl, the government site of the Netherlands, was launched in 1999 as part of the first e-Government action plan to increase the openness of public administration. The website organizes personal and corporate offerings by topics, events, and areas. The site offers the publication of unified national legislation, official documents, regional laws, and online consultation.

Furthermore, Ondernemersplein serves as a gateway for information on legislation, financing, and licensing. The data is available to all levels of government and is accessible through websites, email, phone, and chat, emphasizing the requirements of the business community. Residents may get individualized information and digital communications from the government by registering with DigiD, which allows them to record and check personal data such as their address, family, income, pension, real estate, and automotive data.

A digital ecosystem is being developed to assist firms in doing business with the government. It would enable companies to monitor multiple registrations, acquire customized information, and engage with the government online. The platform will be produced on demand and tested online, with an emphasis on business requirements. In the future, municipal, regional, and private services should be included.

4.5. Government CIO [GCIO]

In February 2019, the Minister of the Interior presented to Parliament the Strategic I plan for 2019-2021, which aimed at achieving digital development at a federal level. CIO council processes were outlined in the I agenda. The plan is all adequate, consistent, reliable information and communication technologies (ICTs), knowledge and skills, and strategic governance.

4.6. E-Government Promotion [EPRO]

The Dutch Digitization Strategy, released in June 2018, addressed all aspects of digitization. The digitization strategy attempts to optimize social and economic benefits, strengthen digitalization fundamentals, raise people and organization resilience, and promote fundamental digital rights and principles.

The Open Government Vision and Action Plan discussed many advances surrounding open government and stressed increasing openness's economic, political, and social advantages. Three significant concerns are government transparency, public engagement, and accountability. The Action Plan for Open Government 2018-2020 emphasized open decision-making at the municipal and provincial levels, the openness of political party financing, and building an innovative Network for Open Government for Municipalities.

The Dutch government promotes open standards to maintain supplier autonomy. The Netherlands requires specific open standards and recommends others. The International Standards Organisation (ISO) has published a list of open standards. The Standardisation Forum may assist the Dutch government in ensuring the use, development, and implementation of open standards for electronic trade.

4.7. E-Participation [EPAR]

The Netherlands falls behind other indicators in terms of E-Participation. Despite a promising score of 8.5, the nation is ranked 24th out of 64 countries.

An Application Programming Interface (API) approach provides a connectivity interface to an application and is an essential part of the country's digital transformation. A national API alliance has been formed in the Netherlands to build a national API strategy. Knowledge Platform APIs help the Dutch government overcome strategic and tactical difficulties linked to the creation and usage of APIs.

Diginetwerk is a network that links all government organizations. From that, a virtual government network has been brought under control. While GovNet enables governments to share information securely, Diginetwerk enables a single organization to share data with many government agencies through a single network link. The TESTA network, which acts as the central cross-border infrastructure for digital communication between EU agencies, institutions, and member states, is actively used in the Netherlands.

4.8. Open Government Data [OGD]

The growth of digitization has propelled Netherland's Open Government Data to the 10th position on the list with a score of 9.750. On July 16, 2019, the European Union's Open Data and Reuse of Public Sector Information Directive, sometimes known as the "Open Data Directive," came into force. The Public Sector Information Directive, approved in 2003 and revised by Directive 2013/37/EU, has been overtaken by this directive.

The database of all publicly available datasets held by Dutch public sector institutions can be found on the open data website, updated regularly. The Ministry of the Interior and Kingdom Relations in the Netherlands is in charge of creating and administering the website and registration process. The Netherlands Publication Office is responsible for the maintenance and development of the website. Data from approximately 150 Dutch government institutions are included in around 15,000 files. The data site is updated daily due to cultivation practices, user submission, and API updates.

4.9. Cyber Security [CYB]

With a relatively high score of 9.700, the Netherlands is rated 16th in terms of cyber security. In June 2018, the National Cyber Security Agenda was unveiled in conjunction with the digitalization strategy. The National Cyber Security Agenda aims to avert new cyber threats. This is accomplished by defining the necessary cybersecurity protections. The government placed a higher concentration on securing the economic and social benefits of digitization while safeguarding national security in the digital domain; providing sufficient digitalization to diagnose, mitigate, and respond appropriately to cyber threats; contributing to digital peace and stability; and being at the forefront of innovation in the development of digitally reliable computer systems.

4.10. The use of Emerging ICT [EMG]

The Ministry of the Interior and Kingdom Relations released a policy letter on Artificial Intelligence AI in October 2019. The letter covers current and future legal actions and the potential and limits of AI for human rights ideals, which were created in collaboration with the Ministries of Economic Affairs, Justice, and Security, as well as the Ministries of the Interior and Kingdom Relations.

The new Self-Driving Vehicle Experimental Law, which went into effect on July 1, 2019, permits restricted public road testing of self-driving automobiles. Before being authorized by the Minister of Infrastructure and Water Management, these applications were reviewed by The Netherlands Vehicle Authority RDW, the police, municipal road authorities, and the Dutch Institute for Road Safety Research (SWOV). They weigh the costs and benefits of avoiding road accidents. This will place the Netherlands at the forefront of nations considering self-driving automobiles.

New Zealand

1. General Information

Area: 270,467 km²

Population: 4,868,514

Government Type: Unitary Parliamentary Constitutional Monarchy

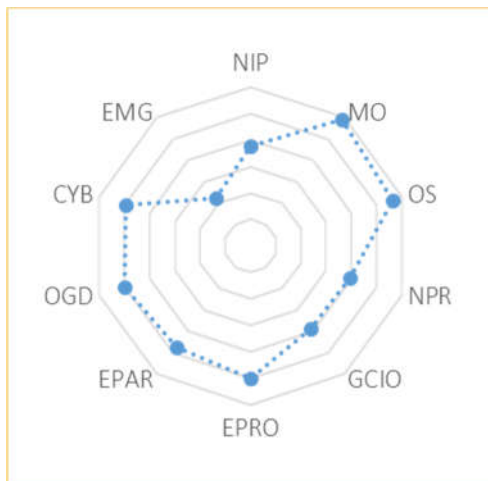
GDP: \$47,500

Internet Users: 90.81

Wired (Fixed Broadband Users): 34.72

Wireless Broadband Users: 114.46

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

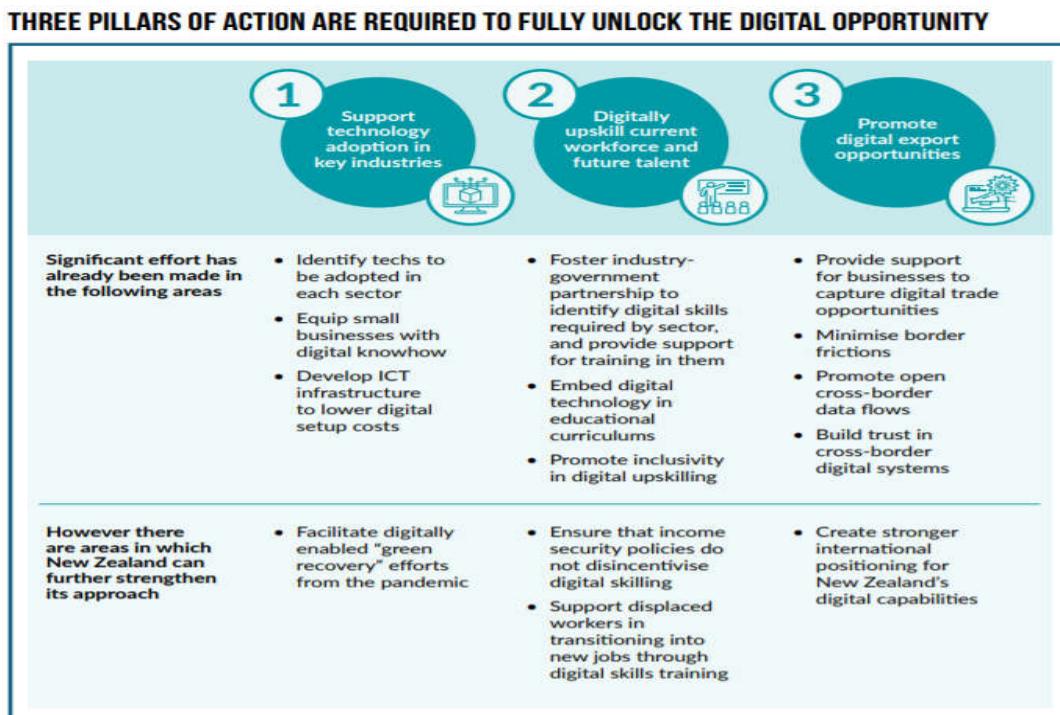
New Zealand has always made significant investments in industrialization and digital governance. Years of hard effort have resulted in New Zealand's ranking as the world's seventh best digital government, with a total score of 90.0918.

New Zealand was successful in creating and executing multi-agency services focused on important life events, ranging from health care to commercial services. Additionally, New Zealand was the first country in the world to use a completely online passport renewal procedure, ensuring that administrative processes are efficient and reliable. To make data infrastructure investments more functional, the Data Investment Framework was developed. The country has also invested much in

cyber security measures that protect all personal information while building trust in individuals and enterprises.

Aside from that, the government offers comprehensive guidance and help to people and businesses in the design and development of digital services and systems. Everyone who interacts with the government will have a better experience due to increased standardization, information exchange, and the promotion of best practices as a result of these efforts.

3.2. New Trends



Three pillars of action are necessary to use New Zealand’s digital advantage properly.

- First, choosing appropriate technologies for each industry, providing small firms with digital capabilities, and expanding ICT infrastructure to assist enterprises with digital setup expenses. Renewable energy and climate-friendly solutions will be promoted as a means of achieving sustainable development.
- Second, existing and prospective workers must be technologically savvy. New Zealand has provided technical training and has integrated technology into business and everyday life.
- Third, it is critical to expand access to digital export potential. The New Zealand Government has aided firms in expanding into international markets by lowering internal border tensions and supporting open domestic and international data flows. The government intends to expand R&D spending, develop industry-academic engagement, and enable partnerships between local start-ups and global technology corporations to stimulate domestic innovation.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 7.518, New Zealand is ranked 15th in terms of network infrastructure readiness. In January 2021, the total number of Internet users reached 4.55 million, increasing 84 thousand users over the previous year. Internet penetration remained constant at 94 percent in early 2021. In January 2021, 3.97 million individuals had access to social media, accounting for 82 percent of the entire population. Mobile phone connections reached 6.56 million at the start of 2021, accounting for 135.6 percent of the total population.

4.2. Management Optimization [MO]

The New Zealand Cabinet approved the Government's ICT Strategy and Action Plan in the middle of 2013. Due to the general changing nature of the ICT environment, the plan strives to achieve the government's objective of using ICT to change public services for New Zealanders.

The Government ICT Strategy is being executed via a partnership structure comprising important stakeholders from several government ministries. The present New Zealand e-Government Strategy addresses practically the necessity of governance and leadership, an assurance framework, programs and initiatives, and ICT system assurance. Overall, New Zealand received such a high score of 11.800, the 8th position, in terms of Management Optimization.

4.3. Online Service [OS]

As credit cards and internet transfers have developed, specific systems for direct bank transfers, such as POLi, have been designed and implemented. Consumers don't need to leave the website and visit their bank with either of these methods since they both use their internet banking to enable speedy online payments. Direct bank transfers increased transaction volume while simultaneously improving payment security, resulting in a positive economic impact.

Additionally, in recent years, the practice of 'Buy Now Pay Later' has gained popularity in New Zealand. Online shopping portals or mobile apps that allow consumers to purchase things online and get them instantly without paying the whole amount are known as marketplaces. When a consumer uses a service provider such as Afterpay, the retailer receives a one-time payment, and the customer makes monthly payments to the service provider. This may be particularly enticing to customers who are unable or reluctant to make the entire payment at the time of the invoice submission. Furthermore, unlike credit card payments, there is no interest imposed on cash advances.

4.4. National Portal [NPR]

New Zealand's National Portal is ranked 6th, among the top ten nations with the highest National Portal indicator ratings. Govt.nz is the national site for New Zealanders who need to contact the government daily and those who want to move or visit New Zealand. Govt.nz attempts to promote agency collaboration and trustworthiness to interact with the government more efficiently. Individuals may use the website to discover what they need to do and how the government can help. They don't need to know which agency to call since information is categorized.

Digital.govt.nz is another site to provide information, resources, and guidance to digitally help the public sector transition. This site will replace the Web Toolkit and ICT.govt.nz. For international audiences and other interested parties, this website is designed to: define New Zealand's digital strategy and approach; promote public sector skills in a digital context. Although divisions contribute to the site, the material may be controlled by the government.

4.5. Government CIO [GCIO]

The GCIO is responsible for liaising with organizations to help them better understand standard ICT services, assisting organizations in advancing their utilization of ICT services, and tracking organizational adoption and the benefits produced. Businesses obliged to submit four-year plans to the Treasury must include ideas to utilize shared information and communications technology (ICT) services.

The GCIO is responsible for assessing an organization's ICT investment case. The GCIO performs reviews to see whether or not enterprises are using or planning to use shared information and communications technology (ICT) services. In addition, the GCIO is also responsible for ensuring that the benefits of information and communications technology investments are coming to realization.

4.6. E-Government Promotion [EPRO]

The government's digital literacy work program begins with an idea to create the tools necessary to engage in, contribute to, and profit from the digital world. This approach reflects the way the majority of people today engage with the digital world and the fact that an increasing number of services and daily activities are moving online.

Besides, improving Government Payroll Systems included collaborating with government entities to streamline payroll procedures. The program's objective was to reassure Ministers that the payroll system spending is justified, the payroll project risks are addressed, and the payroll systems are fit-for-purpose and offered at a fair cost. Government agencies may save money by simplifying the acquisition of payroll systems.

The Alternative Zealand government committed in 2018 to a two-year initiative headed by the Department of Internal Affairs to explore new approaches to digital identity. That transition program analyzed how the government could provide the relevant legislation and environment to leverage new technology and fulfill people's demands and expectations. The Digital Identity Programme Team conducted significant research and worked with essential stakeholders and related bodies in other jurisdictions within 2019 and 2020.

4.7. E-Participation [EPAR]

The development of New Zealand's culture and society has evolved in the context of a high-technology civilization. These factors have driven New Zealand to the forefront of the next generation of e-Government. Both people and governments may take advantage of information and communications technology (ICT) in their daily lives. Despite the successes mentioned above, New Zealand's progress in this area is limited due to the lack of an e-participation site. However, its score is still remarkably high as 9.5, ranked 10th in the list.

4.8. Open Government Data [OGD]

Because of the interactions with the government at various points in life, such as at home, at work, and in their leisure time, everyone is influenced differently by open government. A considerable number of nations worldwide are undertaking open government projects based on the requirements of their populations and governments. The purpose of open government is to strengthen New Zealand's democracy by allowing individuals to participate in and influence the government's responsibilities. The underlying principles of open government are transparency, participation, and accountability.

4.9. Cyber Security [CYB]

New Zealand's Cyber Security Strategy has four main goals:

- Cyber Resilience — The goals are to protect New Zealand's most basic capabilities, ensure that authorities use cyber technology to promote the country's security and maintain preparation for catastrophic cyber-attacks.
- Cyber Capability- to guarantee that all New Zealanders have the knowledge and tools necessary to protect themselves online, making it more difficult for cybercriminals to steal vital information regardless of their educational level.
- Cybercrime Prevention, Investigation, and Response - to prevent, investigate, and react to cybercrime. Avoiding and resolving the difficulties around this situation and taking actions to minimize and reduce harm to New Zealanders have become the country's goal.
- International Cooperation—especially in the Asia-Pacific region—to create international relations. Being regarded as a cyber-safe country enhances the country's global image, particularly the capacity of its businesses to compete internationally.

Establish a national CERT to minimize the damages caused by cyber-attacks and raise the country's ability to adapt to these attacks. The CERT will operate as a single interface for all organizations and individuals who need support, providing information on protecting themselves from cybercriminals.

4.10. The use of Emerging ICT [EMG]

Greater human engagement is being encouraged by a desire to understand better and forecast client behavior. The main goals for increasing work productivity and efficiency are effective automation and big data analytics.

Earlier this year, Vodafone New Zealand unveiled additional Internet of Things (IoT) capabilities for New Zealand enterprises. Vodafone New Zealand's XONE innovation laboratories will provide Connect, a localized version of the company's IoT Global Data Service Platform (GDSP). Spark, a rival provider, has put money into creating Internet of Things solutions for Kiwi enterprises. Spark also offers productized asset monitoring and management solutions to SMEs and big businesses. By June 2020, Spark has seen a 60 percent year-over-year rise in IoT connections, regaining lost ground. On the other hand, Vodafone NZ dominates the market in terms of connections and maintains a worldwide edge thanks to the global networks of its member firms. Localization of the solution will now assist domestic-only clients in growing their businesses by increasing offerings.

Nigeria

1. General Information

Area: 923,768 km²

Population: 212,461,203

Government Type: Federal Presidential Constitutional Republic

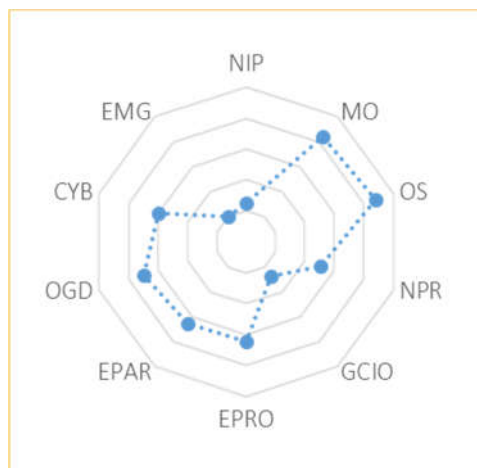
GDP: \$ 2,430

Internet Users: 33.60

Wired (Fixed Broadband Users): 0.03

Wireless Broadband Users: 41.69

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Nigeria has made significant progress in the transition to an open economy throughout the years, in keeping with the worldwide trends of digitization. The country is ranked 62nd with an overall score of 55.4067. The Federal Ministry of Communications was redesignated as the Federal Ministry of Communications and Digital Economy, with the mandate to develop and execute a Nigerian digital economy policy and strategy that is coherent and well-coordinated.

According to the National Bureau of Statistics' second quarter report for 2019, the Information and Communications Technology industry contributed an outstanding 13.85 percent to Nigeria's Gross Domestic Product (GDP). This demonstrates the critical nature and potential of the ICT industry in terms of job generation and economic diversification.

Additionally, the government has encouraged and aided such digital entrepreneurs in developing novel solutions to local and global problems. In the public sector, digitization of critical functions, such as the usage of the Bank Verification Number (BVN), the Treasury Single Account (TSA), and the Integrated Payroll and Personnel Information System (IPPIS), has helped Nigeria to reduce operational costs and combat corruption. The nation is stepping up its efforts to improve the efficiency and efficacy of public procurement procedures.

3.2. New Trends

The Nigerian government issued the National Digital Economy Policy and Strategy (2020-2030) in November 2019 to strengthen the economy and move away from reliance on the oil and gas sector. The approach is based on the following pillars to boost the Nigerian economy:

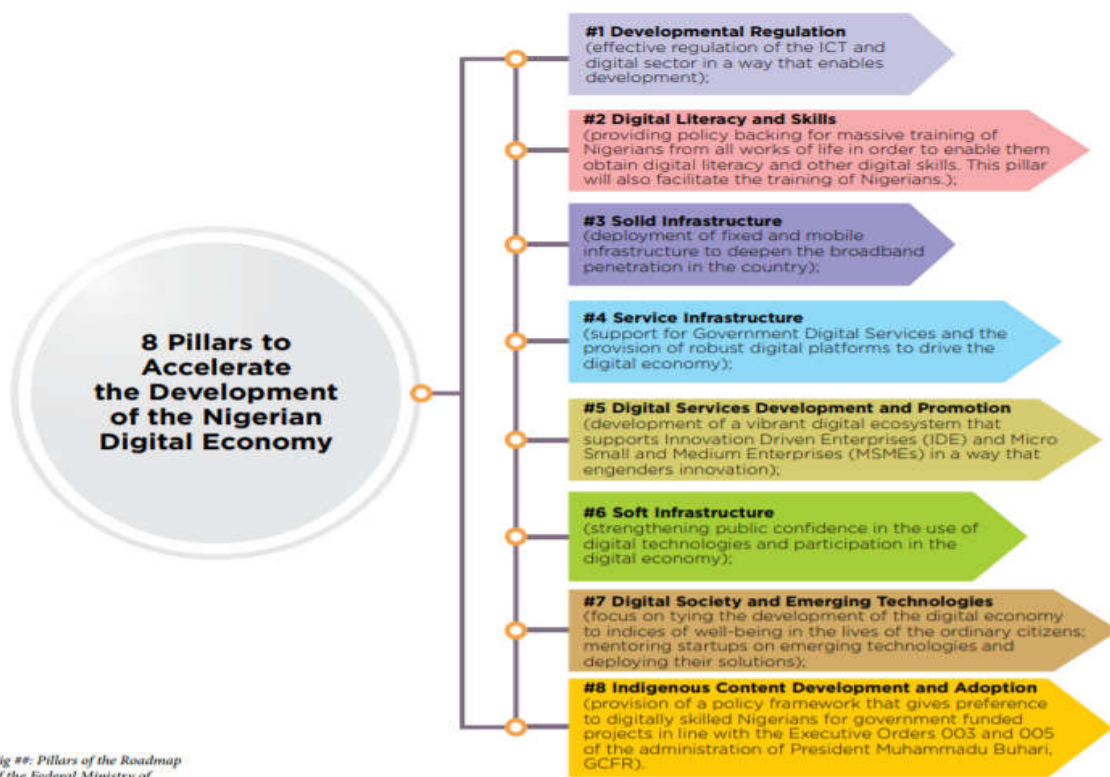


Fig #8: Pillars of the Roadmap of the Federal Ministry of Communications and Digital Economy

The Nigerian Communications Commission (NCC) created the National Broadband Plan for 2020-2025 to help achieve this aim. To provide effective coverage for at least 90% of the population, the Broadband Plan aims to deliver data download speeds of at least 25Mbps in urban areas and 10Mbps in rural areas. As part of its broadband expansion plan, the government is looking for private sector infrastructure partners.

It is recognized that ICT development and broadband access are critical to Nigeria's ambitions to become one of the world's top economies. Several constraints have impeded broadband growth and investment opportunities in the business. Damage to existing fiber infrastructure caused by cable theft, road construction and other activities are just a few of the main difficulties facing the industry.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Nigeria is ranked 62nd in terms of preparedness for network infrastructure, with a score of 2.511. In January 2021, the total number of Internet users reached 104.4 million, a stunning rise of 22% over the previous year. Until January 2021, half of Nigeria's population used the Internet. However, social media was accessible by just 33 million individuals or 14.8% of the population. Simultaneously, there was a 10% growth in mobile connections to 187.9 million, comparable to 90% of the entire Nigerian population.

Over the last several years, the Nigerian government has made a significant effort to promote digitization. Loans totaling \$328 million were granted to fund the completion of the national backbone project. With a proper rollout strategy, 5G has started to reach consumers. Broadband was expanded to rural regions to meet the national broadband plan's goal of 70% broadband penetration. Additionally, two additional satellites have been designated for capacity improvement.

4.2. Management Optimization [MO]

The Department of e-Government Development and Regulation (e-GDR) was established in 2017 to promote the digitalization process for all public sectors. It is also entrusted with building an enabling ICT regulatory environment that promotes Nigeria's indigenous ICT growth, international investment, and overall ICT sector development.

The Department of e-Government Development and Regulation e-GDR helps the Nigeria government to:

- Establish and encourage the creation of IT regulatory frameworks to help the nation grow in the long run.
- Create and implement strategies to promote the use of information technology in government service delivery;
- Coordinate the government's use of information technology tools in service delivery;
- Register and maintain national portal MDAs.gov.ng.
- Coordination and oversight of Nigerian domain registrants via the Nigeria Internet Registration Association (NiRA).

4.3. Online Service [OS]

National/State Economic Empowerment Strategies (NEEDS/SEEDS), Vision 2020, National e-Government Strategy (NeGST) and a well-crafted National Information Technology Policy are all

examples of Nigerian government strategies. The National Information Technology Development Agency (NITDA) coordinated the Nigeria project alongside National e-Government Strategies Limited (NeGSt). Despite numerous initiatives, 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 aimed at creating a technological environment conducive to Nigeria's social and economic development.

The overall amount of electronic payment transactions in the nation, including point of sale, ACH, and Nigeria Interbank Settlement System Instant Payment (NIP), climbed 5.49 percent to N17.3 trillion in September 2020 from N16.4 trillion in August. The Coronavirus epidemic has prompted more bank clients to use alternate financial methods to avoid infection.

4.4. National Portal [NPR]

There are some restrictions to the Nigerian e-Government website, <http://www.nigeria.gov.ng>. Many users find the new design difficult to use, and the site primarily delivers static information on news, the government, the army, and the police, as well as links to pertinent government agencies and organizations. Nigerians will be unable to interact with their government since there are no electronic services incorporated into the platform and little knowledge about social media. However, these obstacles are understandable due to the quality of fixed internet connections and limitations on various digital platforms. Therefore, Nigeria's NPR indicator score is just 5.037, placing it at the bottom of the list.

4.5. Government CIO [GCIO]

Nigeria's government has neither enacted any legislation or established a legislative division for CIO jobs. The phrase "CIO" is still comparatively ambiguous in Nigeria, since there are no organizations or training institutions that have established criteria or requirements for that job title. The head of the National e-government Strategies has duties that are very similar to those of the CIO, but there is no clear details or framework offered.

4.6. E-Government Promotion [EPRO]

The government has emphasized the need of developing a mutually beneficial partnership between government and technology service providers that would benefit people and the Nigerian economy. This close correlation has had the potential to accelerate the adoption of the suitable governance technology. To guarantee the openness and reliability of public services, more revenue-generating channels for government must be developed via the use of technology and digitalization, such as through the use of technology in tax collection.

4.7. E-Participation [EPAR]

The Nigeria authorities have recognized the need to transform through the use of digitalization, which is attempted to examine as e-government. Hence, an e-Participation system was created to enable the government to communicate with the Nigerian public via text messaging using Gprs devices and electronic forms on the internet. It assists the government in keeping the public updated about the

status of all public projects by delivering photographs and other information to them. It also encourages the residents to use this channel to seek public feedback on all the given public projects.

4.8. Open Government Data [OGD]

Following the country's efforts to promote innovation and expose corruption, Nigeria was admitted as the 70th member of the Open Government Partnership (OGP) in July 2016. The Open Government Partnership (OGP) is based on the use of technology and digitalization as fundamental components. It brings together government and civil society reformers who believe that open and transparent governance is essential for success and reliability in economy. The Open Government Partnership (OGP) establishes a framework for engagement between government and civil society at the national level. It connects, empowers, and promotes the reform and growth of the government on a global scale, according to its international features.

4.9. Cyber Security [CYB]

The proposed National Cybersecurity Policy and Strategy (NCPS) 2021 are presently being discussed in Nigeria to address Nigeria's cyber risk exposure, and the framework for strengthening cybersecurity governance. To better handle increasing cyberthreats, the new policy updated the 2014 strategy and orientates the nation's cybersecurity initiatives.

The National Cybersecurity Coordination Centre (NCCC) has identified vulnerable cyberinfrastructure areas to improve risk assessment. The Centre admits the country's reliance on external ICT solutions, highlighting limitations in R&D and human resource capacity. Aside from that, a lack of cybersecurity knowledge is an obstacle to the aggressive growth of cyber threats. A worldwide cyber security market is a competitive one, therefore, multi-stakeholder industrial relationships are encouraged to maintain the data's security and reliability.

4.10. The use of Emerging ICT [EMG]

Nigeria's ICT sector remained active in 2020, as the majority of sectors implemented virtual work environments. According to the Nigerian Communications Commission (NCC), telecommunications contributed 12.45 percent of GDP to Nigeria's fourth quarter of 2020, up from 10.60 percent the previous year. This increase is the result of rising demand, years of successful policy implementation, and sector investment.

The Nigerian government views information and communication technology (ICT) as a critical enabler for other critical sectors such as education, healthcare, agriculture, and industry. To diversify the economy away from oil and gas, the Nigerian government promotes indigenous information and communication technology enterprises to collaborate with foreign investors. To cultivate these linkages and establish an entrepreneurial ecosystem in the technology sector, the government has financed government- or private-sector-led incubator centers, youth innovation projects, and scientific technology parks. Nigeria has improved its EMG rating to 54th with a score of 2.000 as a result of these initiatives.

Norway

1. General Information

Area: 323,802 km²

Population: 5,474,826

Government Type: Unitary Parliamentary Constitutional Monarchy

GDP: \$ 82,000

Internet Users: 97.00

Wired (Fixed Broadband Users): 44.04

Wireless Broadband Users: 103.71

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Norway, along with the other Nordic nations, is well-positioned for digital transformation compared to its European counterparts. The country was ranked 18th with a total score of 83.0516.

Norway adopted several agendas linked to the information society and digital governance between 2005 and 2017. While each of these policy statements had a specific goal, they also emphasized a variety of policy viewpoints based on developing political priorities and stated a variety of purposes; they also depended on one another's successes and shortcomings. As a result of this integrated architecture, there is consistency in policy creation and execution, which has supported Norway's elevation to the top tier of countries in terms of digital government policies.

Attempting to maintain this privileged position in international rankings would imply the continuous development of structural conditions and incorporating an urgency in the Norwegian context to sustain

the drive for advancing the public sector's overall digital transformation. The Norwegian government has set the goals to incorporate new digital technology into public sector operations while sticking to current public sector economic models.

3.2. New Trends

Public sector digitization aims to make life easier for citizens, companies, and volunteers by improving services and maximizing government resource usage. The purpose of the national plan is to assist agencies and the public sector in making the digital transformation. Restructuring the organization, reorganizing responsibility areas, revising rules, and rethinking procedures are examples of this strategy. The public sector must boost its adaptability and creativity to accommodate new work processes and procedures. It's not just about what to digitize; it's also about how to use it to boost productivity and creativity. Increasing the efficiency of the public sector isn't always consistent with a user-centered strategy. This plan will increase the efficiency of the public sector while also increasing the value created by the private sector.

The following are Norway's objectives through 2025:

- The digital transformation of the public sector shall be transparent and inclusive. More tasks will be completed as services online.
- Everyone, including people, corporations, and non-profits, should be allowed to communicate with the government through the internet.

The public sector should use data interchange and utilization to deliver user-friendly services and drive private sector value creation. Governments at all levels must develop services in a collaborative digital environment. Digitization will benefit both local and national government agencies. The plan will emphasize the following to attain these objectives and assist digital transformation:

- By coordinating across administrative levels and sectors, the public sector will improve collaboration on digital services and resource management.
- Data will be shared and reused more widely in the public sector, and open data will be disseminated for commercial innovation and value generation.
- For national digital collaboration and service development, a hierarchically regulated and coordinated ecosystem will be established.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

In January 2021, there were 97 thousand new Internet subscribers, increasing to 5.39 million users in Norway. The number remained almost constant at almost 100 percent of the total population. Meanwhile, just 4.53 million people used social media, representing 83.2 percent of the people. Norway had 5.96 million mobile connections at the start of 2021, accounting for 109.5 percent of the total population.

Norway outperformed all 63 other countries, getting an 8.035 score for the Network Infrastructure Preparedness indicator. This achievement demonstrates Norway's long-term dedication to and investment in digitizing inputs. The regulators consulted on the multi-spectrum 5G auction and recommended measures to alleviate strain on Telenor's network. By 2025, Telenor intended to phase down PSTN infrastructure and decommission its GSM and 3G networks. Telenor founded a firm dedicated to smart buildings and cooperated with NextGenTel to advance the G.fast standard.

4.2. Management Optimization [MO]

Meanwhile, Norway's Management Optimization indicator is ranked 13th with a score of 11.500. The Norwegian Digitalisation Agency was founded in January 2020 by combining the Brnnysund Register Centre's data management section with the Norwegian Agency for Public Management and eGovernment (Difi). The Agency is the Norwegian government's primary tool for promoting and managing public sector digitization. The Norwegian Digitization Agency now has responsibility for the operation of Difi's standard IT solutions, administration of the Altinn collaboration, the Co-Financing Program, the Stimulab innovation scheme, and the Authority for Universal Design of ICT.

Norway has had a Digitalisation Minister since 2018, who oversees digitalization and regional development. The Norwegian Digitalisation Agency was formed on 1 January 2020 by combining Altinn, the Brnnysund Register Centre's data management section, and Difi. The agency is the Norwegian government's primary tool for accelerating and coordinating public sector digitization.

4.3. Online Service [OS]

The Norwegian Mapping Authority (NMA) manages the Land Registry and Cadastre. The Land Registry, a centralized database, is now fully computerized and digitalized. The Norwegian Cadastre is a public register of constructions and addresses to be in charge of document registration. NMA oversees and technically hosts the Cadastre, whereas the authorities undertake cadastral surveys. Consumers may use an integrated online service since the databases are technically linked.

MinID gives users access to government services that need medium-high security, such as changing addresses and seeking a loan from the Norwegian State Educational Loan Fund. 2.6 million Norwegians have used the service. Additionally, BuypassID, Commfides, and BankID are the online services that enable users to access public services needing moderate to high security and maximum protection. This includes health data and document signatures. Citizens may also use their BankID to access online banking.

4.4. National Portal [NPR]

Norge.no is a digital government services platform and resource in Norway, containing information on digital communication between government agencies and people. Norge.no also provides information about the Norwegian government's digital mailbox and Digital Contact Information Register. All government entities must use a digital mailbox to deliver residents secure digital mail. Citizens must have an electronic ID and maintain their contact information in the national contact registration to utilize a secure digital mailbox.

Another national portal in Norway is Altinn, with the new interface that makes government reporting easier. Businesses may communicate with Altinn through an Internet gateway or their internal systems or applications. Individuals may also submit their taxes online with Altinn. Altinn's role as Norway's PSC is to give information to any European service provider interested in establishing a presence in Norway.

The Standardisation Portal in the Norwegian public sector educates users about the mandated or strongly recommended standards. This article examines information technology standards, as well as public contracts, semantics, and service-oriented architecture. Its initiatives on public sector rules seek to increase collaboration, openness, and efficiency among government departments and services.

The GeoNorge Gateway is another of Norway's official portals. In Norway, this is the most widely used open-source eGovernment component. It provided access to both fundamental geographic data and themed data. The content of the site assists public administration and environmental management organizations. GeoNorge also gives citizens digital access to geographic data gathered in a centralized system through a user name and password. Users may access files on elevation data, administrative borders, transformation formulae, cultural heritage, and other issues by logging into the system. The system collects information both locally and nationally.

4.5. Government CIO [GCIO]

Public administration in Norway does not have the authority to hire CIOs or similar positions. The Director of the Agency for Public Management and eGovernment may be considered the chief information officer at the national level. That is the reason why Norway fell behind to 52nd with a score of only 5.182.

4.6. E-Government Promotion [EPRO]

The Public Sector's Digital Strategy, published in June 2019, sets shared objectives and targets for Norway's digitalization initiatives. It aids the public sector's digital transformation. The strategy's primary measures include user-centered services and better use of standard IT solutions to create a uniform public sector digital collaboration platform.

Digital21 was founded by the Norwegian Ministry of Trade and Industry for more innovative, sustainable, and creative industry. With the support of new talents, technology, and research, Digital21 is a government-appointed body to create a strategy for all public sectors under the shared backing of key stakeholders. Digital21's long-term mission is to aid and accelerate enterprise digital transformation.

4.7. E-Participation [EPAR]

Norway's telecommunications networks, services, and eGovernment have adequate infrastructure to support system interoperability and data interchange across government agencies. National Health Network (NHN) is an example of how the government is helping to construct specific infrastructure,

connecting five regional networks, and providing an information exchange platform for health and social services.

As a member of the Trans European Services for Telematics between Administrations network, Norway has access to a high level of security. It ensures performance when exchanging data between public administrations in other European countries. There are now ten administrations in Norway that are connected.

4.8. Open Government Data [OGD]

Norway maintains a collection of publicly available datasets, which may be found at data.norge.no. Open datasets must be made available to the public for them to be valuable and accessible. Furthermore, Data Norway includes information on data storage and dissemination options and information on open data publication and the directory of resources.

4.9. Cyber Security [CYB]

The government has created a new public sector digital transformation plan to support public administrations in accepting change, sharing and reusing information, and encouraging user discussion. In addition, the government released a National Cyber Security Plan and a national plan for digital security in January 2019 targeted to public and private bodies, notably municipalities. The program also ensures that people have the information and awareness of risks required to use safe and secure technology. Moreover, the government published a National AI Strategy in January 2020, which focuses on career and the national need to invest in public health, public administration, energy, and transportation. The government also aims to explore building industrial policy instruments to assist future value generation and AI implementation in business. A section on ethics has been included, including privacy, data protection, and cyber security.

A National Cybersecurity Center was formed in 2019, which took the responsibility to oversee national cyber security and ICT risk assessment. The center has brought together public and commercial sector cyber security experts, law enforcement, and academic organizations.

4.10. The use of Emerging ICT [EMG]

The country indicator or EMG is at the 13th position in the list, denoting a lot of progress made in the ICT construction and implementation. Norway's government has a strategy in place to attract data centers and other data-intensive industries. Businesses and society will profit significantly as data becomes a more valuable resource and input in the long term. Norway's companies and society stand to benefit considerably from this economic potential, and the government's policies and aims will be highly affected as a result.

Norway's National Artificial Intelligence (AI) Strategy was released on January 14, 2020. The government did not specify a date since there were a lot of changes and adjustments that needed to be made. According to this declaration, AI that respects people's rights and freedoms should be researched and deployed in Norway. The AI Strategy starts in Norway since the country has a solid basis for AI success. On the other hand, the Cloud Computing Strategy was released in 2016 and

addressed a variety of difficulties that public sector businesses face when determining whether or not to adopt cloud services.

Oman

1. General Information

Area: 309,500 km²

Population: 5,248,167

Government Type: Unitary Islamic Absolute Monarchy

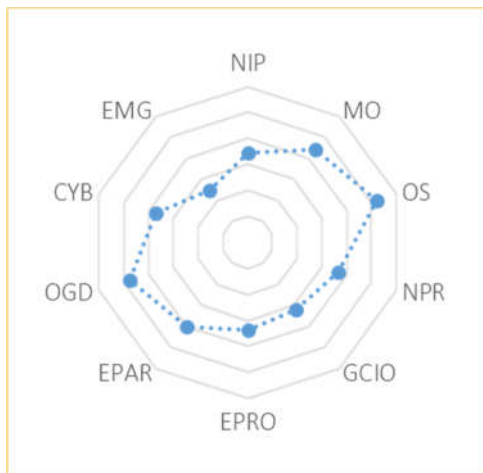
GDP: \$16,210

Internet Users: 95.23

Wired (Fixed Broadband Users): 10.85

Wireless Broadband Users: 114.85

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

An ambitious digital government project has taken over a decade in Oman. Oman, a country with roughly 5 million in 2019, has set distinct targets at each stage. The country's total score is 76.4807, which ranks 29th on the list. In addition, eGovernment technology may help increase public safety and participation while also helping to achieve larger objectives like economic diversification and job creation.

The National Registry System, a single, centralized database for all people's records, was established in 2002 as the cornerstone for all subsequent eGovernment initiatives. Oman started with a National eID initiative. It gives millions of Omanis a single, easy-to-use ID with a driver's license and border control features. In 2009, the government added prepaid ePurse functionality to the eID card. This allowed locals to pay for services quickly and easily, even if they didn't have access to regular banks.

ePassports are innovative travel documents that incorporate integrated personal information, digital fingerprints, and photographs.

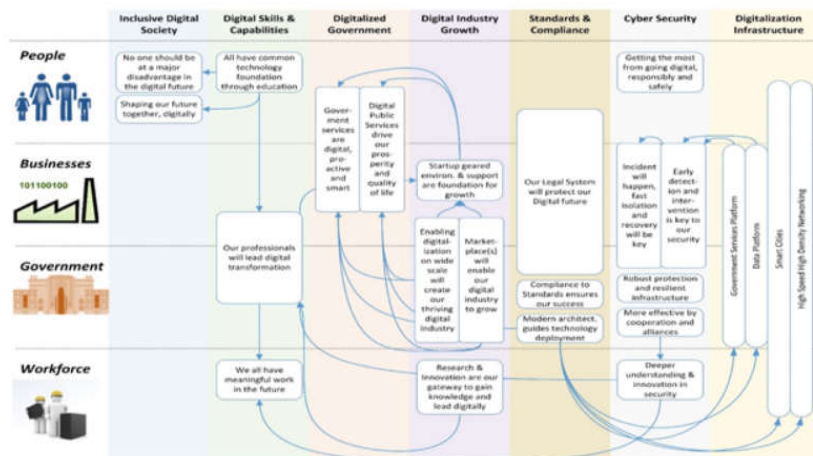
The UN recognized the Royal Oman Police's Civil Status System for national registrations in June 2009. The same organization ranked Oman as the world's most advanced country a year later. eGovernment has shown to be a key facilitator in Oman's change, allowing for more accountability, accessibility, and convenience from governmental services.

3.2. New Trends

The e.Oman 2030 strategy aims to establish a solid foundation for capitalizing on the Fourth Industrial Revolution's digitization and technology advances. As a consequence of a combined "workforce" of people and robots, higher productivity and economic benefit are achieved. It also addresses the implications of changing mobility, longevity, life expectancy, and increased dependence on data and analytics in corporate and personal lives. These issues will shape Oman's future. As a whole, e.Oman 2030 intends to educate the public on the implications of technology and digitalization.

Oman's key goals are as follows:

- Boost IT's contribution to GDP
- Inclusion and digitization of all public services.
- Become a top 20 digital transformation country
- Job creation in digital technologies
- Digital technology startups emerge.
- Oman ranks tenth in cyber security and trust.



e.Oman 2030 Strategic Pillars:

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 6.870, Oman is ranked 34th, towards the middle of the list. According to data, 4.92 million individuals in Oman utilized the Internet in January 2021, a rise of 5.6 percent over the previous year. The percentage of Internet users remained constant at 95.2%. 80.2 percent of Oman's entire population, or 4.14 million people, used social media. Simultaneously, mobile connections decreased by 6.7 percent.

Oman has made significant strides in upgrading its network infrastructure. 5G services and associated frameworks have been deployed, along with installing two new cable networks.

4.2. Management Optimization [MO]

The Digital Oman Strategy, established in March 2003, helps create the Omani digital society and eGovernment. It is the cornerstone of its structure built on solid foundations. This includes streamlining government procedures and emphasizing electronic delivery of services. As a result, the Oman digital strategy will focus on the following topics over the next five years:

- IT Industry Development
- Enabling Society and Individuals
- eGovernment and eServices

4.3. Online Service [OS]

By the National Registry System, Oman's government began collecting data on all residents in 2002. The National Registry System provides the cornerstone for all future eGovernment initiatives. From that, Oman started with a national eID framework. Until now, millions of Omanis have had a single, convenient identification credential that includes a driver's license and border control capabilities. From that, Oman's e-Government expanded the eID card's prepaid ePurse function in 2009. Orman's citizens could pay for a range of government services quickly and effectively without any technical restrictions. In 2011, the system included electronic voter authentication and identification.

Oman has also adopted the Mobile-ID option, allowing users to sign legally binding documents and access services from anywhere. Electronic passports with biometric data, on the other hand, are cutting-edge travel documents that incorporate integrated personal data, digital fingerprints, and photographs. The ePassports will provide high security and speed up border administrative procedures, making travel more accessible. Oman has developed into an accurate e-Government model, ranking 31st on the list with 10.440 scores.

4.4. National Portal [NPR]

The eServices portal in Oman has a new name: Omanuna. The portal Omanuna assists users with their government e-Services needs. Everyone is equally involved in this national approach to eServices. Oman's government services and information are accessible via the oman.om site. The site is hosted by the Ministry of Transportation, Communications, and Information Technology, owning and controlling the content. The website provides access to electronic services and information on how to get additional services such as SMS or printed forms. This website was created with the users with simplified navigation depending on your profile and requirements. Users may access information and services from various government entities via the portal, which is organized in a user-friendly manner.

4.5. Government CIO [GCIO]

The Ministry of Transport, Communications, and Information Technology MTCIT are responsible for the Oman Central Information Officer (CIO) for Government E-Services. Oman's Chief Information Office MTCIT is tasked with developing digitally literate human resources to facilitate the adoption of government e-services and increase public involvement. It helps ministries and other government agencies achieve their IT goals. The MTCIT also intends to assist government agencies in saving money on IT by advising them on all elements of their IT projects. MTCIT makes crucial efforts in Unified Government Network, the ePayment Gateway, the Government eServices Portal, the eGovernment Framework, and Information Security.

4.6. E-Government Promotion [EPRO]

In May 2003, the Omani parliament ratified Oman's National Strategy for the Digital Society and eGovernance. The Digital Transformation Program's goal is to build a sustainable knowledge-based society and increase the public sector's productivity and efficiency by developing national capacities, strengthening infrastructure, setting up the information technology industry, and improving the quality and performance of government services. To achieve the objective of speeding the service procedures for customers, companies, and government organizations, these services must meet specific requirements and deadlines.

Digital Transformation Program is overseen by the Ministry of Transport, Communications, and Information Technology (MTCIT). It helps government organizations streamline business procedures, increase operations, and automate service channels.

4.7. E-Participation [EPAR]

The Sultanate of Oman's Official eGovernment Services Portal allows citizens from all walks of life to join in discussions and debates regarding all aspects of the Oman Digital Society. Members of the public will be able to contact us online, offer feedback, and make suggestions. The country's primary goal is to develop a system for listening to and interacting with people and reacting to their problems, guidance, and ideas.

The Official eGovernment Services Portal of Oman presently provides online participation options such as Facebook to stay up to speed on the latest news and engage in discussions with other users; Twitter to get short, timely messages; Instagram to share photos and videos from the portal, and Youtube to view and comment on videos about the official e-government services portal.

4.8. Open Government Data [OGD]

Communities and economies worldwide have discovered that building an open data culture and putting in place the appropriate legal frameworks at the point where data is created or gathered is advantageous to everyone involved. The use of open data by government agencies in Oman is critical to the country's digital strategy. This policy is intended to help them achieve their goals.

The Sultanate of Oman Government has stated that it is fully committed to open data for the following reasons: to support government efforts to define community and business open data priorities; to

streamline and expedite the dissemination of data by Oman's government entities, and to provide a workable policy framework to facilitate the release of high-value datasets.

4.9. Cyber Security [CYB]

According to the Times of Oman's poll, many Omani citizens reported cyber threats to their service networks. Organizations' cyber vulnerabilities are not being overlooked by security thieves waiting for a chance to take advantage of them. Additionally, those hackers are progressively using newer technology and more sophisticated strategies to their advantage.

The first step is for a company to train and equip its employees to combat cybercriminals. The technology assists in identifying the most vulnerable individuals or groups inside the firm and providing users with additional cyber security training so that they may become more cyber attentive. The company has used tools such as ThreatCop to educate its employees properly. The application gives people the ability to simulate the most current and widespread cyber-attacks. As a result, workers will be better educated on how to spot and avoid cyber threats.

4.10. The use of Emerging ICT [EMG]

In recent decades, the government has spent a significant amount of money on education and workforce development. According to a statement, developing a center of excellence for small and medium-sized enterprises (SMEs) and collaborating with global technology corporations are significant priorities for the Oman International Container Terminal (OICT).

The Ministry of Technology and Communications (MTC) is responsible for administering the government's network and cloud infrastructure. In addition, the MTC is advocating for the expansion of e-government services. To achieve the digital transformation of government services by the end of 2022, at least 59 government departments will be adopting a plan.

According to the Digital Oman Strategy, the growing interest in cloud computing is offering prospects for the construction of data centers. There is another joint venture between the state-owned telecom operator Omantel and a private sector enterprise, the Oman Data Park, established in 2012. (ODP).

It is expected that the government and commercial sector would spend roughly RO 25 million (approximately USD 65 million) in disaster recovery services for Oman to become an established center for disaster recovery services soon. A cybersecurity sector in Oman is being developed, emphasizing managed security services, cybercrime investigation, security incident management, and consultation. The plans were unveiled in August 2019. One of Oman's oldest cyber-security facilities is a component of the Oman National CERT, which is tasked with safeguarding the country's government institutions from cyberattacks and other cyber threats.

Pakistan

1. General Information

Area: 881,913 km²

Population: 225,199,937

Government Type: Federal Parliamentary Constitutional Republic

GDP: \$ 5,839

Internet Users: 17.07

Wired (Fixed Broadband Users): 1.10

Wireless Broadband Users: 40.97

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

According to the Waseda International digital government rankings for 2021, Pakistan had a total score of 56.9483 and ranked 61st. To fight the COVID-19 outbreak, the government has been forced to isolate itself from the rest of society. Pakistan had no choice but to go digital because of the COVID-19 epidemic. The government developed the Geo-Tracking App to make dealing with telecommunications companies easier. The official self-assessment portal might be established in the form of a specialized app or website. Computerized consultations are also available to people who are unaffected by the disease. Through computers, patients no longer have to be admitted to an outpatient facility for treatment, hence reducing their chance of contracting COVID-19. A partnership between the Ministry of Education and PTV resulted in the creation of Tele School.

In addition, e-services have been expanded to include salary payouts through ATMs, mobile services (PTA SIM and NIC verification), passport and visa services, and document filing with Pakistan's Securities and Exchange Commission (SEC). The Department of Education, the National Testing Service, the Higher Secondary School Certificate, and the Secondary School Certificate have all provided online access to test results for citizens.

In October of last year, Pakistan's Prime Minister inaugurated the Pakistan Citizen's Portal to air their problems and ideas online. As a result of Prime Minister Imran Khan's announcement in November 2018, Pakistan's National Financial Inclusion Strategy has been upgraded. The five-year plan aims to make digital transaction accounts and digital payments more widely available. Federal and provincial governments in Pakistan have worked with the World Health Organization and Pakistan's Federal Ministry of Health to create an electronic vaccination program and the National Database and Registration Authority's (NADRA) e-Health cards.

3.2. New Trends

The Pakistani government has teamed up with Chinese technology companies to improve the country's e-government capabilities. Pakistan has lately started producing testing kits and KN95 masks based on models, blueprints, and technology. Because of this, the China-Pakistan Economic Corridor (CPEC) has helped Pakistan's economy and markets during and after the COVID-19 pandemic. It will take more work, though, to effectively deploy the appropriate tools.

Most developing nations lack a modern, efficient tax system, which is essential for lifting a country out of poverty and distributing resources fairly and honestly. The government loses money because of corruption in the tax collecting process, and the public loses trust in the system. As a result of the COVID-19 outbreak, several countries are emphasizing the modernization of their e-government systems. Public trust is fostered through minimizing corruption, extending online tax filing, and modernizing the processing system by the government. Public trust is fostered through minimizing corrosion, expanding online tax filing, and updating the processing system by the government.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

At 64th position in the Waseda rankings for 2021, Pakistan's network infrastructure preparedness received a score of 1.971. According to the statistics, 61.34 million internet users were in use in Pakistan as of January 2021, denoting an increase of 11 million from 2020. In January 2021, there was 27.5 percent of Pakistanis online. At the same time, 46.00 million Pakistanis, accounting for 20.6 percent of the country's total population, were active on social media platforms. Over the year, Pakistan had a rise of 6.9 million mobile connections. Pakistan's population would have a mobile connection in 77.7 percent of households by January 2021.

4.2. Management Optimization [MO]

There are many ways to increase government operations efficiency, accessibility, and convenience by incorporating information and communication technology (ICT) into the system. Using ICT in a

simple, accessible, and cost-effective manner, Pakistan is slowly advancing toward e-governance implementation to broaden the reach and quality of information and services available to the general public.

Federal Ministries and Divisions work with NITB on e-governance initiatives to help the government better serve Pakistan's citizens. NITB is a federal agency. Electronic governance projects can be cost-effective, efficient, and thriving thanks to the NITB's efforts to improve access to services, information, and communication in a fast and efficient manner. All of our initiatives are supported by our high-quality standards, unique ideas, and compliance requirements. In addition, the National Information Technology Board (NITB) identifies and recommends specific measures for operations that require automation to offer Pakistan's people better and more efficient service.

4.3. Online Service [OS]

The score for Online Service is based on five investigating online service, i.e., e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and their URL Addresses. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience.

To measure the level of convenience, the third-party application “Google PageSpeed™ Insight” result on <https://developers.google.com/speed/pagespeed/insights> has shown that the e-Customs and e-Tax have been improved to the above average speed and efficiency, while the One Stop Service has performed in an average level in terms of speed and efficiency. The closest look-alike-e-Procurement web is the only online service in Pakistan that cannot be investigated, and the e-Health could not be investigated during the period of survey. For a certain extent, all online services have implemented some site authentication, and password protection for obtaining the services. In addition to that, all clickable objects worked as average score for the portals of e-Customs and One Stop Service while e-Procurement was inefficiently low and no count for the e-Health as there was no trace on this item.

With the launch of a mobile application that collects biometrics, fingerprints, and facial recognition and scans documents necessary for processing citizen ID cards and paperwork, Pakistan sets a new industry standard for identity management. Apps for smartphones would allow both citizens and expatriates alike to digitally record their fingerprints and photos, as well as their papers. Since it does away with the requirement for specific equipment or physical form to process identity documents in Nadra, this is a huge step forward.

4.4. National Portal [NPR]

The e-Services Portal is a website that allows the Directorate General of Immigration and Passports to deliver online services to Pakistani citizens all over the globe, including those in Pakistan. People can renew their Machine Readable Passports via the e-Services Portal if their passport has expired or if the validity of their passport is less than 12 months.

4.5. Government CIO [GCIO]

The D-Government Program in Pakistan is a project of the Ministry of Information Technology, approved by the Federal Cabinet in August 2000 as part of the National Information Technology Policy 2000. A lot of attention has been paid to this program. Over some time, all federal government agencies were informed of their demands. According to the Office of Government Chief Information Officer (OGCIO), the Government Chief Information Officer (GCIO) released an Information Security Policy in October 2012. Within the Ministry of Information Technology, Pakistan C's National Directorate of Digital Government was established to provide leadership and control over all Federal Government IT spending. As a result, each federal agency has its D-Government unit. As a result, a "Pakistan CIO Summit & Expo" has been conducted yearly since 2013 to bring together the country's top IT executives, IT managers, and IT heads from neighboring South Asian nations, as well as the Middle East and other regions of Asia, to debate the adoption of new technology.

4.6. E-Government Promotion [EPRO]

The Pakistani government has established the Electronic Transaction Ordinance (ETO), which encourages expanding D-Government services. It's not only D-Government.gov.pk and e-Government.pk that provide services; there are many more. The latter has a significant problem maintaining their profitability while connecting to a broad range of public services. People, corporations, and other governments in Pakistan have communicated with one other over the internet for a few years now. To some extent, this is the result of the efforts to establish and promote computerized government services. Internet and other information technologies should be used to increase citizens' access to Pakistani government services, as well as to promote interagency collaboration in the provision of electronic government services, where these collaborations would improve the service provided to citizens by integrating related functions and using internal electronic government processes to provide better services to citizens.

4.7. E-Participation [EPAR]

To address Pakistan's fundamental civic issues, the Pakistani government has focused on e-democracy so far. It is one of several projects designed to increase electronic engagement, including the E-Democracy initiative, which aims to provide citizens access to relevant information on administrative decisions impacting open land in designated locations. Such initiatives by affiliated government agencies will allow stakeholders to voice their opinions on particular topics individually or openly; ICT can aid people in building communities, sharing continuing shared objectives, and influencing and empowering such created groups. Further information about Pakistan's general elections can be found at the ECP website, which can be accessed at <http://www.ecp.gov.pk/>.

4.8. Open Government Data [OGD]

Individuals' ability to access information relevant to their needs is also a factor. The availability of open content, government data in an available data format, and legislation controlling information freedom. People's interest in this form of government data has expanded dramatically in light of the upcoming 2013 elections, the spike in foreign and domestic investment in development projects, and

the rising demand for improved accountability for public expenditure and transparent budgets. Although the Pakistan Data Portal (PDP) today claims to be one of the world's most advanced open data portals, it was formerly known as <http://data.org.pk/>, which now functions as the Pakistan Data Portal (PDP). Using a comprehensive Indicator Dictionary, PDP can sensibly correlate data properties. There are three layers of indicator metadata in this dictionary, making it one of the most advanced indicator dictionaries in the world. PDP is Pakistan's most extensive educational data repository. Data from other sectors, including nutrition, is presently being added to the platform. In addition, it includes the ability to display and analyze data. Dynamic charts and choropleth maps can be generated by PDP based on the user's preferences for any dataset in the portal. Using PDP's dynamic aggregation feature, users dynamically aggregate data from several datasets and years into a single dataset. After then, users can go further into the data they've just retrieved.

4.9. Cyber Security [CYB]

Waseda ranked Pakistan's cyber security 35th with 8.800 points. National cyber security strategy 2021 intends to equip Pakistan with new institutional frameworks and governance to protect Pakistan's "cyber eco-system" against cyberattacks. Computer emergency response teams and security operations centers will be part of the frameworks that will be built. In comparison, cyberspace is meant to be protected, including Pakistan's governmental sector and its business sector and information systems. The strategy paper also states that Pakistan wants a "resilient cyber system and network" rather than a secure one. Because resilience allows the systems to operate even in the face of an assault, it is a critical component. According to the current cybersecurity strategy, protecting citizens while promoting economic development and prosperity are mutually reinforcing. However, attacks on Pakistan's cyberspace would be classified as Category I and II threats and will be dealt with appropriately.

In Pakistan, this was a much-needed and much-awaited piece of policy writing. There are several crucial topics that this policy statement did not include since these concerns are not new to the public and are not a consequence of Pakistan's efforts in cybersecurity. However, these are elements that are already in place and have exposed Pakistan's online security. Since the word "central entity" was used, it is unclear whose organization would be responsible for executing the policy proposals and how long it will take to construct such an institution. In a prior "national cyber-security policy of 2018-2023," a command force structure made of civilian and military personnel was planned. Still, the actual implementation was not seen, and even this current policy document does not mention it. There is also a lack of clarity in this policy statement on how the government should deal with the issue of protecting people's rights in the virtual world, which must be addressed. The strategy paper also fails to address notions like "privacy by design" and "no-legacy." Also, it fails to accept that cyber security is not solely the concern of the Ministry of Information and the Ministry of Foreign Affairs. Governments need to know that cybersecurity is becoming a problem for Pakistan's national security. A lack of implementation of these policies their efforts will damage Pakistan's cyberspace in peace and warfare if they don't address this issue now.

4.10. The use of Emerging ICT [EMG]

An exhibition/showcase on artificial intelligence and the Internet of Things is being organized in Pakistan to bring together all of the country's stakeholders. It's an excellent opportunity for delegates to meet with government officials, industry researchers, academics, and other industry leaders. The following are some of the constituents:

- National centers of excellence, research and development organizations, businesses, and public sector firms are all involved in developing AI technology in Pakistan.
- Policy Makers and Academicians: Members of the Pakistan Engineering Council (PEC), the Pakistan Higher Education Commission (HEC), and academia are included in this category

Artificial Intelligence (AI) can be used in various industries and organizations, including government agencies and healthcare organizations, financial institutions; start-ups; inventors; venture capitalists; and universities.

Peru

1. General Information

Area: 1,285,216 km²

Population: 33,437,184

Government Type: Unitary Presidential Republic

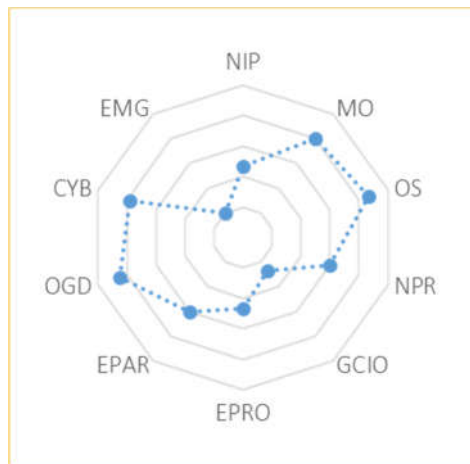
GDP: \$ 6,680

Internet Users: 65.25

Wired (Fixed Broadband Users): 7.93

Wireless Broadband Users: 65.66

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Peru's spot in the Waseda International digital government rankings 2021 was 57th with an overall score of 58.9727. The COVID-19 pandemic has had a dramatic impact on almost every aspect of society. It has had a profound effect on the way people work, socialize, and learn in the modern world. In this way, Peruvian education has also seen a drastic shift. To ensure the survival of higher education services, the state, and its skills have been put to the test by the rapid transition to digital media. As a result, the whole population, especially the most vulnerable, were affected.

Peruvian authorities have ordered that all education, from elementary to secondary, be conducted digitally and remotely because of the outbreak. Pupils were able to spend more time with their families consequently. A few modifications have taken place at home because of this. Several countries throughout the globe have seen an increase in the use of digital education as a result of the COVID-

19 pandemic. Even yet, it wasn't a typical work environment. There is still a need for relevant technology and the dynamics that control its use. Depending on the concentration of technological and economic resources, the gender difference occurs in several ways. It points up the differences between women in different parts of the world.

In Peru, telemedicine has emerged as the dominant eHealth innovation for diagnosing and treating physical and mental health concerns without the need for a physical visit to a health care center. The word "telemedicine" refers to health services and information provided or enhanced over the internet. For healthcare professionals, telemedicine has allowed them to transform a crisis into an engaging, more secure, and cost-effective healthcare service that helps them to save both time and money on travels. Many people sought testing in hospitals as the number of COVID-19 cases started to climb throughout the world, which increased their risk of infection. First, dedicated phone lines were set up to do initial symptom screening to determine whether or not further testing was necessary. As a result of tremendous demand for this service, however, the phone lines rapidly became overloaded. As a result, online consultation tools were quickly implemented as a safe online triage for COVID-19 patients.

3.2. New Trends

Covid-19 will have a far-reaching impact that extends far beyond the averages of any one country. Individuals must be prioritized, and the financial impact on families and human rights violations against the most vulnerable groups must be considered as part of comprehensive solutions. People of Venezuelan descent working in Peru's informal economy, most of whom are undocumented, may face discrimination and hostility similar to what is occurring in other countries. Policies must consider both the overall socio-economic impact and assessments of vulnerable peoples' income and social services while designing them. This dynamic must also be examined concerning gender inequality.

Peru's leadership and the collaboration of all stakeholders, including businesses and citizens, is essential to accomplishing this arduous work. The majority of those involved have shown unity, responsibility, and innovation in their response. Similar to the United States, professionals use social media and Google Hangouts to aid those affected by quarantine and even hold parties on the platform to raise awareness. The engagement with the Ministry of Production and other partners might then be expanded to the rest of the nation.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Peru was ranked 58th with a score of 4.628 in the Waseda rankings 2021 regarding Network Infrastructure Preparedness. According to the statistics counted in January 2021, there were 19.90 million internet users in Peru, which increased dramatically 13 percent between the previous year. Internet penetration in Peru stood at 60 percent. 27.00 million people accessed social media at that time, equivalent to 81.4 percent of the total population. The number of mobile connections in the

country increased by 1.9 million to reach 36.14 million, which was accounted for 109 percent of the total population.

There witnessed critical developments in Peru's efforts in preparing and investing for the country digitalization, which are:

- 5G services were launched based on the existing concessions
- MTC issued Fibertel with a 20-year MVNO license to offer B2B-focused services and dark fiber access over a nationwide fiber network.
- Pacific Cable was positioned at Lurin.
- Eutelsat Communications entered JV with Telespazio allowing the latter to use Ku Band capacity on the EUTELSAT 117 West B satellite to provide telecom services to 1,300 underserved areas in the Peruvian Amazon.

4.2. Management Optimization [MO]

Since the early 2000s, Peru has been slowly laying the foundation for electronic administration and, ultimately, the shift to digital government. A variety of measures have been put in place by the Peruvian government since then.

In December 2019, the PCM gave the Bicentennial with the design of the Digital Agenda, which outlined the future operations of the government with the objective of digital transformation by 2021. ntegro, Competitivo, Cercano, Confiable and Innovador are the five goals of the Digital Agenda 2021. After DU 006-2020 was passed in January of 2020, the National Digital Transformation System was put in place. After DU 007-2020 was given in January of that year, it authorized the Digital Trust Framework to guard against digital dangers.

Executive Power approved Legislative Decree No. 1497 as part of the Government's reaction to COVID-19. It mandates public institutions to adapt their administrative operations to digital platforms or services, among other steps. In addition, 100 government operations have been designated as top priorities for digitalization by the administration. For 2019, Peru advanced 16 spots up the government's internet service indicator, and it held onto that position for the following year.

Law No. 149724 was enacted by the Executive Power as part of its reaction to COVID-19, and it mandates that public entities use digital platforms or services, among other things.

4.3. Online Service [OS]

One-stop service websites, electronic tax, electronic customs, electronic health, and electronic procurement go towards the overall score for online services. For each of the five e-services reviewed, official Peruvian websites are accessible. E-tax and customs website (<http://www.Sunat.gob.pe>) is complex and interactive while giving essential information to the public. A straightforward and uncomplicated one-stop service website (<http://www.tramites.gob.pe>) emphasizes the most frequently visited procedures. The e-procurement and e-health websites are limited to conveying information to

citizens and providing simple, low-complexity services to the general public, which is why the government is not using them.

4.4. National Portal [NPR]

Gob.pe is the sole digital interface available from the country's government. By making institutional information and guidance on procedures and services more readily available, it hopes to improve public relations between the State and its citizens. Each institution's website is responsible for its content and upkeep, even if the Presidency of the Council of Ministers oversees it via the Secretariat of Government and Digital Transformation. Some data may still be generated and accessible on the platform because specific entities are still migrating.

In addition to information on procedures and services for the general public and news, legal norms, and publications from Peruvian State institutions, Gob. pe users may also access basic information about the Peruvian State. Supreme Decree 033-2018-PCM designates Gob.pe as Peru's Exclusive Digital Platform.

4.5. Government CIO [GCIO]

The Chief Information Officer (CIO) has no provision in the legislation that governs e-governance policy. Other tasks fall within the ONGEI's purview in addition to those mentioned above, including advocating for and carrying out the implementation of ICT in government. A CIO training program was listed by at least one educational institution. Further information about CIO regulations could not be discovered at this time, unfortunately.

4.6. E-Government Promotion [EPRO]

Peru's National Policy aims to improve and strengthen the performance of science, technology, and technological innovation in Peru. The government provides grants through transfers to public research institutes and universities. Several policy instruments offer direct financing for R&D innovation, based on a mix of government and international funding instruments. The majority of Peruvian manufacturing firms (72.3%) carried out innovation activities by acquiring capital goods. 4% relied on government support, and 1.3% found funds through less formal means.

Peruvian public sector companies are concerned about the limitations of public policies on science and technology, according to CONCYTEC. Peru lags behind Latin America and the Caribbean, and Ibero-America by such indicators as publications relative to GDP. Peru ranks highest in capacity for innovation, availability of scientists and engineers, and quality of scientific research institutions. Only 39.4% of innovating manufacturing companies polled in Peru admitted to having their intellectual property rights recognized.

4.7. E-Participation [EPAR]

Public participation and transparency are cited as goals of the National Digital Agenda. However, there is insufficient evidence to back up this assertion. Citizens may use websites run by the government to find information on elected politicians, legislation, and the national budget.

Additionally, the president has an official website with a contact form that residents may use to contact him.

The Peruvian government has put a high value on service delivery through mobile applications because of the widespread availability of mobile Internet connections. Toward that goal, a mobile government website (<http://www.movil.softwarepublico.gob.pe/>) was created. This is where a wide range of mobile applications may be accessed.

4.8. Open Government Data [OGD]

Peru's Open Government Data indicator was placed 41st in the Waseda rankings 2021, sharing the same score of 8.500 as Poland. The government has set up an open data site (<http://www.datosabiertos.gob.pe>) where citizens may get their hands on the information they've been asking for. Only 142 datasets from 1,243 institutions, divided into ten categories, are now available via this service. There is also a government transparency webpage where users can check for information on different government agencies.

4.9. Cyber Security [CYB]

Peru has significantly increased digital access over the past decade, and efforts underway will continue to close the gap as expansion continues into rural areas deep in the interior – via satellite connections and associated hardware installation.

Some 65% of organizations in Peru allocate between 1% to 5% of the IT budget for cybersecurity. 80% of companies have a general awareness program on cyber threats, of which only 7% are formal and focused. During 2019, at least 57% of Peruvian companies suffered a ransomware attack, with Peru being the most attacked country in Latin America. This highlights the needs and opportunities for U.S. cyber security products and service offerings in Peru.

4.10. The use of Emerging ICT [EMG]

With growing technological advancements and growth in technology usage in various applications, Peru's Internet of Things Market is expected to rise quickly over the projected period. Big data, cloud computing, data centers, and data analytics are expected to positively impact the sector in the following years.

Supporting government initiatives to promote digital transformation and the construction of intelligent cities in Peru is also projected to aid the country's IoT sector. Internet of Things Market in Peru is broken down into platforms, components, and applications. It is possible to segment the market into three distinct categories: hardware, software, and services. The hardware category is predicted to lead the IoT market through 2025 due to the increasing usage in numerous end-user industries to increase operational efficiency.

Philippines

1. General Information

Area: 342,353 km²

Population: 111,342,659

Government Type: Unitary Presidential Constitutional Republic

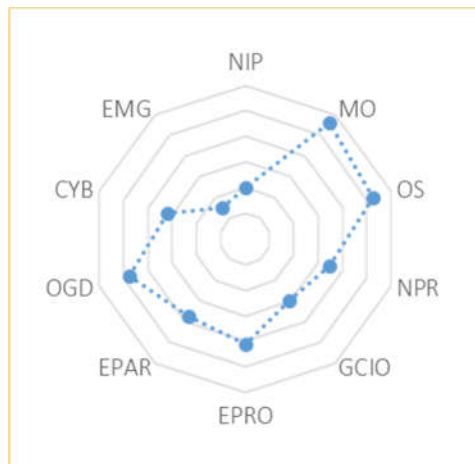
GDP:\$ 3,650

Internet Users: 46.88

Wired (Fixed Broadband Users): 5.48

Wireless Broadband Users: 68.44

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

There has been significant growth in commercial and government investment, increased consumer spending, and growing demand for better service in the Philippines' ICT sector. In the year 2021, the Philippines ranked 12th with an overall score of 73.2548.

The World Bank and the National Economic and Development Authority (NEDA) released a report saying that rapid digital technologies can help the Philippines overcome the Covid-19 pandemic, recover from the crisis, and achieve its vision of becoming a middle-class society free of poverty (NEDA). The use of digital technologies like e-commerce, telemedicine, and online education is rising in the Philippines. This has allowed individuals, businesses, and government to cope with social distancing measures, ensure business continuity, and deliver public services during the pandemic. The

Philippines lags behind many of its neighbors when it comes to adopting digital technology. Lack of competition and limits on the telecommunications market investment hamper the Philippines' efforts to improve its digital infrastructure.

One of the country's goals is to modernize government organizations via a digital transformation initiative. Cloud data centers, software to improve business processes, the transformation of local government units into smart cities, cybersecurity solutions for data privacy, and an enhanced internet and mobile service landscape through a national broadband plan are all top priorities right now, according to the president. The Philippine government believes that improving the country's ICT infrastructure would enhance the lives of Filipinos while addressing several issues that make doing business in the country difficult. In May 2018, President Rodrigo Duterte signed RA No. 11032, or the Ease of Doing Business and Efficient Government Service Delivery Act, which aims to enhance the business environment and support the Philippines' digital transformation.

3.2. New Trends

The Philippines' Department of Information and Communications Technology aims to further the country's digital transformation by developing the Philippine Digital Transformation Strategy for 2022. The 2015 ASEAN ICT Master Plan (AIM 2015) has three pillars: economic transformation, people engagement, innovation, infrastructure development, human capital, and bridging the digital gap as foundations. The core idea was to focus on national interests while monitoring the ASEAN economic agenda.

In the future, governments' enabling activities will focus on digital transformation to promote government transparency and accountability, operational efficiency and agility, direct public participation, and a platform for innovation to help the country's economy recover from the impact of the pandemic. In addition, the digital transformation method, known as e-government 2.0, focuses on the inclusion of social web and user-generated content into government systems, the distribution and use of open data, and network effects through greater user engagement. The goal of e-government 2.0 was to legitimize actual public participation via the deployment of multifunctional communication channels.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a score of 4.027, the Philippines is ranked 60th in terms of network infrastructure preparedness. The overall number of Internet users reached 73.91 million in January 2021, a 6.1 percent increase over the previous year. At the start of 2021, the proportion of the population with Internet access remained stable at 67 percent. Eighty-nine million people, or 80.7 percent of the entire population, would use social media. Mobile phone connections accounted for 138.2 percent of the total population at the time.

There has been significant progress achieved in the Philippines toward global digitization. Smart, Global Telecom, and DITO Telecommunity have all deployed commercial 5G services. DITO has

begun spreading out mobile services. Additionally, the government has increased its investment in and implementation of innovative data centers to promote 5G services.

4.2. Management Optimization [MO]

E-Government Master Plan (EGMP) 2013-2016 was replaced by EGMP 2022 in 2016. While the nation's e-Government infrastructure has remained steady, the e-Government ecosystem has made a lot of achievements. The Philippines ranks remarkably at the 22nd position with 11.200, the second high in South-East Asia, just after Thailand.

Among the most significant changes in the Department of Information and Communications Technology (DICT) and its three affiliated organizations: the National Privacy Commission (NPC), the National Telecommunications Commission, and the Cyber Crime Investigation and Coordination Center. The DICT was established as a goal of the Philippines' 2011-2016 Digital Strategy. The legislation and establishment of the division demonstrate the government's recognition of the critical role of information technology in transparent governance. The National Privacy Commission (NPC) is mandated to safeguard fundamental human rights to privacy and communication while also supporting innovation and progress. The Commission regulates, adjudicates, and manages the nation's communication services.

The Philippines is committed to safeguarding and protecting personal and government information. As a result, the State's plan strives to preserve fundamental rights to privacy and communication while promoting innovation and development. The legislation applies to all businesses and levels of government, with a particular emphasis on information and knowledge management and security.

The implementation challenge for EGMP 2022 is to establish a "One Digital Government" via e-government technologies. First, the DICT is in charge of establishing staff, rules, procedures, and information architecture appropriate for the difficulties mentioned earlier and objectives.

4.3. Online Service [OS]

Initially, websites were seen as the critical e-Government tool to deliver information and services to residents. In this sense, the e-Government Fund was established in 2013 as an accelerator for e-government in the Philippines, promoting ICT to develop digital mechanisms and simplify governmental administration to improve all Government services. National Government Agencies (NGAs) having websites increased from 85.58 percent to 92.99 percent between 2016 and 2017. The proportion of NGAs with an inaccessible website dropped 2.21 percent in 2017, while those without a website declined substantially to 4.80 percent that year. However, the Philippines still ranks 26th with a score of 10.560.

4.4. National Portal [NPR]

The National Government Portal (NGP) serves as a critical measure of the country's internet services as measured by the E-Government Development Index (EGDI). As a result, the NGP is vital for increasing the public sector's visibility and accessibility and fostering citizen trust. Given that many

government information technology (ICT) services, mainly online services, have traditionally been built in silos, the approach for developing a national government portal (NGP) must be based on a more collaborative structure.

The establishment of a national government portal is a digital transformation approach for creating an integrated government. It serves as the official representative of the federal government's essential services. Since 2014, the Open Data Portal (www.data.gov.ph) has published over 3,300 government data files and information on various topics, from public expenditure to agriculture, transportation, and education. Under this context, the Philippine Statistics Authority (PSA) launched openstat.psa.gov.ph in 2017, an online platform that makes multiple statistical data collected and compiled by the government available to the public.

4.5. Government CIO [GCIO]

The Government's Chief Information Officer (CIO) directs and manages ICT initiatives to improve public services. The CIO strikes a balance between applied business strategy, organizational transformation, and regulatory reform. Given that E-Government is intended to increase efficiency and transparency, institutional adjustments are necessary for the country's development. The DICT was established by Republic Act No. 10844 in 2016 as the central planning, coordinating, and administrative institution for ICT development in the nation. The creation of a permanent Department supports an excellent culture in information technology development and electronic government activities. The statute establishes a CIO Council chaired by the Secretary of the DICT. The CIO Council assists the Department in achieving government-wide information technology objectives.

National government institutions are appointed Chief Information Officers. They advise companies on the most effective use of information and communication technologies (ICTs) to enhance public service delivery and save costs. They establish, implement, and manage the agency's strategic strategy for information systems (ISSP). Chief Information Officers will be responsible for the management of information technology initiatives, methods, and procedures. Together with ICT solutions, they will develop and implement a plan for business transformation and strategy implementation.

4.6. E-Government Promotion [EPRO]

The establishment of a Department of ICTs has been a long-standing goal of the Philippine government for years. One of the primary challenges for human resources is rationalizing critical things for e-Government, both inside DICT and other government organizations. Additionally, the state has raised an effort to attract the finest and brightest technical talent by offering competitive compensation and benefits. This is in addition to the fact that present public officials are required to upgrade their ICT skills. These are critical components of the e-long-term Government's viability and resilience.

Coordination across sectors is necessary for specialized firms or services. Business policies, procedures' standards, data interoperability standards, and process interoperability standards are all compliant with the Philippine eGovernment Interoperability Framework (PeGIF). Efficient e-

government projects will result in the growth of the whole economy. The Philippines' government has established a goal of transforming government into a digital platform that supports openness, accountability, efficiency, direct public engagement, and innovation.

4.7. E-Participation [EPAR]

E-Participation is the use of ICT to facilitate participation in governance activities. Digitization measures are necessary to promote e-Participation. It is also part of the Philippine Open Government Partnership's National Action Plan 2017-2019. The initiative provides online tools for residents to obtain government information, consult, and collaborate. It contains three major sections, which are E-Information, E-Consultation, and E-Decision Making.

The National Government Portal uses E-Participation technologies to increase citizen participation in public services. There is an online petitioning system, policy consultation, and public input tools on www.gov.ph. In Albay, Bohol, and Surigao del Norte, the Open Legislation Platform is being created as an E-Participation mechanism. Assists local involvement in Sanggunian judiciary committee and general assemblies. Participation will be improved via technology so that the citizens may use social media such as Facebook. This internet tool enables citizens to interact with local legislators.

4.8. Open Government Data [OGD]

E-Government infrastructure includes the National Government Data Center (NGDC). The NGDC provides consolidated servers and storage for government agencies. It is well known that several government departments have insisted on their own data centers, which have proved to be more expensive and difficult to secure. The previous EGMP's purpose was to simplify data center services and attract more government agencies to join the NGDC. To guarantee system resilience, backup data centers must be constructed around the country. Backup data centers are essential in case one data center is damaged or loses connection. The redundancies guarantee that services are not disrupted and can be promptly restored in case of an emergency.

4.9. Cyber Security [CYB]

The Security Operations Center (SOC)'s technologies now enable active network monitoring. The NextGeneration Intrusion Prevention System detects and prevents security threats, which helps monitor security issues and maintain network infrastructure. Throughout 2017, the SOC was contacted for vulnerability management, log monitoring, and source code analysis. The UN says that government authorities must be made more aware of cybersecurity.

The COVID-19 outbreak has changed the Philippine digital landscape. A February 2020 research found that many Philippine private businesses increased their cybersecurity spending by using anti-malware and antivirus software, next-generation firewalls, or investing in cloud-native security. Due to the pandemic, e-payment and finance systems have grown significantly. By 2023, the Philippines Central Bank anticipates that 50% of retail transactions will be digital, and 70% of the population will use fintech. BMI forecasts \$95 million in software sales in the Philippines by 2025.

The DICT's National Cybersecurity Plan 2022 is rolling out cybersecurity infrastructure, from hardware to software, and a capacity-building program for all national agencies and local governments. The Philippine government is strengthening the 2012 Data Privacy Act, establishing standards for data security, and encouraging all businesses to register on the government's online site and hire a Data Privacy Officer (DPO). The planned deployment bodes well for US software and hardware vendors.

4.10. The use of Emerging ICT [EMG]

Local firms have also invested more money in the digital transformation efforts of organizations. ICT infrastructure is underinvested despite the increasing use of mobile devices and social media. Around 400 software businesses are operating in the Philippines, with the majority being American and European.

In 2020, the Asia Cloud Computing Association predicted that the Philippines would be ranked 11th out of 14 Asian countries. Data storage and processing will become more popular as more firms turn to cloud solutions for better efficiency and pandemic resistance. As part of the Philippines' Digital Transformation Strategy, the government integrates new technology and solutions to improve its digital infrastructure, connectivity, and operational efficiency. Several aspects of the Government's cloud-first policy include staff email, national archives, and the Government's cloud data center. During the pandemic, ICT was used to reduce the impact of Covid. The project includes command centers, resilience management, digital health, education initiatives, and data center upgrades, including cybersecurity and analytics. Investment in a command-and-control center for connectivity and emergency response cost Baguio City \$1.2 million.

The Philippines has also lifted restrictions on telecommunications. The DICT released a new set of guidelines for the construction of independent cell towers in May 2020. Cell towers are presently within the purview of the Philippines' three major telecom providers. Speeding the rollout of mobile networks might be facilitated by implementing a standard policy for towers.

Poland

1. General Information

Area: 312,679 km²

Population: 37,785,893

Government Type: Unitary Semi-Presidential Constitutional Republic

GDP:\$ 16,930

Internet Users: 86.84

Wired (Fixed Broadband Users): 21.70

Wireless Broadband Users: 197.43

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Poland, the sixth-largest nation in terms of size and population within the European Union, has made tremendous economic progress since joining in 2004. COVID-19 infections were minimal in Poland during the first pandemic wave in spring 2020, making it one of Europe's less impacted markets. For 2021, Poland was rated 44th in the Waseda International digital government rankings 2021, with a total score of 69.2256.

Because of the global influence of the virus on everyday life, work, and socializing, a basic level of digital integration has become necessary. During the lockdown, people were forced to use ICTs to keep up with an ever-changing world. First, Poland issued a national digital vaccination certificate that provided a limited amount of anonymized data through the QR code. A copy of the immunization

record is available in the patient's Patient Internet Account for everyone who has gotten the shots. Patients in Poland may access their certificates using Poland's COVID pass website, the Internet Patient Account. Poland's Public Health Fund and the Ministry of Health are responsible for running the website. Additionally, certificates are issued by health care institutions.

Since Poland's recent economic boom, the country's machinery and equipment industry has reaped enormous rewards. As a result of Poland's rapid industrial development, Poland had the third-fastest industrial growth rate in the EU in 2020. Hence, new equipment demand has risen as well. However, even though Poland's equipment market has grown tremendously in recent years, it will require new technologies to stay on top. Industrial Internet of Things (IIoT) solutions are becoming more and more critical, particularly for companies in Wisconsin that provide robotics, artificial intelligence, sensors, software, and hardware solutions.

3.2. New Trends

As a consequence of Poland's digital strategy, Polish businesses can participate in European and worldwide value chains. Poland's state-owned firms may benefit from digitization by using innovative grid technologies and horizontal and platform solutions to improve essential transportation and energy infrastructures, especially when the whole world is thriving to recover after the pandemic. Small and medium-sized firms must have access to a platform that allows them to virtualize industrial processes, incentivize them to combine different data sources to increase productivity, improve manufacturing flexibility, and build new business models. Open machine data should be provided on this platform to encourage new ideas.

Massive data collection and generation will be necessary for the next Industrial Revolution to be realized. Both the industries from whence the data comes, and those who creatively exploit it to generate new value chains will benefit from this new source of data. Data and information systems and data sets must be interoperable to create cross-sectoral synergy and prevent damaging certification restrictions that operate as a form of protectionism.

Digital change is impossible unless people have faith in the digital world. Security and value standards and incentive programs must be developed, as must an effective marketing campaign for digital collaboration platforms. Trade agreements, treaties, and EU policies all contribute to Poland's attempts to speed up digitization. For the data economy to grow, cloud computing and data analytics companies are essential. Market dominance may lead to unfair terms and conditions for businesses that use their services, leading to market fragmentation.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Poland was ranked 31st in terms of network infrastructure preparedness, with a score of 6.951. The overall number of Internet users reached 31.97 million in January 2021, a 4.4 percent increase over the previous year. In early 2021, the proportion of persons with Internet access remained unchanged at 84.5 percent. In January 2021, 25.90 million people used social media, representing 68.5 percent of

the overall population. At the same time, 52.76 million mobile connections were active, accounting for 139.5 percent of the total population.

Poland's liberalized telecom business has grown rapidly in both the broadband and mobile arenas. Fiber infrastructure was built to fulfill increased consumer demand for public services. Mobile data services employing freshly freed and re-farmed spectrum have also characterized the market in recent years. The regulator's intentions to sell range across several bands have been delayed due to the Covid-19 outbreak and legislative amendments.

4.2. Management Optimization [MO]

By 2020, the Strategy for Responsible Development aimed to raise the wealth of the Polish people while reducing poverty and social exclusion. Modern IT solutions can allow the establishment and maintenance of a logical and coherent government information technology system in collaboration with all stakeholders at all levels of public administration, under the eGovernment and digital public services concepts. The objective of eGovernment is to make as many government services available online as feasible, enabling citizens to do business remotely. Maintaining interoperability of public information technology systems and automating administrative tasks are crucial.

The Efficient State Strategy 2020 needed robust interoperability of all information technology systems and public registries to create uniform standards for electronic communication in the public sector and to offer reference data for current offices' work. Automatic cross-checking of data provided by consumers of public services against data in the public register would enable public institutions to better their existing operations while also expediting dispute resolution.

4.3. Online Service [OS]

On 5 September 2016, the Act on Trust Services and Electronic Identification was enacted. The Act created electronic service availability in Poland by integrating at a single point all ICT systems that make public online services accessible, using a variety of electronic identity standards. Users register in any public online service using electronic identity methods issued by electronic identification schemas affiliated to the national electronic identification gateway. The site facilitates access to government portals and electronic services. It is an organizational and technological solution that combines information technology systems into a single-entry point for public online services.

The Public Procurement Law became effective in March 2004. It paved the way for the creation of eProcurement systems for Polish public administrations, sophisticated electronic signatures for tender submissions, and electronic auctions for particular contracts.

4.4. National Portal [NPR]

The Republic of Poland Portal (GOV.PL) is the primary national portal in Poland, providing access to digital information and e-Services. The Ministry of Digital Affairs designed the portal. GOV.PL has news, press, and multimedia, and much other important information.

On the other hand, Dane.gov.pl is an open data site for consumers, businesses, NGOs, researchers, and government officials, including data on education, the environment, budget, finance, culture,

security, sport and tourism, and the labor market. The majority of information is made publicly accessible. The site also serves as a hub for open data expertise, best practices, and new projects in Poland.

The biznes.gov.pl site provides eServices to entrepreneurs considering or running a business. Its main goal is to reduce the administrative costs associated with forming and administering a business.

4.5. Government CIO [GCIO]

The Ministry of Digital Affairs acts as the government's chief information officer position. Currently, the Ministry of Digital Affairs is responsible for internet security, infrastructure, and digital content development.

4.6. E-Government Promotion [EPRO]

The Polish Ministry of Digital Affairs has advanced the information society by encouraging investment in information and technology, which requires universal access to high-speed Internet, efficient and user-friendly public eServices, and increased digital literacy.

This initiative aims to provide all schools with high-speed internet connections and maximize teachers' access to e-Resources. The National Educational Network Act was implemented in December 2017, with the first educational centers joined in 2018.

The Committee of the Council of Ministers for Digitalization was established in March 2007 and advised the Council of Ministers and the Prime Minister. The duties involve advising on draft legislation or computerization initiatives to guarantee interoperability, integrity, and complementarity with existing or planned solutions, as well as architectural compliance with the State Information Architecture.

4.7. E-Participation [EPAR]

The TESTA network is Poland's primary cross-border infrastructure for electronic communications between EU agencies, organizations, and the Member States. Additionally, the program for the opening of public data was Poland's first official document committed to the openness of public data. The document was created to enhance the quality and volume of information and increase administrative transparency and E-participation.

4.8. Open Government Data [OGD]

On September 20, 2016, the Council of Ministers approved the Open Data Program, the first governmental document on data transparency. This function of the document is to increase the quality and volumes of information provided on the open data portal that emphasizes open government, citizen involvement, and the reuse of public data. As a subordinate element to the Open Data Program, a new Open data plus initiative was launched in 2019.

The Polish Ministry of Digital Affairs issued guidelines for data preparation and sharing standards in 2018 with Application Programming Interface standards, security, technicality, and legality to verify the quality of data given by the government. Open data is utilized for both commercial and scientific

purposes for the first time. The public is relatively robust in how the government operates the public data. Access to data should not be restricted by legal or technological constraints that protect personal information. The project about open data produced standards for government data transparency. This term emphasized the need for adequate data preparation and sharing in promoting data utility.

4.9. Cyber Security [CYB]

Poland succeeded in establishing a more substantial cybersecurity infrastructure in 2018. In October 2019, Poland's Council of Ministers approved its 2019-2024 Cybersecurity Strategy. The government has been trying to improve the public sector's cyber-resilience and information security while encouraging individuals and organizations to follow best practices. In 2020, a strategic action plan with tasks, responsible organizations, KPIs, and funding was established. The country came in 21st in the Waseda rankings with 9.500 points and was tied with Malaysia.

A national cybersecurity plan is also mandated under the Directive on network and information systems. A public-private partnership - known as Cybersecurity Cooperation Program was formed with global and national technology businesses to improve information sharing, education, and cyber hygiene. The National Cyber Security System or the Polish legislation Directive 2016/1148 fosters actions to ensure high security for networks and information systems across the EU. The government has decided to keep and improve its decentralized cybersecurity management. The Act established an efficient, comprehensive structure that enables stakeholders to identify, avoid, and minimize potential threats to preserve Polish national security interests.

4.10. The use of Emerging ICT [EMG]

A committee of independent experts led by the Ministry of Digital Affairs identified five priorities to enhance artificial intelligence development in Poland: innovative enterprises, education, public sectors, and international cooperation and society. The Ministry of Digital Affairs has reviewed the document's consultation analysis to find whether it corresponds with the Polish government's aim and the EU's AI regulations.

The Ministry of Digital Affairs has launched its AI Programme with three pillars: education, strategy, and technological efforts. It is coordinated by the Ministry's Department of Innovative Solutions to educate society and public units, offer technical projects and aid in their market growth, and establish a framework for all actions in the nation relevant to AI Policy. Additionally, The Minister of Digital Affairs formed the Internet of Things (IoT) Working Group in August 2018, recruited over 150 government, commercial, and academic specialists. The experts emphasized essential opportunities and the government's unique role in fostering IoT development in Poland.

Portugal

1. General Information

Area: 92,090 km²

Population: 10,161,885

Government Type: Unitary Semi-Presidential Constitutional Republic

GDP: \$ 25,060

Internet Users: 78.26

Wired (Fixed Broadband Users): 40.81

Wireless Broadband Users: 78.95

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Portugal was ranked 36th in the Waseda International 2021 rankings for digital government, with a total score of 72.3409. The coronavirus pandemic has heightened the urgency with which governments worldwide are upgrading their digital infrastructures to meet the growing needs of digital citizens for public services. What was before noteworthy has become crucial. The crisis has highlighted the critical significance of digital resilience as a crucial component of shared governance in managing and overcoming the health catastrophe's consequences 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. Digital technologies are enabling a change of government that is anticipated to result in enhanced governance, more effective public policy, and improved service delivery.

While the fundamental objective of the digital reforms a decade ago was to boost efficiency and save costs, the emphasis has gradually shifted to improving people's quality of life and simplifying government. Intriguingly, the digital government has always been seen in Portugal as a complementary component of the country's administrative modernization efforts rather than a standalone project. The Portuguese experience highlights the vital need of institutionalizing a politically strong governance structure at the core of government charged with promoting reforms and eliminating resistance to change.

Portugal has rapidly climbed to the top tier of technologically sophisticated countries, joining the exclusive club of the Digital Nations in 2018. This award recognizes successive administrations' extraordinary efforts and successes in using new technologies and data insights to enhance government functions for everyone. Portugal has been recognized by the United Nations and the OECD as a global pioneer in digital governance, thanks to its continuous and consistent efforts over the past 15 years.

3.2. New Trends

Portugal is one of the EU's "middle-of-the-road" countries when it comes to digital transformation. The country's human capital performance is much below the EU average. As part of the National Strategy for Economic Digitization, the Ministry of Economy created the "Industry 4.0 Program" in 2017. There were roughly 120 stakeholders consulted as part of the national strategy for Industry 4.0 in April 2016, including 88 companies, academics and organizations, and government agencies. The Strategic Committee, which includes representatives from the government, national agencies, and the private sector, confirmed the list of proposed initiatives to hasten national companies' adoption of industry 4.0 after the consultation. The country has even focused more on these strategic plans as a part of the federal recovery after the pandemic

After completing Phase I in 2018, the Program's goal was to educate Portuguese enterprises and the general public about Industry 4.0. The Phase II of the program began in April 2019 and was organized around three axes – Generalize, Capacity, and Assimilate – with an increased focus on innovation and knowledge development to speed up the shift to industry 4.0. By implementing a widespread digital transformation of business models, the government aims to promote economic and social growth.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

A total score of 6.601 rated Portugal 41st in the Waseda rankings in terms of network infrastructure preparedness. With 8.58 million internet users as of January 2021, Portugal's population has grown by 0.7 percent over the previous year. At the time, 84.2 percent of the people in Portugal were online. There were 7.8 million people who used social media in January 2021, a rise of 11 percent from the previous year. Mobile connection penetration, on the other hand, fell by 3.6% in January of 2021. 15% of the overall population had a mobile phone at some point, thanks to the 15.8 million active subscriptions.

In the following respects, Portugal made significant progress on its digitalization path. The auction for new participants to the 5G network has closed. Additionally, Vodafone and NOS agreed to share their networks, and NOS sold towers to Cellnex.

4.2. Management Optimization [MO]

Because of Portugal's digital transformation plan, its government and its services have undergone significant transformations. Focusing on the digital transformation of the public sector, it employs digital technology to speed public sector modernization for residents and enterprises. The transition was emphasized above digitization in several ways. Political leaders, particularly women leaders, have been instrumental in guiding this transition from the heart of government with strong political will and a clear vision, federal and a persistent aim. A single digital agency with a defined aim and execution skills has been set up to assist promote and occasionally force whole-government transformation.

The key to success was the convergence of political and technical efforts. To enable government digital services, Portugal invested heavily in its digital infrastructure early on. Additionally, strategic steps to sustain political support for the reforms include digital identity and interoperability platforms. The SIMPLEX administrative simplification effort, which began in 2006 and is still ongoing, is one of these strategic undertakings. Additionally, the digital strategy aims to improve the lives of citizens by simplifying vital governmental services like health and justice. The Portuguese government's innovative digital solutions are a good illustration of a citizen-driven approach. The government's objective has traditionally been to rethink rather than automate outmoded or unnecessary tasks. Many countries have fallen into an electronic bureaucratic trap, but Portugal has managed to avoid it. To break down data silos and link government organizations, Portugal is presently working to promote public sector interoperability. The "once-only" concept is also being rolled out throughout Europe, forcing consumers only to submit their personal information once.

These initiatives emphasized locals by focusing government services on people's life events and tailoring them to local realities. Citizenship cards, e-prescriptions, and e-Portugal, a single platform for all government services, are just some of the real-world examples. Life events, rather than governmental entities, have focused on the platform's offerings since its introduction in 2019.

4.3. Online Service [OS]

A multi-channel service delivery paradigm can help to increase public and private sector service engagement by citizens. The Citizen Card, an eID-based identification card, and the Digital Mobile Key, a mobile ID solution, have been introduced in Portugal. The eID uses biometrics and an e-signature to verify a person's identity visually and electronically. This gadget makes it possible to authenticate transactions and sign electronic documents securely. ePortugal.gov.pt, the country's government website, hosts it.

The BASE website must include all public sector contracts. Tender notices are published in the official electronic journal. Even in the post-award phase of eProcurement, eAuctions and dynamic buying systems are becoming more common.

4.4. National Portal [NPR]

The official website of the Portuguese government, Government Portal, provides information on the government's plans, composition, various documents, current public consultations, and basic information about Portugal. For individuals and enterprises alike, it was introduced in February 2019 as a single digital gateway that consolidates all-digital governmental services and information from the National Catalogue of Entities and Services into a single point of access.

4.5. Government CIO [GCIO]

The e-government law in Portugal does not legally recognize CIOs (Chief Information Officers). Governments nowadays are cognizant of the necessity for a Global Chief Information Officer (GCIO). In addition to the AMA's other GCIO duties, it is up to the AMA to encourage ICT use in government and implement the plan. At the very least, a college or university had CIO education programs on its roster. No more items were found in a search for CIO regulations.

4.6. E-Government Promotion [EPRO]

Portugal has placed 28th Waseda rankings in 2021 regarding E-Government Promotion with 8.065 points. The main goal of PORBASE is to preserve and promote the national library's catalog, current national bibliographies, and Portuguese libraries' collective catalog. ePortugal's "Transparency" section has highlighted this site since October 2018 to boost its visibility and circulation. The National Commission for the Promotion of the Rights and Protection of Children and Young People portal is a wealth of information for Portuguese citizens about promoting and protecting children and young people's rights. The National Commission for the Promotion of the Rights and Protection of Children and Young People portal is a wealth of information for Portuguese citizens about the promotion and protection of children and young people's rights, as well as the ongoing efforts of the CNPDPCJ and other national entities to carry out and realize these goals at the local, regional, national, and international levels.

4.7. E-Participation [EPAR]

The Council coordinates an international action plan for Information and Communication Technologies in Public Administration. Aims of the SIMPLEX Program include recovering and reinstating policies designed to take advantage of ICTs' transformative potential and create new approaches that improve people's lives while reducing corporate expenses. A thriving global ICT strategy can be developed thanks to CTIC's new ICT governance models in public administrations that are accessible to society as a whole and are tailored to the government's objectives.

The Interministerial Network for Administrative Modernisation, established by Decree-Law No 4/97 and updated by Decree-Law No 72/2014, brings together representatives from all government areas to collaborate on administrative simplification and modernization. For example, it sets organizational

modernization methods for evaluating the regulatory impact of normative actions. The Commission for Administrative Modernization includes representatives from all of the key players involved in public sector reform. The authorities want to make it easier for the many people involved in public administration to share ideas.

4.8. Open Government Data [OGD]

Member Portugal presented its first National Action Plan for Open Administration in December 2018 after joining the organization in 2017. Between November 19 and December 3, 2018, the National Network for Open Administration collaborated with the public sector and civil society to design the strategy, including a general online survey. Public involvement, open data, and transparency in the government are the goals of this policy. A final four commitments were completed by August 2020, in concert with other relevant public sector and civil society actors, if necessary, to accomplish initial Action Plan objectives. The National Action Plan for Open Administration can be seen on the OGP Portugal and the Open Government Partnership websites if anybody is interested. Portugal's first Action Plan was granted a good assessment by the Open Government Partnership, which assessed Portugal's involvement in the OGP independently. Two of its pledges were branded "Standard Commitments."

Portugal's official open data site, Dados.gov, is available online. Gathering and referencing publicly accessible information and acting as open data are two critical objectives of an open data repository.

4.9. Cyber Security [CYB]

On 5 June 2019 issued a new National Cyberspace Security Strategy 2019-2023, which seeks to preserve essential infrastructures and critical information services while promoting the use of cyberspace by individuals and public and commercial entities alike. Every year the High Council of Cyberspace Security reviews this policy, taking changes in the digital world since it was first enacted in 2016.

As of November 6, and August 13, two laws were signed into law that created the organization of the National Cybersecurity Center and transferred EU Directive 2016/1148 on measures to guarantee the same degree of network and information security in all member states of the European Union.

4.10. The use of Emerging ICT [EMG]

As a result of a combined effort by the Science and Technology Foundation, the National Innovation Agency, Ciência Viva, and INCoDe.2030, the National Strategy for Artificial Intelligence was implemented in June of 2019. It is part of the Portugal INCoDe.2030 strategy and closely linked to AI Portugal 2030, which intends to develop and expand Portugal's advanced cyberinfrastructure until 2030, a science, innovation, and growth strategy. For this purpose, it aims to make scientific computing more publicly accessible and to foster international collaboration in a wide variety of subjects and sectors.

AI Portugal 2030 and ACP.2030 are part of the National Digital Competencies Initiative - Portugal InCoDe.2030, a set of programs to promote the use of new technologies by public sector organizations. In February 2018, funding for public sector data science and artificial intelligence was begun to boost public

tenders and encourage further research and development initiatives and collaboration between the public sector and academic institutions.

Romania

1. General Information

Area: 238,391 km²

Population: 19,105,403

Government Type: Unitary Semi-Presidential Republic

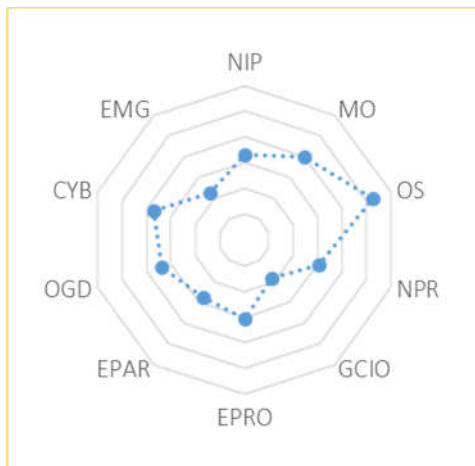
GDP:\$ 14,970

Internet Users: 78.46

Wired (Fixed Broadband Users): 29.55

Wireless Broadband Users: 92.01

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

As a consequence of the pandemic, Romania's progress in digitizing governmental services remains slow and does not keep pace with the rising demand for online services from the populace. Romania ranks 53 with a score of 65.2758. New technologies are becoming increasingly common in the country's network infrastructure, as shown by a rapidly rising number of people who regularly buy online or use electronic payment systems such as credit cards. Although digital services have become more popular, the number of people who utilize government e-services remains small. It is one of two key goals of the National Strategy on the Digital Agenda for Romania for 2020, which has not only not been achieved but is only half-complete, to grow their share to 35 percent of the overall population.

There are problems with the IT infrastructure used by administrative organizations, personnel challenges, and the lack of a standard and efficient legal and procedural framework for providing online public services. Government inactivity has long been a significant barrier to this process. There is a strong correlation between the COVID-19 epidemic and the implementation of previously postponed laws in the sphere of digitalization. Electronic governance was a success, despite the difficulties that came with it.

3.2. New Trends

Despite the impact of the pandemic, the Romanian Digital Agenda prioritizes employment, research and development (R&D), climate change and energy sustainability, education, and poverty and social exclusion in the economy and society. The government focuses on building an eGovernment and cloud computing knowledge base and professional workforce to enhance efficiency and modernize current public administration structures by incorporating new technologies. Information and communication technology (ICT) tools and solutions will be used more widely and more consistently in the areas of education, culture, and the arts, as well as digital inclusion. Research, development, and innovation in ICT, using the comparative advantages of Romanian areas and promoting public sector growth, are also implemented.

Romania's regions should be able to utilize more Internet-connected gadgets due to increased broadband and digital services infrastructure and ensure social inclusion. Digital inclusion, advanced digital skills, and enabling crucial emerging and breakthrough technologies and innovation in the public and commercial sectors are among the goals being pursued by many sectors. With a focus on rural regions, this framework's projects include distributing IT equipment (hardware and software) to schools, training programs for teachers to improve their digital competencies, and awareness-raising programs for public and private sectors to assist their digital transformation.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Romania is placed 38th in terms of preparation for network infrastructure, with a score of 6.667. In January 2021, the total number of Internet users reached 15.49 million, a 0.9 percent raise over the previous year. The proportion of persons with Internet connections stayed stable at 80.7 percent in early 2021. In January 2021, 12 million individuals accessed social media or 62.6 percent of the total population. Simultaneously, 26 million active mobile connections represented 135.6 percent of the entire population.

Romania has made significant investments in developing inputs for the country's digitization effort. Orange Romania establishes its fiber network and expands 5G coverage to over ten more cities. Around 79% of fixed broadband connections are faster than 100Mb/s.

4.2. Management Optimization [MO]

Romania's National Digital Agenda Strategy targets the ICT industry to boost economic development and competitiveness. It aims to achieve both directly and indirectly by enhancing efficiency and

decreasing public sector expenditures, raising private sector productivity by removing administrative state-related hurdles, and increasing the competitiveness of the Romanian labor force. A digital economy plan for 2014-2020 was developed using the Digital Agenda for Europe as a guide.

Under the European Commission's guidelines, Romania developed a strategy in the first quarter of 2019 to promote eCommerce solutions throughout the nation. The document stated the document's primary aims and strategic objectives for the future. In addition to the strategy, there was an action plan detailing the strategy's goals.

4.3. Online Service [OS]

Romania's Authority for Digitalization is implementing the Interoperability System with EU Member States (SITUE) project. The system is developed on top of the Romanian Electronic Identification and Trust Services Regulation (eIDAS) gateway. It connects it to the sites of the other EU Member States and identity and electronic services providers in Romania.

On the other hand, the authority has established the Centralised Digital Identification Software Platform (PSCID) project, which acts as a gateway and initial point of access to secure electronic eGovernment services. Implementing PSCID results in enhancing tools; securing electronic authentication for accessing and using public electronic services and unit management; centralized identification of citizens' electronic identities and credentials; and provision of identities in target systems that provide electronic services.

Romania has a single eProcurement platform that the Rosthe Romanian Authority controls for Digitalization (ADR). All Romanian contracting agencies are required to fulfill notifications about public procurement processes, and all firms interested in offering goods or services to a public authority must register on the site. This technology simplifies operations for suppliers as well as purchasing agencies.

The administered National Electronic Payment System for Taxes is one of the most important portals in Romania, enabling people and corporations to communicate with governmental entities and pay taxes/fees online. The system helps to encourage citizens to engage more positively in public services and minimize the administrative burdens. As a result, the nation is ranked 28th in the online services category, with 10.280.

4.4. National Portal [NPR]

The eGovernment Portal is a transactional platform that provides online access to central and local government services and documents. The users can easily access many interactive and transactional services. The site also provides links to all federal, state, and municipal government offices and contacting the Public Administration.

The Electronic Point of Single Contact portal's goal is to give all required information, working methods, and interactive forms for service providers wishing to do business in Romania. Information about the national business climate, its goals, and rewards is also provided. Using the portal, residents may avoid physically presenting documentation at a counter or wasting a lot of time fulfilling

administrative procedures. The portal includes a comprehensive collection of forms, processes, and legal references, ensuring that individuals are well informed.

4.5. Government CIO [GCIO]

The Ministry of Communications and Information Society, via the National Center for Management of the Information Society, holds the position of Chief Information Officer. The CIO Council is a brand-new private organization whose members include executives from Romania's most important national and international companies.

4.6. E-Government Promotion [EPRO]

Romania launched a plan in early 2019 to increase and encourage the deployment of eCommerce solutions in compliance with EU standards. The report examined the state of eCommerce development at the time and outlined the document's potential strategic objectives. The strategy was accompanied by an action plan defining activities and dates for each aim. Primary goals for developing eCommerce solutions in Romania: providing an enabling and consistent legal environment for eCommerce, educating and informing suppliers and online service providers, and enhancing the institutional structure for eCommerce solutions.

The Digital Romania Consulting Council formed an expert group to help Romania's digital society thrive. Romanian National Computer Security Incident Response Team (CERT) is a government-funded organization that conducts research, development, and expertise in cyber security. CERT is required to develop and implement public safeguards to avoid and minimize national cyberinfrastructure threats.

4.7. E-Participation [EPAR]

The Electronic Networks of Local Communities (LCENs) provide internet access to local communities (schools, government buildings, and libraries). Each region served by the networks has its public access point. The aims are to narrow the digital gap between developed and developing areas and increase the use of ICTs in schools and develop a relationship between citizens and government. The network served 255 rural settlements and small towns across Romania. The Trans European Telematics Services between Administrations enables digital communication between EU agencies, institutions, and the Member States.

4.8. Open Government Data [OGD]

Romania joined the Open Government Partnership in 2011, becoming the country's first member. The Romanian government raised efforts to foster transparency, advance technologies, and be accessible to everyone. It was also mentioned in Romania's National Action Plan 2012-2014 that the country will work toward those three main priorities.

4.9. Cyber Security [CYB]

The Romanian government established a National Cyber Security Strategy in 2013. Based on national cyberinfrastructures, the goal of Romania's cyber security policy was to create and maintain a secure virtual environment that was both adaptable and secure for the country's citizens.

The National Cyber Security Strategy was established by Government Decision No. 271/2013. A comprehensive collaboration of measures is achieved via the new Agency for Romanian Digitalization authorities to provide a practical security level for networks and information systems. Law No 362/2018 regarding the security of computer networks and systems provides a strategic framework for implementing Directive (EU) 2016/1148.

4.10. The use of Emerging ICT [EMG]

The current Covid-19 has pushed Romania's digital transition, driving businesses, and governments toward remote work and education. Despite the drawbacks, the situation was recognized as a possible chance for e-Government implementation. Romania was ranked 24th in 2021 after earning 4.500 points in the EMG indicator's evaluation.

The framework's projects include providing schools with ICT equipment (hardware and software), teacher training programs to improve teachers' digital competencies, promoting awareness about digital skills, and supporting public and private sector digitization. The Romanian government's "Din grijă pentru copii" program addresses children's services, including proper digital identification, warning, treatment, and assessment.

Due to the large amounts of personal data handled by the health system, the healthcare system has become a big consumer of cybersecurity services. Massive healthcare projects are being developed, and cybersecurity is put in priority. There are also changes in the private sector to serve enterprises. Accessed social media infrastructure networks (energy and utilities), telecommunications (Telco), utilities, and energy transportation all stand to benefit from cloud-based solutions. The GOR is proposing creating a cloud agency, the "National Agency of E-Services and Cloud (ANSEC)," as an element of a potential public partnership (PPP) to connect all public agencies' information technology platforms.

Russia

1. General Information

Area: 17,098,242 km²

Population: 145,907,899

Government Type: Federal Semi-Presidential Constitutional Republic

GDP: \$ 11,650

Internet Users: 84.99

Wired (Fixed Broadband Users): 23.21

Wireless Broadband Users: 100.38

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

A total score of 79.5482 points placed Russia 26th in the Waseda International Digital Government Rankings for 2021. As the recession deepened, facial recognition and social monitoring became harder to implement. Activation of the "social monitoring" program, which required users' photos and phone numbers, was made available for download by the Moscow city administration in March. Next, authorities from the local government put in place an electronic ticketing program that resulted in lengthy lines at the metro stations because of poor implementation.

Coercive measures have been used in countries with insufficient digital monitoring capabilities to limit the pandemic, leading to even more considerable regional discrepancies. There is criticism and

resistance against regional and local authorities because of these inequities' incompetency and enforcement.

The latest ICT strategy called "Strategy of the Information Society Development in the Russian Federation for 2017 - 2030" (approved by the Decree of the President of the Russian Federation of May 9, 2017 No. 203). In addition to "The Doctrine of Information Security of the Russian Federation" (Approved by the Decree of the President of the Russian Federation of 05.12.2016 No. 646), Russia adopt a decree "On the Security of the Critical Information Infrastructure of the Russian Federation" (Federal Law of July 26, 2017 No. 187-FZ) and series of acts like "Rules for categorizing critical information infrastructure of the Russian Federation" and "List of indicators of criteria for the significance of critical information infrastructure of the Russian Federation and their values"

3.2. New Trends

The maturity of services provided through the one-stop portal is more or less uniform among the country regions but have a room for enhanced. The government aims for at least 80% of services to be available through the portal by 2020. Other plans include ensuring the services are available irrespective of geographical location, provision of several channels for service access including mobile access, the internet, call centers and on-site service machines.

E-Health and E-Learning systems are expected to be optimized and integrated expanding the services available through one-stop D-Government portal to include requests for sick-leave certificates, electronic prescriptions, and electronic inquiries. Cyber Security also will be in the focus of the government in the nearest years. Implementation of Artificial Intelligence and Quantum Computing programs depends on financial capabilities and not clear yet (financial sources and possible partnerships are under discussions).

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

The Waseda rankings for 2021 place Russian Network Infrastructure Readiness at 33rd place with a score of 6.940. For the first quarter of 2021, there were 124.0 million internet users in the Russian Federation, increasing by 6.0 million. Russia's Internet penetration rate was 85 percent at the same time. 99.00 million people in the nation are on social media, accounting for 67 percent of the entire population. Since 2020, there have been 228.6 million mobile connections in January 2021, representing a decrease of 3.7 percent. More than half of Russians have access to a cell phone, according to recent statistics.

5G networks in Russia will be limited to the use of locally made equipment from 2024 forward. Until 2030, MegaFon has signed deals with manufacturers to create its mobile infrastructure. As part of the agreement, four mobile network operators signed a Memorandum of Understanding. The government proposed just one 5G network operator for the 4.5GHz frequency band. Additionally, ER-Telecom plans to upgrade the whole network to a 1Gb/s service by 2026.

4.2. Management Optimization [MO]

By presidential order No. 215 on May 15, 2018, the Russian Federation formed the Ministry of Digital Development, Communications, and Mass Media. Minister Rossii Mintsifry Rossii is the official acronym for the Ministry. One of its main aims is to deliver digital services to the general public and municipalities while ensuring that the postal service is of high quality and timely.

4.3. Online Service [OS]

The e-Services in Russia are currently available through integrated e-Service portal www.gosuslugi.ru and accessible via password protected personal accounts requiring two-stage identity confirmation. Personal account is accessible via e-signature and universal ID card. Payment services such as paying utilities fees, driver civil penalties are made available through personal account on the portal. During last 2 years, the set of data maintained in the user profile has been substantially expanded (such documents as a foreign passport, medical insurance, military, etc. have been added, it became possible to specify information about children). It is possible to register an account with a mobile phone number that was previously linked to another account. Improved support for e-Services scenarios for user registration from service centers, provided by the use of service and the Web application "Service Center". The possibility of independent registration of state organizations has been added. Non-credit financial organizations were able to connect e-Services.

4.4. National Portal [NPR]

At <http://government.ru/>, the Russian government's official website, visitors can get comprehensive and current details on its work as a collective entity. This website provides easy access to a repository of official documents, including government decisions, legislative actions, directives and programs, and the activities of Prime Ministers and their deputies.

The Government Executive Office will continue to update the Russian Government's official website. New features and sections are being added, and existing ones are being updated, and this will be relayed to the press through the website's public relations department. To put it another way, its official website provides a complete and functional source of information on the Ministry of Telecom and Mass Communication.

4.5. Government CIO [GCIO]

Formally, Russia has no position of government CIO. Minister of Digital Development, Communications and Mass Media of the Russian Federation is in charge of the general management of the program, while the deputy minister is responsible for coordination and control. The head of the department, in turn, is personally responsible for the execution of the department's functions and is appointed by the Minister of Digital Development, Communications and Mass Media.

The Deputy Minister of Digital Development (CDO) has appeared this year. This was stated by the Minister of Digital Development of the Russian Federation. In the first stage, digital managers appeared in the Ministry of Construction, the Ministry of Health, the Ministry of Education, the Ministry of Energy and the Ministry of Transport. It is assumed that the deputy ministers for the development of digital technologies should have three powers - state, digital, and industry.

In addition, the President signed a decree on the appointment of a special representative of the President of the Russian Federation on digital and technological development.

4.6. E-Government Promotion [EPRO]

With 8.710 points, Russia's E-Government Promotion was ranked 14th in the Waseda rankings in 2021. Russian e-government refers to public administration and municipal administration, where the state's major players are the federal and regional executive branches. One of the first moves taken by the Russian Federation in this field was the "Electronic Russia 2002-2010" governmental program. As part of this state-sponsored effort, individuals were given access to electronic information on the activities of Russian government agencies, and government departments were able to communicate information more effectively. The state program "Information Society 2011-2020" logically follows "Electronic Russia," but considers most of its flaws. The plan adheres to the Russian Federation's long-term social and economic growth vision through 2020. Improving citizen digital literacy, raising service quality and accessibility, and expanding the contribution of information technology to economic growth are all top priorities for the government.

4.7. E-Participation [EPAR]

The vast majority of government information, particularly in English, is no longer accessible online. The President, Prime Minister, Governors, and City Administrators are responsible for maintaining the official websites of the nation. These websites provide a feedback form that enables individuals to directly contact their elected officials. Vladimir Putin has an official blog where individuals can debate and comment on Russia's politics. Web 2.0 elements such as RSS and social media networks like Twitter and Facebook also distribute material via portals.

4.8. Open Government Data [OGD]

European Union officials characterize it as "the information gathered by the public bodies (PSI) and made freely accessible for re-use for any purpose" as "open government data." In May 2012, Russian President Vladimir Putin issued an executive order requiring the release of open government data. The Open Government Data Portal (data.gov.ru) was introduced in 2014. Russian President Dmitry Medvedev announced the country's Open Government program, which aims to improve openness in Russia's legislative and executive branches. There is still a need to provide open data, notwithstanding the removal of the minister of Open Government in May 2018.

The policy and execution aspects of Russia's open data approach are examined in the following sections. There are several ways in which governments can use available data to communicate with their constituents.

4.9. Cyber Security [CYB]

Russian officials have just unveiled their National Security Strategy, or NSS, a document that does not include the term "cyber" in its title. The omission is deliberate in this circumstance. Now is the time for the United States to learn what Russia's unusual word choice implies about its cyber actions. Russia's aims in the digital industry go well beyond shutting down pipelines and stealing data. Also,

the Kremlin strives to influence its rivals' beliefs and actions as well. "Information security," rather than "cybersecurity," is more suitable. In terms of alternative energy, there is no limit to how much can be done. This seems like a semantic distinction in the Kremlin's vocabulary, but it's significant for several reasons.

Russian military doctrine outlines two complementary forms of information security: The project has a technological component. Disruption, theft, and surveillance are just a few instances. Americans often refer to "cyber security" using this term. Another element of information security is subtler and even misleading at times. With this psychological component of Russian tactics, the adversary's leaders and the general population are targeted.

4.10. The use of Emerging ICT [EMG]

The Russian government has set up an analytical center to carry out the country's national AI plan and federal AI project and several contests for government subsidies to deploy AI solutions in industry and academia. Commanding autonomous gadget units will soon have a dedicated career path in the Russian military. Yandex and Cognitive Pilot, in contrast to MTS, are both expanding their artificial intelligence (AI) businesses. Students at Moscow State University will be required to take an AI course for the second year in a row. As Russian firms increase their global reach, they've opened a subsidiary in the United States to provide control systems for unmanned agricultural drones.

The term "Internet of Things" encompasses a wide range of devices, sensors, actuators, and network connections (IoT). Data collection, exchange, and processing are all capabilities. Developing smart cities, smart power grids, bright home items, and intelligent transportation would open up a significant new market for Internet of Things (IoT) service providers in Russia.

Saudi Arabia

1. General Information

Area: 2,149,690 km²

Population: 35,449,451

Government Type: Unitary Islamic Absolute Monarchy

GDP:\$ 22,700

Internet Users: 97.86

Wired (Fixed Broadband Users): 22.66

Wireless Broadband Users: 118.86

2. Digital Government Overview in Country



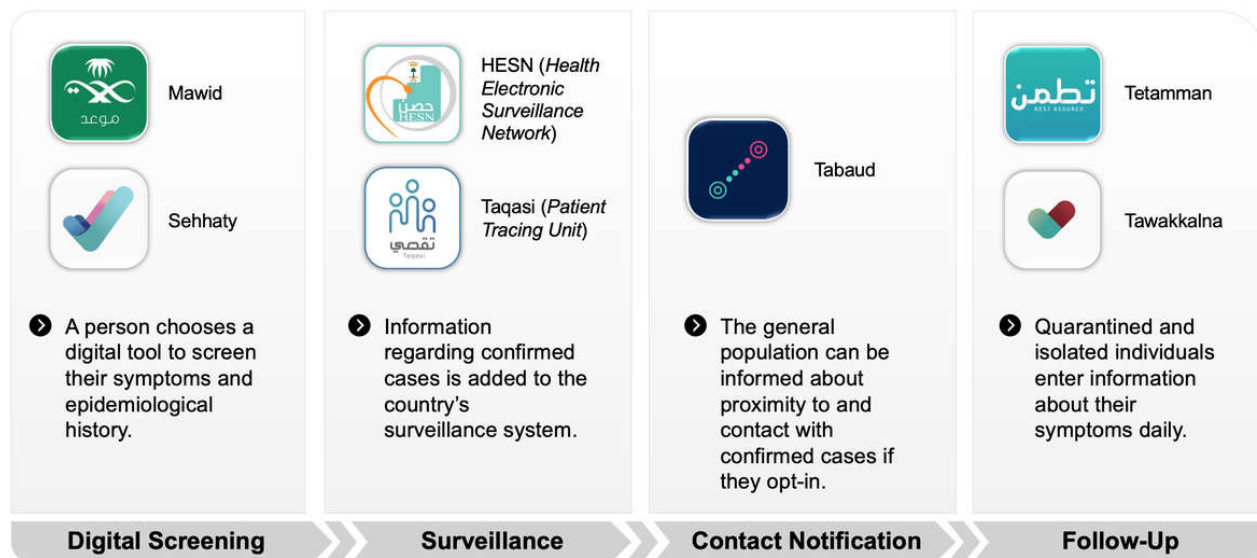
3. Digital Government Development and new trends

3.1. The development

Saudi Arabia's (KSA) government has progressed due to rapid global technical breakthroughs and transforming of political and institutional structures. The country was ranked 30th in the Waseda International digital government rankings 2021, with an overall score of 76.4124. With a well-maintained digital infrastructure, the Kingdom of Saudi Arabia is well-positioned to hasten the shift to a digital world. This method has permitted the Kingdom to cope with disruptive public and private sector crises while preserving business continuity, educational activities, citizen responsibilities, and the ordinary lives of its residents. Saudi Arabia is one of the world's top ten developed countries because of its advanced digital infrastructure.

In 2020, the validity of COVID-19 was confirmed for the first time in Saudi Arabia. In reaction to the epidemic, Saudi Arabia, like many other countries throughout the globe, shut down most government

and commercial activities and restricted people’s movement at the state level. After implementing these strict mitigating measures, technology and digital innovations have made it easier to provide essential services. The public and private sectors in Saudi Arabia worked together to develop and deploy about 19 apps and platforms for public health and medical care. Creating an electronic learning infrastructure has proceeded to ease educational operations in preparation for a more comprehensive application. It was evident that the telecoms sector could work together seamlessly and develop new ideas to help with ongoing efforts. The usage of social media, websites, and SMS text messaging for risk communication followed industry best practices.



Digital applications available for various health care domains during the COVID-19 pandemic in Saudi Arabia.

3.2. New Trends

"Move to Tech" is one of the most significant projects in Saudi Arabia. The Saudi Ministry of Communications and Information Technology has started this program on March 10, 2020. It enables the use of existing digital tools and the development of new ones in response to COVID-19. This has resulted in a surge in the usage of digital technologies across various industries, most notably education, the food industry, and health care. The Kingdom plans to continue this project for further achievement in economic growth.

Vision, goals, and action plans for Saudi Arabia are set out in the Smart Government Strategy (2020-2024). The majority of strategic efforts are targeted at achieving the Sustainable Development Goals and the Saudi Vision 2030. In the Smart Government Strategy, the Kingdom's government aims to be responsive, efficient, and innovative by 2024, resulting in new integrated Smart Government experiences specific to the needs of its beneficiaries. The following are among the government's goals:

- Consistently deliver world-class smart service.

- Use a network of partners to speed up digital transformation.
- Make the most of shared resources for public services

The action plan will guarantee that the Kingdom's goals are met by creating a Smart Government that grows around the interests of its inhabitants, residents, and visitors.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Saudi Arabia ranks 22nd in terms of preparation for network infrastructure, with a score of 7.351. In January 2021, the total number of Internet users reached 33.58 million, a 4.2 percent raise over the previous year. In early 2021, the percentage of people having access to the Internet remained stable at 95.7 percent. In January 2021, 27.80 million individuals, or 79.3 percent of the total population, accessed social media. Simultaneously, 39.53 million active mobile connections represented 112.7 percent of the entire population.

The Kingdom of Saudi Arabia has a robust digital infrastructure that speeds up digital transformation. This strategy has enabled the Kingdom to cope with public and private sector problems while sustaining commercial, educational, and resident daily life. The Kingdom is among the world's top ten developed countries for its advanced digital foundation. During the epidemic, the Kingdom doubled internet traffic, increased internet speed from 9Mbps to 109Mbps, and completed an internal coverage extension.

4.2. Management Optimization [MO]

Data Governance is a Smart Government Strategy goal specifically to modernize government processes and boost citizen services. To accomplish this, the Smart Government Strategy focuses on defining and implementing Data Governance which helps to enhance the quality and dissemination of government data.

National Data Management strives to design and develop needed frameworks and agreements that control data management operations, ensuring data is stored according to best standards, and establish and facilitate data sharing across government entities.

Additionally, the Once-Only Principle is an integral component of the Saudi Arabian strategic objective. Customer satisfaction rose as a consequence of enhanced Smart Government Services. The goal is to ensure that citizens trust all services and that their data is securely managed through a single typical identity service by increasing the security and usability of digital services and enriching/automating these services by connecting the information provided by citizens via this standard digital identity across Government, mandating residents to input their information once and only.

4.3. Online Service [OS]

Digital identity has become a vital element of eGovernment in Saudi Arabia. All Saudi citizens and residents have the right to create a Digital Identity by registering with the National Information Center and the Ministry of Interior's National Single Sign-On system. They may use their digital ID to access

over 700 online government services via my.gov.sa, other government websites, and third-party providers like banks and telecommunications companies.

The Smart Government Strategy contains a specific acknowledgment in the Strategic objective. By increasing the security and usability of digital services and enriching these services with the information provided by citizens through this standard digital identity, the goal is to ensure that citizens trust all government services and that their data is securely managed through a single typical identity service.

4.4. National Portal [NPR]

The Kingdom of Saudi Arabia ranks 15th with a high score of 7.704, which denotes great efforts that the government has put into creating the country's national portals. A few appealing of them are as follows:

- Najiz Portal is a consolidated platform through which the Ministry of Justice distributes all its services to boost customer satisfaction.
- The 'Balady' Portal provides interactive services that promote the idea of 'community engagement' by allowing the improvement of the quality of services supplied to beneficiaries and the submission of electronic applications for the granting of commonly used licenses. Additionally, it supports beneficiaries in making essential decisions that raise customer satisfaction with municipal entities and enhance the quality of municipal services supplied to all secretariats and municipalities across the Kingdom.
- The "FORAS" Municipal Investment Portal is a centralized platform for publishing investment opportunities offered by secretariats and municipalities to enhance and develop investment services, ensuring the quality of service provided to investors and expediting relevant procedures.
- The 'iEN' National Education Portal provides a suite of e-learning services for public education, coupled with interactive content, to increase educational performance and student effectiveness.

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. Users can adopt shared national services and applications provided by the Yesser Program, with the objectives of advancing and strengthening Saudi Arabia's digital transformation.

4.6. E-Government Promotion [EPRO]

In line with Council Resolution No. (418) dated 25/7/1442 AH, the Council of Ministers announced the formation of the Digital Government Authority. Its objective is to regulate the activity of digital government inside government agencies to achieve a digital and proactive government capable of delivering highly efficient digital services and attaining digital government integration across all government agencies. Without limitation to the applicable authorities' capabilities, the administration implements various competencies and responsibilities as follows:

- Endorsing the Authority's policies, as well as the activities and strategies necessary to take them out, and reducing the restrictions for the completion of processes
- Establishing draft rules applicable to the authority's competence
- Responding to the development of the national strategy for digital government
- Collaborating with competent authorities to govern the work of digital government, platforms, websites, digital public services, blockchains, and the standard national portal
- Generating measures, indicators, platforms, and assessments
- Evaluating the effectiveness and capacities of government agencies in digital government and the satisfaction levels among participants.

4.7. E-Participation [EPAR]

Saudi Arabia has made every effort to ensure digital inclusion for all citizens and residents, especially for vulnerable groups such as disabled people, women, youth, the elderly, and immigrants. Digital inclusion and leaving no one behind are two of Saudi Vision 2030's primary objectives. Additionally, the National Transformation Program outlines various targets directly relevant to the digital inclusion of all people, especially disadvantaged groups.

On the other hand, the ICT Sector Strategy highlights increasing female participation in the ICT sector. The country's projects of Open Data and Participatory Citizenship. E-Engagement also assists in meeting the country's expectations towards E-participations. The Open Data project's objective is to increase the availability and use of open data by people and businesses for community activities, research, innovation, and the production of new products and services.

Meanwhile, the Participatory Citizenship E-Engagement expands on existing survey and polling capabilities in Watani and Ma3an, to implement and promote e-consultation capabilities throughout government to increase engagement in policymaking and service improvement.

4.8. Open Government Data [OGD]

One of the objectives of the Smart Government Strategy is to establish national data governance. The Strategic Objective of Improved Decision Making by the Use of Smart Technologies, in particular, seeks to maximize the value of the data held by the government, reform how the government functions, and improve the quality of services. To achieve this, the Smart Government Strategy places a high priority on constructing an insights framework and central team and the adoption of Data Governance to upgrade the effectiveness and data exchange across the entire government organization.

As part of the strategy, one initiative focuses on implementing the strategic objective of constructing and empowering frameworks and commitments that will standardize the approach to information management practices. It helps to guarantee that data is maintained under sustainable approaches.

4.9. Cyber Security [CYB]

The Saudi Ministry of Education and the National Cybersecurity Authority agreed in March 2021 to collaborate on cybersecurity training and research. This is important for contributing to cybersecurity

initiatives and attaining the 2030 Strategy's objectives. The Ministry of Education and the NCA actively work closely on many programs to improve online research and higher education.

After the last cyber-attack on Saudi Aramco, Saudi Arabia took many efforts to reduce the frequency of cyberattacks. The government desires to invest more in cybersecurity infrastructure. They established the National Centre for Cybersecurity Technology in 2014 to research network, software, and information security. The Centre's study helps the country prepare for the implementation of "Vision 2030." To focus on domestic security, Saudi Arabia only engages with a restricted number of organizations.

4.10. The use of Emerging ICT [EMG]

The Kingdom of Saudi Arabia was ranked 41st in the Waseda rankings 2021 in terms of emerging ICT utilization. With the comprehensive integration of various technologies such as artificial intelligence (AI), the internet of things (IoT), blockchain, big data, robots, machine learning, and 5G in both the public and private sectors, Saudi Arabia is on pace to become the global leader in the digital economy.

Saudi Arabia was one of the first countries to experiment with blockchain technology, enabling foreign businesses to explore innovative digital solutions. The Kingdom of Saudi Arabia intends to be a world leader in using Artificial Intelligence for developmental purposes. The Kingdom has successfully established mechanisms to take more efforts, enacted the National Strategy for Data and Artificial Intelligence, which contains several guidelines, and started or supported several programs to achieve the country's strategic goals.

In public sectors as the education, energy, environmental management, health care, open data, smart cities, and smart manufacturing industries, some of the Country's organizations have achieved achievements through the implementation of Internet of Things solutions, and it is expected that these industries will grow and develop in the coming years. Higher efficiency, safety, and security, optimal resource management, precise analysis, cost management, and increased customer satisfaction are indeed a few of the critical benefits that IoT has brought back to many organizations of the country.

Singapore

1. General Information

Area: 710 km²

Population: 5,906,401

Government Type: Unitary Dominant-Party Parliamentary Constitutional Republic

GDP:\$ 64,100

Internet Users: 75.88

Wired (Fixed Broadband Users): 25.94

Wireless Broadband Users: 144.05

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Since 2011, Singapore's government plans have culminated in the eGov 2015 (2011–2015), the fourth iteration of the master plans that seek to be a collaborative government that promotes increased engagement between government, the public, and businesses to co-create more excellent value for the country. The government has shifted from a "Government-to-You" to a "Government-with-You" approach to e-services delivery. This year, Singapore ranked second in the Waseda International digital government rankings with a total score of 94.0520, just after Denmark.

To provide the foundation for the country's Smart Nation, Singapore's government has steadily increased its digital infrastructure and technological expertise. They are offering a set of digital tools to aid in distributing the most up-to-date, accurate, and timely information to Singaporeans, as well

as supporting partner agencies in handling the pandemic more efficiently. Employees could work remotely throughout the outbreak, as could the government remotely interact with citizens. The cloud-based omnichannel communication system "postman.gov.sg" has been used in the delivery of bulk mailings in Singapore by government entities, for example. 1.3 million emails have been sent using the tool as of November 2020.

The pandemic has necessitated the creation of several platforms and channels. Virtual assistant "Ask Jamie" was created by GovTech to answer inquiries about certain government websites. In addition to answering COVID-19-related questions, the chatbot has been updated to integrate machine learning to improve response accuracy and data analytics to discover emerging topics from February 1, 2020. In addition to Gov.sg and the Ministry of Health websites, citizens can now communicate with the chatbot through Facebook Messenger and Telegram. FluGoWhere can help patients quickly and easily locate Public Health Preparedness Clinics that provide particular financial assistance for patients with respiratory illnesses. The Ministry of Health (MOH) and the Public Health Preparedness Clinics partnered to build the website.

3.2. New Trends

Government Technology's Smart Nation strategy has assisted in the transformation of the Chief Information Officer (CIO) office to support better the development and deployment of new technologies, as well as the promotion of TechStartups, the training of high-tech workers, and the transformation of the industrial sector (by IMDA). Singapore's Infocomm Development Authority, which incorporates GovTech and IMDA, is presently under construction (IDA).

Firms need to respond quickly to the pandemic crisis to survive in this new environment. For a business to succeed, it must take action in three critical areas.

- Launch new approaches regarding inspiring leadership, building trust, and advocating for more flexible work arrangements, emphasizing workers' mental health and well-being, as well as their ability to develop skills and abilities.
- Enhance the intelligence of systems by using artificial intelligence, automation, and other exponential technologies.
- Prioritize hybrid cloud utilization as well as the coordination of different corporate processes to increase operational adaptability.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Singapore is positioned 36th in the Waseda rankings 2021 in network infrastructure preparedness, with a score of 6.727. In January 2021, the total number of Internet users reached 5.29 million, a 2.8 percent raise over the previous year. At the beginning of 2021, the proportion of the population with access to the Internet stayed stable at 90 percent. Social media was used by 4.96 million individuals or 84.4

percent of the overall population. At the time, mobile phone connections constituted 145.5 percent of the general population.

Singapore has begun integrating 5G services, which have enhanced the quality of connectivity in various public places. S\$30 million was funded for 5G adoption and installation.

4.2. Management Optimization [MO]

This year, Singapore was in the top 5 scores for Management Optimization. Singapore faces a significant danger of falling behind in developing fields such as e-payments and digital identity systems. Consequently, the Government is taking a more integrated strategy to build infrastructure development and foster wider use of digital and innovative technologies across the economy and society. As a quick response to the COVID-19, the Government prioritizes a few national strategic initiatives which are: “National digital identity framework,” “e-Payments,” “Smart nation sensor platform,” “Smart urban mobility,” and “Moments of life”.

- “National digital identity framework” enables people and companies to conduct digital transactions in a convenient way, whereas the “e-Payments” initiative allows everyone to make easy, convenient, but still safe payments;
- “Smart nation sensor platform” was created to speed the deployment of sensors and other devices, enhancing data security.
- Smart Urban Mobility aims at leveraging data and digital technologies to foster public transportation further.

These projects help minimize the need for individuals to interact with different government entities, resulting in a smoother and more comfortable experience in public services.

4.3. Online Service [OS]

In Singapore, the National Digital Identity (NDI) has been fundamental in encouraging people to verify their identity digitally and securely associate with the public and commercial sectors. The users can input their personal information ranging from marriage registration to bank account opening. This core technology can facilitate digital transactions such as paying taxes, making payments, and engaging digitally with various government institutions.

The Monetary Authority of Singapore (MAS) creates policies, strategies, and infrastructure and works with businesses to ensure a secure and competitive payments environment. By making e-payments easy to use and accessible to everyone, MAS seeks to develop an inclusive e-payments society.

Qoo10 has long been an essential website for many Singaporeans going shopping. It offers daily and home necessities, equipment, and cosmetics. Since Singapore is well known to be a hotspot for shopping, this service promises to be the world's largest online marketplace, giving a rapid and secure purchase experience.

4.4. National Portal [NPR]

Singapore's National Portal (<http://www.gov.sg/>) keeps locals and visitors engaged to news and necessary information ranging from Finance, Education, Immigration, to Taxes and public Health)

The site also provides vital Singapore economic data, digital public services, and national goals, reducing the locals' distance. There's also contact information for government departments, ministerial addresses, news releases, and public policy. In terms of the National Portal, Singapore only ranks 19th with a score of 7.407.

4.5. Government CIO [GCIO]

Singapore's GCIO indicator stood at the top of the Waseda rankings, which shared identical scores as the USA and Japan. The Government Technology Agency of Singapore (GovTech) was founded on 1 October 2016 when the Infocomm Development Authority was reorganized. Its purpose is to empower a country of possibilities via ICT and associated engineering. As part of GovTech, a Government Chief Information Officer (GCIO) is developing and overseeing ICT projects to retain Singapore's leading position as innovative use of ICT to delight consumers and connect people. Moreover, Singapore led all other countries in terms of GCIO with the maximum score.

The Government Technology Agency and Deputy Chief Executive Office manage Cluster Development and GCIO tasks. The Cluster Development Group develops a comprehensive and robust service delivery structure and operational model for CIO services within government agencies. The GCIO promotes the entire-country ICT initiatives to maintain Singapore's leadership position as innovative use of ICT to provide guidance, training, and engagement with and engage other people.

4.6. E-Government Promotion [EPRO]

Integration requires a single data repository and self-service platform across several digital platforms. The Digital Government Blueprint will emphasize data standards and data architecture. In addition, the Singapore Government Technology Stack (SGTS) provides the backbone infrastructure upon which all government agencies construct digital services. The SGTS's initial application was MyInfo, an e-citizen service.

Enterprises will be allowed to use digital platforms like MyInfo. To connect their services to the government-verified central database of citizen information, the MyInfo Developer & Partner portal was launched in November 2017. While data sharing has many advantages, it must be controlled to ensure that only authorized parties can access sensitive data. Consequently, the Public Sector Governance Act was codified to ensure responsible data sharing.

Individuals are the weak link in cybersecurity, but they also drive projects like digital governance and the Smart Nation. For this purpose, the government wants to build a Center of Excellence for ICT and Smart Systems. Having an internal staff of technologists will enable government bodies to move quickly and strategically to exploit digital opportunities. Over the next five years, the government plans to train 20,000 public officials in data science.

The Government Technology Agency of Singapore, the Infocommunications Media Development Authority, and the Singapore Cybersecurity Agency launched a Smart Nation Scholarship in March 2018.

4.7. E-Participation [EPAR]

Singaporeans are used to connecting with the government online and participating in public affairs via various government-provided platforms. Reach (www.reach.gov.sg) is a platform for individuals to share their opinions on public policy and affairs via online forums, events, and public consultations. The public sector's usage of ICT reflects deliberative democracy. Another portal (www.suggestions.citizen.sg) also allows the government to gather feedback and ideas from citizens. All the efficiency and effort raised in E-Participation helped Singapore place second in the Waseda rankings in 2021.

4.8. Open Government Data [OGD]

The Government Data Strategy (GDS) was launched in June 2018 to address GDA deficiencies. It aims to restructure the public sector around an IDMF (IDMF). Each of the five stages of the IDMF lifecycle is described in detail below. It also describes the horizontal enablers required for data management. By 2023, a Government Data Office (GDO) will be established (GDO).

To adapt digitally, the Singapore Public Service has undertaken significant structural modifications. The GDO is currently developing a manual to assist agencies in developing and implementing data strategies as part of their digital transformation efforts. It is also developing a new competence framework for Chief Data Officers (CDOs), which would require their agency to undertake data transformation operations. DSAID has created a data science competence framework to promote coordinated training for public authorities. Our national data strategy is being expanded to include digital technologies such as artificial intelligence (AI) to increase the value of our data assets.

4.9. Cyber Security [CYB]

Singapore's cyber security was ranked second in the Waseda rankings 2021 with the same score of 10.000 as Denmark, Canada, Switzerland, and Austria. Prime Minister Lee Hsien Loong has declared that the Cybersecurity Strategy 2021 seeks to protect cyberspace, simplify cybersecurity for users, and encourage the strategy's norms and standards. Singapore's new approach is centered on establishing resilient critical information infrastructures.

In 2016, Singapore announced its first cybersecurity strategy. The rationale for releasing a new approach is the emergence of disruptive technologies and a shift away from perimeter-based security toward a zero trust model, convergence of IT and OT, an increased attack surface in the aftermath of the pandemic, followed by a shift toward remote work, and increased geopolitical tensions.

4.10. The use of Emerging ICT [EMG]

Coming in second rank with 7.000 points, only after the US, Singapore's government has intended to establish five critical platforms to achieve the Digital Government Blueprint (DGB) outcomes as follows:

- The Singapore Government Technology Stack (SGTS) technology enables public authorities to develop and implement digital services more efficiently and reliably. With expanded

utilization of Commercial cloud and cloud-native services, leaders have more chances to focus on improving existing digital products for citizens and businesses;

- The National Digital Identity (NDI) is a digital certification that allows users to transfer money with the government and private sector using a single trusted digital identity. By the third quarter of the fiscal year 2019, the government planned to launch "SG-Verify," a facility that supports conducting secure identity verification and data transfer through QR scanning.
- The Smart Nation Sensor Platform (SNSP) is a worldwide sensor platform that enables public agencies to improve situational awareness and provide residents with more proactive services through data analysis.
- Moments of Life (MOL) combines various public services to deliver them to a person at a certain point in life. MOL was offered for the first time in June 2018 for families with young children under six. By the third quarter of 2019, Moments of Life was extended to include additional programs such as helping elders.
- The Adaptive Digital Workplace (ADWP) ADWP is a digital platform that enables officials to operate efficiently and interact more effectively with others.

South Africa

1. General Information

Area: 1,221,037 km²

Population: 60,189,712

Government Type: Unitary Dominant-Party Parliamentary Republic with an Executive Presidency

GDP:\$ 5,440

Internet Users: 68.20

Wired (Fixed Broadband Users): 2.20

Wireless Broadband Users: 110.65

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Development is seen in the South African government's use of information and communication technology (ICT) to provide essential services to its citizens. The country was ranked 37th in the Waseda International digital government rankings in 2021, with an overall score of 71.1474. The government has established an eGovernment or D-Government policy framework that recommends using ICT to boost government efficiency, effectiveness, and convenience and make government services more accessible for people.

The open, global system meant the COVID-19 pandemic and its consequences (and solutions) were distributed across complex, sovereign nations, economies, crisscrossing borders and communities. In a global network of sovereign countries and regions, responses to COVID-19 are driven by national

interests. Using a chatbot on WhatsApp, South Africa's government is responding to questions about Covid-19. The African Union has set up a Covid-19 pass system to expedite the passport verification procedure for travelers carrying public health documents.

The government has established an e-Government or D-Government policy framework that promotes ICT to boost government efficiency and effectiveness and make government services more accessible for people to use, recognizing the essential role of ICT. To achieve critical e-government objectives, Gauteng's provincial administration is leading the charge. By creating the Department of e-Government, Gauteng 315 hoped to improve communication amongst the province's departments. When South Africa's digital economy is booming, this province's government plans to keep investing in ICT infrastructure to position it as a hub for State Security Agency-related research and development (SSA).

3.2. New Trends

The South African National Development Plan (NDP) 2030 aims to eliminate poverty and reduce income disparity. According to the plan, South Africa can accomplish these goals by using its resources, increasing inclusivity in the economy, building human capital, enhancing state capabilities, and encouraging cross-sectoral collaboration and leadership.

The NDP is connected to departmental long-term plans to ensure policy consistence and coherence, and policy modifications are recognized in those areas. A crucial part of achieving transformation is ensuring that public services are of the highest quality possible. There is a pressing need to identify and overcome the obstacles that prevent improved outcomes, especially in strengthening the local government's ability as a development tool.

The digital skills of their whole workforce and their digital leadership must be improved and enhanced if a company wishes to stay competitive, expand its business, and please its customers in the digital age. In light of the COVID-19 outbreak, which has ushered the globe into a period of "new normal," the need for digital transformation and the adoption of new working methods is much more critical than ever.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

South Africa ranked 51st in Network Infrastructure Preparedness, with 5.680 points. There were 38.19 million internet users in South Africa in January 2021, an increase of 4.5 percent from the previous year. January 2021 saw South Africa's internet penetration rate reach a level of 64 percent. In January 2021, 41.9 percent of South Africa's population was on social media. At the same time, 100.6 million mobile connections were counted, representing 168.5 percent of the people.

Investment in the digital government of South Africa has taken an enormous step forward. A further 5G spectrum auction was scheduled for December 2020; Telkom's fiber-optic network served nearly three million homes and businesses; and MTN South Africa reintroduced m-money services, among other things. Until October 2020, Comsol conducted 5G fixed-wireless trials on the 28MHz spectrum.

4.2. Management Optimization [MO]

Digital technology is being more widely used by governments worldwide, and the emphasis shifts from e-Governance to digital government. Technology's key role in building an open, innovative, interactive, and reliable public sector needs an upgrading of the regulatory framework. A "whole-of-government" strategy to address the cross-cutting role of technology in the planning and implementation of public policies and customer service objectives is suitable since the public interacts with all three domains of government

South Africa has set a range of 7 goals toward country digitalization, which are:

- Optimize government business operation
- Optimize and transform government services
- Effective and sustainable industry transformation
- Customer centricity
- Build digital Culture
- Effective governance and monitoring
- Financial Sustainability

4.3. Online Service [OS]

There are five subdimensions to the Online Service score: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Citizen Service. Complexity, safety, and simplicity of use were addressed while evaluating each of these services.

Some of the eProcurement and eTax portals have performance issues that might result in considerably delayed access times. There is some difference between eHealth's average speed and that of the research. SSL, Site Authentication, and Password Protection are now standard security measures for most online services.

With the SARS MobiApp and EFT, customers may transfer money in the most modern and secure manner possible. With the bank's average drop-down list of pre-loaded beneficiary IDs, payments may be made through online banking capabilities. The name convention "SARS-" is prefixed to all SARS beneficiary IDs. SARS must identify your payment and accurately allocate it to your account if you make an online payment. If the reference is inaccurate, users are unable to make a payment. The following banks support this approach: ABSA, AlBaraka, Access Bank, Capitec, FNB, HSBC, Investec, JP Morgan, Mercantile Bank, Nedbank, and Standard.

South Africa's advancement and efficiency in terms of Online Services elevated it to the 44th position, with a score of 9.900.

4.4. National Portal [NPR]

Government services of South Africa are now available online, lowering the cost of access, simplifying administrative processes, improving turnaround times, and boosting accountability and responsiveness through the national portal eservices.gov.za.

Content, technology, and functionality all play a role in the National Portal's score. Data about population, national programs, government structure, government agencies, legal documents, and current news about the government are all included in this comprehensive collection of materials. However, there is no other language option apart from English for accessing this data. The website works well on desktop computers but has minor layout issues on mobile devices. It was discovered that the portal's loading speed might be affected by several technical concerns.

4.5. Government CIO [GCIO]

There has been limited development in South Africa's Government CIO (GCIO). In 2002, the Council of Government IT Officers (GITO) in South Africa authorized the Chief Information Officer (CIO) position. As a government IT coordinator, GITO serves as the link between the various government agencies. The council acts as a platform for both the people and the government to ensure that the government is knowledgeable of citizens' interests. Nevertheless, South Africa's GCIO indicator still placed 20th Waseda rankings in 2021 with 6.818 points.

4.6. E-Government Promotion [EPRO]

Strategy development and coordination for Digital Government are managed by a department responsible for public service administration (DPSA). State Information Technology Agency (SITA) and Government Information Technology Officers Council were established by the South African government to monitor and implement D-Government activities (GITOC).

In South Africa, public-private partnerships have long been encouraged to accelerate the country's ICT development. Initiatives to improve a wide range of ICT infrastructure, from data centers to services to inhabitants, are common.

The objective of the South African government is to provide everyone in the country with access to high-speed broadband Internet at an affordable price. The first stage of a three-year broadband network project was launched to help the government achieve this aim. A total of 5803 government-run institutions spread across seven provinces were included in the first phase. These committees are comprised of officials from the province's departments of Education, Public Health, Cooperative Governance, and Traditional Affairs and representatives from higher education, safety, and security liaisons in each of the eight district towns.

4.7. E-Participation [EPAR]

In conjunction with provincial and local governments, the Office of Provincial and Local Liaison has provided development communication and contributed to developing the government's information infrastructure. This organization will coordinate the Thusong Service Center (TSC) project, a one-stop-shop for government services and information in Thusong. It is anticipated that government services would become more accessible to the general population.

4.8. Open Government Data [OGD]

South Africa previously submitted three National Action Plans to the Open Government Data (OGP)'s Head Office. The Department of Public Service and Administration (DPSA) helped civil society and the OGP by facilitating their work and holding the 2020 multi-stakeholder consultation session, which was essential in moving the OGP ahead.

With limited staff and financial resources, DPSA has made sure that South Africa's responsibilities to the OGP are met despite its little effort. Despite the program's limited capacity, South Africa has been a consistent advocate for good governance and core democratic ideals throughout the African continent. Three pledges were developed with help from the OGP national office, and DPSA handled the creation of the fourth NAP to ensure that South Africa complied with its promises.

4.9. Cyber Security [CYB]

According to a recent study conducted by cybersecurity company Varonis, over three-quarters of all South African businesses have been victims of cyber threats. Since the COVID-19 outbreak began, spam frauds have increased about 600 percent. Several methods have been offered to reduce the danger of cybersecurity risks, such as restricting access to just those who need it, implementing observability tools for continuous monitoring, frequent data backups, and careful remote access monitoring.

In recent years, the significance of cyber-security has risen dramatically. Businesses, organizations, and governments will need to commit more time and resources. Containing this danger becomes more critical as the globe becomes more electronically linked.

4.10. The use of Emerging ICT [EMG]

People's lives can be better protected or improved by a focused government Internet of Things (IoT) strategy that utilizes sensors, detectors, scanners, and monitoring technologies to gather relevant information. To increase many aspects of government analysis, planning, and execution of action plans for improving citizen service delivery, the gathering and processing information approach requires the simplicity and real-time processing of government data. The level of citizen service delivery experience is a significant indicator for measuring the success of digital government transformation, considering consumer privacy and data security. To construct a more integrated government service delivery environment for citizens, current government policies prevent information interchange.

South Korea

1. General Information

Area: 100,210 km²

Population: 51,314,092

Government Type: Unitary Presidential Constitutional Republic

GDP:\$ 34,870

Internet Users: 96.51

Wired (Fixed Broadband Users): 43.55

Wireless Broadband Users: 116.90

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

The initial wave of COVID-19 was effectively controlled in South Korea because of the country's successful use of digital technology. Public health measures, remote education, remote labor, and a digital government system in contact tracking and open data management are some of Korea's numerous digital countermeasures to the epidemic. As a result, South Korea came in 8th in the Waseda International digital government rankings 2021, with an overall score of 88.0366. Digital technology played a critical role in the spread of virus-related information during the epidemic. By using location data from mobile phones and cars as well as security camera footage and credit card records during COVID-19, the South Korean government was able to release the detailed trajectory of patients, which includes patients' recent movements and where they stayed, as well as the timelines of their

movements and whether they were wearing masks. The daily publication of new cases turned digital as new instances expanded fast and throughout the nation.

In addition to websites and applications, timelines of those who tested positive were created. Those confined at home for mild symptoms were required by the authorities to download a smartphone application that tracks their symptoms and health conditions. Also transmitted via mobile apps were precautionary information, such as the location of national testing centers and approved mask makers. When it comes to sharing public announcements through mobile apps, the bulk of these tools were created in conjunction with Korean IT and communications businesses and the government of Korea. South Korea is one of the nations planning for the digital transformation of many social sectors due to the pandemic's social-distancing effect. On April 30th, South Korea began a new initiative leveraging artificial intelligence, software programs, networks, and digital gadgets to promote 'untact business.' An internet-dependent society is what this epidemic has shown us to look like. Examples are restaurants offering contactless ordering and delivery, job interviews, and cultural performances conducted entirely online. For many, telecommuting and online education became the norm.

3.2. New Trends

Through innovation and competitiveness in the sector and deeper integration of data, networks, and artificial intelligence into all aspects of economic life in the country, South Korea's Digital New Deal intends to speed up the transition to a digital economy as a recovery after the pandemic period. "The blueprint for the next 100 years" is the goal of Korea's New Deal, a three-pillared structure consisting of Digital New Deal, Green New Deal, and Stronger Safety Net. Examples include 5G and AI-powered brilliant museums, innovative residences, and digital health care and education systems. In addition, the government plans to use CCTVs and the Internet of Things (IoT) to remotely operate ports, reservoirs, and dams through an intelligent transportation system.

Concerning South Korea's future, the Green New Deal aims to reduce dependence on fossil fuels and increase renewable energy output by 20-30% by 2030. Under this strategy, the government seeks to make public buildings, including schools, hospitals, and daycare centers, more energy-efficient and environmentally friendly. In addition, the South Korean government intends to switch from central generation to dispersed generation to reduce the country's carbon footprint. Renewable energy infrastructure like wind and solar power will be set up to allow communities and buildings to produce their own power. Users will be able to share and trade electricity with one another and disperse it over several dispersed power systems, thanks to the advent of intelligent grids. For its part, the South Korean government has taken a hands-on approach to support the development of a hydrogen-based economy, with a primary emphasis on vehicle development and the creation of three hydrogen-powered cities by 2022.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

With a fantastic score of 8.002, South Korea came in fourth place for Network Infrastructure Preparedness. From 2020 to 2021, the number of internet users in South Korea increased by 539 thousand, reaching 49.75 million. In January 2021, 97% of South Koreans had access to the internet. Social media use in South Korea reached 89.3 percent of the country's population in January 2021, with 45.79 million individuals using the service. South Korea had 60.67 million mobile phone subscribers at the same time. In January 2021, South Korea had 118.3% of its population connected to the internet through a mobile device.

South Korea has made significant strides in setting up a foundation for a digital future. SK Telecom has carried out public road testing of autonomous cars; MNOs have been penalized KRW51.2 billion for 5G handset subsidy breaches; Huawei and LG U+ have collaborated to construct Seoul TechCity; the number of 5G customers is hitting eight million.

4.2. Management Optimization [MO]

The Korean government is constantly improving its digital government strategy to anticipate and satisfy the needs of its citizens. This approach was developed in response to the COVID-19 pandemic in Korea, which created a more robust and responsive digital government. The Ministry of the Interior and Safety continues to drive the domestic digital transformation and work with partner countries to build a better global digital society.

Through Government 3.0, the South Korean government aims to provide specialized public services and create new jobs. The new paradigm seeks to transform government into a more service-oriented, competent, and transparent organization to achieve these objectives. As a result of the On-nara BPS, the administration's efficiency and transparency have been boosted since all government business processes are processed, documented, and administered online in a standardized way. The data center is also responsible for managing the information systems of all government agencies that are not under the direct supervision of a single agency. More than 1200 systems from 43 federal agencies are linked to the Government Integrated Data Center (GIDC).

4.3. Online Service [OS]

South Korea's online service indicator was ranked second in Waseda rankings in 2021. The Korean retail market's growth is being driven by e-commerce. Conventional retail networks are struggling as e-commerce continues to expand at an extraordinary pace. Consumers often visit stores for comparison shopping, but they often turn to online retail sites to purchase the items. Connectivity with other platforms is a breakthrough in online purchasing. Consumers seek a one-stop shopping experience that includes product assessments and price, purchasing, and payment through new online payment alternatives connected to the platforms.

According to a Bank of Korea survey, personal computers (PCs) and mobile platforms are the most often utilized payment methods for customers. As online purchasing continues to grow, electronic payment alternatives through PC and smartphones are becoming more popular. Payment Gateway (PG) services based on credit cards were used by an average of 16 million people per day in 2020,

and the total amount of payments was \$628 billion. As mobile payment and digital wallet systems like Samsung Pay and Naver Pay continue to rise in popularity, many people are using them.

Personal computers have been losing market share to mobile devices in every online advertising channel (PCs). More than two-thirds of the market in 2020 went mobile. Parents may also be updated to their children's location information with the use of a smartphone app.

4.4. National Portal [NPR]

Current events, the government, the economy, the arts and culture, history, and society may all be found at www.korea.net, the Korean government's official website. Links to official and private English-language websites regarding Korea can be found in the Directory section.

4.5. Government CIO [GCIO]

Government e-governance is now overseen by the Ministry of Security and Public Administration. There is a chief information officer (CIO) for every government agency. National and bureau level appointments for CIOs are outlined in the Presidential Directive and the Fundamental Law on National Informatization. A Chief Information Officer is required under Presidential Directive No.157 for every ministry and federal organization.

Planned ICT projects, budget distribution, and e-Government rule updates are essential duties of the chief information officer. Extensive awareness of current agency operations, comprehensive viewpoint and professional competence in information technology, and strong willingness to implement new administration using information technology are all requirements for this position.

4.6. E-Government Promotion [EPRO]

A digital government innovation can open the door to a brighter future for all people. The Korean government has constantly been improving its digital government strategy to anticipate and satisfy the needs of its citizens. This approach was developed in response to the COVID-19 pandemic in Korea, which created more robust and responsive digital governments. While working with partner countries, the Ministry of Interior and Safety (MOIS) will continue to spearhead the country's internal digital transformation.

South Korean government has always set Goals, Objectives, and Priorities for their digitalization approach, which are:

- To better serve the needs of the people, non-contact government services will be expanded and reengineered to provide people with more secure and seamless services.
- Delivering government services in new and innovative ways
- Natural language user interfaces may be used to integrate and customize service delivery. People's data sovereignty should be protected, but new services should be developed in their place.
- Advancing a data-driven approach to government administration

- Promoting an inclusive and collaborative digital environment; enhancing the digital economy via collaboration between the public and private sectors
- Improving the dependability and responsiveness of the government's digital infrastructure

4.7. E-Participation [EPAR]

According to the Ministry of Science and ICT, around 90 percent of the country's population went online in 2020. For the first time in the country's history, commercial 5G network services were made available in April 2019. According to the Speedtest Global Index, April 2020, Korea was top in terms of mobile connection speed. As of January 2021, South Korea has had 12.87 million users in the 5G sector due to active advertising by local mobile carriers and government push to construct 5G infrastructure.

4.8. Open Government Data [OGD]

It has always been a critical priority for the Republic of Korea's government to protect and execute open government ideas and values to promote transparency, engage citizens, fight corruption, and strengthen governance via modern technologies. Since joining the Open Government Partnership (OGP), the Korean government has produced and implemented four National Action Plans (NAPs), proving its commitment to open government and democracy. With all of the progress made, South Korea came in sixth place in the Waseda rankings 2021 regarding Open Government Data.

Following several events following the fourth NAP and in light of the lessons learned and evaluations made throughout the preparation and implementation of the four previous NAPs, the fifth NAP for the period 2021-2023 was produced. Co-chair of the OGP, South Korea's fifth national action plan, aims to include the three OGP co-chair objectives of strengthening civic space and public participation, combatting corruption, and supporting inclusive digital innovation into one. The Open Government Forum Korea served as a focal point for the planning process, which enhanced collaboration between the government and civil society and involved a broad spectrum of stakeholders (OGFK). To comply with the OGP's Articles of Governance, which call for a consultative council made up of government and civil society groups, the public-civil board was founded in 2017. It is made up of seven government agencies and 11 civic groups from all around the country. Its goal is to spread the word about the virtues of open government, such as accountability, openness, and democracy.

4.9. Cyber Security [CYB]

The framework for cybersecurity, including the Information and Communication Infrastructure Protection Act, has been in place since 2011, when the National Cyber Security Master Plan was established. Additionally, it provides a robust legislative basis for cybersecurity in Korea.

The Korean government considers both KrCERT/CC and KN-CERT to be computer emergency response teams. The Korea Internet and Security Agency is responsible for network and information security. Additionally, the National Cyber Security Center (NCSC) acts as the government's focal

point for detecting, preventing, and responding to cyberattacks and threats inside Korea. South Korea's National Cyber Security Center (NCSC), working with the private sector and the military, improves security incident warning and response times and protects Korea's critical national infrastructure. The Korea Information Security Agency must educate customers about ethical Internet use via online training and broadcasting.

4.10. The use of Emerging ICT [EMG]

South Korea aims to dominate the global Artificial Intelligence (AI) technology sector. Officials in Korea say AI is an essential part of the country's ICT skills, and they want to make Korea an AI powerhouse. To attain this aim, the government released its first national AI policy in 2019. The federal government's Digital New Deal includes industrial and educational activities, and the federal government has requested about \$2 billion for AI-related initiatives in fiscal 2021. As a consequence, 10 South Korean institutions will be accredited as AI Engineering schools by 2021. The growth of AI startups and enterprises is viewed as critical to the US AI ecosystem. Several government entities have developed AI-focused startup incubation programs to help South Korean AI startups.

Despite South Korea's technical supremacy in memory chips, microprocessors and sensors must be enhanced to compete globally. The government has set many national development strategies to improve the country's semiconductor dominance beyond memory chips. In 2019, the government announced new initiatives for system and AI semiconductors. For a 20 percent global market share by 2030, these national strategies stress state-led investments in local fabless enterprises and educational help to create competitive semiconductor specialists.

The rising use of cloud services by Korean businesses and government organizations is predicted to drive the cloud computing industry's growth in Korea. South Korea was one of the first to embrace cloud computing. Cloud computing was a sub-area of the government's Digital New Deal activities, including state-led projects and investments. Amazon Web Services (AWS), Microsoft (Microsoft), and Google dominated the South Korean cloud computing industry. Global firms have also increased their investments in Korea to increase their market share.

Spain

1. General Information

Area: 505,992 km²

Population: 346,742,344

Government Type: Unitary Parliamentary Constitutional Monarchy

GDP: \$ 31,000

Internet Users: 93.21

Wired (Fixed Broadband Users): 33.90

Wireless Broadband Users: 105.29

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

This year, advancing its public sector's digitalization, the nation came in 27th in the Waseda International digital government rankings 2021 with an overall score of 78.7469. Spain has had a troubling epidemic. Together with Italy, the country was harshly struck during the initial stage of the COVID-19 crisis, and on 14 March placed a strict lockdown on its people and economy, which has subsequently been relaxed but not yet abolished. Although the coronavirus has caused chaos, it has also accelerated the pace of digital change. The government has been focused on revitalizing the economy and public services, the central government agency driving the digital agenda across the public and private sectors. And coronavirus has not derailed that agenda: digitization is generally seen as a necessary weapon for combating the present COVID-19 danger, as well as a critical component of efforts to help Spain's economic and social recovery, he argues.

Of course, at the core of the government's attempts to combat coronavirus. Three "milestones" in health digitization are health card interoperability across Spanish regions, digitized medical history, and electronic prescriptions. Spain's need for digital professionals has grown as the country's digital economy plays an increasingly important role. The industry has a wide range of applications. Thus, this conference focused on using technology in health, tourism, security, sustainable transportation, the agri-food sector, and the digitalization of SMEs and the government. Entrepreneurs can empower their creativity by digitizing industrial processes via industry 4.0 and digital innovation. The digital revolution of the sector is being aided by 5G and Blockchain, both offering new chances for growth and helping things go back to normal following Covid-19.

Essential services like power and gas for hospitals, homes, and telecommunications operators and fuel for transportation and logistics were always accessible during a health crisis. As a consequence of the outbreak, energy usage has plummeted, prices have dropped precipitously, activities have been put on hold, and consumer behavior has shifted. As a result, energy companies are stepping up and ensuring that they can accomplish their environmental objectives while also focusing on digitalization as an essential instrument for dealing with the problem.

3.2. New Trends

Covid-19's impact on Spain's recovery is highlighted in Spain's Recovery, Transformation, and Resilience Plan. A wide range of industries may benefit from digitalization. An efficient digital government infrastructure that can answer people's requests more swiftly and effectively has become imperative after COVID-19. As a result, citizens and companies in Spain are expected to provide digital public services of better quality, more inclusive, more efficient, more personalized, and more proactive.

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. This transition must be accepted by all sectors of society and reconciled with constitutional and European objectives and the preservation of individual and group rights, given the concurrent digital and green revolutions occurring throughout Europe.

There should be more focus on service customization and the end-user experience, and the public sector should be encouraged to lead the way in digital innovation. People in Spain will be better served as a result, with policies and attention geared toward their interests. The quality of public policy and citizen attention will be improved since everyone in the country will have equal access to high-quality services provided by digital services and environments.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Spanish network infrastructure preparedness was ranked 13th in the Waseda International digital government rankings 2021, with a rating of 7,570. Spain had 42.54 million internet users as of January 2021, an increase of 0.3 percent from the previous year. Ninety-one percent of Spanish households have access to the internet. At the time, 37.40 million people were using social media or 80% of the population. A 0.6 percent increase in mobile phone subscriptions in Spain brought the total population to 54.34 million, or 116.2 percent of the population.

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. In addition, Orange and Movistar were given one of the two remaining 10MHz blocks of the 3.5GHz band's spectrum. The expected lifespan of spectrum licenses in future auctions is 40 years. Photonics mesh transport networks in Madrid will handle transmission speeds of up to 800Gb/s after Telefónica and Huawei began testing WDM photonics meshes. Satellite internet service provider SpaceX is launching a trial in Spain of its Starlink service. Vodafone and Canalink proposed an undersea cable extension between the Canary Islands and Spain.

4.2. Management Optimization [MO]

Spain's Management Optimization came in 11th in the Waseda rankings 2021 with 11.800 points. From 2021 to 2024, the Spanish General Secretariat for Digital Administration (SGAD) will design a new digital administration and ICT strategy. The strategy will be implemented under the framework, consistent with Agenda 2030 and its Sustainable Development Goals and European efforts like the Digital Europe Programme 2021-2027, the OECD, and Spanish standards. SGA's coordination role in ICT, the enhancement of citizens' services, a consolidated model of data-centric organization, the enhancement of public administration services, a reflection and study on the opportunities presented by emerging technologies, and a digital skills training plan for public employees will be the main focus of the Plan. In addition, the Plan would address the deficiencies found in the eGovernment baseline, such as mobile-friendliness, public involvement, and cross-border mobility and accountability. The Plan would be implemented.

The Spanish government approved an ICT plan for all General State Administration ministries in 2015 as part of the State Administration Digital Transformation Plan (AGE). Several ministries established sectoral action plans to prepare for the upcoming digital revolution in their respective fields of expertise. Composed of top officials from all departments and the Central Administration, the Commission for ICT Strategy was established as an inter-ministerial committee. For this reason, it is in charge of developing and implementing the government's eGovernment and information technology (IT) policies.

4.3. Online Service [OS]

The national eID card allows individuals to sign documents and contracts digitally. About 38 million Spaniards have a DNIe card. Article 9 of Law 39/2015 compels the public administration to recognize identifying systems based on qualifying electronic certificates issued by approved trust service providers. The PCSP (Plataforma de Contratación del Sector Pblco) is the principal source of information on public sector contracts. It provides electronic notice, electronic tendering, and electronic awarding.

As crucial as the PCSP is to the national government, it is also used by many regional and local governments. The public procurement website allows provincial governments to manage their profiles.

4.4. National Portal [NPR]

The eGovernment Portal (PAe) is a comprehensive repository of information on the current status of eGovernment in Spain. In 2019, PAe had more than 1.75 million visits and 33 144 registered users. The General Access Point provides access to the Citizens' folder, which contains all of the administration's information on a person or company. The Observatory for eGovernment serves as a source of information regarding electronic government in public administration.

4.5. Government CIO [GCIO]

Even though the title "GCIO" isn't often used, the Director of Information Technology for the State General Administration performs a similar duty by coordinating the implementation of a national e-government strategy. A CIO training program was listed by at least one educational institution. Further information about CIO regulations could not be discovered at this time, unfortunately.

4.6. E-Government Promotion [EPRO]

Spanish digital transformation processes have been highlighted by the Ministry of Economic Affairs and Digital Transformation. The Secretary of State for Digitalization and Artificial Intelligence and the Secretary of State for Telecommunications and Digital Infrastructures are the two-State Secretariats for technology-related affairs in this Ministry. To promote and regulate the information society, the Secretary of State for Digital Infrastructure and Telecommunications is in charge of the telecommunications sector and audiovisual services. Additionally, it is responsible for coordinating and collaborating with other governmental authorities on this issue and engaging in discourse with the professional, industrial, and academic sectors. Regulation and engagement with international initiatives aiming at certifying and standardizing digital and telecommunications infrastructures are part of the scope of this policy. Ministers appointed the new Secretaries to State on 14 February 2020.

In October 2015, the Spanish government established a plan to support the development of natural language processing and machine translation in Spanish and other co-official languages as part of the country's Digital Agenda. One of the goals is to increase the number, quality, and availability of linguistic infrastructures in Spanish and other official languages in the country. It aims to reinvigorate the language industry by facilitating knowledge transfer between academics and industry and embracing government as a driver of this new sector.

4.7. E-Participation [EPAR]

In Spain, the Ministry of Economic Affairs and Digital Transformation runs the Red SARA intranet, connecting government agencies. A total of 17 autonomous communities, two independent cities, and roughly 4000 local entities are represented by the government.

To access administrative services at all three levels of government, people and businesses may use the 060.es internet portal, the phone hotline, and local offices. To be fully satisfied, users' organizational needs must be met 24 hours a day, seven days a week. The number 060 is intended to take the roughly 600 phone numbers currently available for the general public to contact the federal government.

Spain depends mainly on the Trans European Services for Telematics network for cross-border digital communication between EU agencies, institutions, and the Member States.

4.8. Open Government Data [OGD]

In the Waseda rankings of 2021, Spain's Open Government Data was ranked 11th with 9.750 points. Datos.gob.es maintains the National Catalogue of Open Data, a one-stop-shop for all public administration entities in Spain to open their data to the general public, researchers, and other administrative bodies. In addition, the site provides available information, training tools, and news on open data in the public sector, establishing Spain as a European leader. More than 700,000 people visited datos.gob.es in 2019, which had more than 25 thousand datasets.

4.9. Cyber Security [CYB]

Considering both the effects of digitalization and its fundamental character as a driver of change with consequences for cyber security, the Government of Canada's 2017 National Security Strategy, approved on December 1st, 2017, reinforced cybersecurity's essential and distinct role.

2019 witnessed the release of a new National Cybersecurity Strategy, built on the previous one from 2017. As part of the 2019 strategy, a National Cybersecurity Forum will encourage collaboration between public and private sector organizations. It is the primary goal of the plan for Spain to provide a safe and stable internet experience for its citizens while both are protecting their civil freedoms and promoting the country's economic growth.

Protecting personal data under Organic Law 03/2018 on 5 December 2018 affects individuals, government, and businesses. EU Regulation 2016/679 passed on April 27th by the European Parliament and Council as amended. Regarding digital governance, Title X provided information on the online environment's inherent digital rights and liberties. 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 the context of employment privacy, the protection of minors online, and the digital media freedom of expression and information clarification. Law 39/2015 of 1 October 2015 on the Common Administrative Procedures of Public Administrations was slightly amended by Organic Law 3/2018, enhancing the role of the National Security Framework (ENS) in personal data protection and making the Once-Only principle easier to execute.

4.10. The use of Emerging ICT [EMG]

An AI R&D strategy for Spain was unveiled in March 2019 by the Ministry of Science, Innovation, and Universities. Spanish R&D in AI serves as the basis for a European vision that is crucial for developing the European framework for R&D in AI. As part of the National Artificial Intelligence Strategy, national investments and policies may be coordinated and integrated via this technique. As

a result, governmental and private investment will foster the widespread use of these technologies in society and the economy. Artificial Intelligence (AI) needs a new set of skills in the Spanish education and workforce. Because of this, the government will construct a map of Spain's AI capabilities and establish a network of AI research centers. RDI agents will be able to experiment with new technologies before they are commercialized, and the RDI perspective will be included in the development of an AI Code of Ethics.

According to Spain's 2013-2020 Science, Technology and Innovation Strategic Plan, the State Plan for Scientific and Technical Research and Innovation 2017-2020 includes four state programs that support the broad goals outlined in that plan: promoting talent and employability, creating and enhancing knowledge, and leading corporations in societally relevant R&D and innovation (R&D&I). The General State Administration uses this strategy to design and execute Spain's Science, Technology, and Innovation Strategy 2013-2020 and the European Strategy 2020 aims. R&D&I grants that have been received through competitive procedures are included. 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 strategic plans are included in a single State Plan, including the Connected Industry 4.0 Strategic Action and the Health Strategic Plan.

Sweden

1. General Information

Area: 450,295 km²

Population: 10,172,461

Government Type: Unitary Parliamentary Constitutional Monarchy

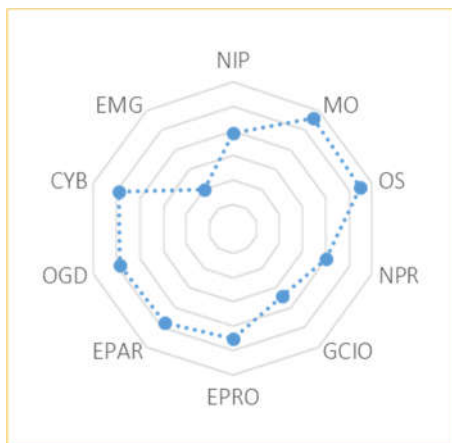
GDP: \$58,980

Internet Users: 94.54

Wired (Fixed Broadband Users): 40.61

Wireless Broadband Users: 129.41

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Digital technology use in Sweden is among the highest in the OECD, with general Internet use and reduced digital disparities by age, education, income, and firm size. Sweden's high-speed Internet is among the best in the OECD regarding availability, quality, and affordability. Sweden's economy is heavily reliant on information and communication technologies (ICTs), and the country is a prominent supplier of ICT services. It has been possible for Swedish businesses to gain a competitive advantage by integrating into global value chains and focusing on high-value-added activities such as product development and marketing. The Internet of Things (IoT) is also a big deal in Sweden.

The pandemic has had wide-ranging effects on people's lives and society, business, and the overall economy. In response to the virus's difficulties, Sweden has established several new research and innovation projects. As a result, Sweden was ranked 12th in the Waseda International digital

government rankings 2021 with a high score of 86.8587. For urgent Covid-19-related research in 2020, the Swedish government has set aside 100 million Swedish Kronor, which was allocated to be used to support current or future efforts to reduce the Covid-19 outbreak. Science solicited research on Covid-19 for Life Laboratories in late March 2020. Antibody testing, a capacity expansion for Covid-19 testing, and the construction of a biobank have been given up to SEK 110 million by the Knut and Alice Wallenberg Foundation.

3.2. New Trends

Although Sweden's economy is recovering from the shock of the COVID-19 crisis, there are still lingering worries. Investing in digital skills and infrastructure is essential to generating jobs and sustaining long-term recovery. A terrible recession was triggered by the pandemic, despite the government's swift response to protect citizens and businesses from the spread of the disease. At some time, when the epidemic diminishes, the government will shift its priority to enhancing vocational training and skills development and expanding investment in sectors like high-speed Internet access and low-carbon transportation. It's essential to keep an eye on regional disparities, which are now modest but rising.

Economic growth and job creation will be aided by education and training investments and labor reforms in compliance with social partners' agreements. Productivity development will also depend on strengthening Sweden's leadership in digital innovation and dissemination. Reaffirming the importance of universities in local economic networks while also improving government-to-government interaction will help achieve this aim.

To fulfill the country's plan by 2025, Sweden must have an active broadband plan to operate effectively in the long term. Because of this, the government wants all broadband providers, especially those serving customers in sparsely populated areas, to maintain and accelerate broadband growth to guarantee that Sweden stays wholly connected. This goal needs both public and private efforts. Continuing this trend of broadband growth is a goal of the government. Market-driven development is at the heart of the new model, which is then backed by government action.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Regarding network infrastructure preparation, Sweden was ranked eighth in the Waseda International digital government rankings in 2021, with a score of 7.838. As of January 2021, there were 9.93 million Internet users in the United States, a growth of 2.7% over 2016. There was 98 percent of people online at that moment. 82.1 percent of the population, or 8.32 million, utilized social media. An additional 14.35 million persons have mobile phone connections, accounting for 141.6 percent of the total population.

A mature mobile and broadband market in Sweden has been boosted by the more significant investment of the leading telecoms in innovation. An LTE infrastructure has been created in the nation,

and its mobile service providers have benefited from the January 2021 auction of spectrum in the 3.5GHz band, which will allow for more excellent service coverage.

As a result, Sweden has one of Europe's highest fiber-optic penetration rates. First and foremost, the goal of FttP is to achieve the government's goal of providing 1Gb/s service to 98 percent of the population by 2025. Regulators supported by public money and spectrum auctions in multiple bands were employed to achieve this goal.

4.2. Management Optimization [MO]

The Swedish government unveiled its digitization plan during a news conference in May 2017. Economic development, full employment, and long-term resilience were all stressed in an integrated strategy to achieve their objectives. The objectives were included in the plan, all of which were aimed at becoming a global leader in capitalizing on the digital transformation: enhancing citizens' digital skills; increasing citizens' trust and confidence in the use of digital services; encouraging digital innovation, and ensuring that digital services are accessible to all.

In December 2012, Sweden's government launched its "Putting the Citizen at the Center" plan to strengthen the capacity of its agencies to work together. The most prevalent digital services have grown more accessible to individuals and enterprises alike. They must be easy to use, safe, and available to everyone. Innovation has been stimulated by making public information and digital services more easily accessible and used by other systems. Since the internet and social media have made public sector information more publicly accessible, transparency and citizen participation have become more straightforward. Government administration has improved in quality and efficiency due to integrated information management, increased data security, and automated processes.

4.3. Online Service [OS]

On October 1, 2005, the Swedish government made the official electronic ID card with biometric data available to the public. To prevent misunderstanding, paper identification cards will not be phased out by the new "national identity card." It is necessary for identification and evidence of nationality, as well as a valid Schengen travel document. Also included is an old-fashioned microchip that might one day be used to access eGovernment services more securely.

In December 2010, a digital procurement system was built by providers that specialize in the various stages of the electronic procurement process to provide e-procurement services. To ensure the quality of the services being delivered, the central e-procurement authority is responsible. Sweden's government has hired private enterprises instead of building a centralized computerized platform for public procurement. Many privately-held websites, some of which specialize in government procurement, are available.

Swedish central bank Riksbank ensures that the country's payment system is secure and effective when most people quit using cash. The general population might utilize an eKrona, which would be government-backed digital money. This investigation was part of Riksbank's eKrona initiative. The project team has contacted some national and international organizations to gather their opinions on an eKrona. For these agents to be trusted, the Riksbank must maintain its ability to issue eKronas.

4.4. National Portal [NPR]

The official website of the Swedish government and its agencies is also the national portal. Information on current government legislation and programs and ministerial actions, and explanations of how the Swedish decision-making process works can be accessed via the website. Sweden came in the fifth position in the Waseda rankings 2021 regarding National Portal.

For information about Sweden's geographic information system, Geodata.se is the best place to go. National registration of geographical data services, Geodataportalen provides users with the option of searching and examining data and downloading it. The European Commission's Inspire Geoportal can be accessed via Geodataportalen, maintained by Sveriges data portal, Sweden's open data portal. Landmäteriet (Swedish cadastral and land registration agency) coordinates the Swedish geographic data infrastructure by hosting Geodata.se and Geodataportalen.

4.5. Government CIO [GCIO]

All levels of government appear to have a Chief Information Officer (CIO), but with somewhat different titles and duties.

4.6. E-Government Promotion [EPRO]

In May 2018, the federal government issued two assignments that lay the groundwork for a more standard and interoperable national approach to base registries and information sharing. Some of the essential government agencies were on board, and DIGG, the coordinating agency for the projects. Under the studies' recommendations, 2019 saw the start of government initiatives to create a national core data architecture for public administration. Through the implementation of this framework, an information exchange digital infrastructure will be in place in 2021.

On July 1st, 2010, Sweden's Law No. 2010:566 of the 3rd June 2010 transposed Directive 2003/98/EC to re-use public sector information. With the knowledge that they cannot be used to hinder others, individuals may reuse competition in the information market, resources provided by the government according to this legislation.

Sweden currently lacks an efficient central knowledge management system. Governments around the country have come together to create a platform for collaborative use to share best practices and increase the adoption of eGovernment at the community level. Over the past 15 years, a third of Swedish municipalities have collaborated on more than 30 initiatives to offer a uniform design, platforms, and basic functionality for municipal eServices by pooling their resources. This platform also supports active knowledge sharing on digitalization and change management.

4.7. E-Participation [EPAR]

By 2018, e-Services were used by almost 60% of Swedish citizens, with over 3800 online services in all. In 2011, these clients made over 250 million transactions in a range of commercial and public e-Services because of the world-class internet. As a result, individuals and businesses alike will have a lot more options for using the internet to connect to public electronic services.

Health and dental records of all residents aged 16 and over were expected to be available to everyone in Sweden by 2020 as part of the country's updated national eHealth vision. Around 10 million Swedes

live in the country, and as of June 2017, 41% of them (or roughly 4.1 million individuals) created a 1177.se account to access personal e-services.

4.8. Open Government Data [OGD]

With 9.750 points, Swedish's Open Government Data indicator was placed ninth in the Waseda rankings in 2021, denoting tremendous progress made within the year. The Swedish government has begun a new effort to advance open data and artificial intelligence goals. For the government's strategic plan of increasing public access to open government data, DIGG was tasked with enhancing the public sector's ability to make open data available and cooperate on data-driven innovation. DIGG will develop a national action plan for open data management, and methodological support and suggestions will be provided to help implement the project in the most critical sectors. In response to a government recommendation, DIGG released research in January 2020 on Promoting public administration's potential to deploy AI in the public sector. The initiative also aims to increase the public sector's ability to use artificial intelligence starting in 2021.

There has been a change in the management of DIGG's apps since September 2018. In 2019, Sweden's data portal beta version was launched. Data resources from both the private and public sectors are available via the portal's primary goal. ' This older site will stay functioning until the new site is fully operational and ready to use. An open data policy and open data-driven innovation initiatives have been implemented.

4.9. Cyber Security [CYB]

The government unveiled Sweden's first National Cyber Security Strategy in June. The plan was revised in July 2018 and included an appendix detailing government activity throughout 2017-2018. The government took or completed over 50 initiatives between 2017 and 2018. Seven government entities responsible for cyber security presented an action plan for 2019-2020 in early March. The cyber security action plan's 77 significant actions are set to be executed in 2019. In March 2020, the Swedish Civil Contingencies Agency (MSB) and the seven government ministries will revise the cyber security action plan. It includes additional steps to do and a review of the 2019 events. On March 2, 2019, the government unveiled a strategy to protect critical infrastructure against cyberattacks.

The MSB is in charge of all civil protection, public safety, disaster management, and civil defense elements. For example, MSB is the NIS directive's single point of contact for information and cyber security in Sweden. National CERT-SE of Sweden is likewise situated at MSB Stockholm. MSB is creating a national model for cyber security as part of the national information and cyber security policy. This nationwide model shows one of the steps in the overall cyber security action plan.

4.10. The use of Emerging ICT [EMG]

For the European Blockchain Partnership, Sweden has sent experts to every working group to show its commitment. From July 2019 to July 2020, Italy and the Czech Republic agreed to share Sweden's presidency of the European Blockchain Partnership.

The Swedish government has passed a National Artificial Intelligence Strategy. For the government's goal of becoming an AI leader in Sweden, the plan contained a list of essential requirements for using AI in Sweden. For the research "Promoting public administration's potential to use AI," DIGG released its findings in January 2020. Vinnova's studies provide a comprehensive assessment of the current level of artificial intelligence in Sweden, its applications and problems, and suggestions for future initiatives that may be available to government decision-makers. Aside from the 150 million SEK annually invested in AI-related activities, Vinnova also stated that it would contribute an additional 50 MSE each year over the following decade.

Switzerland

1. General Information

Area: 41,284 km²

Population: 8,728,154

Government Type: Federal Semi-Direct Democracy Under a Multi-Party Assembly-Independent Directorial Republic

GDP: \$ 94,700

Internet Users: 93.15

Wired (Fixed Broadband Users): 46.48

Wireless Broadband Users: 101.51

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Switzerland was placed 15th in the Waseda International digital government rankings for 2021, with an overall score of 85.3347. The pandemic has expedited Switzerland's digitization process since the number of medical consultations done online over the phone has risen dramatically, and numerous institutions have boosted their investment in digitalization projects. As of April, the Corona-Memory.ch project has collected roughly 400 audio, video, and text-based contributions from Swiss citizens who had been affected by the coronavirus epidemic.

Switzerland has also offered a \$4.4 million contribution to the United Nations Conference on Trade and Development UNCTAD's e-commerce and digital economy initiative. Since the project's inception, the funding has promoted technical collaboration, research, and consensus-building

activities. Because of the recent outbreak of COVID-19, the Swiss contribution will enable the project to better react to the increased need for UNCTAD assistance from nations.

During the pandemic era, banking and financial institutions have to adapt their organizational structures to accommodate remote working, communication, and customer service. The financial services sector faced a substantial operational issue due to the rapid expansion of remote working arrangements, with the majority of Swiss workers working from home. In challenging settings, robots demonstrated their capabilities. To benefit small and medium-sized businesses in Switzerland, Swiss banks rapidly collaborated with the Swiss government to devise a financing strategy for affected companies.

3.2. New Trends

In the form of computerized patient dossiers, telemedicine is predicted to increase public health care quality and cost-effectiveness. An estimated \$1 trillion in revenue will be generated by digital health throughout the globe by 2025. Credit card fraud may be detected and prevented using AI and real-time data analytics. With the COVID-19 outbreak upon us, financial services companies are scrambling to change their digital business models.

A large portion of the recent spending by Swiss banks has gone into enhancing the value of their clients' portfolios via advanced research and the provision of specialized products, investments, and advisory services. Digital technologies, such as data mining and predictive analytics can help customers increase the relevance of their interactions and better tailor their financial services to their unique needs. To transform raw data into usable knowledge, these technologies integrate powerful analytics with increased interactivity/visualization.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

In terms of Network Infrastructure Preparedness, Switzerland was ranked 5th in the Waseda rankings in 2021, with 7.988 points. In January 2021, there were 8.42 million Internet users, an increase of 1.8 percent over the previous year. A majority of the Swiss population was still logging on to the Internet at the time. 7.1 million people accessed social media, which accounted for 81.8% of the total population. 10.42 million people had cell phone service, which was equivalent to 120 percent of the whole population.

Compared to other nations, Switzerland has achieved many significant advancements in the field of infrastructure readiness, making it one of the most advanced countries in the world. A few of them are as follows:

- Requirements for 5G towers were set to stimulate the deployment of network equipment,
- Swiss Fiber Net has signed an agreement with Salt to enhance its FttP footprint; Swisscom has shut down its GSM network.
- Swisscom's USO has increased its minimum internet speed

4.2. Management Optimization [MO]

The Federal Council, the Conference of Cantonal Governments, and the boards of directors of the Swiss Union of Cities and the Association of Swiss Municipalities agreed on a new eGovernment Strategy at the end of 2019. This replaces the 2016 eGovernment Strategy. The Confederation and its cantons have made progress in the development of a secure e-Voting system. Re-implementing eVoting will be made as easy for the cantons as possible thanks to this project, which contains technology that has been thoroughly tested and a new approach to risk management. These two eVoting systems were withdrawn by the canton of Geneva and Swiss Post in 2018 and 2019, respectively, and this operation followed their removal. E-voting trials are not possible in Switzerland since no e-Voting system has been approved.

4.3. Online Service [OS]

Plastic cards having a picture on them will continue to be issued by Switzerland until further notice. SwissID, a new kind of digital identity, is now available as of Spring 2017. In the end, the new SwissID was not a substitute for the old SuisseID. SuisseID users may continue to use their old IDs since there have been no changes. Smiles are plastered on their faces. The capabilities of both services were similar. In the long run, SuisseID will be absorbed into the SwissID group.

Each of Switzerland's three levels of government utilizes simap.ch to acquire goods and services. Bid and tender documents, as well as a list of all current Swiss contracts, may be downloaded by interested parties.

4.4. National Portal [NPR]

The ch.ch website is Switzerland's gateway. As the electronic business card of Switzerland, it serves as the principal source of information from the federal, cantonal, and local administrations in French, German, Italian, and Romansh. Access to all government information and services is provided via a single site that is segregated depending on target groups. Among other things, it gives dossiers on essential subjects and current events and a comprehensive administrative authority directory for the whole country.

Administration portal admin.ch gives access to all of Switzerland's government agencies and operations. It provides direct access to seven government ministries and their connected federal offices, the Federal Chancellery, Parliament, and federal courts for businesses and people.

To help small businesses, the sme.admin.ch website offers a multitude of resources that range from startup advice to succession planning and general management.

With the use of the portal, creditors who want to begin debt collection processes may make an online request and identify the appropriate cantonal or municipal office. Making a debt collection request is made easy with the site's step-by-step instructions.

4.5. Government CIO [GCIO]

Even though Switzerland does not have a formal GCIO, the E-Government framework specifically identifies persons with GCIO-level responsibilities. In education, there are no programs explicitly

intended to teach CIOs, although there are MBA programs in information technology that educate highly skilled professionals who, among other things, possess CIO competencies. In the Waseda rankings 2021 regarding the Government CIO, Switzerland was placed only in the 31st position, after Brunei.

4.6. E-Government Promotion [EPRO]

The development of D-Government in Switzerland is not supported by a specific national or regional legal instrument in Switzerland. However, some ministries' publications provide this information. D-Government advertising is also primarily carried out by commercial partners of the Swiss D-Government initiative, such as Swiss Mail.

Promotion campaigns are sometimes overlooked because of the widespread usage of ICTs in society and a high level of computer proficiency even among the senior population. Switzerland also holds an annual e-government conference with the help of leading IT companies and is actively engaged in international e-government projects and agreements.

4.7. E-Participation [EPAR]

Administrative digitalization may benefit Switzerland to the fullest extent possible due to the country's advanced post-industrial society. Society's active use of electronic tax and procurement has fueled the government's desire to explore new frontiers in this area. One of the critical components of the 2020 strategy is creating an electronic identification system and consolidating all D-Government services under a single domain. The level of e-participation is still high, although it is lower than in other European countries like Germany or France.

4.8. Open Government Data [OGD]

On November 30th, 2018, the Federal Council approved Switzerland's Open Government Data (OGD) Strategy for 2019-2023. The Federal Statistical Office (FSO) has been given the job of executing the strategy. One of the objectives of the eGovernment Strategy is to implement the OGD.

Opendata.swiss is Switzerland's primary repository of open government data. The portal was created as part of Switzerland's "Open government data initiative for the period 2019 to 2023," which was designed to serve both citizens and businesses.

4.9. Cyber Security [CYB]

On April 18, 2018, the Federal Council approved the 2018 National Strategy for Protecting Switzerland from Cyber Risks. Federal Council resolutions on 15 May 2019 to execute the 2018-2022 National Strategy for Protecting Switzerland from Cyber Risks and construct a cyber security competence center were made.

The Swiss Federal Council officially launched a Cybersecurity Competence Center on January 30th, 2019. Cyber Delegation includes the chiefs of the departments of Finance; Defense; Population; Protection; and Sport; as well as Justice and the police. Aside from protecting residents and companies from cyber-attacks, the Confederation plans to enhance its own security measures. With all progress

made in Cyber Security, in 2021, Switzerland was ranked within the top 5 countries in the Waseda rankings with the highest score of 10.000.

4.10. The use of Emerging ICT [EMG]

Supporting the eGovernment Strategy, the cloud computing strategy has been prepared by a team of eGovernment specialists from Switzerland's Confederation and cantons, municipalities, and associated firms. Newly found options and the required procedures to follow are laid forth in this document. The eGovernment steering group approved it on October 25, 2012.

Switzerland's Federal Council released research on the continued development of the federal regulatory framework, including blockchain, fintech, and other distributed ledger technologies, in November 2019. The Federal Council has set up a working group in the federal government to study artificial intelligence. The State Secretariat for Education, Research, and Innovation, which chairs this organization, encourages information and opinion interchange and manages Switzerland's positions in international organizations. The Department of Environment Transport Energie & Communication established an action plan to help towns, cities and cantons develop "Smart Cities."

Taiwan

1. General Information

Area: 36,193 km²

Population: 23,862,818

Government Type: Unitary Semi-Presidential Constitutional Republic

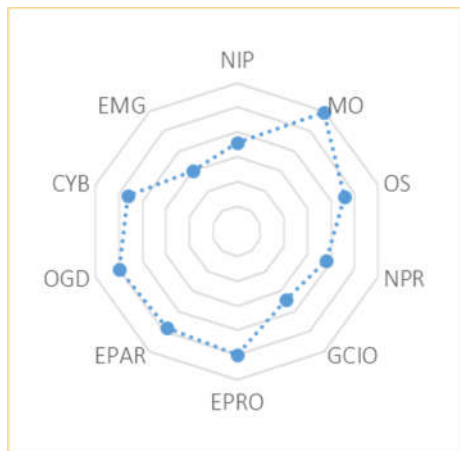
GDP: \$ 32,120

Internet Users: 88.96

Wired (Fixed Broadband Users): 24.99

Wireless Broadband Users: 115.94

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

The Waseda International digital government rankings for 2021 placed Taiwan in tenth place with a total score of 87.3255. Due to collective knowledge obtained from online bulletin boards, Taiwan was one of the first governments to find and respond to the virus. Residents were soon able to use live maps, distributed ledger technology, and chatbots to identify the nearest pharmacy where they could claim free facemasks, with stock levels updated in real-time to avoid panic buying.

The Taiwanese Government has used various innovative digital solutions since the emergence of SARS-CoV-2 in Taiwan. Since the Ebola virus outbreak in West Africa in 2013, the United States has been using digital tools to distribute real-time health information, track quarantined individuals, and facilitate international border control by requiring inbound passengers to share their travel history before arrival. Public health personnel, who have had to react to pandemics under time restrictions and, in some instances, scientific uncertainty, find digital tools appealing in reducing

human contact and administrative costs. The social acceptability of digital items is another important factor in their success.

Since taking office, the government has used several social media channels to build trust and engagement with the public. The success of Taiwan V-Watch, the government's new online monitoring effort for vaccination-related adverse reactions, depends on public acceptability. As a great example of a public-private partnership, the government collaborated with a technology company to build the monitoring program. Still, an equally stringent regulatory framework safeguarding the privacy and data security remains essential.

3.2. New trends

5G, the Internet of Things, robotics, renewable energy, and artificial intelligence were predicted to be the five most important technologies by 2025 in the United Nations' Technology and Innovation Report 2021, published in September. Through the platform, Taiwanese firms were given a chance to learn about the entrepreneurial atmosphere in Silicon Valley and to imagine the new business potential in a 'new normal' economy. The pandemic in 2020 provided young entrepreneurs with more significant time and resources to experiment with cutting-edge ideas and technologies. Technical research and development have become even more critical as a result of the pandemic.

Because of their enormous economic value, they assist countries in translating their research and development expertise into commercial possibilities on the global market. Taiwan's Minister of Science and Technology (Minister of Science and Technology): A pandemic on a worldwide scale is the catalyst for digital transformation. Taiwan has shown its skill in two areas: public health and digital technology. Taiwan has demonstrated its capacity in both sectors. Taking advantage of Taiwan's epidemic presents an excellent chance to showcase the country's exceptional information technology capabilities and industrial chains. The business is working on a non-invasive diabetes screening and treatment gadget that may be used at home.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Waseda's rankings for Network Infrastructure Preparedness in 2021 rated Taiwan 26th with a total score of 7.132. Since last year, Internet users in Taiwan have increased by 4 percent to 21.45 million. A total of 90 percent of Taiwan's population had access to the internet. The number of Taiwanese social media users remained steady at 19.70 million throughout the same period. Eighty-two-six percent of the people in Taiwan utilize social media. In 2021, Taiwan had 28.77 million mobile subscriptions, or 120.7 percent of the population, at the beginning of that year.

Far East One acquired an 11.6 percent stake in APT in 2021, and Taiwan implemented a strategy to capture a significant share of the global IoT market. The regulator also completed a multi-spectrum 5G auction, and the government released NT\$20.5 billion to encourage the development of 5G services and apps. Additionally, the DSL sector shrank as subscribers migrated to fiber.

4.2. Management Optimization [MO]

This statistic measures the extent to which information and communications technology (ICT) is being used to enhance government business processes. Waseda put the country sixth in the rankings for the linked indicator in 2021, with a score of 11.900. Taiwan has long been a leader in administrative and information technology reform. As a result, Taiwan's internal office has been simplified, and the legitimate functioning of the government has been established after five stages of continual electronic/digital government programs.

Of the newly announced digital government program's seventeen federal agencies, there are a total of 24 sub-plans. In addition, it aims to complete four integrated one-stop services throughout the nation and achieve a 60 percent e-service utilization rate by 2015. Further ensuring the digital government program's activities are being monitored, NDC has created a team of specialists.

Taipei has released a national strategy for government, business, and residents as part of the 2017-2025 Digital Nation and Innovative Economic Development Program. To expedite different government digital transformation solutions, NDC's Taiwan Digital Government Program 2017-2020 was designed under these principles.

4.3. Online Service [OS]

Although government tried to issue new eIDs in the third quarter of 2020, a national digital ID framework has been postponed due to covid-19. It has been determined that if consumers agree to allow the government to access their data, they may use the T-Road, a cross-agency data transfer channel developed by the National Data Center (NDC). A more straightforward application process and a more efficient "smart government" idea have resulted from eliminating the requirement for hardcopy papers in the application process.

4.4. National Portal [NPR]

Building a diversified collaboration environment and "creating one stop digital services" are the critical goals of Taiwan's Digital Government Program. There is a focus on digital services for topics important to the public, such as education and health care, to address those demands and improve national competitiveness. So far, the government's use of e-government projects has yielded considerable gains in terms of both efficiency and quality of government services. More than 25,000 government services may now be requested using the My e-Government single portal website. The number of machine rooms/data centers has been reduced by around 44 via the utilization of integrated data centers.

4.5. Government CIO [GCIO]

The Deputy Ministers or Chief Secretaries of cabinet-level government agencies form Taiwan's GCIO structure. In the Executive Yuan, the Convener of the National Information and Communications Initiative Committee (NICI) serves as the GCIO. Ministerial-level Chief Information Officers (CIOs) are charged with coordinating business and ICT resources, promoting business process re-engineering and regulatory relaxation, and using ICT to improve administrative efficiency.

4.6. E-Government Promotion [EPRO]

Accordingly, all Taiwanese programs continue to support the government's efforts to promote digital transformation as its principal goal via Taiwan Digital Government Program, which is tied to Smart Government Action Program's promotion objectives. When it comes to the promotion of E-Government, Taiwan was placed second only to New Zealand.

4.7. E-Participation [EPAR]

In June 2019, Taiwan's Executive Yuan established the Smart Government Action Program, which has three primary goals: "transparency of open data, maximum added value application," "link to governance network, maximize decision-making quality," and "integrated service function, innovative smart service" Only a few of the seven techniques for promoting open government data, public participation and social innovation, integrated service functions, and intelligent service have been implemented. There are three more supporting activities: "create a regulatory adjustment platform,"; "implement privacy protection monitoring,"; and "enhance data security defense in depth." Public policy should be more diversified in terms of communication and collaboration.

Local governments should use the online participation platform. The National Audit Office and all special municipalities in Taiwan, including Hualien and Hsinchu, are currently utilizing it. With the help of public input, 55 people's livelihood difficulties were addressed, including the rising ban on single-use dinnerware, the opening of fishing ports to fishers, and the reform of mountain climbing application processes.

4.8. Open Government Data [OGD]

There are currently more than 45,000 datasets of accessible government data available, a threefold increase since 2015. A majority of these are "machine readable, structured, and open format" data. A total of NT\$93.6 billion was earned in 2019 by the data services sector as a result. For the 2019 Presidential Hackathon's Silver Haired theme, the government was able to identify older adults who live alone and provide services with precision, proactive care for those who are disadvantaged, and an increased level of governance by using open data from the Ministries of Health and Welfare and the Ministry of Interior.

The K-12 Education Administration, the Ministry of Education, and First Bank completed the development of the Exemption from Incidental Expenses of High School Students from Medium and Low-Income Households and Credit Card Online Application systems to test personalized services in the financial and educational sectors using My Data. They plan to begin operations in the first quarter of 2020.

4.9. Cyber Security [CYB]

Even though certain government data is not intrinsically sensitive, it has not been made accessible for external use via the open data technique because of the need to restrict the number of users and the extent of their service or the need to pay a fee. It will be necessary for government agencies to inventory the data they have control over and provide a high priority to information with high application value. According to the NDC, this would enable the industry's digital transformation via digital governance. With the scope of the Freedom of Government Information Law, the NDC

revised the Operating Principles for The Opening of Data by the Executive Yuan and Its Subsidiary Agencies in 2019 to maximize open government data.

4.10. The use of Emerging ICT [EMG]

In its next four-year technical, strategic plan, Taiwan joined the space market and proposed building a digital development ministry/council. ItTheation's policy goal was to utilize open data to enhance the governance capabilities of intelligent government and open it up to a wide range of general applications to support the growth of a data economy. Digital country status is a goal that Taipei must pursue with all of its might. It is possible to increase government performance and improve people's quality of life while simultaneously being aware of new technological trends and capitalizing on chances to ensure Taiwan's continued global relevance via data and emerging technologies.

The digital revolution will affect all sectors of society, business, politics, and culture, which the world's most sophisticated nations have planned to prepare for it. The Executive Yuan's Digital Nation and Innovative Economic Development Program, launched in 2017, includes seven effective programs. Data governance must be promoted at all levels of government by the National Data Center to achieve "open government smart governance people can experience." Concerning a government's digital transformation and open data, the government will continue to broaden the scope of available data releases to simplify the process of government-public interaction, eliminate unnecessary administrative procedures or resource waste, and achieve tangible government service.

Thailand

1. General Information

Area: 513,120 km²

Population: 69,981,176

Government Type: Unitary Parliamentary Constitutional Monarchy

GDP: \$ 7,700

Internet Users: 77.84

Wired (Fixed Broadband Users): 16.62

Wireless Broadband Users: 90.34

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

In the Waseda International digital government rankings 2021, Thailand was positioned 25th with an overall score of 79.6510. Since COVID-19, most firms have moved into the digital adopter stage rather than the digital evaluator stage. At the same time, the adoption of sophisticated technology, except robotics and foundational technologies, has accelerated. There has been rapid adoption of digital technology during the COVID-19 era across all business sectors. A rise in the velocity of digital change during the pandemic era, coupled with the COVID-19's massive and unexpected impact on all companies, is apparent. Digital transformation and the market's digital environment require businesses to take a more proactive role in the movement, especially in this era of uncertainty.

In the wake of the coronavirus pandemic, Thailand's small and medium-sized businesses (SMEs) have been forced to embrace digital transformation, which is essential for a better economy and society. Despite Thailand's longest-running wave of diseases, digital payments have increased by a factor of two since pre-pandemic levels. E-payments surged considerably throughout the

pandemic in all forms of electronic payments but notably in digital payment. The pandemic has accelerated Thailand's journey to a cashless society, with payment innovation becoming an increasingly important aspect of people's daily lives.

As a result of COVID-19's effects, the government has pledged to use digital technology to promote equality and support people who have been impacted. To better prepare Thailand's legislative framework for the digital age, the Thai parliament issued the Personal Data Protection Act B.E. 2562. Since Thailand has a solid basic infrastructure, a skilled labor force, the backing of the public sector, and a strategic location that makes it a desirable location for data centers serving businesses in the Association of Southeast Asian Nations, the country is well-suited to become a significant colocation data center destination.

3.2. New Trends

The Thai government's "Thailand 4.0" digital government strategy will help Thailand's economic competitiveness. Demand for data centers and cloud computing in Thailand has been spurred by the country's high internet and mobile penetration levels. Digital platforms in the financial and telecommunications industries and content and digital media demands also increase demand. Cloud computing, big data, and analytics are all expected to continue to drive demand for data centers in the future.

In Thailand, the government's digital government initiative aims to improve the public sector's ability to serve citizens. For the Law on Digital Government Administration and Services (BEE 2262) of 2019, four initiatives are outlined: Offering people with end-to-end digital services, improving the ease of doing business with digital technology, providing open data platforms, and increasing public participation in policymaking are just a few of the goals the federal government is working to achieve this year. Data centers that cater to the Association of Southeast Asian Nations businesses are well-positioned to grow in popularity in Thailand.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Thailand was ranked 44th in terms of Network Infrastructure Preparedness, with a score of 6.160. There were 48.59 million Internet users in January 2021, 7.4 percent higher than the previous year. At the time, 69 percent of Thailand's entire population continued to use the Internet. On the other hand, 55 million individuals utilized social media, accounting for 78.7 percent of the overall population. Additionally, there were 90.66 million mobile connections, representing 129.7 percent of the total population.

Thailand has also made significant strides in infrastructure investment in preparation for the country's digitalization future. The credentials for the data center hub have been enhanced. The installation of the 8000-kilometer MIST underwater cable connecting Thailand to Malaysia, Singapore, Myanmar, and India has been implemented. Additionally, Thailand's mobile market is getting more responsive to 5G services.

4.2. Management Optimization [MO]

Thailand continues to score well; the country builds on the EA framework's base by implementing digital development structures into all critical sectors as a new blueprint for D-Government growth in Thailand. By changing into the DGA, the EGA is solely responsible for ensuring public sector interoperability. Newly formed MDES agency DEPA (Digit Economy Promotion Agency) is responsible for implementing Thailand's current Digital Economy and Society Development Plan proposals and working closely with the existing authority of EGA (Economic Governance Authority). The government now supports "Prompt-pay" to allow online payment and money transfer using a national ID across all local banks without charging for public administration or internet services.

4.3. Online Service [OS]

Due to the rapid rise of eCommerce, e-Payment may become increasingly popular as a means of buying goods. Internet and mobile banking may become more widespread in Thailand in the next six years. In part, this is due to the country's electronic payment system and the fast growth of mobile broadband use.

The national e-Payment initiative has been extensively promoted by both the public and commercial sectors, pushing businesses and consumers to forgo cash in favor of electronic payment. With PromptPay, registered users may make and receive payments between consumers and companies using their mobile phone numbers or citizen identity numbers.

According to a JP Morgan report, Thailand's mobile commerce business is presently the country's biggest e-commerce sales channel, accounting for 52% of all online purchases and valued at over \$13.6 billion. Consequently, Thailand has become a regional leader in the use of smartphones and tablets to conduct business.

4.4. National Portal [NPR]

An Internet portal is a single point of entry that allows users to access several services without visiting multiple websites. thaigove.net was created in November 2001 and has subsequently improved online government-to-resident communication. The site's links to all federal government websites provide a wide variety of e-services and general news. Thai people can be able to access government services through e-Government anytime and wherever they choose. The portal site's integration with all federal government entities allows people to renew licenses and pay taxes online.

4.5. Government CIO [GCIO]

Thailand's Government CIO indicator was ranked 13th in the Waseda rankings 2021, presenting a lot of progress made over the previous year. The Chief Information Officers (CIOs) are appointed at all levels of government, including provincial, and by default, they are bureaucratic positions. It is possible to find forward-thinking CIO groups in Thailand, such as the CIO Association of Thailand, which brings together CIOs and IT experts from the public and commercial sectors, and the International Academy of CIOs. As a part of the EGA, the D-Government Academy partners with other agencies to provide CIO-related activities such as conferences and seminars. CIOs in Thailand's public sector have guided their organizations' digital transformations under the Digital

Thailand umbrella. To date, the interim ICT training sessions for government CEOs have been held annually to reduce the gap between the CEO and CIO in ICT literacy.

4.6. E-Government Promotion [EPRO]

Thailand 4.0's national development plan, which intends to promote the adoption and innovation of digital, automation, and robotics technologies among SMEs, industrial businesses, and the service sector's need for data centers, is a significant component of this demand. Thailand 4.0 aims to leverage digital technology to improve citizens' quality of life, participation in political governance, and the country's economic competitiveness through initiatives such as the Smart City Development project, a big data platform and analytics for agricultural, educational, and healthcare policies, and investment in digital infrastructure.

The Thai government has continuously enhanced its digital government strategy by introducing the Digital Government Administration and Services Law B.E. 2262, which defined four goals to strengthen the public sector's ability to serve the people. Digital Government Development Agency (DGA), which is tasked by statute to foster the adoption of digital government architecture among government entities, has campaigned to deploy this technology. The Thai Government Information Exchange, a central database of government agencies designed to reduce the burden of documentation on the private sector, increase efficiency through the elimination of redundancy, and promote the use of Digital ID, including digital signatures, among government agencies among the key measures. For the business sector, the construction of a government data catalog is another big task.

4.7. E-Participation [EPAR]

People in Thailand are logging on to manage more and more aspects of their everyday life as they try in the following years to avoid the COVID-19 pandemic in 2020, according to the "Global Digital Report 20216." As it turns out, Thai internet users spend nearly nine hours a day in front of a screen, which is higher than the global average and even tenth most in terms of time spent on the web.

Only Indonesia and the United Kingdom had a higher percentage of internet users who had made an online purchase in the previous month than Thailand, which placed third in the world for e-commerce adoption. It was also ranked sixth in terms of QR code use, with 60% of its internet users utilizing this service by December 2020. With the government's digital co-payment scheme for pandemic relief, Japan recorded the highest number of transactions using mobile banking and financial transaction apps in 2020.

At 308.35 megabits per second for fixed internet and 51.75 megabits per second for mobile, Thailand has the best internet infrastructure globally, according to a January 2021 report from the International Telecommunication Union (ITU).

4.8. Open Government Data [OGD]

The Digital Government Act, passed in Thailand, intends to make government activities more efficient and effective. DGA plans to create a federal data exchange platform to set security standards for data sharing under this act, according to Tiarawut. – Before the advent of cloud computing, data transfers required a six-month agreement. Once the technology is in place, this exchange will be completely automated.

To protect people's privacy and national security, agencies are compelled to make their data accessible to the general public, excluding sensitive information. New services and technology might be developed by analyzing data on transportation and agriculture, for example. The DGA has been working with the Thailand Anti-Corruption Association to keep tabs on government projects via data. There is also an application that monitors revenue streams, expenditures, and procurement strategies for agencies.

4.9. Cyber Security [CYB]

Thailand Cybersecurity Strategy 2017-2021 recognizes that cyberthreats are not limited to a particular country or region. Additional claims made in the Strategy include international cooperation, support for international standards, best practices, and national solid laws and processes to fight cyber-threats and ensure cybersecurity. Preventing and combating cybercrime is one of the primary goals of the Strategy.

The National Security Council's Office of the National Security Council has the following goals for cybersecurity:

- obtain the means and tools required to protect the state from cyber-threats, making sure the country's networks and data are secure and adaptive;
- By catching and prosecuting offenders, the government can strengthen state security and investigate assaults.
- Investing in research and development in science and technology and cyber security, and capacity building is essential.

The Ministry of Digital Economy and Society was established in 2016. The Minister is a member of the National Security Council. The ministry's mission statement includes creating national policies and regulations relevant to digital growth and overseeing the country's statistics system to assist in decision-making.

4.10. The use of Emerging ICT [EMG]

Due to EGA's development, cloud and mobile computing, big data, and the Internet of Things (IoT) have all been gradually integrated into the public sector. As a result of accreditation to ISO/IEC 27001:2013, the government's G-Cloud as an Infrastructure as a Service (IaaS), which employs cloud computing technologies to manage government resources, has been certified. To begin with, MDES is supporting start-up firms that are using Big Data in government sectors to open up new commercial opportunities. The EGA Research & Development team has developed a development plan for several active government IoT pilot projects, implemented over several years.

Tunisia

1. General Information

Area: 163,610 km²

Population: 11,958,806

Government Type: Unitary Semi-Presidential Constitutional Republic

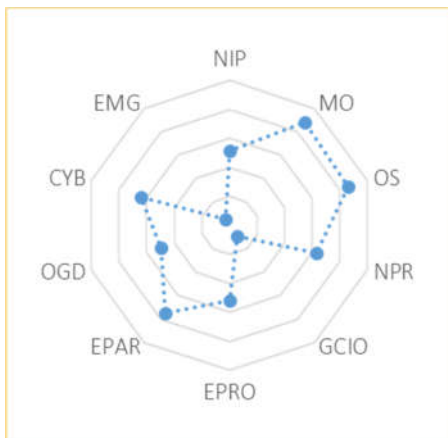
GDP: \$ 3,680

Internet Users: 66.70

Wired (Fixed Broadband Users): 11.29

Wireless Broadband Users: 76.05

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Tunisia is in the process of developing a digital strategy. One of the country's long-term goals is to become an African data storage facility hub, a site for European companies' offshore investments, and, eventually, the first nation in the world to implement 5G technology. Tunisia, as a newly digitalizing developing country, obtained the lowest score in the Waseda International digital government rankings for 2021. However, the country has made significant strides toward digitalization in the last year and a half.

In the Tunisian economy, COVID-19 pandemic-related impacts are being witnessed, ranging from quarantine and social isolation to decreased demand and interrupted supply networks. Small firms are especially susceptible to economic downturns because their profit margins are so tight. A large number of enterprises, on the other hand, have a significant influence on local economies, both by generating employment and by supplying necessary goods and services. Adapting to the economic effect of COVID-19, the Mashrou3i project has been extended and improved its current activities.

It uses digital technology to secure the long-term viability of small companies and employment and a sustainable way of life in the country's interior areas.

Many of Tunisia's investments in high-value fields such as electronics, engineering, and technology have been lauded in recent years. Many of these investments are now assisting in the battle against COVID-19. Engineers from the German car parts company Kromberg & Schubert in Beja, in the country's northernmost region, created face shields using 3D printing technology. Youth who have dropped out of school may get free training in digital and technology skills at the Orange Solidarity FabLab, located in Orange, California. Tunisia's Abderrahmen Mami Hospital has received a robot developed in Tunisia by Dräxlmaier Tunisia, a German automotive component supplier. The robot will be used to provide telemedicine assistance to Covid-19 patients.

3.2. New Trends

Tunisian industry faces both challenges and opportunities as a result of the shift to Industry 4.0. A governance structure and working groups are being set up to handle the following issues: I4.0 financing methods, the Future of Work, and the I4.0 Ecosystem. One of the key goals is to make it easier for Tunisia to transition to Industry 4.0 by creating new funding channels, identifying required competencies, and establishing the future responsibilities of potential players in Tunisia's I4.0 eco-system.

It is expected that Tunisia will push for a new identity scheme soon, notwithstanding the benefits its proponents perceive, in a global atmosphere where many nations are rushing to embrace new technological systems to prove their efficacy in responding to COVID-19. Despite considerable government investment in this area, data security breaches have been reported in countries with similar approaches, including Estonia. Tunisia must build a solid framework for data security, which includes a mechanism for unique identification. According to international human rights standards, Tunisia's present data protection rules and regulations do not adequately safeguard or guarantee the protection of personal data. The government and civil society should quickly update the data protection legislation and put it on the legislative agenda to cope with the COVID-19 scenario.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Network infrastructure preparedness in Tunisia was ranked 55th in the Waseda rankings in 2021, with a total score of 5.133. There were 2.92 million Internet users in January 2021, an increase of 5 percent from the previous year. In early 2021, the proportion of persons with Internet access remained at 66.7 percent. More than seventy-nine percent of the population was using social media at that time. There were 17.84 million mobile phone connections in January, accounting for 150.2 percent of the people.

These are just a few of the significant improvements Tunisia has accomplished throughout time:

- As part of an agreement with India, Tunisia has adopted UNESCO's Internet Universality Indicators (UIUs).
- Telnet aims to launch 30 nanosatellites.

- Ooredoo Tunisia has started working with Nokia and Huawei to build 5G networks and technologies;
- M-money and the three mobile networks have now been interoperable.

4.2. Management Optimization [MO]

The digital economy of Tunisia was being developed as part of the country's National Strategic Plan. During the 2014-18 period, Tunisie Digitale aimed to increase the country's ICT infrastructure and leverage the sector's assets to accelerate the country's economic and social development. An additional goal of Tunisia Digital was the development of an entrepreneurial culture within the country's ICT sector, reducing gaps in IT access throughout the country, and a shift in public perceptions of the industry in general – especially, trust. By 2018, TD6 billion (€2.6 billion) in exports and TD11 billion (€4.7 billion) in digital economy value were the main goals of the plan, according to the 2014 announcement. Additionally, the initiative aimed to create up to 95,000 new jobs in its fifth year by guaranteeing that three out of every five households have internet access.

Furthermore, the Minister of Local Affairs and the Minister of Communication Technologies and Digital Transformation issued a governmental decree on 12 May 2020 to establish a national unique citizen identification system, followed by a second decree on 15 May to clarify its implementation. Tunisia's government, according to Fakhakh, prioritized the implementation of a decree on the unique identity as a way to resolve the COVID-19 conflict. As a result, Tunisia's Management Optimization was 47th in the Waseda rankings in 2021, with 8.800 points.

4.3. Online Service [OS]

Ongoing coronavirus outbreaks in Tunisian hospitals have been testing the government's ability to establish e-commerce systems that can be used for the long term. A resurgence of electronic services has been observed since a pandemic. However, the sector still faces several hurdles, including individual and government unwillingness to embrace digital technology, and the persistence of legal and logistical barriers that impede the development of digital systems in the country.

Analysts suggest that despite the pandemic's terrible economic implications, e-commerce remains a bright spot. Elyes Fakhfakh's administration opted for digital alternatives and reduced cash circulation at the beginning of this health problem.

4.4. National Portal [NPR]

There are several ways to get information on Tunisia's government, and one of them is via the official government site, "<http://www.tunisie.gov.tn/>." Information regarding internet services and links to linked sites are all that the site provides. Most of the site's content is available to visitors who speak Arabic, although it also includes information in French.

There is a single point of access to a wide range of public data on the National Open Data Portal, www.data.gov.tn. One goal of this site is to increase transparency and accountability, while the other is to give free and open access to information that may subsequently be used to generate extra value through mobile applications or online services.

4.5. Government CIO [GCIO]

Public administration in Tunisia cannot designate CIOs or similar positions at the national or local levels. Director-General for eGovernment under Prime Minister may be regarded as a CIO at the national level.

4.6. E-Government Promotion [EPRO]

An engaged and well-educated workforce of ICT engineers and developers helps to keep Tunisia's IT and related businesses growing in the future. As part of a central government initiative, Tunisia Digitale intends to aid entrepreneurs and innovators in the information technology sector and gradually digitize the government and its processes. There are still obstacles in the way of the sector's growth. Technoparks and IT infrastructure must be upgraded, and new digital centers must be created for Tunisia's IT industry to grow appropriately. The public and commercial sectors must work to guarantee that this happens. Simplified administrative procedures and more financial and structural aid from incubators and financial institutions will be critical to the development of Tunisian start-ups. All of these measures will encourage more outsourcing companies to grow their operations in the country.

4.7. E-Participation [EPAR]

E-Participation can be successfully implemented in Tunisia, one of the region's most technologically proficient nations. Despite this, there has been little recent progress in this field. Most government websites provide services in Arabic and French, on average. High-level government websites, such as the national portal, demonstrate interactive functionality and well-considered design. The success of national ICT activities is linked to growing public awareness of their importance. With polling and feedback channels in place, it's clear the government considers public opinion in its decision-making process. Concerns concerning accountability and detailed policy statements remain unresolved.

4.8. Open Government Data [OGD]

Data from public institutions can be found on the National Open Data Portal, which acts as a centralized repository to ensure that the Organic Law on Access to Information's requirements are met while creating innovation and services by encouraging the reuse of public data. There is a single repository for all publicly available data, the National Open Data Portal (NODP). Using the back offices of numerous government websites and other sector-specific open data portals, it centralizes the information that the public has manually contributed.

Tunisia's government is presently writing an open data decree to maintain and institutionalize the process of public bodies sharing available data and building an atmosphere favorable to innovation and economic development. For the nationally available data project, this regulation sets up a governance structure and defines the technological standards that must be met.

4.9. Cyber Security [CYB]

In 2021, Tunisia hosted a national workshop to help in developing a specialized cybercrime reporting system as the third of the CyberSouth project's target countries. It was discussed by representatives from the Council of Europe and Tunisian authorities who were informed on the Romanian cybercrime reporting mechanism's structure, models, and ways of collecting

complaints. The Tunisian delegation outlined their reporting processes for cybercrime, describing the responsibilities of the institutions involved, and highlighting their preventive actions. Additional support for Tunisia's online reporting tool for cybercrime attacks and documented mechanisms for processing cybercrime complaints was identified during the session.

4.10. The use of Emerging ICT [EMG]

Cloud services have been offered by local internet and telecommunications providers for some time now. A local cloud provider, Tunisie Electronique, launched its cloud services in 2012 before Tunisiana was founded. Ooredoo, a Qatar-based telecommunications operator and HP, signed a collaboration agreement two years later as part of its move to building and upgrading its cloud services for Ooredoo Tunisie. In 2015, Ooredoo signed a contract with Cloud Temple Tunisia, a subsidiary of Intrinsic and the Paulina Holding Group, to extend its cloud capabilities. To strengthen Ooredoo's cloud and cybersecurity capabilities, the agreement mainly targeted commercial clients.

The Tunisian government is also working to build up a cloud-based infrastructure. Interministerial networks are being set up to allow the interchange of digital information across government departments while ensuring data confidentiality and the protection of individual privacy. As part of this effort, the government is building a unique login ID for individuals that will allow them to upload and share personal data (such as their date of birth and social security number) with the necessary agencies.

Turkey

1. General Information

Area: 783,562 km²

Population: 85,193,714

Government Type: Unitary Presidential Constitutional Republic

GDP: \$ 9,330

Internet Users: 76.2

Wired (Fixed Broadband Users): 32.4

Wireless Broadband Users: 124.9

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Turkey placed 48th overall with 67.8051 points. After China, Turkey is the only country with a statewide system of distant education. After a temporary suspension due to the coronavirus, Turkey's Ministry of Education will resume providing distance education to more than 18 million students. The EBA app has been downloaded 27.1 million times on Android and 2.9 million times on iOS so far this year. Tablets issued by the Ministry of Education in Turkey are available for students to use while completing distance education courses. Since the first coronavirus infection in Turkey was verified on March 11, 2020, more than 18.5 million children in the country's elementary, secondary, and high schools have observed significant changes. In Turkey, students have access to these digital possibilities, helping them adapt to the new distance education procedure much more swiftly.

3.2. New Trends

Young, energetic, and enthusiastic Turks have the potential to catapult the country to worldwide leadership in the development of new economic sectors. In addition, MoIT has partnered with Ecole 42, a new generation of free coding schools that incorporate a project-based, peer-to-peer, and gamified learning approach to teaching. An employment rate of 100 percent is feasible after three years at the two 2,000-pupil schools, which are integrated. Mentorship, curriculum, and activities are all influenced by the business sector.

COVID-19 epidemic and regional tensions have accelerated Turkey's economic and ICT sector development. For companies dealing with the current climate's unique challenges, technology is anticipated to play a vital supporting role. There are new challenges, but there are also new opportunities as companies re-align their investments in particular technologies so that they may accelerate their digital transformation journeys while positioning themselves for future growth. An overview of Turkey's post-pandemic IT market, investment objectives, and technical strategy is presented in this IDC Sector Presentation.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

The Waseda rankings' Network infrastructure preparedness in Turkey was ranked 49th, with a score of 5.844. There were 65.8 million Internet users in January 2021, a rise of 6 percent from the previous year. In early 2021, the proportion of persons with access to the Internet remained stable at 77.7 percent. Sixty million people, or 70.8 percent of the population, used social media. There were 76.89 million mobile connections in January, or 90.8 percent of the population, according to ComScore data.

There have been substantial measures taken in Turkey's telecoms sector toward implementing 5G technology. The operators have done extensive testing with the help of Ericsson and Huawei. There have been LTE networks in place throughout the country, reaching nearly 93% of people. Many base stations have been upgraded to provide LTE-A service.

4.2. Management Optimization [MO]

Turkey's first comprehensive eGovernment strategy and action plan were integrated with the National Development Plan and the Information Society Strategy to be on the structure of eGovernment in a holistic way, taking into account Turkey's particular conditions, new technical developments, and global trends. In particular, the 2016–2019 National eGovernment Strategy and Action Plan aimed to provide the essential momentum for Turkey's digital transformation and social, economic, and environmental progress. Electronic governance will become more integrated and technologically advanced to establish an efficient eGovernment ecosystem and act as a facilitator of the transition to an information society and sustainable development. To achieve Turkey's 2023 Vision and improve the country's well-being, the eGovernment Strategy and Action Plan has to be implemented. The 2016-2019 National eGovernment Strategy and Action Plan's goal was to improve society's quality of life through effective eGovernment, in line with this purpose.

4.3. Online Service [OS]

The Central Population Management System (CPMS) was enhanced in 2005 by introducing the Identity Information Sharing System, KPS, and MERNIS. MERNIS database ID information may be accessed via the KPS by public institutions and agencies that meet the stringent requirements of access procedures. Each user of the KPS is assigned a unique username and password for usage on the system's Virtual Private Network. It keeps track of every user and every query.

The Public Procurement Authority hopes to simplify and improve the procurement process for government goods and services by using automated procedures. Since the end of 2010, the Electronic Public Procurement Platform (EKAP) has been used to do this. The establishment of the Platform, which all public agencies require, is one of Turkey's Information Society Strategy's significant measures for upgrading public services. Continual improvements to the platform are being made in response to changing market conditions and new technical developments.

To process electronic payments, the eGovernment Gateway was created. A credit card is used to make payments to government bodies. The ePayment infrastructure of the eGovernment Gateway has been connected to seven municipalities in the last year alone. The central bank has been in charge of privately run electronic payment systems (TCMB) in Turkey. By all progress made in 2021, the Turkish Online Service indicator came in 33rd the Waseda rankings in 2021.

4.4. National Portal [NPR]

On December 18, 2008, the Turkish government-issued e-Devlet Kaps as the country's eGovernment Gateway. People and companies can access eGovernment services via the Portal, a single point of entry. The eGovernment Gateway may also be accessed via the eGovernment Gateway's contact center for further convenience and accessibility. The eGovernment contact center, which was specifically designed for people with disabilities, started taking eGovernment inquiries in 2018. According to ISO/IEC 40500 and 9241-151, the eGovernment Gateway has been certified as accessible.

4.5. Government CIO [GCIO]

The head of the Digital Transformation Office was named the Government Chief Digital Officer. The Government Chief Digital Officer has the primary responsibility of developing public digital transformation strategies, managing implementation processes, and developing a digital transformation roadmap to improve the performance of public institutions, increase their efficiency in providing services, and pioneer the public sector's digital transformation. Public sector organizations in countries with a proven track record of digital transformation have begun appointing chief information officers (CIO) and chief digital officers (CDOs).

4.6. E-Government Promotion [EPRO]

The development plan for Turkey approved by the Grand National Assembly in 2019 focuses on improving the country's international status and social welfare. The plan was conceived as the first Development Plan after the implementation of the new Presidential Government System. As the world's economic and geopolitical balances shifted and tensions rose, the plan was developed to address these issues. The plan provided suggestions to reduce possible dangers while optimizing efficiency to increase prosperity and ensure a fair distribution of economic advantages.

The plan focuses on the following development axes: environmental sustainability and healthy cities; qualified people and a strong society; the rule of law, democratization, and good governance; competitive production and productivity, as well as a stable and robust economy. Policy on eGovernment is included in the Plan's section on 'eGovernment Applications in Government Services. Transformation and innovations that ensure efficiency and compatibility are part of the Eleventh Development Plan, aiming to increase service quality and consumption via the eGovernment Portal.

4.7. E-Participation [EPAR]

Data exchange across Turkish government agencies is made possible via PublicNET, a virtual private network. The General Directorate of Communications is in charge of setting up the web, under Council of Cybersecurity Decision No 2012/1. In 2018, the eGovernment Gateway began receiving data from public agencies through PublicNET, which improved national cybersecurity. One hundred thirty-eight public entities were linked to PublicNET by the end of 2019.

An eGovernment Gateway's highest level of security was achieved by installing software and hardware that allow Turkish citizens to use electronic governmental services securely. Equipment for the eGovernment Gateway's network was replaced in September 2018. With the eGovernment Gateway, more than 45 million registered citizens have continued receiving services without any interruptions.

When it came time for taxpayers to file their tax returns online, the Ministry of Treasury and Finance set up a nationwide communications network. Revenue Administration tax offices, regional finance administration, traditions, and tax inspector offices are connected to the system. Tax returns may be filed online, and citizens can see their tax records at any time.

4.8. Open Government Data [OGD]

There have been several eGovernment projects implemented in Turkey since the President's Annual Program 2020, which aims to improve public administration while also prioritizing those most in need. Thus, to improve openness, accountability, and citizen participation, this program proposes creating a National Open Data Portal. Central Service Design Platform will also be established to simplify government processes.

Reusing public sector information is covered in part under the Right to Information Act (RTIA). Initiatives to reuse and share information from the public sector were also included in the National eGovernment Strategy and Action Plan from 2016 to 2019. These included initiatives like reforming public sector information and creating the Open Data and Sharing Portal and Public Expenditure and Monitoring Portal.

4.9. Cyber Security [CYB]

The National Cybersecurity Strategy and Action Plan has two main objectives. Cybersecurity is a critical component of national security. An information security circular was issued to reduce security risks and safeguard essential categories of data that might compromise national security or degrade public order. The Presidential Circular underscores that Turkey's top priority is the development and deployment of national cybersecurity solutions. Law 5809/2008 governs personal data protection, processing, and cross-border flow regulations for traffic and location data.

4.10. The use of Emerging ICT [EMG]

According to a sectoral group, Turkey's ICT market was expected to be worth 189 billion Turkish liras by 2020. The Informatics Industry Association and Deloitte Turkey collaborated on a study that found that this industry grew by 22% year over year. Annual growth of 5-10 percent was predicted by the ICT Sector 2020 Market Data and Trends. However, the actual amount spent was significantly more than that. With an estimated 15 percent average annual growth from 2016 to 2020, the study concluded that currency fluctuations and electronic communications greatly influenced the sector's growth.

An Artificial Intelligence Strategy is being developed in compliance with the Presidential Annual Program 2020 in partnership with universities, corporate sector participants, and non-governmental organizations. By focusing on the needs of human beings and aligning them to stated goals, this Strategy aims to ensure that big data and artificial intelligence applications in the public sector are used effectively. It sets out Turkey's road ahead in artificial intelligence and outlines crucial technological areas for progress.

United Arab Emirates

1. General Information

Area: 83,600 km²

Population: 10,011,701

Government Type: Federal Elective Constitutional Monarchy

GDP:\$ 35,170

Internet User: 100

Wired (Fixed Broadband Users): 32.81

Wireless Broadband Users: 224.24

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

The United Arab Emirates came in 16th in the Waseda International digital government rankings 2021, with an overall score of 83.6673 points. The media's role, the legal environment, and future skills are utilized to adapt to changes in daily life. Digitization and ICTs' role in aiding economic development have long been recognized as necessary in the UAE. As a first step, the UAE constructed Dubai Internet City (DIC) in 2000, a collection of purpose-built office buildings where international information technology companies established regional offices and young entrepreneurs based themselves. Government services in the United Arab Emirates are now paid for and collected through eGovernment and eDirham.

The government has been steadily extending the number of government services that may be accessed online. A result of this is that the 2018 E-Government Development Index of the United Nations ranked the United Arab Emirates sixth worldwide in terms of online services and sixteenth globally in terms of eParticipation. With the help of the UAE Strategy for Artificial Intelligence (UAE Strategy for AI), the government of the UAE was able to manage the growth of COVID-19.

Police officers using smart helmets equipped with infrared cameras were able to detect COVID-19-infected individuals from a safe distance. In addition, the helmets were equipped with sensors that could identify faces and vehicle registration plates. The ability to read vehicle plates made it easier to track down anyone who tried to leave during disinfection times without the proper paperwork. Robots and drones were used to clean up the city's streets. When paramedics walked through them, they sprayed mist to sanitize them. To save power, the device only sprays disinfectant when a person walks by. Hand sanitizers may also be dispersed utilizing the device.

3.2. New Trends

The pandemic has sped up the UAE's shift to digital technology dramatically. Just a few of the many trends shaping the UAE's digital economy include the overnight change to contactless digital services for government and financial services; unprecedented large-scale adoption of remote (and increasingly hybrid) work models; the adoption of online and hybrid learning; the increased reliance on online commerce; and the rapid introduction and adoption of teleconsultation in healthcare.

Today's organizations must anticipate and plan to keep up with an ever-changing and unpredictable environment. A business must be "future-ready" by conducting foresight exercises, increasing its human resource pool, adopting a digital mindset among its top executives, and implementing a value-driven digital strategy.

Any country or company that wants to stay competitive in the global digital economy has no choice but to adapt to technological disruption. In some instances, a cultural shift from technology consumption to technology creation is required. The importance of strong leadership cannot be overstated, regardless of how cliché it seems. A technical vision has been created by UAE officials, who then mobilized government departments and enterprises and people and residents to work together to achieve that aim. It's critical to distribute responsibility for technologically-driven innovation across the organization. Priority must be given to fostering the next generation of digital talent. Critical thinking and creativity must be trained alongside technical skills in specialized technologies like artificial intelligence to drive technological progress.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

As for Network Infrastructure Preparedness, the United Arab Emirates placed ninth in the Waseda rankings in 2021, scoring 7.769 points. UAE internet users grew 1.6 percent from 2020 to 2021, reaching 9.84 million in January of 2021. Additionally, the United Arab Emirates had a 99 percent internet penetration rate in January 2021. The UAE had 9.84 million social media users who were accounted for 99.0% of the population in January 2021. The country had 17.06 million mobile connections in January 2021, equal to 171.6 percent of the country's overall population.

The United Arab Emirates (UAE) has made significant progress in preparing its infrastructure for the digital age. Regulator confirms plans for GSM networks to be phased out by the end of 2022. UAE telecommunications companies have increased their foreign ownership restriction to 49

percent. UAE has one of the world's fastest median 5G download speeds. Moreover, Amazon Web Services plans to establish data centers in the United Arab Emirates in the first half of 2022.

4.2. Management Optimization [MO]

Digital transformation is more successful when people are at the center of it and are well-prepared to use the technology. The leaders and executives of the United Arab Emirates (UAE) were aware of this and implemented it to implement the UAE digital vision.

In the UAE, digital change is moving quickly. It's worth noting that the World Bank recently named the UAE government one of the world's top leaders in government technology. The UAE Cabinet has renamed the Ministry of AI, Digital Economy, and Remote Work Applications to emphasize the UAE government's vision for the digital economy and the adoption of new business models and practices in the workplace due to this move. In 2021, Dubai Digital Authority reported that the Dubai Electricity and Water Authority (DEWA) had become the first government agency in the United Arab Emirates to become completely paperless, removing all paper transactions and offering all services through digital channels. Government agencies are also advancing toward their goal of achieving 100% digitization by the end of 2021.

When physicians and medical personnel were occupied with patients, the Ministry of Health and Prevention (MoHAP) launched a chatbot service dubbed the virtual doctor for Covid-19 to assist the public. This is a service that allows people to see whether their symptoms are linked to the Covid-19 virus.

4.3. Online Service [OS]

Through significant achievement gained in terms of Online Services, UAE was ranked 6th in the OS metric. Government entities in the United Arab Emirates are increasingly accepting online payments for their services. There is a single government portal where customers may apply and pay for services or a separate government portal for each emirate. A user can make payments on their electricity or water bills and other costs. Many government services in the United Arab Emirates may now be paid for via smartphone applications developed by the government. Some of these applications are dedicated to payments, while others include built-in payment options.

Government service providers accept credit cards as a form of payment for services provided to the public. A credit card can be used at counters or online to pay for government services. When it comes to government fees, most banks in the United Arab Emirates enable their customers to pay using their bank accounts rather than credit cards. Several government service providers use electronic kiosks in malls, business centers, and other public places for bill payments and additional service costs. Users must input their account information and follow the on-screen instructions to pay at an electronic kiosk.

4.4. National Portal [NPR]

The official website of the United Arab Emirates government is <https://u.ae>, founded by Vice President and Prime Minister of the United Arab Emirates and Ruler of Dubai, Sheikh Mohammed bin Rashid Al Maktoum in May 2011. As a single point of entry for all government services, the portal was created to benefit individuals, visitors, businesses, and the government. By providing

world-class multi-channel services, the eGovernment aims to strengthen the UAE's competitiveness and offer world-class services based on the preferences of its citizens.

Improved open data platforms are available for public use via the UAE's official open data portal, which promotes the digital economy. The site <https://bayanat.ae/en/> is a symbol of the government's commitment to fostering more open and participatory communities. The portal's homepage contains data sets on economics, education, society, technology, transportation, environment, government, health, and infrastructure. The Federal Competitiveness and Statistics Authority maintains and updates this data portal (FCSA). A wide range of assistance is offered to all UAE institutions and citizens as well as international partners.

4.5. Government CIO [GCIO]

H. E. Hamad Obaid Al Mansoori, Head of the UAE Digital Government, is the UAE's Chief Information Officer (CIO), who serves as the country's chief information officer and is responsible for overseeing and implementing the country's digital transformation projects and activities. Heir E. Al Mansoori was appointed as Head of the UAE Digital Government (TDRA). In June 2021, Dubai Digital Authority Director-General H.E. Hamad Obaid Al Mansoori was appointed.

4.6. E-Government Promotion [EPRO]

The UAE's National Digital Government Strategy aligns with the following national goals:

- Vision 2021 is to create a competitive economy powered by educated and inventive Emiratis and a nurturing and sustainable environment conducive to excellent living.
- The National Agenda seeks to ensure the sustainability of the environment and infrastructure.
- The Unified Digital Platform Policy intends to deliver all government services via a single unified platform by using digital government enablers to integrate and link the UAE federal government's digital systems and increase the efficiency of digital services.
- The UAE Strategy for Government Services aims to provide 90% of public services via a single digital platform, to design 100% proactive digital services, to design 100% of services in collaboration with all sectors of the community, and to ensure that all government services are accessible from anywhere and at any time by 2023.
- The UAE's National Cybersecurity Strategy aims to establish a secure and resilient cyber infrastructure by establishing a comprehensive legal and regulatory framework covering all types of cybercrime.
- The National Policy for Digital Life aims to strengthen community members' capacities and enable them to use the internet responsibly, reinforce positive digital values and behaviors, guide the community toward positive content, and protect users from the risks associated with dealing with suspicious activity parties.
- Future Foresight Strategy aims to integrate foresight into government strategic planning by conducting studies and developing scenarios to forecast all priority sectors' future and develop plans and policies in response. UAE Centennial 2071 is a comprehensive plan

spanning five decades after 2021 and serves as a roadmap for future government work. A future-oriented government is one of Centennial 2071's four pillars.

4.7. E-Participation [EPAR]

There has been an emphasis put on eParticipation and utilizing current technologies and ICTs by the UAE government to incorporate all of its citizens in developing public services and future projects. The United Arab Emirates has launched a free online course on eParticipation to increase civic involvement and open governance. eParticipation practices are critical for effective participation in decision-making, which is why this course aims to teach the importance of public engagement to everyone in the community. As a result, UAE's E-Participation was in the top five countries, with the highest score in the Waseda rankings in 2021.

4.8. Open Government Data [OGD]

Transparency and accountability in government transactions benefit from the release of government data. Both UAE Numbers and Bayanat serve as data hubs for the emirate of Dubai. Public access to government data helps the public to assess the government's performance. Open data makes it possible to allocate resources better, provide more tailored services, and create new jobs. It empowers individuals to make informed decisions about public policy and to identify opportunities for advancement. The SDGs may be achieved with the use of open government data.

4.9. Cyber Security [CYB]

There have been considerable changes in the UAE's data security environment during the last 12–18 months, and this trend is projected to continue. The passing of Federal Law No. 2 of 2019 in 2019 was a small step toward data regulation in the healthcare business. There has been an increase in the federal government's attention to consumer protection issues. Consequently, the Federal National Council approved a draft federal consumer protection law in June 2020 to increase consumer protection and data security. Consumer Protection Law No. 15 of 2020 was enacted soon after.

Dubai International Financial Center (DIFC) and Abu Dhabi Global Market (ADGM) have made substantial measures to guarantee compliance with global data privacy standards and best practices, including the EU General Data Protection Regulation. It was recently implemented and repealed the ADGM Data Protection Regulations 2015, providing a more robust and relevant legal framework for protecting personal data. The ADGM Regulations established a new Office of Data Protection, headed by a Commissioner of Data Protection, to guarantee that the ADGM Regulations are being adhered to. An administrative penalty of up to USD \$28 million may be imposed on firms that handle or process personal data and break the ADGM Regulations' limits on handling or processing personal data. This is a significant increase above the earlier maximum administrative fines of USD \$25,000 under the 2015 legislation.

It is also worth noting that the DIFC recently passed a new Data Protection DIFC Legislation No. 5 of 2020 to bring its data protection framework in line with worldwide requirements for GDPR compliance. This law consolidates and replaces prior DIFC data protection regulations. In addition, significant fines have been imposed and extra obligations for data processors and controllers to notify authorities in the instance of a breach.

4.10. The use of Emerging ICT [EMG]

The government has highlighted how the UAE may become an early adopter of emerging AI technologies and recruit top AI professionals to experiment with new technologies and work in an innovative, secure environment to handle complex challenges.

This foundation and increased AI governance will encourage building innovative AI solutions in the UAE over the next decade and beyond. In terms of licensing and exporting, these groundbreaking technologies provide significant economic benefits. The UAE Strategy for Artificial Intelligence intends to meet the UAE Centennial 2071 goals to improve government performance at all levels. The government plans to make the United Arab Emirates a global leader in artificial intelligence by investing in various industries and building new critical markets with high economic value.

United Kingdom

1. General Information

Area: 242,900 km²

Population: 68,273,369

Government Type: Unitary Parliamentary Constitutional Monarchy

GDP: \$ 46,340

Internet Users: 94.82

Wired (Fixed Broadband Users): 40.49

Wireless Broadband Users: 108.13

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Worldwide attention has been focused on Covid-19 over the last year, influencing the economy, society, individuals, and businesses on a global scale. Artificial Intelligence (AI) and machine learning (ML) technologies are being used more and more in the healthcare industry in the UK as a response to the pandemic. As a result, the UK was ranked 3rd in the Waseda International digital government rankings 2021, with an overall score of 93.9841, behind only Denmark and Singapore.

AI and ML technologies have been used in hospitals in the United Kingdom at the Bolton NHS Foundation Trust to quickly diagnose and monitor the development of the virus to make critical decisions like whether or not to move a patient to the ICU or intubate them. Covid-19 sufferers can be diagnosed using cloud-based artificial intelligence software developed by academics at King's College London and a multinational collaboration called icovid. Using this information, doctors can prioritize incoming patients, so reducing the strain on critical care units. The combination of data and enthusiasm is essential to the growth of AI technology as new use cases arise. AI-powered technology has been employed on several fronts in response to Covid-19, from

detecting viral spread to generating vaccines, reducing staff workload, and anticipating infection. The UK has come so far in terms of digital innovation in the country's development journey.

Furthermore, when it comes to the healthcare industry, the UK witnessed one of the most disruptive uses of digital sales: video consultations with doctors. There were restrictions and hesitation in many regions prior to the pandemic but remote consultation became widely accepted and utilized by necessity in 2020. While both patients and doctors were pleased with this change, it also accidentally increased the accessibility of healthcare to underserved communities and those who live in remote locations. As a result of this paradigm change, many businesses are increasingly embracing a more decentralized healthcare model that incorporates more technologically enabled and efficient solutions.

3.2. New Trends

The following are the UK's five most important digital transformation issues for business growth and recovery:

1. Data as a source of inspiration

Data-driven methods to customer experience development are becoming more popular with business leaders and are being included in their strategic plans. Throughout the pandemic, Ocado used AI and analytics to enhance real-time stock management.

2. Growth will be fueled by new internet business models.

As a result of the pandemic, businesses are searching for new sources of revenue. As a result, new online business models based on digital ecosystems are being developed. In the healthcare industry, video consultations between doctors have been one of the most disruptive use cases. In some instances, corporations are still relying only on digital without any service or assistance or on self-service in person.

3. A considerable emphasis on the development of robust supply chains

The evolving supply networks between the UK and the rest of Europe will focus on Europe's logistics revolution. This might imply a shift away from reliance on large trucks and shipping altogether, favoring smaller, more localized delivery methods.

4. Complementary AI technologies for a variety of application scenarios

Incorporating complementary technologies and a focus on the consumer will allow AI to reach its full potential. As AI applications grow more widespread in the following years, this trend is projected to intensify in the United Kingdom.

5. Cloud computing and the Internet of Things will serve as significant growth foundations.

UK businesses will focus on cloud-native infrastructures and the Internet of Things (IoT) during the post-pandemic recovery era. Many UK organizations will emphasize customer service and overall operational excellence as a result of the Internet of Things (IoT). This improves productivity and efficiency while removing some of the more tedious tasks.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

The United Kingdom is in 6th place in terms of Network Infrastructure Preparedness, with a score of 7.844. Internet users in the United Kingdom increased by 325,000 between January 2020 and January 2021, reaching 65.32 million in that month. UK internet penetration was 96.0 percent in January 2021. 77 percent of the population or 53.00 million people were active on social media in January 2021. With just 67.61 million mobile connections in January 2021, the UK is down 2.5 million from the year before. In the UK, 99.4 percent of the population had access to a mobile phone in January 2021.

The statistics show that 38 percent of UK homes had access to gigabit-capable internet by the end of the year 2020. Most homes have access to ultrafast broadband (more significant than 300Mbps). In December of 2020, Eutelsat's Konnect satellite has provided high-speed data transmission rates of up to 100 megabits per second (Mbps) over the whole United Kingdom. Withdrawal from EU and withdrawal from Galileo satellite positioning system, the government purchased a 45 percent stake in OneWeb. A joint venture between Virgin Media and Telefónica's O2 resulted in Virgin Media O2's solid competitor to BT. The sale of 700MHz and 3.6GHz blocks of spectrum in March 2021 bolstered the development of 5G.

4.2. Management Optimization [MO]

In February 2017, the UK Government Transformation Strategy 2017–2020 aimed to strengthen the UK's digital capabilities. The Government Digital Service (GDS) supports the strategy by allowing and assuring digital government initiatives. The plan ensures that digital development in the United Kingdom underlined the necessity of an economy that works for everyone and ensures that wealth and opportunity are dispersed equally. The strategy is a framework developed in cooperation with industry to support the implementation of successful sectoral policies. Digital businesses and the government continue to build on this interaction as the UK builds its industrial and digital strategies. This digital strategy signals the beginning of a dialogue between the two groups.

The Government's Digital Inclusion Strategy stated how the government would cooperate with public, private, and voluntary sector partners to increase digital inclusion. This means aiding others in learning how to use and benefit from the internet effectively. In November 2015, the team responsible for this initiative was relocated from the Cabinet Office's Government Digital Service to the Department for Culture, Media and Sport (DCMS) as part of a Machinery of Government restructure.. The focus has shifted away from Digital Inclusion and toward Digital Engagement since the team relocated. In this case, the policy has been reframed as an issue that motivates involvement first and foremost. It's the job of the Digital Engagement Team to identify and prioritize new delivery goals and work areas. It will replace the existing governance structures of the Sub-Group and the Delivery Board, which bring together representatives from the public, private, and volunteer sectors and is led by the Minister for Culture and Digital Economy. The Council will oversee many tasks and working groups to deal with many essential issues relating to digital engagement in education.

4.3. Online Service [OS]

Due to a government shutdown that lasted most of 2020, the United Kingdom was more dependent than ever on internet services for everything from entertainment, commerce, communication, information, teleworking to home education. Nearly 94 percent of all UK homes had internet access at the end of the year, compared to roughly 89 percent in 2019. During the outbreak, more people used the internet for gaming, video conferencing, and online healthcare.

Online services also played an essential role in disseminating information about the pandemic and helped governments monitor and manage the virus's spread. It is estimated that 22.5 million British citizens utilized NHS online services during the shutdown in March 2020. In October 2020, 12.6 million people in England and Wales were using the NHS Covid-19 app, while the Protect Scotland app reached 23% of adults in Scotland and the StopCOVID NI app reached 3% of adults in Northern Ireland.

Email remains popular and essential in many cases, including shopping sites when it comes to online registration. In 2020, Gmail was the most popular email provider for adults, with 61% of the UK's online adult population using it. However, the pandemic has widened the digital divide. The majority of people reaped the benefits of internet access, while others who are digitally excluded faced the burden of the shutdown.

4.4. National Portal [NPR]

The UK came in 2nd in the National Portal metric, with 8.000 points, only below Denmark. GOV.UK is the government of the United Kingdom's official web page. It gives citizens and businesses in England and Wales rapid and easy digital access to all public services and related information. Maintaining the website is within GDS' purview. To replace Directgov and Business Link, and hundreds of government departments and public organizations' websites, the portal was created in 2012 as a single access point to HM government services. During the last seven years, technology and customer expectations have changed dramatically. When it comes to user contact, GOV.UK will no longer rely on a reactive strategy but rather a proactive one. A consent-based approach will warn users of activities they must do, support them in digesting material they may not be aware is relevant to them, guide them through intricate life events, and advance them to the next stage of their job. Vision and strategy are being used to drive the transformation of GOV.UK, which is being modeled on the way things should be done.

Additionally, by GOV.UK Pay, users can make secure payments that are easy to integrate and develop to meet the Digital Service Standard. Citizens may now safely pay the government online, reducing the time and hassle of doing business with the government and removing the need for the government to buy or construct payment systems several times. It was implemented in September 2016.

4.5. Government CIO [GCIO]

The term "CIO" changes from country to country. As of 2013, the GCIO was still in existence for Britain. GDS is the new accountability agency for the government (GDS). Local governments have neither GCIO nor the GCIO mandate, even though GCIO has grown exponentially over the last several decades.

4.6. E-Government Promotion [EPRO]

As an independent regulatory agency, the Information Commissioner aims to enforce and monitor data privacy and freedom of information legislation. Many duties are within the purview of the Commissioner, which includes encouraging data controllers to uphold high standards of behavior and processing of individuals' data. In response to the devolution processes in Northern Ireland, Scotland, and Wales, three regional offices were established in 2003.

The UK government has created the Digital Service Standard and the Technology Code of Practice as standards for designing and running digital services. Guidelines and principles laid down in the European Interoperability Framework focus on adopting open standards to improve interoperability between services and technical components. Technology Code of Practice and Service Manual both provide detailed guidance on how to implement available measures. Standards are examined by the GDS Open Standards Board, which follows the CAMMS approach. Afterward, they must be employed. Open data must be provided in available formats; otherwise, it cannot be considered open. The government has joined open standards associations and development organizations to understand standards promotion better. The Digital Service Standard and the Technology Code of Practice both emphasize identifying user needs when creating and running any government digital service.

On 28 May 2019, the UK unveiled its fourth Open Government National Action Plan (NAP) for 2019-21. The Center for the Development and Improvement of Local Governments promotes new ideas and initiatives in municipal governance. Using networks, online communities of practice, and online resources enables local governments to create best practices and collaborate.

4.7. E-Participation [EPAR]

A System of Governmental Services Collaboration, reduction of duplication, and sharing of resources among public sector entities are all facilitated by the Public Services Network (PSN). With this, the government may trade services safely and work together better. This includes all of the central government departments and councils in the United Kingdom and every single local authority and town hall.

The Government Secure Intranet (GSI), the Government Connect Secure Extranet (GCSx), and the Government Secure Extranet (GSI) are all members of the GSI family of legacy networks (GSX). These networks provide secure and reliable Internet access, file transfer and search capabilities, directory services, online publishing, and email services inside and outside the GSI community. Customer's GSI networks were transferred to the Public Services Network (PSN) using a GCF framework, allowing them to pick and choose among different PSN service suppliers. EU agencies, organizations, and the Member States rely significantly on TESTA. This cross-border infrastructure serves as the primary means of communication between the United Kingdom and the European Union.

4.8. Open Government Data [OGD]

Government data can be accessed, examined, downloaded, and analyzed by the general public in the UK through Data.gov.uk. The UK government published the "Open Government National Action Plan 2016–2018, joined the Open Government Partnership, ranked first in the Open Data Barometer, and, most importantly, released government data to the general public on the data.gov.uk website, all in support of the G8 Open Data Charter.

Find Open Data application helps consumers find and utilize open government data, and it helps data producers keep their data current. They are improving data discovery tools for individuals. Over ten thousand datasets have been made accessible to develop products and services by the UK government, local government, and other public organizations.

It is the responsibility of the Cabinet Office and the Open Standards Board to choose and implement open standards openly and transparently. Because of the GDS Open Standards team, government agencies are required to provide their data in available formats. To ensure the broadest possible range of data is shown as "open data," the Open Standards Board has produced 14 standards.

Nearly 800 services are included in the Performance Platform, which is obligated to submit performance data under the Digital Service Standard. The Performance Platform has aided government decision-making and contributed to the UK's global open data leadership position and the ability of external stakeholders to hold the government accountable. The UK's Open Government Data indicator was placed 3rd in the Waseda rankings 2021, representing a significant gain over the previous year.

4.9. Cyber Security [CYB]

According to the government's National Cyber Security Strategy 2016–2021, the United Kingdom's cyber security and resilience must be protected and strengthened. As part of this effort, the administration will seek international cooperation and create new relations with new partners, including NATO, the EU, and the United Nations. Cyber security in the United Kingdom will be significantly improved during the next five years, with a total of GBP 1.9 billion being invested.

The House of Lords received the Data Protection Bill on September 13, 2017. Data Protection Act 1998 was abolished and replaced with a new law that provided a comprehensive and modern framework for data protection in the United Kingdom, with harsher penalties for data protection offenses. It created new standards for the protection of general data under the EU's GDPR.

Act on Digital Economy aimed to regulate electronic communications infrastructure and services, ban access to online pornography, protect intellectual property in connection with electronic communications, and control data sharing.

4.10. The use of Emerging ICT [EMG]

With the help of the Office of Artificial Intelligence (OAI) and GDS, the United Kingdom has launched a new artificial intelligence (AI) review, examining how the public sector can benefit from using artificial intelligence and automation to increase public sector efficiency and generate economic benefits. Government Digital Service (GDS), Office for National Statistics (ONS), and Government Office for Science (GOS) have joined forces to form the Government Data Science Partnership (Cabinet Office) to help the government realize the potential of data science and support the development of the skills and tools required to speed adoption across departments and agencies.

Using the Data Science Accelerator, analysts in the public sector can polish their data science skills and become more proficient (also linked to the Government Data Science Partnership). To achieve this, they work with experienced mentors to tackle real-world business challenges. About 150 government and public sector employees have been educated as a result of this endeavor thus far.

London, Newport, Bristol, Sheffield, and Newcastle are all home to Data Science Accelerator centers.

The Government Technology Innovation Strategy for the United Kingdom was released in June 2019. Organizing government operations around new technology is the initial stage in this process. It discusses how to provide the framework in the public sector so that increasing technological innovation may thrive.

United States

1. General Information

Area: 9,372,610 km²

Population: 333,305,608

Government Type: Federal Presidential Constitutional Republic

GDP: \$ 68,310

Internet Users: 89.43

Wired (Fixed Broadband Users): 36.41

Wireless Broadband Users: 152.17

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

In 2021, the United States placed 4th in the Waseda International digital government rankings, with a score of 93.7210. Almost all individual indicators were ranked within the top ten of the rankings. A projected \$9 billion increase in the Technology Modernization Fund in the United States would provide uniform IT and cybersecurity services throughout the government. Automating manual procedures and deploying virtual assistants powered by AI are just two examples of how governments use automation to improve service and reduce the stress on workers. As demand for critical services soared in the United States, the Department of Housing and Urban Development, the National Institutes of Health, and the Internal Revenue Service used robotic process automation (RPA). Artificial Intelligence (AI)-powered virtual assistants, chatbots, and "virtual doctors" have also helped governments address COVID-19 questions more quickly by answering citizens' questions, tracking contacts, and overcoming language barriers.

Many governments have considered remote work solutions, such as remote desktops and virtual private networks, insufficient to cope with the unexpected rise in distant employment. In the US, it was easier to transition to telework since cloud computing was more flexible. With the help of

the state government's early exploration of cloud computing, 90% of California's nearly 200,000 employees were able to switch to telework easily.

In reaction to the coronavirus's strain, a large portion of the American healthcare system has gone digital. The use of telemedicine and remote diagnostics is allowing people to acquire medical advice and diagnoses without having to attend a doctor's office or hospital, while 3D printing is expediting the creation of critical medical supplies such as personal protective equipment (PPE). Knowledge sharing is the most effective preventative medicine in the absence of a vaccination or proven medication. A practical approach to regulating the spread of COVID-19 in East Asia has already been shown via digital contact monitoring.

3.2. New Trends

In the pandemic era, digital payment and identification infrastructure may help solve structural concerns like financial exclusion and informality as the fourth industrial revolution continues. In contrast to industrialized economies, just 40% of the population in developing countries has access to mobile internet. Developing countries seek foreign investment to help them achieve their digital infrastructure needs. The United States has an opportunity to help other countries realize their economic and social potential by participating in the digital banking and identity infrastructure arena. A coordinated and gender-sensitive approach to regulatory framework design is needed to address the gender gap.

There are also long-term political and economic consequences to a shortage of US investment and leadership in the digital infrastructure sector. Digital financial inclusion and identification infrastructure align with US foreign policy goals and has a wide range of benefits. A few of the US government's initiatives aim to increase the financial inclusion of underserved groups, including the poor, women, and other historically marginalized individuals, as well as empower women in the workforce. For USAID, digital technology has the potential to narrow the gender gap and enhance economic productivity.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Network infrastructure preparedness in the United States of America (USA) was ranked 14th with a score of 7.528 in the 12th Waseda International digital government rankings 2021. In January 2021, there were 298.8 million Internet users in the US, a rise of 3.7 percent over the previous year. There was no change in the percentage of people having Internet connectivity at the beginning of 2021. There were 240 million people, or 72.3 percent of the population, who used social media. Moreover, there were 353.8 million cell phone connections in the US as of January 2021, accounting for 106% of the total population.

As a result, the United States has made significant progress toward global digitalization. To develop Starlink, SpaceX was awarded \$885 million in government subsidies through the RDOF auction. In the third quarter of 2020, e-commerce sales accounted for 14.3 percent of total retail sales. School and library officials have also petitioned Congress to provide \$12 billion in emergency funding for the E-Rate program. On the other hand, Google has developed a new undersea cable linking the United States, the United Kingdom, and Spain.

4.2. Management Optimization [MO]

The private sector's efficiency, convenience, and effectiveness have been revolutionized by advances in information technology (IT) during the last decade. Poor technology investment management has resulted in the Federal Government mainly missing out on that transformation. IT projects that cost hundreds of millions of dollars more than necessary take years longer to deploy and deliver obsolete technologies by the time they are completed. Consequently, we're seeking to reduce the gap between successful private firms and the federal government.

The government's Chief Information Officer (CIO) leads the Office of E-Government and Information Technology (E-Gov), which develops and oversees the use of Internet-based technology to ease citizen and corporate contacts with the Federal Government, save costs, and expedite participation.

4.3. Online Service [OS]

In the United States, technology companies dominate mobile payments. There are also a few new entrants who are trying to get in their way. Companies may gain from an increase in mobile payment methods, but this will harm more profitable sections of the company.

More than 15 years after Congress passed the REAL ID Act, all 50 states are now completely compliant with the act's standards for issuing these cards, with most states complying in the previous four years. Actual ID-compliant licenses and ID cards have been published in all 50 states to date, accounting for 38 percent of all drivers and ID holders. All federally regulated airports, federal institutions, and nuclear power plants planned to adopt full REAL ID enforcement on October 1, 2021.

Counterfeiting technology, preventing insider fraud, documenting and validating a person's identification are among the security measures that must be taken. Federal agencies are also prohibited from allowing admission to government facilities like nuclear power plants and commercial airlines with licenses and identification cards that are not in conformity. State-issued driver's licenses and ID cards have become more accurate and trustworthy due to these regulations.

4.4. National Portal [NPR]

Citizens of the United States of America may access a variety of government services through the website www.usa.gov. Many government entities' information and online services are brought together in a single area. One of its functions is to improve public-government relations by providing access to information and otherwise unavailable services to the public. As a bonus, it provides information that aids the general public in their understanding of the issue. The site also allows users to set up government accounts to customize the portal to their tastes. On weekdays except for holidays, the website provides accessibility features, a live chat platform, and chat hours that may be adjusted.

Government-related information and services may be found on this website. Thanks to this site's simple design, listing all of the government's many programs and resources is a simple task. E-tax, driver's license applications, complaints, seeking a doctor, passport applications, and travel information are available online via the National Portal. Site design allows visitors to quickly access both broad, general information and more specific, customized services. The government

has established enterprise Roadmaps and modernization profiles to plan out the next phase of government modernization.

4.5. Government CIO [GCIO]

The White House Office of Management and Budget (OMB) appointed the country's CIOs to oversee and direct federal agency IT spending. As stipulated by the Clinger-Cohen Act, each Federal agency has a Chief Information Officer. CIO positions in government are significant indicators of worldwide e-Government rankings, not to mention their significance in enhancing American e-Government platforms. Federal CIO Suzette Kent is currently in charge of the federal government's IT infrastructure. The U.S. was placed 2nd in the Waseda International digital government rankings 2021 with the same score of 10.000 as Japan and Singapore.

4.6. E-Government Promotion [EPRO]

The US government's digital interactions with people, companies, labor and foreign governments have increased substantially for the past several years. Promoting the use of the Internet and other information technologies helps citizens to have more opportunities to interact with the US government and encourages interagency collaboration in providing electronic government services. Efforts have been taken to build and promote electronic government services and processes, including creating an Administrator Office of Electronic Government within the Office of Management and Budget. The introduction of e-government has lowered the costs and burdens on businesses and government entities.

4.7. E-Participation [EPAR]

Individuals in the United States can interact, contribute, and become empowered in innovative and modern ways. For the government to be more effective, it has to make better decisions with the public. Transparency in the federal government may be improved by enlisting the help of new approaches, such as boosting public participation. The Open Government Dialogue Platform, Challenge.gov, and the Citizen Engagement Platform are all part of this effort.

According to this statistic, e-Government in the United States has made significant progress. The national portal offers a wide range of online services to citizens, including the ability to pay taxes, file tax returns, apply for a driver's license, file a complaint, acquire a passport, or receive a travel advance. For the average citizen, it's a lifesaver.

4.8. Open Government Data [OGD]

Using Data.gov, the public can find, download and use datasets gathered and maintained by the federal government much more rapidly and efficiently. This website provides information on government datasets (metadata), how to access the datasets, and how to use national data. As new datasets are uploaded to the catalog, the size of the catalog will grow. As part of Data.gov's initial release, Federal and Executive Branch data are provided. Throughout the years, the site has been constantly updated and refined.

4.9. Cyber Security [CYB]

In fiscal year (FY) 2020, agencies reported 30,819 cybersecurity incidents, an 8 percent increase above the previous year. As a result of this trend, cybersecurity incidents are becoming more frequent and more serious, and the Federal Government must take action to prevent and minimize

their repercussions. All three agencies received reports of at least six significant incidents in a little over a week.

4.10. The use of Emerging ICT [EMG]

It was undeniable the significant impact of the U.S.'s ICT on the country's development and the world's. Therefore, the U.S. came in the highest position in the Waseda rankings regarding Emerging ICT. There are both great opportunities and significant risks associated with advances in technologies, which is why the US Department of State is paying more attention to Artificial Intelligence (AI). The United States can improve its scientific and technology capabilities while advancing democracy and human rights by working together to identify and grasp opportunities while tackling problems.

With the help of partners, the Department of State works to create an international policy environment that encourages the progress of artificial intelligence (AI), safeguards national and economic security, and promotes core values. Several Departments engage in bilateral and international discussions that the Department participates in to enhance the safe use of trustworthy artificial intelligence technologies.

IBM, Microsoft, Intel, Applied Materials, Participates, and Lockheed Martin contributed \$340 million to the Department of Energy's five quantum computing facilities at US national labs throughout a five-year, \$625 million endeavor. Sophisticated computer systems, such as voice recognition and spam filtering, are now commonplace in today's workplaces. Although quantum computing is still in its infancy, many experts believe that the unusual physics of the ultra-tiny will have a profound impact on new material creation, financial predictions, and delivery systems. However, government programs aim to boost the quantity of basic research being done in these areas.

US government, commercial and academic research aim to make advances in vital areas more quickly and efficiently. It follows the same model as earlier US technical achievements, such as the Manhattan Project's creation of the atomic bomb during WWII, the Apollo program's voyage to the moon, and the military-funded endeavor to build what became the internet.

Uruguay

1. General Information

Area: 181,034 km²

Population: 3,487,434

Government Type: Unitary Presidential Constitutional Republic

GDP: \$ 15,650

Internet Users: 83.35

Wired (Fixed Broadband Users): 29.25

Wireless Broadband Users: 97.61

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

Uruguay placed 35th in the Waseda International digital government rankings 2021, with an overall score of 72.4353. When it came to developing its test for the Coronavirus, Uruguay was among the first to begin sequencing the virus's genome from patients in March. As a result, the transmission of the virus was slowed since they did not have to wait for testing to begin. As a part of the country's national preventive and containment efforts, Uruguay used big data and other innovative strategies to stem the virus's spread. As a result of the risk profile data, they could start steps quickly to help contain the situation.

In addition, their healthcare app and contract monitoring software were used to focus on the healthcare system as a focus of their efforts. A universal healthcare system was already in existence in Uruguay, and a 2017 survey revealed that most residents had confidence in their government. When the official Coronavirus UY app was developed and linked to social media, the majority of the community welcomed the usage of this technology for digital health records, provider

information, and other things like this. It took only seven days to build all of the multi-channel communication systems.

In addition to healthcare, Uruguay transformed education by making computers widely available. Antel, Uruguay's state-owned telecoms company, collaborated with Plan Ceibal, a national virtual program, to provide online education while schools were closed in the last decade. For example, all public schools in the Uruguay had wi-fi networks by June 2020. Each home received a laptop for each child in 2007 to promote digital inclusion and justice. Because of this national policy, the country could easily transition to a digital learning environment at home.

3.2. New Trends

Uruguay's digital plan for 2025 will attract software and hardware firms and telecom and network service providers. In addition to progress on the 5G deployment, FTTH networks will be extended to locations with less than 3,000 residents, public utility sensors will be placed, and new frequency bands will be allotted to mobile technologies as part of the plan. Agesic, an e-government organization, started working on the concept in December and has recently revealed it. The primary purpose is to revise the five-year digital transformation plan.

The national strategy is divided into five primary sections and twelve targets. Government agencies have been given specific objectives that must be met within the timeframe provided in the goals. Digital citizenship, digital governance, innovation in critical areas, connectivity infrastructure, and cybersecurity are the most pressing issues. The government's objective of using IoT to improve customer service and boost competitiveness in the productive sector by placing meters and sensors in the supply and management of public services, particularly energy, water, communications, and transportation, is an essential issue on the agenda.

Additional goals include fiber-to-the-home internet connections in tiny towns and statewide 4G cellphone coverage. Another public service initiative intends to enhance jail communications infrastructure so that telemedicine, distance education, and court appearances may be conducted there. Another significant achievement is the inclusion of new frequency bands for the application of radio communication technology. One of the core aims of the digital strategy is to accelerate 5G implementation "while respecting environmental requirements.

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Having received a score of 7.007, Uruguay was rated 30th in the Waseda rankings for network infrastructure preparedness in 2021. As of January 2021, there were 2.69 million internet users in Uruguay, representing a 3.8 percent increase over the same month the previous year. Uruguay had a penetration rate of 77.4 percent for the Internet at the time. The number of people using social media climbed by 200 thousand in January 2021, totaling 2.9 million. It was stated that 5.72 million mobile connections were active in Uruguay, representing 165.5 percent of its population.

4.2. Management Optimization [MO]

For the past decade, Uruguay has been on a strategic road toward digital transformation, and the government has set the fundamental pillars to ensure continued progress in that direction. The first

pillar is the integrated regulatory framework that serves as a guide and a foundation for the regulation of digital transformation. The second is establishing a cohesive institutional structure for collaboration between government agencies and other parties. The last one is the technical infrastructure that is prepared to meet increased demand for services while maintaining the necessary security to safeguard residents' and government data.

Uruguayans now employ technology solutions so extensively in their daily lives that they have transformed Uruguay into the region's most sophisticated digital civilization. Additionally, Uruguay has been recognized internationally for the high quality of its digital government, information security, interoperability, citizen service, e-participation, online services, personal data protection, access to public information, and electronic signature solutions. These advancements have enabled the government to rapidly enhance its worldwide standing, owing to its unique approach to Digital Government policy and the deployment of digital technology while maintaining a focus on residents.

4.3. Online Service [OS]

In addition to informational and interactive components, Uruguay's official website also has a welcome section that provides information to the general public. The Presidency Channel on YouTube and Twitter is utilized to promote online political engagement in the Uruguayan government.

4.4. National Portal [NPR]

As part of its attempts to save resources, Uruguay plans to develop a national policy to use public software. As of December 2012, the architecture was in place, and the application was accessible through the IMM's System of Electronic Resolution Programs (SAE), which is also accessible via the State portal's main page -software public.gub.uy-. Apps from six countries are included in this section.

Citizens and electronic collaborators may engage for an extended period in Trantic.gub.uy allows for feedback and ongoing improvement to information on government operations and services.

4.5. Government CIO [GCIO]

In 2007, the Uruguayan parliament established the Agency for Electronic Government and Knowledge and Information Society (AGESIC) to promote digital technologies in public administration, strengthening Uruguay's digital policy, and achieving the country's Digital Agenda goals of 2010, 2015, and 2020. The Society of Information and Knowledge (SIC) was founded by the AGESIC in 2012 as one of its divisions to expedite the advancement of the Information Society and SIC projects. The AGESIC assumes the function of the GCIO in promoting Digital Government, the Information Society, and Open Government.

4.6. E-Government Promotion [EPRO]

Public sector websites and services can now be accessed via a single portal (gub.uy), which provides a consistent user experience and information architecture. They also made it possible for consumers and companies to get personalized information, messages, and warnings through

gub.uy, which they established. As a result, a system for successfully monitoring the performance of each government function has been devised.

4.7. E-Participation [EPAR]

Uruguay's E-Participation came in 30th Waseda rankings 2021 with 8.500 points. All Central Administration services in Uruguay can be accessed over the internet due to the general country's government's standardization of electronic interactions between citizens and the state. Standardizing first-level support at Central Administration and developing new channels for service delivery using emerging technologies are also among the goals of this initiative.

4.8. Open Government Data [OGD]

Transparency, accountability, participation, and innovation are all aims of Open Government. There has been an increase in the demand for more government openness from citizens. More than ever, they are searching for methods to increase their governments' transparency, sensitivity and accountability, and efficiency. By joining the Transparent Government Partnership in 2012, Uruguay committed to putting a comprehensive strategy that included objectives and initiatives to promote open government.

The goal of the project is to develop a government that prioritizes and improves administration based on the requirements of its citizens. The fourth strategy for Open Government in Uruguay was implemented in 2020 after the country had put three in place. People can exercise their rights more readily since governments can engage directly with them. As part of this effort, the DGS promotes openness, data availability, citizen co-creation, and engagement in public-interest problem resolution.

4.9. Cyber Security [CYB]

Reliable Digital Government" is primarily concerned with building frameworks and making them readily available to guarantee that the use and expansion of Digital Government are safe and confident.

Uruguay's government has made investments in infrastructure development and enabling frameworks to define and support people's use of digital technology while fostering security and confidence in their actions. The DGS intends to continue advancing cybersecurity ecosystem development, risk management, operational continuity, universalizing digital management, privacy and data protection, and other related areas.

4.10. The use of Emerging ICT [EMG]

By fostering a digital ID ecosystem that can adapt to varying levels of security and device kinds, Uruguay's government has taken a step toward universalizing digital IDs. With the help of the Ibirapita Plan, they are also focusing on enabling Mobile-ID and cloud-ID services to make digital identification more accessible to residents.

Additionally, as part of the country's digitalization strategy, the regulatory framework for the digital government has been revised. The agencies aid in developing the nation's legal system in light of worldwide norms that are now evolving, such as GDPR, IoT, drones, artificial intelligence. To promote awareness of the fundamental right to data protection, they engage with the ANEP. At

many stages of the software development process, privacy-by-design best practices have been developed.

Vietnam

1. General Information

Area: 331,212 km²

Population: 98,335,209

Government Type: Unitary Marxist–Leninist One-Party Socialist Republic

GDP: \$ 3,610

Internet Users: 70.29

Wired (Fixed Broadband Users): 17.16

Wireless Broadband Users: 80.23

2. Digital Government Overview in Country



3. Digital Government Development and new trends

3.1. The development

With an overall score of 69.0893 points, Vietnamese came in 45th in the Waseda International digital government rankings 2021. Vietnam's rapid and evidence-based response to COVID-19 has been supported by the country's focus on digital transformation. Local administrations used several digital ways to send warnings (text messages, websites, and social media). There was a significant rise in online government service utilization as a result of this effort. Additionally, the COVID-19 outbreak has led to a long-term surge in technology adoption in Vietnam. The height of Vietnam's pandemic coincided with a rise in traffic to the National E-government website, which was established at the end of 2019 and received 11 million visits by the end of January and over 28 million by the end of March. According to a recent report, Vietnam's Internet economy is expected to reach a value of US\$ 52 billion by 2025, making it the fastest expanding in Southeast Asia.

Vietnam's prime minister has often underlined the crucial role of technology and technology businesses in Vietnam's long-term economic development. Tiki and Sendo, two of Vietnam's most popular e-commerce platforms, have been sponsored by the government under the 'Make in Vietnam' program, officially launched in May 2019. Lazada and Shopee, two of Southeast Asia's most popular online marketplaces, competed successfully because of this help. Several local IT companies, including VCCorp, a sizeable Vietnamese internet corporation, have started developing their social media platforms to challenge Facebook's dominance in the nation.

As the post-COVID innovation scenario swiftly changes, the government has shown its determination to create a local champion to oppose China-based Zoom's widespread use and to stay at the vanguard. Three Vietnamese technological solutions have already been developed to prevent the spread of COVID-19 and satisfy customers' changing needs in a pandemic. According to the company, a contact monitoring software called Bluezone and a virtual health-screening platform will be launched in Vietnam in April 2020. The checkup platform has boosted the government's attempts to digitalize Vietnam's health sector, allowing remote medical examinations.

3.2. New Trends

In 2020, President Nguyen Xuan Phuc signed the National Digital Transformation Roadmap, a blueprint for Vietnam's digital transformation, to be implemented by 2025.

All government services and administrative processes should be digitalized and integrated into a single database called "e-government." As part of this government digitization effort, all government-related papers will be provided and authorized electronically. A national data center will be linked to national databases for population, land, company registration, finance, and social insurance.

The digital economy is predicted to contribute 30% of Vietnam's GDP by 2030, according to the country's 2030 development plan. The importance of internet commerce has been widely acknowledged in this new economy. Vietnamese tech businesses have been designated as the driving force behind the country's "Make in Vietnam" brand.

Efforts are being made to close Vietnam's "digital gap," or the inequality in internet and online service access and usage. To get to 80% broadband penetration by 2025 and a 100% broadband penetration over the following decade, Vietnam aims for an internet penetration rate of 60%. E-payments are expected to account for 80 percent of all transactions by 2030. Proposed changes emphasize the need for postsecondary educational reforms that encourage students to learn about emerging technologies, including artificial intelligence (AI), blockchain, big data, cloud computing, and the Internet of Things (IoT).

4. Digital Government by Indicators

4.1. Network Infrastructure Preparedness [NIP]

Waseda's Network Infrastructure Preparedness indicator in 2021 ranked Vietnam 52nd, with a score of 5.589. Vietnam has 68.72 million internet users as of January 2021, an increase of 0.8 percent from the previous year. In Vietnam, the Internet penetration rate is 70.3 percent. Social

media was utilized by 72.00 million people, or 73.7 percent of the total population. The total number of mobile connections in Vietnam grew by 1.3 million to 154.4 million, or 157.9 percent of the population, according to the country's official statistics in January 2021.

Vietnamese efforts to prepare for and invest in digitalization have progressed significantly. Starting in 2022, the MIC is contemplating phasing out GSM infrastructure and reallocating the spectrum to LTE and 5G networks. By the middle of 2020, commercial 5G services were planned to be available on Vietnamese mobile networks. Additionally, Viettel performed a trial run to test LTE services in the 2.6GHz frequency spectrum.

4.2. Management Optimization [MO]

The Prime Minister approved an e-government development plan, with a view to 2030, between 2021 and 2025. Digital governance and the future digital economy and society will be guided by fundamental principles laid forth in this strategy. Creating a digital government with a new operational model, data, and digital technology-based operations is the first and most important goal. The government's information reporting system, the National Document Communication Axis, and the national bidding network will be established and completed as part of the plan. For national cybersecurity, it plans to launch an analysis system that can handle huge volumes, as well as a system to coordinate and react to cybersecurity disasters. Improved quality of services, timely policy formation, efficient use of resources, and effective resolution of significant socio-economic and managerial difficulties will be achieved as a result of this.

4.3. Online Service [OS]

Online purchases in Vietnam accounted for \$54.7 million in 2019. Almost half of the country's total population is represented by this figure. E-commerce giants Lazada, Shopee, Tiki, and Sendo, make up the country's top four. The Shopee's popularity in Vietnam has skyrocketed. Small businesses to the world's largest CPG companies use the major e-commerce platforms to sell their products and services. There is no question that e-commerce is the future of retail in Vietnam.

Mobile payment apps are getting increasingly popular in Vietnam, especially when the pandemic happens. The apps establish their payment infrastructure and then connect to merchants and retailers to make mobile payments. In terms of their services, they only provide a small selection. Zalo Pay and VNPay are only two of the many payment options available to Vietnam. Significantly, Vietnam was ranked 18th in the Waseda International rankings 2021 regarding Online Service, with 10.860 points equal to the Netherlands and Germany.

4.4. National Portal [NPR]

It is expected that the Ministry of Science and Technology's Directorate for Standards, Metrology, and Quality (DSMQ) will create a national monitoring portal in the fourth quarter of 2021. Through the portal, products and commodities traceability systems from various ministries and sectors can be linked together, including market management from the Ministry of Industry and Trade, taxation and customs from the Ministerial of Finance, and health care from the Ministry of Health.

This site will be a crucial part of Vietnam's traceability system, involving all supply chain players, including manufacturers, packers, transporters, distributors, retailers, traceability solution

providers, and government management agencies. It also establishes a standard set to ensure the traceability of national site-linked agencies, organizations, and enterprises. The Directorate is doing this for Standards, Metrology, and Quality."

4.5. Government CIO [GCIO]

Vietnam's Government CIO was ranked 21st in the Waseda rankings in 2021. A Government CIO Council was created in 2011 with the directors of ICT departments from all provinces as members. The council has proved its function by various acts, including using state funds to implement ICT in government organizations. Minister of Information and Communications' Decision No. 814 / QD-BTTTT of can18, 2016, consolidates the Chief Information Officer Council of State Agencies under a central government.

4.6. E-Government Promotion [EPRO]

Recently, the Vietnamese government has pushed to improve the efficiency of state agencies through the development of IT applications and an e-Government system. E-Government in Vietnam has been an enormous success thanks to the Prime Minister's leadership, the efforts of government ministries, agencies, local governments, and the support of the international community and domestic and foreign experts.

To put it another way, in recent years, there has been an increase in public awareness of the benefits of electronic government as well as the implementation of digital government, economy, and society. Vietnam has completed the analysis and execution of vital information systems, such as the national text communication axis and the government meeting and affairs information system. In addition, safety and security efforts have been bolstered throughout the years.

Final systems have been implemented ineffectively, and data connection and interchange have been severely limited. Despite the widespread usage of electronic document transmission and delivery, the legal validity of these documents has not been synchronized. Furthermore, the digital signature formats used by ministries, agencies, and municipal governments are not standardized. While e-Government is an innovative and sophisticated idea, the Prime Minister has said that its implementation would be impossible without the determination and dedication to abolishing the old system.

The heads of ministries, agencies, and local governments must focus and allocate resources in the following years so that e-Government can continue to grow. It is their responsibility to define a standard for digital signatures to approve electronic documents and be responsible for the progress and quality of their work. It is imperative that these companies grow and enhance their technical infrastructure and upgrade their text management, administration, and digital signature systems to be compatible with electronic documents.

Public service gates and electronic one-stop information systems at ministerial and provincial levels linked to the national public service portal should be developed quickly by relevant authorities to satisfy the new criteria for the works. The provision of officially sanctioned online public services at levels 3 and 4 must also be completed.

4.7. E-Participation [EPAR]

Vietnam's Prime Minister has signed a decree authorizing 55 online governmental services via the National Public Service Portal by 2021. These public services include the issuance, re-issuance, and renewal of identity cards; registration of permanent and temporary residence; the declaration of temporary absence; the registration of births and residences; and the issuance of ordinary passports. The list includes 44 services that fall under the category of essential online public services.

4.8. Open Government Data [OGD]

The national data portal makes access to information and data more accessible by the national data portal, which provides a single point of entry for all State agencies. Publicly available state data can be processed and accessed via the portal, which also offers a variety of publications and services. The national data portal serves as a collaborative platform for State agencies to share data and inventory to enhance transparency and accountability. Aside from that, it will collaborate with other state agencies on data infrastructure development to meet long-term goals and address issues that can emerge from cross-agency data sharing.

E-Government development will also include new digital services that allow individuals and businesses to access their data recorded by State agencies and access to digital services for data synthesis from a wide range of sources. Data kept by state agencies will be accessible to citizens, businesses, and communities, allowing them to conduct research, study, and product creation, all of which will contribute to the nation's progress. It is also part of efforts to make the government more transparent by making data more available.

State agencies can use the portal to solicit feedback and information from other organizations, businesses, or individuals to ensure that their data is accurate and up-to-date. With the help of other government agencies, the Ministry of Information and Communications has defined the current condition and needs for national databases. Agencies now recognize the necessity of making their data accessible to others because of the strong push toward digital governance and the digital economy.

4.9. Cyber Security [CYB]

The International Telecommunication Union's (ITU) 2020 Global Cyber Security Index (GCI) ranked Vietnam 25th out of 182 countries. Recently, the country's primary cybersecurity agency has been active in its investigations and prosecutions of cybercrime. The enforcement strategy has concentrated on combating illegal data trade, illegal data disclosure, and illegal data theft.

Vietnam Cybersecurity Emergency Response Teams/Coordination Center (VNCERT/CC), established in 2019, coordinated the nation's reaction to security emergencies and ensured information security in the country. The MPS' Department of Cyber Security and High-Tech Crime Prevention is another agency that handles severe cybercrime. Online service providers must also inform their customers and cybersecurity task forces about the possibility of a data leak.

Building secure cyberspace will ensure social order, national sovereignty, and long-term economic prosperity. According to the Global Cyber Security Index, Vietnam has achieved significant progress toward this aim. Businesses should, however, keep in mind that Vietnam's cybersecurity

landscape is constantly changing, and new legislation is on the horizon. People who commit crimes should be punished, not data controllers, according to Vietnamese law and practice.

4.10. The use of Emerging ICT [EMG]

In the field of artificial intelligence (AI), Vietnam has a lot of room for growth. Artificial Intelligence (AI) is being used in a broad range of industries throughout the globe while the United States continues to expand. FPT Corporation, a Vietnamese corporation, has deployed artificial intelligence for smart traffic in Ho Chi Minh City, a prominent example of how AI is implemented locally. In Vietnam, Viettel Group has employed artificial intelligence in endoscopy for their business. Anti-cyberattack and IT security services are also provided by Viettel, which leverages AI. According to Resolution No.50-NQ-TW, which was released in August, the government plans to increase the number of companies in advanced technology and Industry 4.0 to 50% by 2025, which would allow AI to progress even further.

According to the Vietnam E-Commerce Association's E-Business Index 2019, by 2025, Vietnam's e-commerce sector might be ranked third after Indonesia and Thailand. Vietnam's e-commerce activities are concentrated in Hanoi and Ho Chi Minh City, the country's two largest cities. 70% of all sales in the United States are made in these cities. Rural internet connectivity is robust, and the majority of the population lives in rural areas, making this an excellent opportunity for rural market penetration. With their online stores, local e-commerce firms like Shopee, Sendo, and Tiki compete with regional e-commerce giants like Lazada and Shopee. Customers also use Instagram and Facebook to do e-commerce. More than \$1 billion in finance has been invested in Vietnam's online economy over the last four years. However, the country's e-commerce businesses are still struggling to gain confidence from customers, face tough competition, and face significant logistical expenses.