THE 14TH WASEDA – IAC INTERNATIONAL DIGITAL GOVERNMENT RANKINGS 2018 REPORT

October 2018, Tokyo, Japan

The Institute of D-Government at Waseda University, Tokyo in cooperation with the International Academy of CIO (IAC) has released the results of its 14th International D-Government rankings survey for 2018.

Edited by: Prof. Dr. Toshio OBI

Executive Summary

(Prof. Dr. Toshio Obi)

14th Annual Survey with 10 Indicators (35 sub-Indicators)

The Institute of Digital Government, Waseda University headed by Dr. Toshio Obi, has released the results of 2018 Waseda-IAC International Digital Government ranking survey for the 14th consecutive years. This survey is conducted by the distinguished experts from Waseda University and ten world-class universities under the umbrella of the International Academy of CIO in the field. These Institutions are Waseda University (Japan), Peking University (China), George Mason University, (USA), Thammasat University (Thailand),Bandung Institute of Technology (Indonesia), National University of Singapore (Singapore), RANEPA (Russia),University of Turku (Finland), Bocconi University (Italy), Taiwan e-Governance Research Center (Taiwan) and De La Salle University (Philippines).

Thanks for their contributions to the multi-stages of the evaluation and analysis. Both Digital Innovation and Digital Economy become the key to economic growth and challenges in line with the target of Digital Government.

Warning Signal against Digital Divide and Innovation Gap

The 2018 ranking survey marks Denmark jumping at first place, followed by Singapore in 2nd which was the top position last year, the United Kingdom in 3rd, Estonia in 4th, the USA in 5th, South Korea in 6th, Japan in 7th, Sweden in 8th, Taiwan in 9th, and Australia ranked 10th as the top group.

As a matter of fact, most governments have increased their excellent achievements in citizen-centric approach and demand-pull online services. This report provides an early warning signal against increasing digital gap and innovation among nations.

In the middle of overall ranking, there are many countries which increased or decreased their ranks compared to the ranking in a few years. Ten main indicators and 35 sub-indicators evaluate the process of Digital Government ranking in 2018. In addition, we keep some countries for the evaluation target is 65th countries (economies). The 2018 rankings are summarized based on a combination of Waseda University and IAC (International Academy of CIO), during one year survey, and we prepare the relevant reports from many international conferences and meetings with institutions organized such as APEC, ITU, and OECD, as well as receiving the comments from experts of IAC member universities.

This report contains Chapter II [Ranking by indicators and Sector Analysis] with ten indicators, Chapter III, IV, and V, as rankings by organizations, size of population and

GDP and Regions, and Chapter VI [New trends and Highlights], Chapter VII for comparison among others ICT rankings, Chapter VIII for methodology. Chapter IX shows a contribution list, Chapter X is for professor Obi as one of the World's 100 Most Influential People in Digital Government, Chapter XI is the International Academy of CIO and Capacity Building for ICT Leaders (2004–2017), and Chapter XII is 65 country reports.

Emerging Technologies-AI, Blockchain for Digital Government

The 2018 rankings also point to significant trends in the usage of ICT in government activities. The report shows that there are some new trends and they continue to grow strongly in the coming years. An analysis for 14 years of the Waseda University – IAC Digital Government Rankings Survey indicates the following five highlights of the new trends: these are (1) re-definition of e-government, (2) Usage of AI and IoT for Digital Government, (3) Expanding the Scale of Smart City and e-local government, (4) Blockchain Technology for Digital Government, and (5) Digital Government for Anti-Corruption.

In the context of continuing ICT development, especially the rising of AI, IoT, Big Data, and Cloud Computing, the development of destructive technologies has some impact on the promotion of Digital Government in 2018. Although there are lots of fluctuations in the usage of AI and other technologies, these have not yet made much progress on the activities of the digital government. Few countries have adopted both AI and IoT to improve the quality of service and productivity of work, most of which are concentrated in developed countries such as Denmark, top of the ranking 2018.

In addition to the above topics of highlights, there will be six challenges in Digital Government to be solved. They are "Digital Innovation－Cloud computing, IoT, AI applications", "Ageing Society with skyrocketing population ageing", "Globalization of Open Innovation", "Digital Divide for global and local communities", "Urbanization with Mega-Smart city-harmonization of urban and rural communities" and "Cooperation between Central and Local governments". The UN's SDGs do not mention on Digital Government. However, Digital Government could support the smooth digital transformation needed for each SDGs sector.

For the details, a full ranking report on 2018 Rankings with all 65 Country Reports is attached, and also you may access to the IAC homepage (http://iacio.org/) or contact with Institute of Digital Government, Waseda University, Tokyo, Japan (obi.waseda@gmail.com).

Acknowledgments

The 14th Rankings survey 2018 has been conducted by both Waseda University and International Academy of CIO. There were 2 Expert meetings held for the preparation of the publication. One was in Kazakhstan on June 28th, and another was in Taipei on October 3rd, 2018, to discuss the topics and methodology as well as scheduling and scoring. The 2018 edition is successfully prepared by the group of the 11 international experts: Prof. Dr. Toshio Obi, Prof. Dr. J.P Auffret, Prof. Lim Swee Cheang, Prof. Dr. Luca Buccoliero, Prof. Dr. Suhono Harso Supangkat, Prof. Dr. Fracisco Magno, Prof. Dr. Fang Chun Yang, Dr. Jirapon Sunkpho, Prof. Dr. Alexander Ryzhov, Prof. Dr. Tomi Dahlberg, Prof. Dr. Pin-yu Chu, and 5 researchers Dr. Nguyen Manh Hien, Dr. Nguyen Ngoc Anh, Dr. Pingky Dezar Zulkanain, Dr. Yang Yao, and Mr. Bandaxay Lovanxay at Institute of Digital Government, Waseda University as well as Steering Committee Faculty members.

We have many articles which contributed by international experts and senior researchers such as Prof. Dr. Auffret of George Mason University, Prof. Dr. Iwasaki of Waseda University, Prof. Dr. Suhono of Bandung Institute of Technology, Dr. Jirapon Sunkpho of Thammasat University, Prof. Lim Swee Cheang of National University of Singapore, Prof. Dr. Pin-yu-Chu of Taiwan e-Government Research Center, Dr, Nguyen Manh Hien, Dr. Nguyen Ngoc Anh, Dr. Pingky Dezar Zulkarnain, Dr. Yang Yao, and Mr. Bandaxay Lovanxay of Institute of Digital Government, Waseda University. Also, 54 students at the Graduate Schools of International relation and Political Science and 7 Professors at the Institute of Digital Government have supported this big project.

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I. 2018 Overall Ranking

In the 2018 Waseda-IAC International Digital Government Rankings, there is not much change compared the rankings last year. The ranking keeps the same methodology and approach as 2017, with ten main indicators and 35 sub-indicators. Unlike the previous ranking, the 2018 rankings will be published late as the research team has needed more time to refine the evaluation model as well as to analyze the raw data as well as emergent trends of technology

No	Total Rankings	Score	No	Total Rankings	Score	No	Total Rankings	Score
1	Denmark	94.816	23	Belgium	64.776	45	Vietnam	56.029
2	Singapore	93.843	24	Ireland	64.528	46	Brunei	55.334
3	UK	91.921	25	Malaysia	63.965	47	Bahrain	55.149
4	Estonia	91.125	26	Portugal	63.567	48	Colombia	53.984
5	USA	90.340	27	Italy	63.490	49	Chile	53.054
6	South Korea	85.500	28	Spain	63.341	50	Lithuania	52.385
7	Japan	84.493	29	Macau	63.092	51	Morocco	51.951
8	Sweden	81.700	30	Russia	62.580	52	Kenya	51.721
9	Taiwan	80.383	31	UAE	62.564	53	Saudi Arabia	51.718
10	Australia	80.248	32	China	62.079	54	South Africa	50.823
11	Norway	79.760	33	Indonesia	61.486	55	Uruguay	50.369
12	Switzerland	79.030	34	Kazakhstan	61.285	56	Brazil	48.467
13	Finland	78.982	35	Philippines	61.281	57	Peru	47.488
14	New Zealand	74.694	36	India	61.009	58	Argentina	45.442
15	Iceland	73.942	37	Poland	60.846	59	Tunisia	44.858
16	Canada	72.459	38	Romania	60.757	60	Costa Rica	42.757
17	Netherland	70.259	39	Czech Republic	60.169	61	Pakistan	42.299
18	Hong Kong	70.236	40	Georgia	59.840	62	Egypt	41.984
19	France	69.761	41	Turkey	59.481	63	Nigeria	41.774
20	Germany	68.176	42	Israel	59.111	64	Fiji	41.355
21	Thailand	68.131	43	Oman	58.071	65	Venezuela	41.300
22	Austria	65.412	44	Mexico	57.768			

Table I-1: Waseda – IAC Digital Government Overall Ranking 2018

The results of the 2018 Rankings are shown in Table I-1. The results show that Denmark has replaced Singapore in the first position and this is the first time Denmark is the leading country in Waseda – IAC Digital Government rankings. Thanks to the newest digital program running up to 2020 which covers central, regional, and local governments and creates the foundation for the Danish public sector to become a top countries in ICT application to government operations.

After nine consecutive years in the first place, the 2018 rankings mark the first time Singapore is in the second place in digital government activities. Singapore is a top country in Smart Nation development. By introducing the vision "Digital to the core, and serves with heart", Singapore citizens and businesses can transact with the Government online daily. Digitalization will, therefore, be a key pillar of Singapore public service transformation efforts. It will enable a public service that is leaner and stronger, with skilled and adaptable officers at the leading edge of service delivery and innovation.

The 2018 rankings show that the United Kingdom ranks in the third place for the first time. Compared to the rankings last year, UK jumped six steps and became the third country on digital government development in Waseda rankings. In 2017 the UK government introduced "The Government Transformation Strategy 2017 to 2020", providing a great platform to build on, and helping the government work better for everyone. There were more than 175 services across government and especially, they introduced GovWifi – a single Wi-Fi login for all government agencies. GovWifi is now available in more than 340 locations across the UK. Furthermore, the government improved the procurement service, tax service, and open government data.

Estonia is ranked at 4th with a significant change in total score compared to last year. In most indicators, Estonia received higher scores. In Estonia, citizens can select e-solutions from among a range of public services at a time and place convenient to them; everyone can use public services as e-services with 99% of the population online. The Estonian government has introduced Digital Agenda 2020; they create an environment that facilitates the use of ICT and the development of smart solutions. The ultimate goal is to increase economic competitiveness, the well-being of people and the efficiency of public administration.

In the 2018 Rankings, the USA dropped to the fifth position and was at its lowest place since the Waseda-IAC digital government ranking was introduced. However, compared to the 2017 rankings, the total scores in this 2018 Rankings are higher. ICT continues to provide new and innovative ways for U.S. citizens to interact, get involved and become empowered. Public participation enhances the government's effectiveness by improving the quality of its decisions through collaboration. Innovative tools can be used to create unprecedented openness in the Federal Government through increased citizen participation to make this type of collaboration a reality.

Together with Denmark, Estonia, and the UK, South Korea has shown significant progress over the past few years in developing its digital government efforts and has quickly become one of the leading innovators in this area. Compared to the last year South Korea increased two steps and ties at sixth place. By implementing some initiatives and programs for optimizing the business process of public sectors such as Government-wide Enterprise Architecture (GEA), On-nara BPS, and Government Information Sharing. The

South Korean government has reached a high level of efficiency and transparency of the administration process.

In comparison with 2017, Japan has slipped from the fourth place to seventh place. As the situation above, the Japanese government has built a sophisticated promotion system for digital government initiatives and precise GCIO regimes into every rank of government (Central and local government; government agencies) to assure the implementation and evaluation process of D-Government initiatives. Japan received high scores on "Government CIO" and "D-Government Promotion". Japan also continues to update its online service system as the objective of initiatives to simplify administrative procedures and working systems.

Sweden is advanced into the top 10. In the 2017 Rankings, Sweden was not in the top 10 of the Digital Government Rankings, but in 2018 Sweden jumped four steps and ties at eighth place. There have been many efforts carried out by Swedish Government to promote Digital Government. These activities could be found in both central and local government levels. The newest strategy was introduced in May, in which the Government presented a strategy for how digital policy will contribute to competitiveness, full employment, and economic, social and environmentally sustainable development. The strategy outlines the focus of the Government's digital policy. The objective is for Sweden to become the world leader in harnessing the opportunities of Digital Transformation.

In recent Digital Government Rankings, Taiwan is always in the top 10, and the 2018 ranking is no the exception. Together with many developed countries, Taiwan has many ICT applications in administration. Taiwan has propelled the administrative reformation by information systems since the 1980s. After consistent electronic/digital Government plans of five stages with particular emphases on government system integration, Taiwan has optimized the internal office and established valid operations. The newly launched digital government program includes twenty-four sub-plans involving seventeen central government agencies. In particular, the program identifies clear targets with quantitative measures such as the completion of four nation-wide integrated one-stop services and a sixty percentage e-service usage rate.

Australia has shown incredible progress over the last years and jumps to the top 10 in the 2018 Rankings. The addition of the Digital Transformation Agency this past year was one significant addition, and Australia appears to be primed to continue to compete with other top governments in the coming years. Australia is also a leader in e-Participation, and its mandatory voting policy provides an impetus for the government to ensure that it is simple and easy for each citizen to participate fully in the democratic process.

In the middle group of the 2018 Rankings, some countries such as Spain, Russia, and China have increased some steps and ranked at the excellent position compared the 2017 rankings. Some countries such as Hong Kong, Kazakhstan, and Georgia have increased.

Hong Kong moves from the 24th in 2017 to 18th in 2018, Kazakhstan jumped 11 steps and ties at 34th in 2018 while Georgia has increased from 51st place to 40nd in the 2018 rankings.

Kazakhstan government has approved "Digital Kazakhstan" with the main mission of the program to improve the quality of life of residents and the competitiveness of the country's economy, through the use and development of digital technologies. The program is planned for two vectors of development: "Digitalization of the existing economy" in the medium term and "Creating a digital industry of the future" in the long term. The 120 planned events of the program will form the basis of the digital sector as a new branch of the economy and will be implemented in five directions: "Digitalization of economic sectors", "Transition to a digital state", "Realization of the digital Silk way", "and Development of human capital" and "Creation of an innovative ecosystem". Since the program affects all spheres of life and is aimed at improving the standard of living of every resident of the country, the beneficiaries of its implementation will be citizens, business entities and government agencies of the Republic of Kazakhstan.

The new document "A Digital Georgia: e-Georgia strategy and action plan 2014-2018" defines the path leading to a modern Georgia and provides a comprehensive framework for societal changes enabled by ICT. It focuses on those potential fields, where the public sector can take measurements and set frameworks to exploit the full potential of ICT. The e-Georgia strategy is, however, not limited to the activities covered under the term D-Government. The vision for the e-Georgia strategy reflects a wider scope and is defined as "Georgia will become a more efficient and effective public sector offering integrated, secure, and high-quality e-Services. Improved usage and participation enable ICT-driven sustainable economic growth."

In this group, while some countries have increased their position, the 2018 Rankings show that Turkey, the Czech Republic. Mexico and Bahrain have dropped and are at 41st, 39th, 44th, and 47th place respectively. Compared to 2017, these countries have a few changes in the administration activities. Most of them countries manitained their total scores compared to 2017 while other countries in the group receive higher scores. This reason explains why they are in lower positions.

In the bottom of 2018 rankings, there remain the same countries (economies) as 2017 Rankings, Tunisia, Pakistan, Costa Rica, Egypt, Nigeria, Fiji, and Venezuela. Compared to 2017, Colombia ranked at 48th place, the highest position they have had. The same case as Colombia, Morocco received a higher position compared to the rankings in 2017. In 2018, the Moroccan government launched a new important program "Morocco Digital Program 2020". In this program, the Moroccan government aims to have more human power by training IT professionals, boost public service by reinforcing digital government and foster competitive IT economic models by setting up Moroccan Agency for Investment and Exportation Development. The Morocco government pushes hard to

extend the expertise in the IT area and tends to improve the proficiency of IT to attract more investments.

II. Digital Government Ranking by Indicators and Sector Analysis

The Waseda – IAC Digital Government Ranking relies on comprehensive benchmarking indicators in order to obtain an accurate and precise assessment of the latest developments of D-Government in the ICT section of all targeting countries. Ten main indicators are currently used to carry out the Waseda - IAC Digital Government Ranking survey. The table below shows all ten indicators and their thirty-five sub-indicators.

Indicators	Sub-indicators
1. **Network Preparedness/Infrastructure (NIP)**	1-1 Internet Users 1-2 Broadband Subscribers 1-3 Mobile Cellular Subscribers
2. **Management Optimization/ Efficiency (MO)**	2-1 Optimization Awareness 2-2 Integrated Enterprise Architecture 2-3 Administrative and Budgetary Systems
3. **Online Services / Functioning Applications (OS)**	3-1 E-Procurement 3-2 E-Tax Systems 3-3 E-Custom Systems 3-4 E-Health System 3-5 One-stop service
4. **National Portal/Homepage (NPR)**	4-1 Navigation 4-2 Interactivity 4-3 Interface 4-4 Technical Aspects
5. **Government CIO (GCIO)**	5-1 GCIO Presence 5-2 GCIO Mandate 5-3 CIO Organizations 5-4 CIO Development Programs
6. **D-Government Promotion (EPRO)**	6-1 Legal Mechanism 6-2 Enabling Mechanism 6-3 Support Mechanism 6-4 Assessment Mechanism
7. **E-Participation/Digital Inclusion (EPAR)**	7-1 E-Information Mechanisms 7-2 Consultation 7-3 Decision-Making
8. **Open Government (OGD)**	8-1 Legal Framework 8-2 Society 8-3 Organization
9. **Cyber Security (CYB)**	9-1 Legal Framework 9-2 Cyber Crime Countermeasure 9-3 Internet Security Organization
10. **The use of Emerging ICT (EMG)**	10-1 The use of Cloud Computing 10-2 The use of Internet of Things 10-3 The use of Big Data

Table II-1: The Main Indicators and Sub-Indicators

Network Preparedness

No	Country	Score
1	Denmark	7.993
2	Norway	7.923
3	Iceland	7.866
4	Switzerland	7.856
5	South Korea	7.793
6	France	7.600
7	Sweden	7.593
8	Germany	7.590
9	UK	7.513
10	Japan	7.493

Management Optimization

No	Country	Score
1	Denmark	12.000
1	Singapore	12.000
1	UK	12.000
4	Estonia	11.900
5	Switzerland	11.800
6	Iceland	11.600
7	Netherlands	11.450
8	USA	11.200
8	Japan	11.200
8	Australia	11.200

Online Services

No	Country	Score
1	Denmark	12.000
1	Singapore	12.000
3	Iceland	11.640
4	UK	11.280
5	Estonia	10.920
5	Finland	10.920
7	USA	10.900
8	Norway	10.800
9	Sweden	10.320
9	Australia	10.320

National Portal

No	Country	Score
1	Denmark	8.000
1	UK	8.000
1	Estonia	8.000
4	USA	7.900
5	Australia	7.703
5	Switzerland	7.703
5	New Zealand	7.703
8	Iceland	7.500
9	South Korea	7.450
10	Japan	7.300

Government CIO

No	Country	Score
1	Denmark	9.545
1	Singapore	9.545
1	Japan	9.545
4	Taiwan	9.318
4	UK	9.318
4	Estonia	9.318
7	South Korea	9.200
8	USA	8.000
9	Australia	7.272
9	Iceland	7.272

D-Government Promotion

No	Country	Score
1	Denmark	9.677
1	Singapore	9.677
1	Taiwan	9.677
4	Japan	9.354
5	UK	8.709
5	Estonia	8.709
7	USA	8.387
7	South Korea	8.387
9	Sweden	8.064
9	Australia	8.064

E-Participation

No	Country	Score
1	Singapore	10.000
1	Estonia	10.000
1	USA	10.000
4	Denmark	9.000
4	UK	9.000
6	Sweden	8.500
6	Norway	8.500
6	UAE	8.500
9	Taiwan	8.000
9	Finland	8.000

Open Government

No	Country	Score
1	Denmark	10.000
1	USA	10.000
1	S. Korea	10.000
4	Taiwan	9.800
5	UK	9.500
6	Singapore	9.000
6	Estonia	9.000
6	Finland	9.000
9	Japan	8.500
9	Australia	8.500

Cyber Security

No	Country	Score
1	Singapore	10.000
1	Estonia	10.000
1	USA	10.000
4	South Korea	9.850
5	Germany	9.700
6	UK	9.600
6	Denmark	9.600
8	Switzerland	9.200
8	Canada	9.200
8	France	9.200

The use of Emerging ICT		
No	Country	Score
1	Singapore	8.000
2	Denmark	7.000
2	UK	7.000
2	USA	7.000
5	South Korea	6.800
6	Sweden	6.500
6	Norway	6.500
6	Germany	6.500
9	Estonia	6.000
10	Taiwan	5.500

Table II-2: Top 10 Countries by 10 Individual Indicators

1. Network Preparedness/Digital Infrastructure

According to the Waseda - IAC Digital Government Rankings, network preparedness (or digital infrastructure) is a primary indicator for evaluating Digital Government development in a country. In this ranking, digital infrastructure is measured by the development of ICT such as the number of Internet users, mobile subscribers or the percentage of broadband connections. Network preparedness also refers to the integration between central government and local government through network backbone system and its capability of connecting all bureaus and departments via the core Government Backbone Network.

Iceland's development and implementation of ICT services and infrastructure is among the most advanced in the world. It has been ranked fourth in the world for ICT Development by the International Telecommunication Union (ITU) for the past three years. With a usage rate of 98.2%, Icelandic citizens are more likely to use the Internet than the citizens of any other country. 37.6% of citizens had wired broadband subscriptions in 2018, and 104% had wireless broadband access, placing the country within the top five for this metric.

The total of Internet users in South Korea accounts for nearly 92.7% of the population in 2018, according to the Measuring the Information Society Report 2018 from International Telecommunication Union (ITU). Among them, more than 111.5% people have a wireless broadband connection, while the figure for fixed-broadband subscriptions is only 41.1%.

2. Management Optimization

This indicator reflects the utilization of ICT for improving government business processes and internal processes (back office in each organization). Management optimization is a significant indicator of Digital Government development because it

relates to optimization awareness, enterprise architecture (EA) and also the administrative management system.

Singapore is one of the first countries that started computerization and telecommunication infrastructure construction. With the development of information society, the government in Singapore has launched continuous strategies in different aspects of e-Government. Also, Singapore has made an effort to integrate the internal government network architecture. For instance, CUBE is the latest program which is designed as the new intranet platform for public agencies to communicate, connect and collaborate.

In early 2014, Estonia launched the Digital Agenda 2020. The ultimate goal of this agenda is not merely an ICT use in daily life and business. The current plan emphasizes improving economic competitiveness, the well-being of people and the efficiency of public administration. Some priorities have been set on the agenda such as completing the next generation broadband network, generating greater control over personal data, and utilizing data analytics in public sectors.

3. Online Services/ Applications

Online service is one of five critical indicators. It was evaluated in the first ranking survey in 2005 and referred to the interactions between service providers and customers. Online service or electronic service (e-Service) refers to the integration of business processes, policies, procedures, tools, technologies, and human efforts to facilitate both assisted and unassisted customer services provided over the Internet and other networks. E-Services are the primary indicator in the development of digital government. The outcome of Digital government is e-Services or products/services that the government introduces to citizens, making e-Service as the interface of digital government. Over twelve years of ranking, there has been no significant change in this indicator or its associated sub-indicators. We found that e-Services have been implemented and expanded in many governments around the world and have become primary solutions in digital government development.

Denmark has a healthcare portal, Sundhed.dk which was launched in December 2003 and was given a significant update in 2012. The site is a public, Internet-based health portal that collects and distributes healthcare information among citizens and healthcare professionals. It is unique in bringing the entire Danish healthcare sector together on the Internet and providing an accessible setting for citizens and healthcare professionals to meet and efficiently exchange information. From the main portal, all Danish citizens have access to sundhed.dk and everyone has a personal page, which reflects the specific needs of the individual.

Icelandic citizens have had the option of submitting their annual income tax declarations electronically since 1999. Citizens can also calculate their future pension

payments, and personalized access accounts are about social security, and health insurance benefits at the portal www.tr.is. Citizens can also apply for unemployment benefits, passports, driver's licenses, and other documents entirely online. Businesses also have a wealth of online services available to them, including various tax and employee contribution declarations, customs declarations, and procurement services. Many of these e-Services can be completed entirely online. Others provide forms and information on how to complete the process.

4. National Portal/Homepage

National Portal (one-stop service) is defined as a place where the government integrates all e-services and makes them accessible via one gateway. It is also a primary interface for stakeholders to access government electronically. Through the national portal, governments offer many benefits to users of public services—from citizens and businesses to the public administrators themselves—including faster, cheaper and superior services. In the public sector, one-stop service is one of the most promising concepts of service delivery in public administration. National Portal implementation is included in the Digital Government strategies in most countries.

www.usa.gov is the U.S. Government's Web portal for citizens. It presents a wide range of information resources and online services from various government sources, accessible from a single point. It is also known as the National Portal of the USA and is a gateway to improve the communication experience between the government and the public. Furthermore, it provides information that helps the public to understand government structure better. The well-organized portal serves as a platform that assists the public to find desired information. The portal also allows users to create government accounts that allow each user to customize the portal as they desire. The website contains accessibility features, a live chat platform, and the chat hours operation services are conveniently available every weekday except holidays. The portal provides a one-stop-shop for all government information and services. It comprehensively lists all public services, forms, tools and transactions that the government provides in a user-friendly manner.

5. Government Chief Information Officer (GCIO)

Since 2005 in the first Waseda Digital government ranking, the GCIO plays an essential role in Digital Government implementation. It is also one of the priority indicators for evaluating Digital Government. The CIO is expected to align management strategies with ICT investment in order to achieve a balance among business strategy, organizational reform, and management reform; hence, the Government CIO is considered by many governments to be one of the critical factors in the success of Digital Government implementation. CIOs are now expected to achieve quantum-leaps in efficiency, offer new capabilities, create actionable information out of disparate data sets,

provide citizen services that are fast, accurate, and user-friendly and that enhance public's trust in government.

In Japan, each central ministry has a CIO who is appointed among senior staff within the ministry (mainly Director General of administration) and an assistant CIO who is an expert recruited externally. The Federal CIO Council composed of Ministry CIOs has the authority to decide many rules on in-house ICT installation and online services. The percentage of CIO appointments at the prefecture level is 90%, and 85% was at the city level in 2017. The government established a Government CIO as a core of all Ministry CIOs in November 2012.

The U.S. CIO position was established within the White House's Office of Management and Budget (OMB) to provide leadership and oversight for IT spending throughout the Federal Government. In addition, each Federal agency has a CIO, as established by the Clinger-Cohen Act. The CIO in government is a significant indicator in the world e-Government ranking, not to mention its importance in improving American e-Government platforms. The Federal CIO position is currently held by Suzette Kent.

6.   Digital Government Promotion

This indicator measures a government's activities toward the promotion of Digital Government and distribution of e-Services to citizens, businesses, and other stakeholders. It includes activities involved in supporting the implementation of Digital Government such as legal frameworks and mechanisms (laws, legislation, plans, policies, and strategies). In other words, the government carries out these activities in order to support the development of e-Services as well as Digital Government as a whole. This indicator is one of the leading indicators in Waseda-IAC Digital Government Rankings because it shows the main legal framework in each country.

The newest Taiwan Digital Government program published in 2017 focuses on the digital government establishment utilizing emerging technologies including IOT, Cloud Computing, and Big Data. The Digital Government program has proposed three main objectives as "Provide convenient living" "Develop digital economy" and "Fulfill governance transparency". The core concept of the new program is "Data-driven" "public-private collaboration" and "civilian-centric". There are also many promotions covering issues such as government open data and infrastructure at the national level. In addition, the public sector tries to develop public-private partnerships and work with the private sector to implement and govern the development of the smart city. For example, Taipei City government has established the "Taipei Smart City Project Management Office" to build an innovation matchmaking platform to combine industry and government resources to develop a smart solution that satisfies public demands.

For municipalities' digitalization, the Swedish Association of Local Authorities and Regions (SKL), Swedish Association of Municipalities for Joint Development of Public

e-Services (SAMBRUK) was initiated in 2003, for joint development of e-Services. So far, this organization's members include approximately 80 member municipalities from all over Sweden. Regarding monitoring e-Government progress, the Digitalization Commission was established in 2012 by the Swedish Government to analyze and monitor progress towards the Swedish ICT-policy goal to become the best in the world at digitalization. Sweden also has research think-tanks on e-Government, such as eGovLab of Stockholm University.

7. E-Participation/ Digital Inclusion

E-participation refers to ICT-supported participation in government and governance processes. Processes may concern administration, service delivery, decision-making, and policy-making.

Most of the government agencies in Taiwan have developed channels for citizens to interact with specific agencies via email, telephone, online message forum, and social media such as Facebook. A simple search engine on the one-stop service portal enables citizens to find the departments they want to reach directly and effectively with completed contact lists by names. In response to the rapid development of the Internet and the rise of citizen participation awareness, the government has established an E-participation Platform (http://join.gov.tw) to gather the public opinions. People can initiate proposals on this website. Once the proposal gets 5,000 signatures within 60 days, then the authority has to respond formally in 60 days after comprehensive research and analysis. The program typical enables the government to win people's trust and make good use of social innovation power to improve the effectiveness of government governance. In addition, "vTaiwan," an on-line to off-line PPP platform, facilitates stakeholders to come together on consensus issues and leads to original policy formulation.

In UAE, one of the significant features of the enhanced portal is the inclusion of E-Participation channels. The federal portal utilizes multiple platforms like forums, blogs, chats, surveys, polls and social media tools like Facebook, Twitter, Flickr, and YouTube to reach out to the general public and engage them in active communication with the government about their opinions and experiences on government services, and policies.

8. Open Government Data

Open Government/Data is one of the newest indicators in the Waseda-IAC Digital Government Rankings. This indicator evaluates the openness and transparency of governments. The top-ranking countries on this indicator have provided citizens with the application-programming interface (APIs) that help developers and researchers create innovative citizen-centric applications. There are some small-scale utilization cases and applications for smartphones and tablets.

In South Korea Government 3.0 pursues transparency of government. Open Government regarding data and information means the transition from supply-driven transparency (reactive, responsive disclosure of public information) to demand-driven transparency (proactive sharing). Government 3.0 places emphasis on "make information sharing more equitable and transparent between the central government, local governments, government agencies, and the public." Aligning with this vision, Korea has published the National Action Plan on Open Government Partnership 2014 - 2016. Currently, citizens can access public information and data at "https://data.go.kr/".

Taiwan received comparatively high scores on the indicator of Open Government Data. The Open Data initiative has remained one of the priorities in the Digital Government plans of Taiwan, within legal preparedness such as "The Freedom of Government Information Law (2005)" "Copyright Act (2014)" and "Personal Information Promotion (2015)". The Open Data Portal (http://data.gov.tw/) not only provide datasets on every aspect of social life and government but also provides space for citizens to comment and discuss after checking the data. What's more, the details on data standards and guidance for users to read and utilize information are presented on the website. Other international organizations have also recognized the accomplishment of Open Government Data of Taiwan. For example, Taiwan retains the top spot for the second year running among 94 surveyed countries in the latest Global Open Data Index published by U.K.-based Open Knowledge International.

9. Cyber Security

The emerging trends in ICT and security are reflected in the 2018 Rankings as the top 10 countries in cyber-security have an adequate legislation framework, effective cyber-crime countermeasure solutions, and robust security organizations.

Singapore has released multiple acts and regulations on Cyber Security issues, such as Computer Misuse Bill, The Electronic Transactions Act and Personal Data Protection Act (PDPA), and the later Computer Misuse and Cybersecurity Act (CMCA). A government body called the Personal Data Protection Commission had been established to administer and enforce the PDPA. Recently, the Cyber Security Agency of Singapore (CSA) was established to oversee the national cybersecurity strategy and outreach. Also, the New Cyber Security Act will be published in the coming year.

Estonia has strengthened its organizational capacity for cybercrime countermeasures by setting up CERT-Estonia and giving a mandate to Information System Authority (RIA) to supervise the continuous application of security measures in regards to the information systems used for the provision of vital services. Moreover, the Estonian government decided to change the encryption method for Digital Identity code from RSA 1024bit to Elliptic Curve Cryptography.

The United States government believes the security of computer systems is vital to the world for two reasons. The increased role of Information Technology (IT) and the growth of the e-Commerce sector, have made cybersecurity essential to the economy. Also, cybersecurity is vital to the operation of safety-critical systems, such as emergency response, and to the protection of infrastructure systems, such as the national power grid. Based on then-DHS Secretary Janet Napolitano's testimony to the Senate in 2012, in 2011 alone, the DHS U.S. Computer Emergency Readiness Team (US-CERT) received more than 100,000 incident reports and released more than 5,000 actionable cybersecurity alerts and information products. Twitter, the Wall Street Journal, New York Times, and the Department of Energy and many other prominent companies have reported that their systems had been breached. Furthermore, classified government data has been leaked to the press and the public in several high-profile cases. Current efforts are being made to secure sensitive data to prevent future breaches.

10. The use of Emerging ICT

This indicator refers to the newest technology which governments want to apply for the Government activities such as using Cloud computing in delivering services, Big Data, and application of IoT.

As a leading country in e-Government area, Singapore would not pass up the chance to introduce and apply emerging technologies in public sectors. Public projects within Cloud-computing, Big Data, and IOT utilization are ongoing or planned into sophisticated phases. Organizational preparedness such as National Cloud Computing – Advisory Council (NCCAC) is paying attention to the adoption of technologies, standard industrial construction and fostering collaboration between different sectors. Great potential in the development of emerging technologies into e-Government area can be anticipated, and the government' guidance should play the crucial role in leading industry and society.

Japan has moved fast at utilizing emerging ICT application into public sectors. There are already some national plans such as Smart Cloud Strategy, and Big Data in Government. Cloud computing in the national platform is at the ongoing phase. The Ministry of Economy, Trade, and Industry also has sponsored public projects which have been selected to facilitate the IOT utilization. The next stage should be the development draft of a legal framework on emerging technologies applications.

In Thailand, the total of Internet users accounts for nearly 89.9% of the population in 2015, according to the Measuring the Information Society Report 2016 from International Telecommunication Union (ITU). Among them, more than 109.7% people have a wireless broadband connection, while the figure for fixed-broadband subscriptions is only 40.2%. The https://www.egov.go.th/ is actively served as a national portal in for Information, Technical, and Functionality while www.damrongdhama.moi.go.th for filing citizen problems and grievances as the main channel of e-Participation to fight against un-transparency and corruption. The use of Cloud Computing is projected to reach the total

number of 259 Cloud Computing-based system. Big Data has been implemented in some high demand for government units like Department of Highway and the Ministry of Digital Economy and Society (MDES) is encouraging private entities to explore government Big Data for sourcing out new business opportunities.

Moreover, in October 2017 the Government published that the National Statistical Office, MDES will lead the development of the Big Data center as well as the IoT Institute will be a part of the Digital Park to be built in Chon Buri province, as a flagship project under the Eastern Economic Corridor. The Park aims to attract investors by offering numerous benefits and providing an environment for domestic and foreign digital professionals to collaborate. It will focus on the development of S-curve industries (Automation and Robotics, Aerospace, Bio-Energy and Biochemical, Digital and Medical and Healthcare), which can serve as growth engines to accelerate Thailand's future growth. The MDES is planning to spend Bt100 million to draw up the Digital Park master plan and Bt1 billion (USD 30 million) to build the Digital Park building in 2018 on a site of around 280 Acres.

III. Digital Government Ranking by Organizations

1. Ranking of APEC Economies

APEC Economies			APEC Economies			APEC Economies		
No	Economies	Score	No	Economies	Score	No	Economies	Score
1	Singapore	93.843	8	Canada	72.459	15	Philippines	61.281
2	USA	90.340	9	HK SAR	70.236	16	Mexico	57.768
3	South Korea	85.500	10	Thailand	68.131	17	Vietnam	56.029
4	Japan	84.493	11	Malaysia	63.965	18	Brunei	55.334
5	Taiwan	80.383	12	Russia	62.580	19	Chile	53.054
6	Australia	80.248	13	China	62.079	20	Peru	47.488
7	New Zealand	74.694	14	Indonesia	61.486			

Table III-1: Digital Government Ranking in APEC Economies

Singapore, USA, and South Korea are the leading countries in this group. They are ranked in the 1st, 2nd, and 3rd position respectively. Compared to last year Japan is not in the top three. In the overall Ranking, Japan slipped down and ranked in 7th. Chinese Taipei and Australia followed Japan are ranked for 5th and 6th place respectively. In the middle of the group New Zealand, Canada, and Hong Kong ranked at 7th, 8th, and 9th place respectively. Following are four countries from Southeast Asian and Russia. In the bottom of the group are Vietnam, Brunei, Chile, and Peru.

As a leading nation of digital government in Asia, Singapore continues to maintain the momentum. The performance on indicators of Management Optimization, Digital government promotion, and cybersecurity are showing its strong points and advancement this year. Especially on the effort for cybersecurity, Singapore has developed the law and regulatory framework to assure every safety measure and security upgrade can be enforced on a legal basis. In respect to policy, National Cyber Security Masterplan 2018, as the latest strategy, guides the government to enhance the nation's security environment and create a robust and trusted society for public, private and individuals. Continuous master plans in each critical segment are one of the keys to keep Singapore proactive and possessing execution capacity on digital government development.

To future direction, Singapore still has potential on the growth of the usage of emerging technologies. This new indicator has been introduced to Waseda Digital Government Ranking this year. Because many countries are still at the start-up phase, direction for expanding the new technologies into the public service sector needs more endeavor to be clarified. Singapore could seize the opportunity to formulate policies and standards, guide not only domestic innovation but also foster international co-development.

2. Ranking of OECD Countries

OECD Countries			OECD Countries			OECD Countries		
No	**Country**	**Score**	**No**	**Country**	**Score**	**No**	**Country**	**Score**
1	Denmark	94.816	11	Finland	78.982	21	Portugal	63.567
2	UK	91.921	12	New Zealand	74.694	22	Italy	63.490
3	Estonia	91.125	13	Iceland	73.942	23	Spain	63.341
4	USA	90.340	14	Canada	72.459	24	Poland	60.846
5	South Korea	85.500	15	Netherlands	70.259	25	Czech	60.169
6	Japan	84.493	16	France	69.761	26	Turkey	59.481
7	Sweden	81.700	17	Germany	68.176	27	Israel	59.111
8	Australia	80.248	18	Austria	65.412	28	Mexico	57.768
9	Norway	79.760	19	Belgium	64.776	29	Chile	53.054
10	Switzerland	79.030	20	Ireland	64.528			

Table III-2: Digital Government Ranking in OECD Countries

In the top 3 of this group are three European countries, Denmark still keeps their first position compared to 2017 rankings, followed by the UK and Estonia, they ranked in 2nd and 3rd place respectively. The USA dropped out from the second place in 2017 ranking to the 4th place in 2018. In the 5th and 6th place are two East Asia countries – South Korea and Japan.

Denmark has shown marked development in Digital Government projects, but there are few available resources on e-Government related promotions particularly at the local level. The government released its e-Government strategy 2016 - 2020 on in May, and it outlines 33 projects for the government to accomplish in the coming years. The government is always trying to establish online services that are simpler and more effective. In order to do this, the government will establish horizontal cooperation throughout local, regional and central governments. Institutions for education, knowledge or culture can still apply for funds to provide their users with free Internet access.

In 2018, despite the already high 2017 ranking of Digital Government, the UK government made some improvement and scored higher in some indicators. The UK government scored well in most indicators, and the number of Internet users increased. There is some improvement of the National Portal, but the sitemap is still missing. There is the presence of GCIO, but the GCIO Mandate is missing from the GCIO category. The score on Digital Government promotion scores is low, but it is not because of the lack of promotion but because most people have already been using the e-Government services as indicated in the high rate of participation.

Citizens can access government information without having to pay the cost, and there is the legal framework for the cybersecurity in case of emergencies. Moreover, the UK

digital government development has been in a high rank, with some functions missing but not resulting in a significant problem.

In this group, Switzerland has a big jump compared to 2017 ranking. Swiss strategy on E-Government provides distinct and feasible objectives for each aspect of E-Government on both national and regional levels that have been developed as a result of collaboration between the central and local governments. The strongest points of Swiss E-Government are Open Data and cybersecurity that indicate the importance of transparency and safety as of core priorities for a neutral country. Importance of transparency highlights the tradition of direct democracy in which the voice of every citizen matters and is taken into account while discussing the most important legislation and policy issues. In order for the direct democracy to succeed, the constituent is obliged to be well informed of the current state of affairs of the country, and thus a portal for official governmental data is needed. Another strong aspect of Swiss Digital Government is active cooperation between the private and public sector, allowing diversification of labor and high quality of end product.

IV. Digital Government Ranking by the Size of Population and GDP

1. Ranking in Big Population Countries (bigger than 100 million)

No	Country	Score	No	Country	Score	No	Country	Score
	Big Population Countries			Big Population Countries			Big Population Countries	
1	USA	90.340	5	Indonesia	61.486	9	Brazil	48.467
2	Japan	84.493	6	Philippines	61.281	10	Pakistan	42.299
3	Russia	62.580	7	India	61.009	11	Nigeria	41.774
4	China	62.079	8	Mexico	57.768			

Table IV-1: Digital Government Ranking in Big Population Countries

In the Waseda Digital Government Ranking, eleven countries have a population over than 100 million. In the top four of the ranking group, there are still four countries of USA, Japan, Russia, and Indonesia. In the top five, Philippines has an impressive score on Management Optimization, Open Government Data, and Online Service based on the foundation of the comprehensive Digital Government Master Plan.

The Philippines is attempting the pursue the connected yet integrated government under the theme "iGovPhil" Initiative. The iGovPhil started in June 2012 as a flagship project of the Department of Science and Technology (DOST) and administered through its attached agencies, namely the Advanced Science and Technology Institute (ASTI) and the Information and Communications Technology Office (ICTO). This is constituted by various components across several offices and will interconnect the current online services of the 98 national government agencies (NGAs) utilizing a network of fiber optic cables that traverse from Metro Manila to Cebu.

Under the new policy architecture, the Philippines can now transition from the non-integrated and agency-specific applications toward an E-Government model where there is sharing of data and interoperability of government offices to provide public services with better value for citizens. The membership of the country in the Open Government Partnership has led to the design of online services that leverage technology to promote participation, transparency, and accountability. There is a need to develop the demand side of Open Data and policies. Citizen oversight and monitoring of public services can be strengthened with information intermediaries who can analyze the information made available in online transparency portals. The government can engage universities as knowledge partners in capacity building for CIOs and research programs for tracking digital government progress.

The bottom of this group is Brazil, Pakistan, and Nigeria. The most difficult issues for Brazil in developing Digital Government are how to provide better and efficient service to the public. It is hard to give the opportunity to citizens to access government information and to participate in some political, administrative decisions.

2. Ranking in Small Population Countries (Less than 10 million)

Small Population Countries			Small Population Countries			Small Population Countries		
No	**Country**	**Score**	**No**	**Country**	**Score**	**No**	**Country**	**Score**
1	Denmark	94.816	9	Iceland	73.942	17	Brunei	55.334
2	Singapore	93.843	10	HK SAR	70.236	18	Bahrain	55.149
3	Estonia	91.125	11	Austria	65.412	19	Lithuania	52.385
4	Sweden	81.700	12	Ireland	64.528	20	Uruguay	50.369
5	Norway	79.760	13	Macau	63.092	21	Costa Rica	42.757
6	Switzerland	79.030	14	UAE	62.564	22	Fiji	41.355
7	Finland	78.982	15	Israel	59.111			
8	New Zealand	74.694	16	Oman	58.071			

Table IV-2: Digital Government Ranking in Small Population Countries

The Waseda ranking covers 22 countries that have populations of less than 10 million. In the top three are Denmark, Singapore, and Estonia. In the Rankings this year Sweden, Norway, and Switzerland have increased their position compared to 2017 Ranking. Finland ranked in 7th place having an advanced digital government development level. The digital government promotion activities of the Finnish Government are no longer focused on the developing citizens' awareness and are now focusing on how to improve users' experience with government digital services due to the increase in citizens' expectations. More attention needs to be paid to utilizing of emerging technology such as the Internet of things or Big Data within government agencies.

In the middle of group Hong Kong, Macau, UAE, and Israel are in similar place compared to the 2017 Ranking, while Austria did not keep their 5th position in 2017 ranking and slipped six steps to the 11th place. Among the ten indicators in the current Ranking, the Open Government is the top indicator in Austria. Management Optimization, Cyber Security, Online Service, and National Portal are also at high levels. This result shows that the Platform Digital Austria, which was created in 2005, has become the center point for coordination and strategy of e-Government in Austria by the Federal Government. All e-Government projects in Austria now run under the Platform Digital Austria designation. The weak point in Austria is about the use of emerging ICT. Austria is commencing the use of Big Data as vital lever to increase efficiency within public administration.

The bottom of this group still are Brunei, Lithuania, Uruguay, Costa Rica, and Fiji; they ranked 18th, 19th, 20th, 21st, and 22nd place respectively. The 2018 Rankings show that there is not much change in administration activities of these countries.

3. Ranking in Top 10 Countries with the Highest GDP.

Highest GDP Group		
No	Country	Score
1	USA	90.440
2	UK	91.921
3	Japan	84.897
4	Canada	72.459
5	France	69.760

Highest GDP Group		
No	Country	Score
6	Germany	68.475
7	Italy	63.490
8	Russia	62.579
9	China	62.079
10	Brazil	48.467

Table IV-3: Digital Government Ranking with Highest GDP Group

In the group, USA, UK, Japan, Canada, and France are ranked at the 1st - 5th place respectively. In the top 5, France is a new country compared with the 2017 Ranking. In the bottom of the ranking group, there are still Russia, China, and Brazil. They ranked in 8th, 9th, and 10th place respectively. Brazil is now still struggling to improve the efficiency of the public policy and service for societies via Digital Government and tries to improve efficiency and transparency of the management process through giving an opportunity for its citizens to access government information and to participate in some political, administrative decisions.

In the USA, ICT continues to provide new and innovative ways for U.S. citizens to interact, get involved and become empowered. Public participation enhances the government's effectiveness by improving the quality of its decisions through collaboration. Innovative tools can be used to create unprecedented openness in the Federal Government through increased citizen participation to make this type of collaboration a reality. On the U.S. National Portal, citizens can use many online services including e-tax, applying for a driving license, filing a complaint, finding a local doctor, applying for a passport or getting travel advice. The portal's design makes it easy for citizens to find both broad, characteristic information, as well as specific, personalized services. The government has also developed forward-looking Enterprise Roadmaps and modernization profiles to offer a path forward into the next phase of government modernization.

As one of the advanced Digital Government nations, Japan keeps its leading impetus at the top 10 of Ranking. As the situation above, the Japan government has built a sophisticated promotion system for digital government initiatives and precise GCIO regimes into every rank of government (Central and local government; different government agencies) to assure the implementation and evaluation process of digital government initiatives. It can be reported on high scores on "Government CIO" and "Digital Government Promotion". Japan also continues to update its online service system as the objective of initiatives to simplify administrative procedures and working systems. However, the National Portal seems to be the only weak point for digital government in Japan. Some necessary information including demographic data and introduction to Japan

political situation has been provided at the site, but it still needs much more necessary functions to serve visitor's needs rather than providing information only. In consideration of the coming Tokyo Olympic Games, a large number of visitors will choose the National Portal as a reference and it is a chance and challenge at the same time for the Japan government to reconsider that what is the appropriate way to provide information and deliver e-service to Japanese and non-Japanese through the Internet.

V. Digital Government Ranking by Regions

1. Ranking in Asia-Pacific Countries

Asia-Pacific Countries			Asia-Pacific Countries			Asia-Pacific Countries		
No	Country	Score	No	Country	Score	No	Country	Score
1	Singapore	93.843	7	HK SAR	70.236	13	Philippines	61.281
2	South Korea	85.500	8	Thailand	68.131	14	India	61.009
3	Japan	84.493	9	Malaysia	63.965	15	Vietnam	56.029
4	Taiwan	80.383	10	Macau	63.092	16	Brunei	55.334
5	Australia	80.248	11	China	62.079	17	Pakistan	42.299
6	New Zealand	74.694	12	Indonesia	61.486	18	Fiji	41.355

Table V-1: Digital Government Ranking in Asia-Pacific Countries

Singapore, South Korea, and Japan are three leaders of countries in this group. They also are in the top 10 countries in the overall Ranking. South Korea ranked in the 6th in total ranking and also has a good position in Asia-Pacific countries. Followed the top three countries are Taiwan, Australia, and New Zealand. They ranked 4th, 5th, and 6th respectively.

In 2016, Taiwan launched the Digital Nation and Innovative Economic Development Plan (2017-2025) (DIGI+ program). The plan's main goals for 2025 are to grow Taiwan's digital economy to US$205.9 billion, increase the digital lifestyle services penetration rate to 80 percent, speed up broadband connections to 2 Gbps, ensure citizens' fundamental rights to have 25 Mbps broadband access, and put Taiwan among the top 10 information technology nations worldwide. Accordingly, the National Development Council (NDC) of Taiwan promoted the national Digital Government program of Taiwan (2017-2020) in 2017. The newly launched program aimed to adopt emerging technologies such as Big Data, cloud computing, artificial intelligence in order to build a comprehensive global leading e-government of which citizens can take full advantage instead of receiving standard public services. Data-driven policy-making, citizen-centric service, and public-private participation are the three main core concepts of the program. Various promotion plans have been implemented, and the results are significant. For example, Government cloud service and structure reached 60% in 2017, and are expected to achieve the goal of 90% by 2020. As of March 2018, Taiwan government has opened more than 35,672 datasets and 172 Application Public Interfaces (APIs). Open Knowledge International has published the Global Open Data Index 2016, showing that Taiwan topped the Index for two consecutive years.

Following New Zealand are Hong Kong and Macau and four Southeast Asian countries, Thailand, Malaysia, Indonesia, and the Philippines in the middle of the group. In Thailand, Digital Government Development Plan is now in its 2nd edition (2017-2021). The Electronic Government Agency (Public Organization) (EGA) has a broadened

mandate as the Digital Government Agency or DGA. The government aims to develop digital capabilities within all key sectors, including agriculture, tourism, education, the medical profession, investment, disaster prevention, and public administration, in order to drive economic and social progress. To achieve the objective, digital technologies need to be incorporated into public services. An integrated information network will be developed cooperatively by government agencies, with a focus on four key development models, namely Government Integration, Smart Operations, Citizen-Centric Services, and Driven Transformation.

At the bottom of this group are China, Vietnam, Brunei, Pakistan, and Fiji. They are in the same places compared with the Ranking last year. Compared with other economics, China had a comparatively slow progress on e-Government development. Except for the indicator of "Management Optimization", performance on all the segments of ranking are lower than advanced nations. The absence of GCIO not only pares down the scores for evaluation but more importantly, has influenced the execution of ICT plans in each government level. According to China's strategy, e-Government has been regarded as a tool for administrative reform and government process re-engineering rather than developing e-Government itself. More and more online service has reached the phase of the transaction, although not e-decision making. However, some megacities in China have promoted advanced e-Services and data sharing to citizens (for example Beijing, Shanghai, Guangzhou), and continue to pull ahead of underdeveloped areas. The gap of wealth has affected every aspect of the societies in China, and the implementation of better e-Government is no exception. China's Internet users reached 688 million; Internet penetration rate reached 50.3%, and the number of Internet users and broadband access users ranked first in the world.

2. Ranking in Americas Countries

Americas Countries			Americas Countries			Americas Countries		
No	Country	Score	No	Country	Score	No	Country	Score
1	USA	90.340	5	Chile	53.054	9	Argentina	45.442
2	Canada	72.459	6	Uruguay	50.369	10	Costa Rica	42.757
3	Mexico	57.768	7	Brazil	48.468	11	Venezuela	41.300
4	Colombia	53.984	8	Peru	47.488			

Table V-2: Digital Government Ranking in Americas Countries

In this group, the USA and Canada ranked at the 1st and 2nd place. The table V-2 shows that the difference in score between the USA and Canada is quite high. Canada has kept its pioneer position among other countries in providing advanced e-services to citizens, which has a splendid one-stop service system endeavoring to embrace all the information and services that citizens or enterprises need at one centralized place. Massive contents have been divided into very understandable and concise catalogs, and users can always go to the destination directly. Also, citizens easily to interact with

government agencies through straightforward communication channels. That is why Canada has outstanding performance on the indicators of both "Online Service" and "E-participation". As one of the leading nations in Digital Government area, Canada is still expected to increase more scores on the latest indicator for the usage of new technologies, which is to have an efficient model of adopting emerging technologies such as Cloud Computing or IoT.

Compared to 2017, Colombia has a big step in Digital Government development, from the 9th place in 2017, they moved to the 4th place in 2018. Peru, Argentina, Costa Rica, and Venezuela are placed at the bottom of this group. Compared to 2017 Ranking, Argentina slipped three steps and tied at 9th place in 2018 Ranking. Argentina has many of the necessary elements for innovative and dynamic e-Development. Argentina has the highest per capita GDP and second-highest life expectancy in Latin America, with well-trained quality labor force who have high literacy rates. The Argentine government is gradually opening its ICT market for competition.

Compared to 2017 Rankings, Costa Rica has risen overall, but in this group, Costa Rica is still in the bottom. The use of emerging technology and Government CIO are the weak points of Costa Rica. The Director of Digital Government is the closest analog to a CIO position in Costa Rica. The Director has administration over the three Digital Government divisions, Projects, Technology, and Digital Inclusion. Moreover, Costa Rica also has a low score on Cybersecurity.

3. Ranking in European Countries

EU Countries			EU Countries			EU Countries		
No	**Country**	**Score**	**No**	**Country**	**Score**	**No**	**Country**	**Score**
1	Denmark	94.816	8	Iceland	73.942	15	Portugal	63.567
2	UK	91.921	9	Netherlands	70.259	16	Italy	63.490
3	Estonia	91.125	10	France	69.761	17	Spain	63.341
4	Sweden	81.700	11	Germany	68.176	18	Poland	60.846
5	Norway	79.760	12	Austria	65.412	19	Romania	60.757
6	Switzerland	79.030	13	Belgium	64.776	20	Czech	60.169
7	Finland	78.982	14	Ireland	64.528	21	Lithuania	52.385

Table V-3: Digital Government Ranking in European Countries

Denmark, the UK, and Estonia are leading countries in this group. They keep their position compared to 2017 Ranking. They are followed by Sweden tied at 4th place, Norway in the 5th place, Switzerland in the 6th place, and Finland in the 7th place.

The Digital Government in Estonia has reached the connected stage. E-Tax system in Estonia is one of the online services utilize the presence of X-Road. Estonians enjoy the simple procedure for filing a tax report in which they merely click four to six buttons for completing the procedure. It is not necessary to input the similar data time after time

because the data is already there. Hence, everything is prefilled. Estonia joined with the United Kingdom, South Korea, Israel, and New Zealand to establish a Digital 5 (D5) Cooperation. Strong commitment to ICT is inherent on the part of the prime minister and senior government officers. The prime minister chairs the E-Estonia Council, which leads the making and execution of national digital agenda in the country.

The middle of this group has some change and Norway and Switzerland have increased their position to the 5th and 6th place, while Iceland, Germany, Austria, and Ireland did not keep their position compared to 2017 Ranking.

Ireland has a strong motivation to well develop its e-government due to the government type and prosperous business in Information Communication Technology. In 2015, the Ireland government paused the cloud computing strategy and decided to combine it with "build to share" ICT strategy. In 2017, the Ireland government released new regulation in data protection and cybersecurity. In addition, furthering its outstanding one-stop-service, Ireland has launched MyGovID, an online identity for online services in 2017, which built on the Public Services card, linking citizens' identity to online identity.

The bottom of this group is the Czech Republic, together with Lithuania in the same place compared to 2017 Ranking. In 2015, the Czech government introduced a strategy for ICT Service development in public administration. The strategy focuses on national cybersecurity until 2020 and also introduces the idea to legislatively delegate to the Department of Chief Architect of the e-Government at the Ministry of the Interior the role of "watchdog" to oversee the efficiency of public spending in public administration ICT area. The strategy includes a list of improvement opportunities that should lead to the better nation-wide governance of ICT services in public administrations.

Czech National Security Authority Cybersecurity was established according to the Decision n. 781 / 2011 of the Government of the Czech Republic. The name is National Cyber Security Centre (NCSC), and it is headquartered is in Brno. The main task of the NCSC is the coordination of cooperation on both national and international level to prevent cyber-attacks, to propose and adopt measures for incident solving and respond to ongoing attacks.

4. Ranking in Africa, the Middle East, and CIS Countries

Africa, Middle East & CIS			Africa, Middle East & CIS			Africa, Middle East & CIS		
No	Country	Score	No	Country	Score	No	Country	Score
1	Russia	62.580	6	Israel	59.111	11	Saudi Arabia	51.718
2	UAE	62.564	7	Oman	58.071	12	South Africa	50.823
3	Kazakhstan	61.285	8	Bahrain	55.149	13	Tunisia	44.858
4	Georgia	59.840	9	Morocco	51.951	14	Egypt	41.984
5	Turkey	59.481	10	Kenya	51.721	15	Nigeria	41.774

Table V-4: Digital Government Ranking in Africa, the Middle East, and CIS Countries

The 2018 Waseda Digital Government Rankings cover six countries from Africa, five countries from the Middle East, and four countries from CIS. The leading countries in this group are Russia, UAE, and Kazakhstan followed by Georgia and Turkey in the 4th and 5th place respectively.

There has been little progress in Georgia regarding the provision of Digital Government services. Most of the Digital Government services such as E-tender, Social Security Services, Civil Registration Services, Consular Services, and Labor-Related Services are provided at static websites. E-payment and e-voting services are not available yet. Georgia was among the first group of countries to join the Open Government Partnership (OGP). In April 2012, the country's government presented a relevant Action Plan which focused on improving public services, increasing public integrity, managing public resources effectively, and creating safer communities.

Georgia has adopted a New Cybersecurity Strategy that will be the primary document defining state policy and establishing basic guiding principles in the cybersecurity field. It should be mentioned that strategy considers cyberspace protection equally crucial as the inviolability of land, air, and maritime boundaries.

In the middle of the group, there is no significant change in positions. In the bottom of the group are still Egypt and Nigeria. They are ranked in 14th and 15th place respectively.

In this group, Kenya has progressed and received a significant place in the 2018 overall Digital Government Rankings. Kenya is developing rapidly in digital government; the ICT helps grow of economic and technologies in Kenya. The implementation of e-government is associated with infrastructure, policy, and information security, human capital, and social factors. The National ICT Master Plan (2013/14-2017/18) has three foundations and three pillars. The first foundation of this Masterplan is ICT human capital and workforce development, the second is integrated ICT infrastructure, and the third is integrated information infrastructure. The first pillar of this Master Plan is E-Government services, the second pillar is ICT as a driver of industry, and the third is developing ICT businesses.

VI.　New Trends of Digital Government in 2018

Highlights of the remarkable trends of Digital Government in 2018 are (1) re-definition of e-government, (2) Usage of AI and IoT for Digital Government, (3) Expanding the Scale of Smart City and e-local government, (4) Blockchain Technology for Digital Government, and (5) Digital Government for Anti-Corruption.

These are well connected to each other to support the great Digital Government activities and interrelated as a part of the Digital Government Ranking survey. Five highlights mentioned will be the most important for understanding the 2018 trends of the digital economy and innovation.

1.　Re-definition of e-Government
(Dr. Yang Yao, Researcher, Institute of e-Government, Waseda University)

E-government implementation has been cultivated over the last 20 years. In the decades of its development, e-government has been defined and discussed by a great deal of public international organizations and scholars. In general, this phenomenon is not about putting in a few computers or building a website for information access, but about transforming the fundamental relationship between the government and the public. However, e-government initially began with technical changes in the government. It is indeed a dynamic mixture of goals, structures, and functions, whose scale has been extended by new concepts such as transparency, accountability, citizen participation in the evaluation of government performance, and changes in political practices, such as e-democracy and e-governance.

As the most famous international agency that conducts the broadest range of surveys on e-government every two years, in 2001 the United Nations (UN) defined e-government as 'utilizing the internet and the world-wide-web for delivering government information and services to citizens'. Two years later, the Economic Co-operation and Development (OECD) e-government task force of the public governance and territorial development directorate defined e-government as 'the use of information and communication technologies, and particularly the Internet, as a tool to achieve better government'. In 2014, the OECD updated the term e-government to 'digital government', indicating that it 'refers to the use of digital technologies, as an integrated part of governments' modernization strategies, to create public value'.

Other organizations have their definitions of e-government as well, which differ in their emphasis on different points. The World Bank defines e-government as 'the use by government agencies of information technologies (such as Wide Area Networks, the internet, and mobile computing) that can transform relations with citizens, businesses, and other arms of government. In a like manner, different ends can be met through ICT, including 'better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment and more efficient government management'.

Furthermore, the European Commission defines e-government as 'the use of information and communication technologies, combined with organizational change and new skills, to improve public services, increase democratic participation and enhance public policy-making'. According to the European Union (EU), the essence of e-government is about 'using technology to make public service better, cheaper and faster; for society and the good of public administrations.'

Despite international organizations' various definitions of e-government, to which scholars have contributed as well, there is still no universal definition. Nonetheless, consensus may be reached regarding some interactive features of e-government, such as the use of ICT in the political section to improve public services delivery; the revolution of the interaction process between government and society; and facilitated public values such as transparency, democracy, and innovation.

There are different kinds of interactions in the implementation process of e-government, depending on the objects at both ends of the communicative channel. The convergence of e-government stages and categories of relationships between the government and its constituents in their electronic government framework.

In 2002, the Office of Management and Budget (OMB) in the US published an 'e-government strategy', which proposed four groups that provide opportunities to transform the delivery of services:

- Individuals/citizens – government-to-citizens (G2C): Build easy-to-find, easy-to-use, one-stop points-of-service that make it easy for citizens to access high-quality government services.

- Businesses – government-to-business (G2B): Reduce the government's burden on businesses by eliminating the redundant collection of data and better leveraging e-business technologies for communication.

- Intergovernmental – government-to-government (G2G): Make it easier for states and localities to meet reporting requirements and participate as full partners with the federal government in citizen services while enabling better performance measurement, especially for grants. Other levels of government will see significant administrative savings and will be able to improve program delivery because more accurate data will be available in a timely fashion.

- Intra-governmental – internal efficiency and effectiveness (IEE): Make better use of modern technology to reduce costs and improve quality of federal government agency administration, by using industry best practices in areas such as supply-chain management, financial management, and knowledge management[1].

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[1] Documents.mx

The structure of the e-government categorization into an illustrated four-quadrant diagram. Simplifying the portfolios into four objects: government to customers (G2C), government to business (G2B), government to the employee (G2E), and government to government (G2G).

1.1 Government to Government

The US e-government initiatives broadly define G2G as 'new partnerships among levels of government. These partnerships facilitate collaboration between levels of government and empower state and local governments to deliver citizen services more effectively'. G2G systems are the types of e-government operations that support relationships between different structures of government. Government departments must ensure that internal processes are developed to manage the flow of paper-based correspondence, contracts, or application submissions. G2G integration requires cooperation between different public departments and various degrees of ICT interoperability, and it will deliver technologies for distributed and remote data for internal use in analysis and planning as well as for external communications.

1.2 Government to Business

G2B denotes the exchange between governments and commercial or non-profit enterprises. The transactions of G2B are often multi-level processes that involve multidisciplinary functions and multiple transactions that are often contingent upon one another. The operations of G2B contain various services exchanged between the government and the business sectors, including the distribution of policies, memos, rules, and regulations. The opportunity that G2B brings to conduct online transactions with the government reduces red tape and simplifies regulatory processes, thus helping businesses to become more competitive. The G2B process is beneficial to both government departments and business sectors. For the public authority, the traditional government procurement process has been radically re-engineered and replaced by network-enabled facilities or counterparts of e-procurement systems. On the other hand, the business sector perceives the emerging opportunities of using G2B electronic services not as an alternative way of doing procurement with public agencies, but as a way of securing more government business opportunities. Hence, the G2B process could enable businesses to have new and direct relationships not only with government organizations but also with other market participants to be more competitive.

1.3 Government to Employees

In contrast to internal interaction between organizations, G2E concerns the online relationship between government bodies and their employees which is sometimes called 'intra-government' (IEE) Many specialized services in terms of internal staff issues are covered under the umbrella of G2E, such as the online services of payroll, tax information, the provision of human resource training and development that improve the bureaucracy's day-to-day functions; calculation of retirement benefits, access to applications, content

and collaboration with other government employees anytime, anywhere; budget and finance, administration, procurement and store management, e-learning, messaging, and workflow and project management. In short, according to the above classification of e-government categories, G2E comprises the internally focused utilization of ICT to manage organizational resources—capital, human, material, and machines—and to administer policies and procedures in the connection between government organizations and individuals in the back office.

1.4 Government to Citizens

G2C is considered to be the primary sector of service delivery in e-government and deals with the relationship between government and citizens. The majority of government services are found in this category. This design to facilitate citizen interaction with the government online is what some industry observers perceive to be the primary goal of e-government. If e-government initiatives serve different layers of processes, then the G2C component forms the 'bottom of the pyramid' to achieve social inclusion in the country. It offers online non-commercial interaction involving different levels of administration (central and local government) and private individuals outside of government. Many federal governments around the world have established national G2C services, such as USAgov (FirstGov), GovUK (DirectGov), and CanadaGov, among others. At the regional level, G2C applications with more local features are provided to satisfy the specific needs of residents. Though nowadays national portals are empowered to create access for citizens, G2C practice is more often examined and discussed at the local e-government level. The primary focus of G2C applications is to facilitate instant and convenient access to government information and services for citizens anywhere and at any time online

2. Usage of AI and Blockchain for Digital Government
(Prof. Dr. Toshio Obi and Prof. Dr. Naoko Iwasaki, Waseda University)

2.1 Introduction

The purpose of this highlight is to find out that Smart Cities can be digitally transformed into Smart silver cities which the authors are proposing. Digital applications are applied in most areas of our life, and the world economy is shifting to a new form - the digital economy. The services should be provided faster, more efficient with high security and might be considered as developing in all countries. Digital government is one of those services. Digital Government encompasses the usage of all information and communications technologies (ICT) to deliver governmental services to citizens/business and improves the quality of governmental activities. The governments have been primarily focused on the Internet as a mean of public service provisioning.

2.2 Strengthening Digital government and economy

Digital Government is applied for most countries around the world with different level, method, and application in each country, from developing countries to developed

countries. In the developing countries, they mainly focus on the implementation plans and D-government roadmap for each year or for a certain period, or on upgrading the infrastructure network system by raising the proportion of Internet users and broadband connections. While in the developed countries tend to focus on promoting new online services, they are introducing smart online services at the higher level to customers.

Smart city is sometimes referred to as D-municipality, which is a part of the extension of D-government to Digital platform, where the strategic use of government services and applications are only possible by using cellular/mobile telephones, laptop computers, personal digital assistants (PDAs) and wireless internet infrastructure. The following Figure 1 indicates the outline of the issues on Japanese super ageing society.

Figure VI-1: Japan Super Ageing Society

In recent years, the number of smartphones sold in the market is increased. They have gradually replaced the 2nd mobile generation, along with the rapid development of technology for improving connectivity and quality (4G, LTE, and 5G) on a smartphone. There will be some possibility that the smartphones replace the PC in the future. With the gradual shift from e-Government to Digital Government it will bring higher efficiency for both suppliers and users. These services can have a significant impact include e-education, e-health, e-mobility, and mobile payment services, as well as location based services.

It is noted that, with the application of new digital technologies, Digital Government services will be raised at a higher level of public development. The largest utility in the application of Digital Government is the citizens/business sectors, and the governments are connected continuously by online. It makes the deployment of new services by the government which is faster and more efficient. The application of m-government also creates many advantages for the universal service, especially to the remote areas, Digital Government scheme also reduces the digital divide in many countries, increases

transparency in government operations, reduces corruption and always creates a connected government with grassroots. This also increases people's trust in government.

2.3 IoT for Smart Silver City

The concept of "Internet of Things - IoT" appears recently and will become a hot topic in the next ICT development. As everyday objects, the society is inspiring the term "Internet of Things." where any device can be internet-enabled, linking it to additional computing power and analytic capabilities that make it "smart."

Typically, IoT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) communications and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is expected to usher in automation in nearly all fields, while also enabling advanced applications like a smart grid, and expanding to the areas such as smart cities.

In term of delivering services, Digital Government has many practical contributions to citizens; however in many countries, especially for least developed countries and developing countries, the governments are difficult to spread services to all citizens due to lack of communications, connections, and end-users. With an application of IoT into D-Government services, the government can solve this issue. With the ability to connect multiple devices, through different approaches, the government can expand services in order to be connected to make services better and more efficient government requirements. By applying IoT in the government operations, it enables the government can respond better and faster in the case of emergency (ex: early warning of natural disasters system, climate changes), deliver value to citizens and making security a priority.

The Internet of Things offers new ways to make citizens smarter, more efficient and more informed – while, at the same time, delivering cost savings to the government. Connected infrastructure – from toll roads to parking places to utility meters – delivers real-time "actionable" information around costs, condition, usage, and utilization to citizens and government alike. Citizens can instantaneously find parking or cut back on electricity usage, while the government can allocate the right resources at the right time to charge fees, deliver services, and manage public infrastructure.

Furthermore, the IoT applications in the public sector also reduce the operating costs, to help the government sharing data and reuse data among government agencies. Based on these activities, the governments build effortlessly smart solutions to develop ICT as well as to create new services for citizens.

Based on available data, there were 22 mobile-cellular subscriptions for each machine-to-machine (M2M) subscription worldwide at the beginning of 2015. The countries with the highest M2M penetration rates are highly industrialized, advanced

economies, including the Northern European countries of Sweden, Norway, Finland, and Denmark

2.4 IoT for Ageing Society

IoT applications have been referred to as a trend, where all devices can be connected together and connected to the Internet to share information, increase the transmission of information. It is particularly useful for delivering public services. According to IDC's research, IoT industry is forecast to generate around $ 6 trillion in 2025. In the public administration, IoT is remarkably effective if applied thoroughly. These include IoT applications in public management.

The application of IoT in Disaster Management and emergency management for older adults: In the Disaster management, sharing and transmission of information are crucial. In this issue, the government can fully control and prevent damage caused by implementing early warning systems, such as tsunami warning, earthquake, or forest fire warning by setting up a sensors network for the seniors. IoT connects them to the Internet to control simultaneously synchronized data sharing among government agencies.

One of the applications of IoT is to build smart cities friendly for all. It can be seen as the most effective in implementing smart city. IoT applications that leverage ubiquitous connectivity, big data and analytics are enabling Smart City initiatives all over the world. These new applications introduce tremendous new capabilities such as the ability to remotely monitor, manage and control devices, and to create new insights and actionable information from massive streams of real-time data. IoT offerings are transforming cities by improving infrastructure, creating more efficient and cost-effective municipal services, enhancing public transportation, reducing traffic congestion, and keeping citizens safe and more engaged in the community.

In the application of Digital Government for all, e-Health is one of the services to be deployed, and most have many applications in most countries. The IoT application in healthcare, is also known as the Internet of Medical Things IoMT). These are the collection of medical devices and applications that connect to healthcare IT systems through online computer networks. Medical devices equipped with Wi-Fi allow the machine-to-machine communication that is the basis of IoMT. IoMT devices link to cloud platforms on which captured data can be stored and analyzed. As is the case with the broader Internet of Things (IoT), there is now a possible application than before because many consumer mobile devices are built with Near Field Communication (NFC) radio frequency identification (RFID) tags that allow the devices to share information with IT systems. The practice of using devices to monitor patients in their homes, known as telemedicine remotely. Figure 4 indicates [Big Data, AI and Creation of Life Support Businesses for Smart Silver City as a matrix.
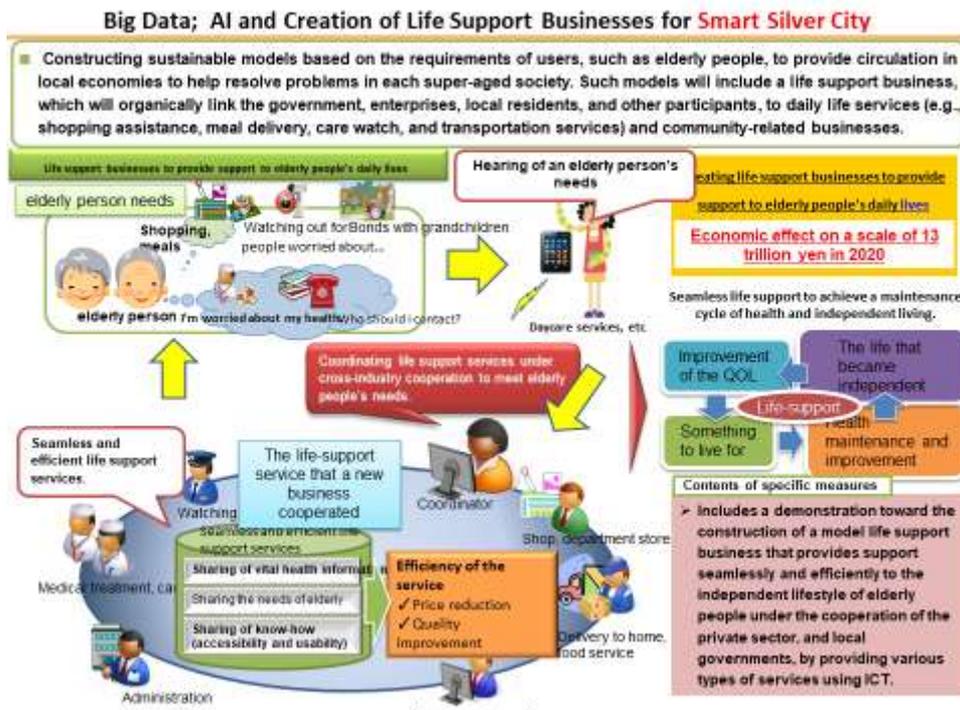
Figure VI-2: Big Data, AI and Creation of Life

By improving IoT in e-mobility for old persons, it helps many cities have begun smart transportation initiatives to optimize their public transportation routes, create safer roads, reduce infrastructure costs, and alleviate traffic congestion as more people move into cities. For developing countries, IoT helps to solve congestion of the heavy traffic, through IoT everyone could know and grasp the situation of the road that he or she will crossroad (Figure VI-2)

Figure VI-3: Revenue Forecast of Insights-Drive Businesses

The figure VI-3 above shows AI will drive the insights revolution. All other data points shown are estimates and prediction for 2020 (*Source: Economic Intelligence Unit, Morningstar, and PitchBook Data*). The democratization of insights is driven by the desire of businesses to be more informed in their decision-making and the response by insights technology vendors in making their solutions more business-friendly. Half (51%) of data and analytics decision-makers in 2015 had unencumbered access to insights. This increased to 56% in 2016. Forrester expects this trend to accelerate in 2017 to around two-thirds. The stimulus for this accelerated democratization will be embedding AI, big data, and IoT into their analytics processes. In 2017, these technologies increased businesses' access to data, broaden the types of data that can be analyzed, and raise the level of sophistication of the resulting insight.

Nowadays, the application of ICT increasingly has been applied in many fields of state activities including ageing society. It requires every organization, an individual must understand and has perfect skill in using ICT application. Therefore, everyone has to strive to change and to improve skills to meet the need of the requirement. With the IoT applications deeper in the ageing field, IoT has created a new environment to promote and enhance the development of human resources.

One of the most popular applications of IoT is Web of Things for an ageing society. It is a new paradigm for ageing society to promote active sharing of information and removal of barriers existing among communities for better collaboration. The ultimate goal is to secure the driving force for national administration and to provide personalized services to individual citizens, and at the same time, generating more jobs and supporting the creative economy.

2.5 Evaluating AI driven Smart Silver City

AI with big data analysis is becoming popular in research and ICT application, not only for businesses but also for public sectors. AI helps organizations build smarter infrastructures by reducing investment costs, using analysis tools to optimize input, create stream information and sharing output data in order to use shared database inside organizations. It will provide a basic platform for decision-making processes, prediction business results. To build flexibility system reduces the input load, and revolutionize the way we work with smart devices based on cloud computing. Therefore, it is indeed a useful and indispensable tool for every organization.

E-Mobility is no longer a technological revolution. It is more about how both businesses and governments can provide better social infrastructure through mobile applications and services. Adoption of mobility, therefore, is an indispensable asset for the public sector in meeting the demands of citizens as well as businesses. Open innovation regarding data and information means the transition from supply-driven transparency (reactive, responsive disclosure of public information) to demand-driven transparency (proactive sharing). For the smart silver city activities, AI application to

improve the efficiency of online services, which can help developing and least developed countries to catch up with developed countries, minimize digital divide, and facilitate connectivity. The use of AI in the public administration helps the state agencies to minimize the investment process through the use of a common database, increasing the efficiency of state management in the smart city as well as the transmission of services. To deliver services for senior people faster and more effective, we need more monitoring the demand and supply activities between users and suppliers. For example, Japan, the country as the world No.1 super-ageing nation is the best test bed in this field; AI is not to make delivering services to citizens easier and faster, but also to help older adults for controlling the technology and easy to access new services. In addition, AI is genuinely useful in managing natural disaster and directing people to a safe life.

Regarding the economic impact of AI, AI has the potential to double annual economic growth rates in the countries which AI is well introduced. It is analyzed regarding gross value added (a close approximation of GDP).

Japan has moved fast at the emerging ICT application into many sectors. There are already some national plans such as Smart Cloud Strategy, Big Data in Government, AI Promotion, etc. Cloud computing in the national platform is at the ongoing phase. The Ministry of Economy, Trade, and Industry (METI) also has sponsored the public projects which have been selected to facilitate the IoT utilization.

For the IoT applications, Japan is one of the developed countries which have thoroughly applied the benefits of ICT in the administration and management in smart silver city. Especially, the IoT projects include the application of IoT in Disaster Management which to minimize risks and remedial most quickly. Some most popular IoT applications for older people in Japan involve transportation management, surveillance, and e-health services. The following Figure 5 is typical convergence of ageing and digital societies.

Figure VI-4: Transformation of Digital Economy

To build a smart silver city and associate it to the smart silver city services, the policymakers should consider the characteristics and features of the new smart silver city such as building healthcare community by promoting e-health services, implementing e-education, to develop mobile services for connectivity and services to accelerate and improve the efficiency in the use of energy, with particular emphasis on green and clean energy sources. Furthermore, building digital communication and giving a solution for ICT innovation is incredibly significant in society.

Smart cities revolve around the IoT use of technology to deliver goods, reduce costs for service providers, and allow cities to be better managed. With smart silver cities, e-governance offers the opportunity for governments to make their management of cities more timely and beneficial to senior citizens mainly through the diversified supports.

2.6 Conclusion

In this article, we have characterized the new trends in ageing society in Japan. The lessons from our best-engaged practices in the case studies of smart silver cities such as Otsuki, Shinjuku and Yokohama cities hinted significant trends. These trends include (1) Rapid increase of ageing population, (2) The increase of living alone people, (3) Decreasing digital divide, (4) Accepting nursing at home.

Other significant trends of usage for silver innovation are described as follows: Popular applications for silver Innovation in Japan can be divided into two parts:

Firstly, Macro and social infrastructures will be (1) BCP for disaster, (2) Cybersecurity, (3) Smart mobility and (5) barrier free buildings.

As for more individual usages, the following 6 items are quite popular among senior people when we made the questionnaires for them

- Assistive Robots

- Smart home

- Online shopping

- Auto driving

- Home monitoring

- Mobile 5G and TV 8K

Therefore, it will be imperative for the smart silver city to consider the above macro and micro aspects of quality of life to live there and innovatively institutionalize the system and infrastructures. The most significant trends on smart silver city might be how we can make the global standard on the comprehensive sectors of new city concept as a part of the digital transformation to accommodate overall innovation to match the new demand of the ageing society. Especially, usage of emerging technologies such as AI, Big data and IOT as well as cybersecurity and cloud computing will be the critical engines for promoting the smart silver city which will grow so fast.

3. Expanding the Scale of Smart City and e-Local Government

3.1 Overview

The purpose of the Smart Cities is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to Smart outcomes. Area-based development will transform existing areas (retrofit and redevelop), including slums, into better-planned ones, thereby improving the livability of the whole City. New areas (green field) will be developed around cities in order to accommodate the expanding population in urban areas. Application of Smart Solutions will enable cities to use technology, information, and data to improve infrastructure and services. Comprehensive development in this way will improve the quality of life, create employment and enhance incomes for all, especially the poor and the disadvantaged, leading to whole cities[2].

As there are different levels of administrations exist in a country, e-government can also be classified into layers. Heeks (2006)'s category explains e-government's five levels as international, national, regional, state/provincial and local. Although the interactions between government and other sectors (business, citizen) lie in almost all the layers of e-government, the G2C service-delivery is usually placed at the local level. This can be tracked from the definitions, as local e-government is considered to be "information, services, or transactions that local governments provide online to citizens using the

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[2] https://finaacle.com/

Internet and Web sites. Rahman (2009) advocates the implementation of local e-government can enhance citizen engagement and participation for better service delivery. In local e-government, the citizen becomes the most important "customer" as G2C usually refers to the e-procedure of an individual's daily life, which often locates at the grassroots instead of higher administration. The local government is closest to and delivering the highest number of service directly to citizens. National government as the primary director for the welfare of the whole country is unlikely to understand the needs of communities in the same way as local government. Local officials are also close to a more narrowed audience to understand their needs, which is a vital factor for designing satisfied e-service to citizens. Global statistics have confirmed this fact; it was reported in 2002 than 80% of the government transactions with individuals are dealt with at the local level. In 2005, a report stated that between one-half and fourth-fifths of government contracts are at a subnational level in industrialized countries.

Another reason about why G2C e-service delivery at the local level may be considered as that local government would be more innovative in reforming e-government than higher administration owing to lower barriers to its change. Local government is more flexible to adopt new technology and application for the local-based e-service, and citizens' feedback can be reflected in the changing process promptly. For instance, the utilization of social media is reported to be more active at the local e-government section, while the SNS tools have helped to provide a more innovative mechanism for service delivery. Therefore, local e-government becomes a suitable place for testing G2C innovation, whether in technological or managerial aspect. Having more opportunities to access to citizens also enables local e-government to encourage citizens to participate in the public matters easier, as it is reported that local e-government in the United States officially aimed citizen participation or e-democracy

Based on the discussion above, the fact that G2C e-service delivery is mainly implemented and innovated in local e-government reconfirms local e-government to be the target of this research. As a promotion for G2C, by its very nature, is a communication process between government and citizen, a study of local e-government provides the closest observation of e-government promotion.

3.2 E-Local Government Case Studies
(Dr. Nguyen Ngoc Anh, Deputy Director, Software Center, Haiphong Department of Information and Communication)

3.2.1 *South Korea*

The local government in South Korea consists of 248 separate units. The local political system of Korea is broadly distributed into two categories: the general and the special. According to the country's constitution, it is acknowledged that the general local governments in South Korea are comprised of two tiers: the upper-level local (i.e., metropolitan cities and provinces) and the lower-level (i.e., cities, counties, and districts).

South Korea has actively pursued e-government as a critical means to make the government more competitive, by leveraging the world's best IT infrastructure, including broadband Internet. It has laid the foundation for e-government since the 1980s, starting with the establishment of the National Basic Information System computer, followed by the restructuring of applicable laws and institutions in the 1990s. In the 2000s, the South Korean government has considered e-government as one of the primary targets on the national agenda for the new century. In the late 2000s, the government started to link and integrate each respective e-government system for broader applicability, so e-government has been successfully integrated into all public sectors.

The latest strategy on e-government, Government 3.0, was drawn out by President Park with the intention to "make information sharing more equitable and transparent between the central government, local governments, government agencies, and the public."10 By pursuing Government 3.0, President Park shows her ambition and interests the use of ICT to transform government.

The South Korean government believes that cooperation among the different levels of administrative units and between the central government and various agencies and organizations will significantly enhance the efficiency of the government, as well as facilitate paperless services. Following the strategies set for decentralization, the Korean government undertook the local e-government project in order to establish information management systems at the local and regional levels and to fully integrate the regional networks with central agencies. The local e-government project, with the total funding of nearly KRW 72,000 million, can be divided into the cities-counties -districts (CCD) administrative information development project and the cities-provinces (CP) development project. This far-reaching project is one of the South Korean government's most ambitious IT projects, connecting the central government with regional and local governments to shape the foundation of the nation's e-government system.

The CCD administrative information system (IS) development project was launched in1998, targeting 21 government functions at the city, county and district level, with the targets of promoting the sharing information resources among departments and related agencies. Reducing the amount of time and documents required for citizens, and promoting information transparency. By late 2008, there were in total 507 tasks in 22 areas being transformed from manual processing or physical registries and documentation to fully electronic and computerized tasks. This process of transformation increased the overall rate of the computerization of CCD administrative processes from 47.6% to 74%.

Along with the CCD information project, the CP administrative IS development project forms the core of the local e-government projects targeted at enhancing administrative services at the CP level, which had formerly relied on manual processes; the projects also focus on establishing an information-sharing architecture and a standardized process system that enables seamless administration between the central

government and metropolitan centers and provinces around the country. As the results, the CP administrative information project computerized a total of 904-unit work processes by March 2007, creating links with 751 civil petitions and other government services and 48 Internet services (G4C). In addition, 819 report and statistics management tasks between the central, CCD and CP governments have been established. Over 3,500 permits, licenses, and other official document-reissue services are offered through the system, with 192 linked services between CCD and CP administrative units.

The outcomes of the South Korean government's efforts to promote local e-government are notable. The local one-stop service portal, Miwon24, connects the civil services of each governmental institution, including the resident registration management system and local government administration system, allowing all of the procedures of civil services to be done in a one-stop process. The On-nara BPS provides a common platform to record and manage government administrative businesses online, as well as to facilitate collaboration among government entities. To date, approximately 850,000 government officers from 179 administrative institutions of both the central and local governments use the system (MOI Korea, n.d.).

With the deployment of the intelligent transport system nationwide, the South Korean government aims to facilitate optimized and automated traffic operation and provide traffic information to travelers. To date, 50 local governments in South Korea have adopted the bus information system (BIS), which provides information about bus routes and arrival times. As a result, the number of a bus passenger in Seoul, a large metropolitan city, has increased by 40 more than 20% over the past ten years, from 3,827,000 in 2004 to 4,647,000 in 2011, since Seoul introduced BIS and the electronic transport card (MOI, Korea n.d.).

The vision and strategy of local e-government projects have received broad approval from government officers at all government levels. The strong willingness and commitment from the excellent leadership are one of the success factors in the development of e-government in all administration level in South Korea.

3.2.2 *Japan*

Japan has a two-tier local government system: prefectures and the municipalities. Japan is made up of 47 prefectures, and Tokyo is one of these regional authorities. Prefectures are regional authorities consisting of municipalities, which are responsible for regional administration. Municipalities are local public entities that have a strong and direct relationship with local citizens and are responsible for handling affairs directly related to the residents.

The central government ministry with the responsibility to promote local e-government is the Ministry of Internal Affairs and Communications. Within this ministry, the promotion of local e-government is carried on by the Local Administration Bureau, which is in charge of the computerization of administration, and by the Information and

Communication Policy Bureau. In order to strengthen coordination in the development of local e-government, the Japanese government has established a GCIO system at each level of government to ensure the implementation of ICT strategies in organizations and societies.

The "i-Japan 2015" strategy focuses on three major priorities, 11 the first among them concerns "electronic government and electronic local government fields" and emphasizes government administration reform and business process re-engineering at all levels. In March 2014, the Ministry of Information and Communications (MIC) announced the ten guidelines to accelerate e-local government initiatives. The guidelines call for establishing systems to promote local e-government, starting with deploying cloud-based local government services. The local government cloud is an initiative that enables local governments in rural areas remotely to make use of system hardware, software, and data that are managed and operated at an external data center. This initiative saves local governments in rural areas from purchasing their own IT equipment and operating systems.

The MIC is also running preliminary projects under the ICT town development promotion project to pursue ICT-smart towns. In 2012, five cities were selected for implementing pilot projects: Mitaka in Tokyo, Kashiwa in Chiba Prefecture, Shiojiri in Nakano Prefecture, Toyota in Aichi Prefecture, and Fukuroi in Shizuoka Prefecture. In total, 28 local projects, including these five, were carried out in 2012 and 2013 (MIC Japan, 2014). Another initiative is the primary resident registration network system, which was implemented as a local government system for essential resident registries. The system enables the provision of personal identification records (name, address, date of birth, gender, resident registration code, and update information) to government institutions, along with the administrative processing of primary resident registers between municipal boundaries. The number of personal identification records provided from the resident registration network system to government institutions has been increasing year by year, reaching approximately 559 million items in FY 2013. This growth is due to the start in 2011 of the provision of personal identification records to allow the elimination of change-of-address and other notifications by pensioners.

In partnership with the Association for Promotion of Public Local Information and Communication (APPLIC), the MIC is taking the opportunity, afforded by the introduction of the "my number" system and the migration to cloud-based local government services, to assist the provision of information and other tools so as to advance regional information platforms—infrastructure that connects and coordinates various information from different sources—by local governments across the country. As of January 2014, approximately 1,600 local governments were working on deploying systems that make use of regional information platforms. APPLIC is currently drawing up a standard specification for local information platforms targeting 26 internal operational systems used by local governments. APPLIC plans to add rules needed for

standards between the systems of multiple local governments in order to support my-number system[3].

However, there are several issues with local e-government in Japan. The awareness of local government officers with the directives and policies from central government is still limited. According to a survey given to local governments concerning the awareness of local public officers on the my number initiative, 53.5% of local governments have experienced confusion about the future expansion of my-number applications, as suggested by this percentage selecting "no clear images of specific uses or applications" as their first answer in the survey (MIC Japan 2014). The second choice, "don't know how to move forward with applications (systems)," was chosen by 44.6% of surveyed local government workers, followed by "difficult to construct systems that can be used by all departments or throughout the region" and "tough staffing conditions," which both made up 35.9% of local authorities. This response suggests that many local governments are interested in applying my-number system but still have confusion about its actual adoption. Another issue with Japanese local governments lies within the social culture, where paper documentation with "hanko" or "inkan" (personal seal) are still preferable. There is a limited number of procedures being digitalized, resulting in the online-use rate for local government administrative procedures being only 42.6% in 2012.

Although known as one of the leading countries in technologies, the development of local e-government in Japan has been encountered with many issues. The most serious one is the awareness of local government officers with the general vision and strategy formulated by the central government.

3.2.3 The UK

Local government in the United Kingdom is structured in two ways. In Scotland, Wales, Northern Ireland and parts of England, a single-tier, "all-purpose" council is responsible for all local authority functions. The remainder of England, mostly rural areas, is governed locally through a two-tier system comprising district and county councils. In total, there are 464 councils in England and Wales. Under these authorities are around 10,000 parish and town councils across the United Kingdom, with some limited service delivery responsibilities.

Under the United Kingdom's two-tiered, unitary system of government, central government documentation such as the National Strategy for Local E-Government offers a common framework with broad contexts and requirements for development. In their evaluation of e-government policy approaches in the United Kingdom and the Netherlands, Flowers et al. (2005) found that the United Kingdom's top-down model offers a framework for development, with "general points of reference to frame and support specific initiatives developed closer to the context of the application. In the

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[3] http://www.soumu.go.jp

absence of such generic guidelines, local initiatives may lack the necessary political and financial support to achieve their objectives" (Flowers et al., 2005). This approach privileges local authorities creating their online initiatives to suit local priorities and the specific needs of their citizens, while backed by national resources. The central government provides support to local authorities through, for example, supplying technical and legal standards, coordinating work between central and local governments, identifying and addressing barriers to development (such as skills gaps and training programs), and developing products to reduce costs for local governments (Office of the Deputy Prime Minister, 2002).

By 2015, central government funding for councils was cut by 40% throughout this parliament. The Institute for Fiscal Studies anticipates that the spending cuts will continue until 2020, and these cuts come at a time when the impact of the economic downturn, demographic change, and significant government initiatives, including Universal Credit and Troubled Families, new public health responsibilities, and fundamental changes to the local government finance system, are compounding the pressures on councils. Councils deliver an estimated 80% of local public services, and are located in and form part of the communities they serve (Local Government Association, 2014).

"Future city / Glasgow'108" is a program with £24 million funding which was designed to demonstrate the implications of technology to build a life in the city smarter, safer and more sustainable. Glasgow city has won 29 other cities to be awarded the funding for the program in a contest run by the Technology Strategy Board–the United Kingdom's innovation agency. This project seeks to bring together a new city technology platform and operations center to help make services including travel, energy efficiency and social transport smarter and more efficient. Progress has also been seeming in Manchester where technology and information are utilized to improve and modernize transport in the city.

In sum, the most significant advantage in the UK is the local government plans aligned well with the central government strategy. Eighty-three percent of United Kingdom local authorities indicated that the national strategy directly impacted improvements to service delivery, and 64% highlighted that the policy influenced public engagement in local decisions.

3.2.4 Australia

Australia has a three-tiered structure of representative government that works within a parliamentary system of democracy. There are 562 local governments, with a broad diversity in the sizes of their respective populations and geographies. Australian local governments have limited authority, with their responsibilities primarily restricted to day-to-day services, including household waste collection; the provision and maintenance of parkland, play equipment, local libraries, and community centers; local road

development; and town planning. State governments are responsible for education and policing, which often fall under the responsibility of local governments in other countries.

Australian e-government adoption efforts have been clarified under the 2012–2015 e-government strategy, which shows that Australians continue to embrace the Internet as a way of interacting with government. The National Digital Economy Strategy, published on 31 May 2011, emphasized the mission to position Australia as a leading digital economy by 2020. Drawing upon this vision, a collection of policies, strategies, and guidelines were published by Ministry of Finance and Deregulation and the Australian Government Information Management Office (AGIMO), in the pursuit of making the Australian government an effective one, seeking to reduce costs, increase customer satisfaction and promote innovation.

With the replacement of australia.gov.au accounts by MyGov, the Australian government aims to link all government services to only one single username and password. By creating a MyGov account, customers can access various utilities like MyGov Inbox, MyGov Profile and a growing range of services including Medicare, Australia Taxation Office, Personal Controlled eHealth Record, Child Support, and so on. In addition, a myGov shopfront, defined as "your first stop to access more government services in one place," is undergoing a trial process. The first shopfront has been implemented in Brisbane, allowing the customer to access a wide range of government services and to connect with other MyGov members. Regarding the online tax-filing service, the OECD (2013) reported that "for the majority of countries, the electronic filing did not significantly lower processing time standards, except Australia, Canada, and Ireland". In those countries, the processing time for tax returns by electronic filing is three to four times faster than by paper form. In Australia, this is the result of the provision of two free, convenient and secure tools for online tax filing: myTax and e-Tax, which are said to be able to process requests within 12 days.

However, the government websites at the local level are typically not as well developed as those at the federal level, even though Australian e-government initiatives have received longstanding international recognition (United Nations, 2008). The local e-government in Australia is currently advancing autonomously from federal guidance, frequently implementing ad hoc ICT applications without guiding policy documentation.

The broad geographic, demographic, and population diversity of Australian local governments make it difficult for many authorities to implement online participatory practices, and for citizens to use e-government mechanisms. Many local authorities struggle to develop and implement e-government practices due to, for example, insufficiently skilled staff or lack of funding. Australia has the largest local government area in the world, the Shire of East Pilbara (also in Western Australia), which spans more than 370,000 square kilometers and is home to just over 8,000 people. In this instance, citizens sparsely populating the remote desert regions of the municipality experience

limited Internet service availability and a lack of affordable access. In cases like these, local governments are unlikely to possess sufficient resources to ensure civic access to the Internet and to develop participatory e-government practices. Improvements to infrastructure availability often depend on national coordination in order to ensure equity of access for citizens.

3.3 The Quality of e-Government Services
(Dr. Nguyen Manh Hien, Researcher, APEC e-Government Research Center)

Public service and the Internet: the Internet has had a significant effect on government agencies. The Internet has created a favorable environment for government departments to improve their internal promotion in order to improve their provision of services and make them more effective. Due to widespread Internet accessibility, governments around the world can minimize negative issues by increasing transparency, reducing costs, and creating the truth environment for citizens. The Internet allows the government to provide useful information and services to citizens, businesses, and reduce the gap of the digital divide between rural areas and cities. The Internet also helps to extend services by quickly adopting new technologies, such as promoting smart cities and a smart nation.

The application of e-Government in administration and management is one step of service quality improvement. E-Government can be considered the second revolution of public administration and management after new public management (NPM). According to "The Economist", e-Government will transform not only the way in which most services are delivered, but also the fundamental relationship between governments and their citizens. Broadly speaking, e-Government involves the use of Internet-based technologies to transact the business of government.

Compared to government's traditional service approach, applying e-Government can help to reduce the time and allow everyone to access required services at any time; e-Government promises full 24/7 services, without ever having to visit a government office.

The development of computer technologies has caused a major change in information management in various fields. There is no denying that the Internet has changed and influenced both service providers and customers. The application of the Internet in government administration and management has created an ideal premise to bring enormous efficiency to both the government and its citizens.

The concept of e-Government and related issues have been referenced many times in the past two decades. E-Government appeared with the Internet boom and has become a prime topic of many conferences, forums, research studies, and academic papers. However, the understanding and evaluation of government service quality, especially e-Government service, is still limited and less commonly studied.

To understand and evaluate the quality of e-Government service, this research will explore the concept of e-Service, e-Service in the public sector, e-Service quality, measurement of e-Service quality and e-Government service quality.

<u>E-Services:</u>

Online service or e-Service is a broad concept that includes services provided by organizations, companies, or an individual via an Internet connection. If the government provides the services, then it is called e-Government. If companies provide the services, then the services are referred to as e-business or e-commerce.

Electronic service or e-Service appeared and is closely associated with the development of the Internet and e-commerce. From the perspective of online providers, it has created a new method of service delivery between sellers (providers) and buyers (service users). The most common and accessible way to deliver e-Service to users is through a web service. Therefore, the processes of e-Services involve various types of delivery systems. Service quality in the public sector is also related to information technologies, methodologies, and applications that are provided by the government.

E-Service is the integration of business processes, policies, procedures, tools, technologies, and human efforts to facilitate both assisted and unassisted customer services in using the Internet and other networks. The government provides services at different levels: for other governments and agencies (G2G), for private enterprise initiators (G2B), and for citizen access (G2C). Government-to-citizen services involve all the communications or transactions between government, at various levels, and citizens. Now, governments are developing the next stage of e-Government by establishing the e-Service infrastructure and organizational capacity for constituents to transact official business online.

In summary, based on the above analysis of e-Government maturity models, some basic features of e-Service and the intimate relationship between e-Service and e-Government have been revealed. Each stage shows a step of processing in e-Service development, and while each model may have different stages, they do have standard features, such as:

- One-stop service: E-Service involves a concept that the Deloitte maturity model referred to as a one-stop service. One-stop service is a service aggregator in which citizens visit only one place to obtain any government service. The one-stop service concept is essential for the development of e-Service and has become a new trend for all nations who want to integrate their range of services into one access point.

- Customer centricity: governments around the world recognize that e-Government is essential to support and enhance public sector functions and processes (OECD,

2009). A customer-centric approach focuses on being transformational or process-oriented, considering service development and delivery.

- Interoperability: in the development of e-Government, interoperability is shown in various aspects: the first is providing better service for end users, the second is sharing data for more efficient services within agencies, and the third is building cross-agency value-added services for citizens, businesses, and public agencies. Improving interoperability between public organizations is of critical importance to make e-Government more successful.

- Personalization: for the development of web technologies (web 2.0), personalization allows users to use various tools, including social media, user-generated content, or web applications to customize their web interface, optimize work processes, and share information and data, so it is suitable for the users' requirements.

- Payment: this is a complicated process when implementing e-Government. It allows users to transact and use the services, while also allowing them to pay all fees during the transaction. Typically, the payment stage is located in the highest stage of the maturity e-Government models. Through this process, it helps both the government and its citizen to reduce costs while improving productivity and processing efficiency.

- E-participation: the role of e-participation is crucial in the implementation of e-Government. It requires participation from both sides, the government, and citizens, in order to improve the sharing of information online, electronic consultation, and e-decision-making. In the Waseda-IAC e-Government Ranking, e-participation was named as one of nine main indicators for the evaluation of e-Government development.

In the public sector, this means that the government makes all services accessible to all citizens and businesses via one portal. This is often called one-stop government service, or simply one-stop service. One-stop service is one of the most promising concepts of service delivery in public administration. Its implementation is included in the e-Government strategies of most countries. Originally, one-stop service denoted a physical location where users (i.e., citizens or organizations) could settle all of their public administration matters in one place and, preferably, with a single point of contact. Whether physical or virtual, one-stop government consists of the full integration of public services from a user's perspective. Virtually, this integration occurs mostly in the front-end interface, where public services are provided according to users' needs and preferences, while back-end processes are primarily left unchanged.

The Quality of e-Services:

Service quality is defined under many different perspectives, derived from the customer perspective, service performance, customer expectations and perceptions of service. According to Gronroos, service quality is the difference between expected service and perceived service. Many earlier studies also defined service quality as the extent to which a service meets customers' needs or expectations.

As with service quality, e-Service quality can be defined as the customer's overall evaluations and judgments of the excellence and quality of e-Service delivery in the virtual marketplace. Unlike traditional service, customers are less likely to evaluate sub-processes in detail during a single visit to a webpage; instead, they are likely to perceive the service as an overall process and outcome.

Recently, research on service quality has increased in popularity, especially since the Internet boom and the expansion of e-commerce applications in daily life. E-commerce became popular thanks to the rise of smart devices (tablets, smartphone). With the rapid changes to technology and ICT trends, customer behavior when shopping online and accessing information or services that the government provides will also change. Therefore, the roles of e-Service and its perception have been improved and strengthened.

E-Service is primarily defined as the transmission of information and services via the Internet. Providers communicate with customers through the online interface. Hence, the quality of service relates to various factors (dimensions). When evaluating the quality of service, we cannot ignore these factors. This research tries to describe and assess the quality of service as accurately as possible, through evaluating and assessing it from different angles and perspectives, in order to fully understand the nature of service quality.

E-Services Quality Approaches:

As with traditional service quality, the evaluation of e-Service quality is based on an original model – SERQUAL. Many researchers have applied the results of the SERQUAL model to develop their work and present their models. Aside from the SERQUAL approach, many studies have selected other ways to evaluate the quality of e-Service. These approaches include technical approaches that evaluate the quality of the website, customer satisfaction, or the quality of web service. Some highlights of these approaches are listed below.

WebQualTM: This approach is based on a website quality measurement with twelve dimensions. Researchers developed this model by interviewing web designers and web visitors. The WebQualTM approach used the outcomes from the general theoretical frames of the Theory of Reasoned Action and Technology Acceptance Model to develop a measure of website quality. This model provides researchers with a validated and reliable measure of website quality and provides a clear understanding of TAM, even refining TAM to increase its diagnostic power.

Quality of Service for Web Services (QS-WS): The Web Services QoS requirement mainly refers to the quality of both functional and non-functional aspects of a Web Service. This model includes seven dimensions: performance, reliability, integrity, accessibility, availability, interoperability, and security. Applying this model can help determine the quality of websites and improve the quality of service that the website offers.

Online Service Quality: Can and Jun proposed this model in 2003 as a way to attract and retain customers; they suggested that online providers should have a clear knowledge of what online customers expect for e-Service quality and pay more attention to separating online users into two types: online buyers and information seekers. They also suggested that the difference between online buyers and information searchers is their behavior. For online buyers, four dimensions significantly influence online buyers' evaluations of the overall quality of service, while only three dimensions (website design, communication, and trustworthiness) are influential for information searchers regarding overall service quality.

SiteQUAL: Based on analyzing previous research in information quality and service quality, they provided a new way to measure the quality of websites and also presented a focus for future research on extending the knowledge of quality dimensions affecting B2C websites in order to more fully develop guidelines for B2C website development for both researchers and practitioners. They called this model SiteQUAL.

Customer Perspective of E-Service Quality: A model called the e-Service quality model to deal with the relationship between these factors and the consumers' attitude toward e-Service and examine the factors that contribute to e-Service. Their proposed model consists of such constructs as individual differences, e-Service convenience, website service quality, risk, e-satisfaction, and intention.

E-QUAL: The E-QUAL has proposed the approach after testing it in many domains, including online bookstores, auction sites, knowledge sharing platforms and e-Government. This approach is based on a 23-item survey to capture the subjective perceptions of users. E-QUAL suggested three principal components: usability, information quality, and service interaction quality. Through this approach, Barnes and Vidgen proposed a quality framework that comprises user perceptions of website quality that they called E-QUAL. The main contribution of this approach is the recognition of a need to combine user and supplier views of quality and the quality assurance framework into a coherent, lightweight, end-to-end framework for website quality.

E-Service Quality: this approach by modifying the SERQUAL model. They developed the model to examine how e-Service quality dimensions affect overall service quality, customer satisfaction, and purchase intentions in the context of online shopping. The dimensions of e-Service quality included website design, reliability, responsiveness, trust and personalization. After collecting data from 297 online customers, they found that the "trust" dimension most strongly affected overall service quality and customer

satisfaction, the "reliability" dimension is significant for all dimensions, and the "responsiveness" dimension is significant, but only mildly affects overall service quality and customer satisfaction. The "website design" dimension had only a minor effect on overall service quality, while "personalization" was not significant in their approach.

E-S-QUAL: this approach was proposed by Parasuraman, Zeithaml, and Malhotra in 2005 with the purpose of identifying dimensions for assessing e-Service quality. They called this approach E-S-QUAL. When developing this approach, they divided the process into two stages. The basic E-S-QUAL is based on twenty-two items in four broader dimensions: efficiency, fulfillment, system availability, and privacy. The second scale they called E-RecS-QUAL which contained eleven items in three broader dimensions: responsiveness, compensation, and contact. By applying this approach, Parasuraman et al. sought to introduce a method to improve e-Service quality (website service quality). They indicated that the E-S-QUAL dimensions had the most substantial influence over quality perceptions, perceived value, and loyalty intentions. Based on the results of this approach, system availability, privacy and recovery services (backup) also influence e-Service quality. E-S-QUAL and E-RecS-QUAL are generic and parsimonious scales, intended for obtaining a global assessment of e-Service quality in the context of a website's service quality.

3.4 Smart City, Indonesia Case Studies
(Prof. Dr. Suhono Harso Supangkat, Institute Bandung Technology, Indonesia)

In 2008, the global urban population exceeded the rural population for the first time. The same trend occurred in Indonesia where the urban population increased from 49.8% in 2010 to 53.3% in 2015. This urbanization's trend leads to the increase in energy demands, waste and water services in and around the cities, which calls for environmental care. In Indonesia, urbanization causes a massive land conversion from agricultural areas into industrial estates or from water conservation areas to roads, creating an environmental problem. These problems emerge due to the limitation of physical structure that is no longer able to support the growth of the urban population. As the number of people growing, city problems become more complex and finally, it is causing conventional solutions no longer able to solve the problems. The city needs an innovative, effective, and integrated solution as a smart solution.

Since the late 1990s', the term Smart City has been used by urban planners and development scholars as part of the Smart Growth Movement, which focused on a new paradigm of intelligent urban development. Smart city initiatives also came from IBM, Information, and Communication Technology (ICT) companies, which introduced that concept as smarter cities for a prosperous and sustainable future. The IBM's concept defines cities as built on six core systems: people, business, transport, communication, water, and energy. These core systems are interconnected and interdependent with one another. In understanding how these systems work, ICT becomes one of the critical

element in understanding and controlling city operation and development. It is also highlighted that ICT is one of the main characteristic of the smart city since it helps city stakeholders to use their resources better.

The smart city literature shows that there is still no standard about the definition of a smart city. Therefore, for Indonesia, we define a working definition on the smart city, which is adjusted according to Indonesian context. We define the smart city as a city that has excellent capability to manage all resources effectively and efficiently to solve all city problem using innovative, integrated, and sustainable solution by delivering good city services to improve quality of life. Each municipal government has their characteristic that is unique and special, as well as the potential of its resources to make its position to be famous and unique as well. The municipal government responsible for managing, developing and serving the community has established a strategic plan for city government development. Many cities in Indonesia have smart city-related initiatives, but currently, in Indonesia, no reference can be used together to evaluate the city's achievements in implementing the smart city initiatives.

Measurement of the city is critical for the city to know the state of a city. The Waseda-IAC for instance, developed e-government ranking to assess e-government among countries. This 2015 e-government ranking is arranged by including nine main indicators and 32 sub-indicators and took one year of survey.

In carrying out this measurement, we used the Garuda Smart City Framework 2 (GSCFF2) which include "digital government" as one of many indicators that cover sustainable indicators such as the economy, social and environment and enabler indicators such as technology/infrastructure, people and governance. Through this measurement, it was expected that the cities know their position and hopefully they can identify their weakness and finally can improve their city into a smarter city.

Garuda Smart City Framework (GSCF) is developed by Smart City and Community Innovation Center (SCCIC), Institute of Technology Bandung, Indonesia. GSCF adopted by the Association of Indonesian Smart Initiative (APIC) as a model for Indonesia Smart City. GSCF is a comprehensive framework that consists of Smart City Model, Measurement Model, Development Cycle, Collaboration Model, and other components.

Garuda Smart City Framework model, Smart City, represented as three layers: (1) resources, (2) enablers, and (3) services. Services grouped into three layers: (1) Service Domain, (2) Service Cluster, and (3) Service Items. Smart City Service (Service Item) is a real service delivery to the citizen. The government can deliver this service, non-government, or collaboration among them. Resources are something available in the city as sources, for example, people, environment, natural resources. Resources can be enhanced become enablers. Enablers are enhanced resources or something that created to be an enabler for the upper layer (service layer). There are three enablers: (1) people, (2) governance, (3) infrastructure, technology, and environment. People as resources are

differing with people as enablers. People as resources are people as is, without enhancement. People as an enabler is people with strong and dedicated competencies and ready to become an enabler for the upper layer.

GSCF have Smart City Measurement Model. This model combines two views or dimension of a city or smart city as seen in Fig. 3. The first dimension is the status or achievement of the city. This view represents the achievement of "Quality of Life". The second dimension represents the way that conducted by the city to move to the better condition. This view represents the smartness dimension. This second dimension consists of 5 (five) levels such as (1) ad hoc, (2) initiative, (3) scattered, (4) integrative and (5) smart.

Measurement process: This research is done through several stages as follows:

- The Self Evaluation Survey was conducted to all cities in Indonesia excluding the central city of DKI Jakarta Province (total of 93 from 98 cities). The self-evaluation survey technique is conducted where each city fills the city questionnaire sheets independently and online through the web.

- Evaluation of self-evaluation results from cities based on the GSCF method, the result of this stage is the determination of 31 cities of finalists by division of city classification: Large Cities (population > million people); Medium Cities (population between 200 thousand - 1 million people); Small Cities (population < 200 thousand inhabitants)

- Surveyor verification for the data received based on the city self-evaluation to 31 selected cities was done by going to those cities. The in-depth assessment was conducted by conducting interviews and surveys to the municipal authorities as well as to the community (sampling)

- Mapping is done by evaluating the results of verification and In-depth assessment of the finalist city. Based on the assessment result we will get the city position in its readiness to apply smart city.

The critical success of moving towards Smart City is the implementation of all components of the model in a holistic manner. If the city cannot meet its need based on its available resources, then the city should focus consequently on: (1) enabler and (2) processor initiative. Enabler is a crucial component to ensure the achievement of the various processes of Smart City (Smart-Health, Smart-Education, and so on). Today many cities are focusing only on processes or initiatives but ignoring its enabler. As a result, the goal of the process is not effectively achieved. For example, a city that has an MRT fails to solve the congestion issue due to no attempt to improve human behavior for other modes of transport. The evaluation and mapping process of GSCF 2 is done by assessing two categories:

- Current situation by assessing each dimension/subfield has a list of indicators with assessment metrics and evaluation values.

- The process, which is assessed through questionnaire data to know the process / smart way of the city in overcoming the problems of the city and innovate and the city management in the framework of a smart city.

The measurement of smart cities in this study uses GSCF 2 that was adapted to fit on Indonesian condition. Based on a case study, our measurement results had shown that the maturity level of some selected cities in Indonesia had reached the integrated level (level 4 out of 5) but the others still in scattered level or even in initial level. Management & development process and also integration readiness are the aspect that needs more attention to cities in their efforts to be a smarter city. From the results of these measurements, for further research, we can develop some recommendations and roadmap details to support the cities toward smart cities.

3.5 Singapore - The Heartware of a Smart Nation

(Prof. Lim Swee Cheang, School of Continuing and Lifelong Education, National University of Singapore)

The Government Heartware - Strategic Shifts

Politicians often advocate leaving no one behind in the transition to a digital economy. Efforts are underway to provide access to and adoption of digital technologies and at the same time ensuring that everyone is included, especially those who are economically or socially disadvantaged. Nevertheless, not everyone benefits from a digital society in the same way.

Recent research shows that "usability divide" and "empowerment divide" typically exist. While usability divide refers to inequality caused by the disparity in skills to utilize digital technologies, empowerment divide refers to the gap that results from different propensities to harness digital opportunities. These divides contribute to inequality in participation, despite technological advancements that make digital devices and services more comfortable to use. This phenomenon has persisted where the majority of users do not contribute to online networks and communities, and a tiny minority of users makes most contributions.

Noticeably, building a Smart Nation is more than the provision of hardware, software, and applications. According to a Singapore government website, Singapore strives to become a Smart Nation to support better living, stronger communities, and create more opportunities, for all. Moreover, "smartness" is not a measure of how advanced or complex the technology being adopted is, but how well a society uses technology to solve its problems and address existential challenges. Citizens are ultimately at the heart of our Smart Nation vision, not technology! We call this the government`s "heartware" of a Smart Nation.

Singapore Ministry of Communications and Information and Ministry of Education named three strategic shifts to ensure that all Singaporeans can participate and benefit:

- Design with the user in mind: It is a shift from merely providing services to designing with the user in mind. Whether designing government e-services or technologies used in the home, the user interface must be easy to use for everyone.

- Redefine digital access to include equipping people with skills: There is a need to define digital readiness as being more than having access to technological devices but also having the skills to use digital technology safely and confidently.

- Collaborate across organizational boundaries: The Ministry of Communications and Information has set up a Digital Readiness Workgroup to study the issues related to building digital readiness in Singaporeans. Workgroup members come from organizations across the public, private and people sectors. The Senior Minister's strategic shifts are wise directives in tackling the smart nation effectiveness to secure a successful outcome. However, we must bear in mind that the devil is in implementation.

The Citizen Heartware - Technology Acceptance

Besides providing access to a device and Internet connection, citizens must be equipped with knowledge and skills, accept and use digital technologies creatively to enhance their living in order to unlock the full benefits of a smart nation. Some factors influence their decision about accepting and using technology, notably, the perceived usefulness and ease of use.

Back in 2009, LTA launched the Green Man Plus initiative at locations with nearby health facilities and transport nodes. It allows elderly and disabled pedestrians to have more time to cross the road when using signalized pedestrian crossings. They can activate the Green Man Plus function by tapping their smart travel cards on the card readers mounted above the push button on traffic light poles. The traffic light system will then recognize their cards and give longer "green man" time for pedestrian crossings. For disabled pedestrians, there will also be a sound alert and two vibration alerts to let them know that the crossing time has been extended. With positive feedback and suggestions, the scheme has been expanded to more locations. To date, the Green Man Plus system was activated up to 50 times each day at high-usage crossings.

Leveraging on Smart Card technology, the Green Man Plus scheme has been successful, providing apparent benefits for elderly and disabled pedestrians. At the same time, it is straightforward to use "tap, wait and go." In order to create an inclusive, smart nation, which includes those who are less advantaged, besides providing access to digital devices and technologies, the target users must accept and use technology with delight. The smart nation project should gain the heartware of the citizens.

The Business Heartware - Building an Ecosystem

The collaborative ecosystem fostered by the government and private sector supports Singapore`s transition into a Smart Nation. Government ministries are to provide adequate support for startups. The Singapore government has invested in setting up various startup accelerators to build a startup ecosystem which is actively supported by the business organizations. Lately, the Singapore government has set up SGInnovate to "tackle hard problems" that matter to smart nation development and people around the world.

SGInnovate is established to help ambitious and capable people and startups to build "technology-intensive" products borne out of research. Its strategy is to establish a global startup hub with unique ties to ASEAN, Asia, North America, and Europe, creating a gateway for exciting new opportunities and resources. SGInnovate has planned to bring together over 7000 regional and global corporations that would provide go-to-market help, joint product development, investment funding, and possible exits.

The Development Heartware - Managing Talents and Agility

Organizations in Singapore hire foreign talents for IT, engineering, business, finance, and R&D work. Often they justify their action by citing the shortage of highly skilled local talent. Many corporate leaders have overlooked their responsibility to develop new capabilities of local employees and nurture the employees by assigning them to in-house projects. The risk-avoiding leaders compound such lack of development culture. We call this "lack of staff development heartware" and it has to be addressed urgently to ensure sustainability of a smart nation.

The creation of a smart nation is a human endeavor with hardware and software as enablers. A Smart Nation is a vision set by the government, a rally to mobilize citizens in the country to share a dream, a design that should be co-created amongst government, citizens and business for a compelling outcome, a journey that has no end point as smartness is evolving over time with emerging new technologies, an exploration for new discovery and innovation, and an ambition to bring prosperity to business and quality life for citizens. A smart nation is, therefore, a complex undertaking which needs leadership, management, resources, innovation, technologies, operations, and partnerships.

Underlining such complex ambition is the human ingenuity. Affected by an increasingly disruptive digital and globalized world, a smart nation development encompasses the development of human capital, strategies, policies, budgets, funding schemes, legislation, and regulations. While adaptability is the ability to cope with change, agility is another essential factor to manage disruptive change. Agility is the speed and ability to learn from experience and then apply that learning to perform successfully under new situations. Yet, most of the today's development for human capital, policies, budgets, and funding schemes are using traditional waterfall methodology which is suitable for traditional construction and manufacturing workflows that are in a sequential manner,

going through typical steps of requirements, seeking inputs from stakeholders, design, construction, testing, implementation and maintenance. Such an approach has been proven rigid and slow in coping with changes, often ineffective for high tech projects and inhibiting innovation. Owing to its top-down management structure and lack of timely regular reviews and testing with participation by stakeholders, the outcome is often not ideal and full of shortcomings.

A new agile development approach is becoming more popular whereby it is not only suitable for high tech software development to facilitate innovation but also highly effective for non-software projects such as the development of products, services, human capital, policies, funding schemes, budgets and so forth. Agile development is prescribing close collaboration of users/citizens, product/service management team, developers and quality assurance team to bridge the gaps through rapid multiple iterations of design, development, testing, implementation, and reviews throughout the life cycle of development. As a result, agile methods are responding faster and effectively to an increased pace of changes. The stakeholders are walking the journey together during every iteration of the development lifecycle. It is, therefore, an ideal approach to deal with disruption as it is adjusting or correcting rapidly in responding to changes. The approach allows new ideas to be tested stepwise and introduced continuously to meet the needs of the citizens or users. Agile development approach inculcates paradigm shift.

Closing Remarks

In conclusion, a new heartware is needed for leaders and builders of the smart nation, who are developing policies, innovative products, and services for the future economy. An agile approach would help in coping uncertainty and disruption. Here is a list of characteristics describing people who are practicing agility:

- Applying design thinking
- Acting fast, nimble, and adaptively
- Seeking feedback
- Working effectively in a team
- Practicing continuous improvement
- Regularly reviewing with stakeholders
- Practicing self-awareness
- Being open to experiment
- Highly motivated to learn and self-learning
- Empowering teams and allowing failure
- Learning from failure
- Conducting reflection

Developing a smart nation is about creating a better life for citizens, a conducive environment for businesses, and responsive and effective government services. In this regard, instead of being on the receiving or giving the end of smart initiatives, citizens, business professionals, leaders, and government officials should be empowered to collaborate, contribute, innovate and co-create a digital society with an agility approach.

4. Blockchain Technology for Digital Government
(Dr. Jirapon Sunkpho and Mr. Jirapon Tubtimhin Thammasat University, Bangkok, Thailand)

In transforming into the so-called "Digital Government", technology is one of the key drivers in transforming into the so-called "Digital Government". "Blockchain" has been highlighted in every occasion when government officials gather. Blockchain as the technology underpinning Bitcoin, has gone from relative obscurity to mainstream topic in just a few years. This article aims to fill up the gaps of such remarkable notions and to reflect the power of "Blockchain" in "Digital Government Transformation" which is evolving globally by elaborating and synthesizing current writings and articles among organizations, leaders and experts in the field of blockchain at global scale, in 2 folds including firstly, overview of blockchain technology and how government can harness blockchain and benefits from this promising technology.

4.1 Blockchain Technology Overview

The blockchain is best known to associate with Bitcoin. It is, in fact, the technology behind the bitcoin and could potentially be more than just cryptocurrencies. Simply put, a blockchain is a type of distributed ledger, comprised of unchangeable, digitally recorded data in packages called blocks. Within a block, data can be recorded, time-stamped, and linked to another block thus forming a chain of unalterable truth controlled by an algorithm that has been designed to prevent changes made without the consensus of the participated parties. Recently NISTIR 8202 Blockchain Technology Overview has been released under National Institute of Standards and Technology (NIST), U.S. Department of Commerce with the intention to widely expose easy and better understanding about blockchain, thus to provide a high-level technical overview of blockchain technology[4].

As such, NIST simply mentioned that blockchains are tamper evident and tamper resistant digital ledgers implemented in a distributed fashion (i.e., without a central repository) and usually without a central authority (i.e., a bank, company, or government). At their basic level, they enable a community of users to record transactions in a shared ledger within that community, such that under normal operation of the blockchain network no transaction can be changed once published [1].

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[4] NIST (2018). Blockchain Technology Overview. Available from https://doi.org/10.6028/NIST.IR.8202

4.2 How Government can harness blockchain

Government leaders are beginning to recognize blockchain's potential to address the challenges of government. Pilot government projects involving the use of blockchain technology has been introduced all around the world from US, UK, Estonia, and Switzerland[5]. Three potential uses of Blockchain technology including enhancing trust for citizens, managing identity, and improving efficiency.

4.2.1   Enhancing Trust for Citizens

According to the Pew Research Center, American trust in government is near an all-time low with the outcome of only 18 %. Blockchain can enhance trust for the government by making it decentralized in which no single entity that controls it. The governments of Sweden, Estonia, and Georgia are experimenting with blockchain-based land registries, enabling multiple parties to hold copies of the registry securely[6]. Tamper-proof blockchain-based voting systems are being tested in various contexts in eight countries[7].

4.2.2   Managing Identity

Identity has received a great deal of attention from governments globally as an application of blockchain. As identity management is a prerequisite for any other blockchain-based implementation. Without it, other meaningful implementation of blockchain technology will be limited, especially for the government solution. However, the only developed government use of blockchain identity services is in Estonia deployed on the Keyless Signature Infrastructure (KSI) Blockchain[8]. One main reason is probably the lack of standard tested solutions in the area of identity management may be slow down further development of government blockchain in general. The private sector is also starting offering digital identity management solution on Blockchain[9].

4.2.3   Improving Efficiency

One of the biggest complaints about government today is about inefficiency. Blockchain cuts out inefficiencies and waste from systems. For interfacing with citizens such as paying taxes, renewing a driver license, and receiving social benefits, blockchain can be used to automate and streamline the processes that make most citizen transactions with the help of smart contract. The smart contract is a computerized contract s that can execute automatically based on a set of rules and triggers. One can think about buying a

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[5] Tom Macaulay (2018). How governments around the world are using blockchain. From https://www.computerworlduk.com/galleries/applications/how-governments-are-using-blockchain-3680393/

[6] Kate Boeding, Jonah Czerwinski, and Richard McConkie (2018). 3 POTENTIAL BENEFITS OF BLOCKCHAIN FOR GOVERNMENT from https://www.boozallen.com/s/insight/blog/3-potential-benefits-of-government-blockchain.html

[7] Third A., Quick K., Bachler M., Domingue M. (2018) Governemtn Services and digital identity. Knowledge Media Institute of Open Technology.

[8] Guardtime (2018). KSI Technology. https://guardtime.com

[9] Shocard (2018). Secure Enterprise Identity Authentication from https://shocard.com

car from someone. With the help of a smartphone app based on smart contract, each party will receive proof of ownership and all the related document recorded right away without the need of government to validate the transaction.

4.3 Summary

Blockchain technology shows tremendous potential for governments to enhance trust, managing identity, and deliver citizen services more effectively. To reach full potential, blockchain technology shall be supported by collaboration between the public and private sector in developing welcoming environments for blockchain start-ups through incentives, funds, and other mechanisms. Intelligent blockchain strategies at the national and local level will become a competitive advantage for countries that embrace it.

Figure VI-5: Sharing Economy

Figure VI-6: Use Case, Birth Registration
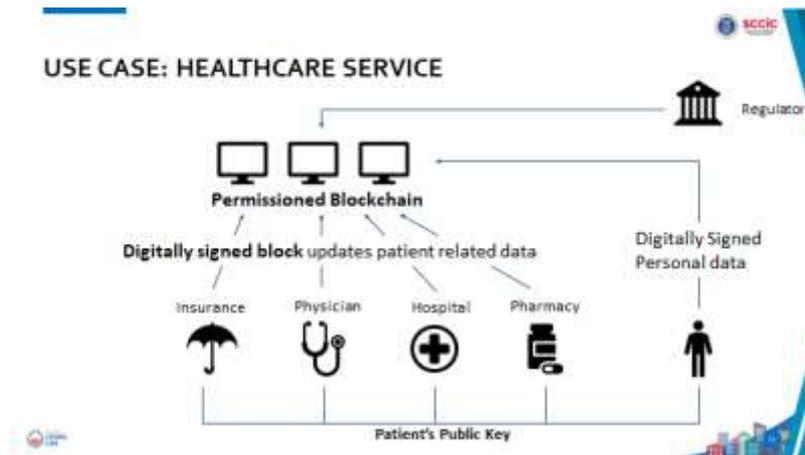
Figure VI-7: Use Case, Healthcare Service
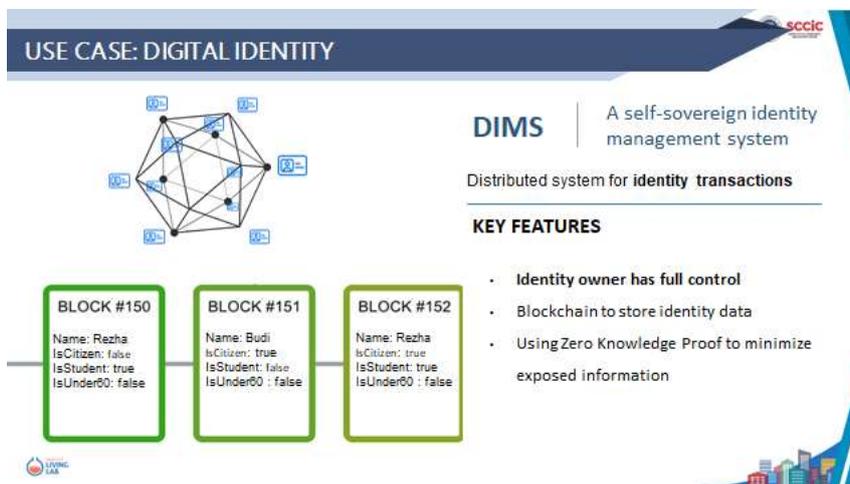
Figure VI-8: Use Case, Digital Identity

5. Digital Government for Anti-Corruption

(Dr. Pingky Dezar Zulkarnain, Researcher, Institute of e-Government, Waseda University)

5.1 Overview

Information Technology (IT) with its rapid growth is increasingly influential in the daily activities of individuals, business, and government. Particularly in the government sectors, as well as in the business sectors, the importance of IT requires organizations to integrate IT within their business process at all organizational levels. As for governments, IT has been seen as the crucial, indispensable component in the changes that affect the working practice, structure, and performance in order to provide the stakeholders with a better service. These transformations can be achieved through e-government.

E-Government refers to any use of information technologies by government institutions that enable them to transform their way to communicate and interact with citizens, businesses, and other government institutions (World Bank, 2011. E-

Government enables government institution to serve a variety of different outcomes; better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management (World Bank, 2011). IT enables government institution to be more collaborative with stakeholders and with other government institutions (Zussman, 2002. In addition, the resulting benefits of e-government can be less corruption, increased transparency and accountability, and cost reductions. The importance of e-government further escalates with the recognition that e-government can be used to help gain competitive advantage (Obi, 2007). Andersen (2009) argues that e-government can be considered a solution to the corruption faced by developing countries (Andersen, 2009). However, according to ACFE on its Report-to-the-Nation (RTTN) 2014, IT only contributed 1.1% in detecting fraud, including corruption.

Recent issues related to corruptions, frauds, and demands on government to work more transparent and accountable have increased the imperative of e-government (Ionescu, 2013). Like other IT, however, effective use of e-government depends on several factors such as technology, stakeholders, environment, and organizational culture (Luna-Reyes, Gil-Garcia, Romero, & Felipe, 2012). Governments can take the benefits of e-government to strengthen democracy and to promote efficiency and effectiveness by establishing a system of transparency, public participation, and collaboration (Obama, 2009). Collaboration among government agencies is one of the common issues faced by governments in developing countries (Waseda Institute of e-Government, 2014).

Supreme Audit Institution (SAI) refers to a government organization in each country that has the mandate to conduct an audit on government institutions and thereby, sets standards for government audit works (OECD, 2013). In order to accomplish their tasks objectively and effectively, SAI is required to be independent of the audited entity and are protected against outside influence. However, since SAI is part of the state as a whole, SAI cannot be fully independent. Therefore, SAI is requested to have the functional and organizational independence to fulfill the mandate (INTOSAI, 1998). Audit Board of the Republic of Indonesia (BPK) is the name of SAI in Indonesia.

Lima Declaration was founded on top of the rule of law and democracy which are essential foundations for independent and accountable government auditing. Independence, accountability, and transparency of SAI are essential prerequisites in a democracy and enable SAIs to lead by example and enhance their credibility. These elements can improve governance, promote accountability, and therefore can help SAIs to fight corruption (INTOSAI, 2010). SAIs has responsibility for combating corruption and actively involved in eradicating corruption activities. ISSAI 20 Principle No.4 states that SAIs prevent internal conflicts of interest and corruption and ensure transparency and legality of their operations.

While connecting the government information system are commonplace permitting real-time data communication among governments and the current state of e-government application enables one government to receive some information online from other governments, the utilization of such capability is still immature among developing countries (Waseda Institute of e-Government, 2014). The more common practice is for one government to receive the information from others, generally by request, by using email or secondary storage devices such as a compact disc or flash disk. These practices, based on the author's experience when conducting an audit, create an unnecessary delay for concerning agency to process further. The delayed data may also create the possibility that it was manipulated or fraudulent data (Lanza, 1998).

Using the case of BPK in synergizing all of its auditees, this study is aimed to investigate how to create such collaboration through institutional strength and e-government. In addition, this study looks for the opportunity to propose e-Audit as a platform for connecting all government information system.

5.2 Literature Review

Open government is considered as a prerequisite for democracy society by promoting government transparency and accountability (Bertot, Jaeger, Munson, & Glaisyer, 2010). On January 21, 2009, President Barrack Obama endorsed a memorandum about transparency and open government to the head of executive departments and agencies. He gave directions for strengthening democracy and promote efficiency and effectiveness in government by establishing a system of transparency, public participation, and collaboration (Obama, 2009). The following list explained these three principles of open government briefly.

- Transparency: Government should provide the citizen with information about what the government is doing, thus promoting government accountability.

- Public Participation: Government should engage citizens for participating in the policymaking process and to provide the government with the collective expertise and information, hence improving the quality of the government's decisions.

- Collaboration: Government should cooperate among themselves and with stakeholders such as non-profit organization, business, and individual, thus creating opportunities for innovation while improving the level of collaboration.

Transparency can be regarded as the availability of information concerning government activities to the public timely, relevant, and reliable (Ferranti, 2009). The ultimate goal of transparency is to provide the public with government's data and information so that the public will have the opportunity to assess government action and exercise voice in the decision-making process (Florini, 2007). Through transparency, the government enables individuals to become more knowledgeable. They may consider their public participation more effectively (Rucinsky, 1991). Transparency and public

participation are the essential elements for helping the government to solve the problem of legitimacy (Fung, 2006).

Collaboration is slightly different from transparency and participation which are frequently associated with the democratic political action. It is an arrangement of democratic participation (Noveck, 2009) so that the decision is deliberated in connected circumstances. These circumstances require continuous interaction among governments for integrating their functions into the governance process (Peters, 2011) thus constructing trans-governmental networks. Works of trans-governmental networks are appropriate in the domain of commerce, financial regulation, environmental protection, and in legislative areas of government (Slaughter & Hale, 2011). Such an inter-government network established a cybernetic government in which one government may effectively deliver the task with the help of other governments (Wiener, 1948; Ashby, 1956)

Open government data is the indicator which represents the spirit of freedom of information in many countries (Yu & Robinson, 2012). The availability of the Freedom of Information Act (FoIA) and open data portal in a country are the significant sub-indicator for measuring the level of open government in the country's e-government score. FoIA is considered as the basic requirement that must exist before further implementation of open government data while open data portal is considered as a media that can be accessed by a citizen to obtain government data without restrictions.

On the press release report of the ranking, there is an exciting finding that some countries like United States, Singapore, and Estonia have created a specific mechanism to connect government information system for improving the public service delivery (Waseda Institute of e-Government, 2014).

5.3 Context Case

As an institution of 5621 audit professionals with statewide coverage including 33 regional offices and tight audit schedules, the SAI Indonesia (BPK) needs an IT Solution that is expected to improve audit efficiency, to promote audit consistency, to provide a centralized repository for audit program and result, and to automate testing and analytical procedure.

In 2010, BPK had announced a national project named a National Strategy of Information System (SNSI) for collecting electronic data from all BPK's auditees and matching the data across auditees. The purposes of this project are to improve the whole audit process and to equip the BPK for accessing information on auditees with the advanced utilization of Information and Communication Technology (ICT). According to Article 10 of the Audit on State Finance Management and Accountability Act 2004 (No. 15/2004), in performing the audit, BPK has the authority to:

- Request any mandatory documents to the respective officers regarding the audit on state finances

- Access all data stored in any media, assets, location, and all types of assets or document managed and controlled by auditee or other parties as needed for the audit purposes

- Put sealing to any custody of money, goods or documents related to the state finance management

- Request information to relevant people or parties

- Take pictures, record, and sample for the audit evidence purposes.

Under this project, BPK has built a national database which is an extensive database of national financial data. The database will consist of the financial-related electronic data from 2000+ auditees which are scattered all over 33 provinces in Indonesia. IT Bureau, as an organizational unit in BPK that is responsible for providing BPK with IT solution to support core activities of BPK, is assigned to define and to deploy the appropriate platform and technology for BPK concerning the SNSI Project.

In addition, through the SNSI project, BPK build an automated analysis and measurement so that BPK's auditors could validate every batch of data thus providing BPK with Early Warning System (EWS) on the system. Due to the existence of this EWS, BPK will be able to notify the auditee when, in some circumstances, the anomaly occurred.

Using SNSI, BPK's auditors could have valid preliminary data for preparing their audit assignment. As a result, when in the field audit, the auditor will have adequate time to complete their audit cycles including preparing audit working paper and audit reporting. On this cycle, SNSI is expected to improve some audit processes such as confirmation technique, audit correspondence, and follow-up the audit recommendation.

SNSI is supported by a primary component called e-Audit. E-Audit is a combination of three components; Consolidator Application, Data Model, and Portal. Each component has its function. Consolidation Application is a pair of two applications; Consolidation Agent (AK) and Master Consolidation Agent (MAK). AK is the application services that are installed on auditee's premise. Its job is to extract, compress, encrypt, and send the data from auditee's database to the MAK. MAK is deployed on BPK's premise. Its job is to receive the packet from AK, decrypt it, decompress it, and load to the operational database.

Once the data resides in the operational database, the system will transform and load the data into a data warehouse schema which is available for auditors. The data warehouse schema is formulated using auditor's analytical procedure as a reference. Auditors access the information through the portal. The Portal provides the auditor with a list of functions that represented the audit program which is commonly used by auditors. Using the portal, the auditor will get an instant result of a particular audit program. All auditors can execute the analysis that was previously conducted by auditor using several steps with only one click on the portal.

5.4 Findings

As of June 2014, BPK has connected 593 out of 756 targeted auditees including local government, central government, and state-owned enterprises with BPK's data center. Periodically, these auditees submit the financial data automatically using ICT. E-Audit system process the incoming electronic data and release the data to the on-duty auditor. The rest 197 auditees are mainly located in the rural area which has a handicap on telecommunication and electricity infrastructure.

In order to speed up the development process of e-Audit, BPK uses its institutional strength to influence the auditee for participating in the e-Audit project. According to the Audit on State Finance Management and Accountability Act 2004 No. 15, BPK has the right to access all data and information related to government auditing process. The refusal of BPK's right will be considered as a criminal act and subject to criminal law. In addition, BPK is considered as the supreme state institution in the term for government auditing function.

BPK has a higher level of both enforcement and stability than its auditees have. As a result, BPK has successfully ratified 756 Memorandum of Understanding (MoU) with its auditees within three years. For comparison, Ministry of Information and Communication Technology (MICT) launched a policy program called IGASIS (Inter Government Access Sharing Information System), a similar initiative with e-Audit, in 2004. Conversely, this program is discontinued because the Institutional Strength of MICT is not stronger than that of other ministries.

Waseda Institute of e-Government stated that the connected government would be the next wave of e-government development. BPK is the example of government institution achieving such connected government through e-audit. Besides the BPK, Ministry of Finance has launched the similar program namely Indonesian National Single Window (INSW) managed by Directorate of Customs and Excise. INSW has connected Ministry of Finance with Ministry of Industry, Ministry of Trade Affairs, Ministry of Forestry, Ministry of Agriculture, Ministry of Marine Affairs and Fisheries, Ministry of Defence, and the National Agency of Drug and Food Control. However, the technology used for INSW is different from e-audit in term of autonomy level. Moreover, in the similar initiatives, DKI Jakarta Province has implemented a similar technology for connecting Provincial Revenue Office with Bank DKI, a local government-owned banking, and the hotels to automatically calculate local government tax. Despite that, further research is needed to understand its effectiveness and implementation.

E-Audit is a method for not only receiving electronic data from a government information system but also providing the government institution with specific information as part of an audit correspondence such as anomaly of the financial report, an indication of misconduct, and progress of recommendation completeness (BPK RI, 2010). The new method has successfully connected most of its auditees for creating the

synergy on the government information system by utilizing the ICT. It is recognized as the strategic use of e-government by BPK in the area of collaboration and integration. Strategic means that the initiative is considerably large and long-range planning and development yet secure and offer the value-added (Mintzberg, 1978). E-Audit is strategic because it has a high-level coverage which includes not the only central government but also local government and government-owned enterprises. It has strengthened BPK's authority by transforming the procedure of collecting data from a manual and an on-demand to an automatic and a scheduled data collection. E-Audit requires significant resources and some full attention from all BPK's elements (BPK RI, 2010) (BPK RI, 2011).

Referring to user's activity log of the e-audit portal, there are 4000+ auditors have accessed the e-audit portal during the audit assignments including the audit planning and executing phase. In the planning phase, auditors use e-audit to conduct an analytical procedure on financial transactions for validating the cohesiveness of these transactions and detecting the potential occupational fraud such as asset misappropriation and an over/understatement of asset and revenue. During the execution phase, auditors use e-audit mainly to execute confirmation procedures. A feature of online confirmation on air ticket holds 75% of the e-audit usage, followed by online confirmation on tax transaction note (NTPN).

Before the implementation of e-audit, only certain audit teams can execute confirmation procedure entirely. Complete execution means that the audit teams received the response from the third party. In many cases, audit teams are unable to get the answer. The time limitation, audit team's capacity, and responsiveness of the third party's counterpart are the cause of incompleteness of confirmation procedure. These conditions create a capability gap among audit team in which some audit team can conduct confirmation procedure entirely while the other teams are unable to do so.

Using the e-audit system, the related third parties periodically submit the data to BPK. As a result, in the execution phase for executing the confirmation procedure, it is not necessary for auditors to contact them directly. Instead, they use e-audit to conduct confirmation process and get the result straight away. This is an innovative use of ICT by BPK to cut the formal bureaucratic procedure thus reducing the time needed for completing the confirmation process.

5.5 Conclusions

This study has found that BPK has successfully utilized its institutional strength for implementing e-audit. BPK has introduced e-audit as its e-government flagship that highlights inter-government collaboration for improving its audit authority, efficiency, and effectiveness thus strengthening its role in monitoring government financial transaction. As a result, BPK has established a collaboration system that addressed to wipe out fraud in a government institution.

E-Audit can be viewed as a model of context-based governmental collaboration. The collaboration model, considering its simplicity and scalability, is feasible to be implemented by other government institutions based on their specific institution strength. It offers a quasi-real-time process for data confirmation across participating institutions. Therefore, not only does the model improve the public service delivery, but it also minimizes the government officer's opportunity for committing fraud.

Finally, the BPK's experience in the development of e-audit as its e-government platform shows that government collaboration can be achieved using institutional strength and ICT by reducing technical complexities which are commonly found in any government collaboration initiatives.

VII.   Comparison

1.   Historical Trends of the Ranking

Throughout the fourteen years of the Ranking, USA and Singapore are always in the first place. The USA stood at the first place from 2005 to 2008, and then Singapore replaced and took the top spot from 2009 to 2013, for the five consecutive years, USA and Singapore have been alternately ranked at first place. In 2014 the USA and Singapore swapped the positions, but from 2015 to 2017 Singapore was on top of the Digital Government Rankings. In 2015 and 2016, the USA followed by Singapore in ranked at 2nd place, but in 2017 it replaced by Denmark while Singapore is still on the top. In 2018 Denmark replaces Singapore and becomes the first country (not Singapore and the USA) in the first position in Waseda – IAC Digital Government Rankings. The table below shows the historical trends of the rankings from 2005 to 2018.

No	2005	2006	2007	2008	2009	2010	2011
1	USA	USA	USA	USA	Singapore	Singapore	Singapore
2	Canada	Canada	Singapore	Singapore	USA	UK	USA
3	Singapore	Singapore	Canada	Canada	Sweden	USA	Sweden
4	Finland	Japan	Japan	Korea	UK	Canada	Korea
5	Sweden	Korea	Korea	Japan	Japan	Australia	Finland
6	Australia	Germany	Australia	HK SAR	Korea	Japan	Japan
7	Japan	Taiwan	Finland	Australia	Canada	Korea	Canada
8	HK SAR	Australia	Taiwan	Finland	Taiwan	Germany	Estonia

| 9 | Malaysia | UK | UK | Sweden | Finland | Sweden | Belgium |
| 10 | UK | Finland | Sweden | Taiwan | Germany Italy | Taiwan Italy | UK Denmark |

No	2012	2013	2014	2015	2016	2017	2018
1	Singapore	Singapore	USA	Singapore	Singapore	Singapore	Denmark
2	USA	Finland	Singapore	USA	USA	Denmark	Singapore
3	Korea	USA	Korea	Denmark	Denmark	USA	UK
4	Finland	Korea	UK	UK	Korea	Japan	Estonia
5	Denmark	UK	Japan	Korea	Japan	Estonia	USA
6	Sweden	Japan	Canada	Japan	Estonia	Canada	Korea
7	Australia	Sweden	Estonia	Australia	Canada	New Zealand	Japan
8	Japan	Denmark	Finland	Estonia	Australia	Korea	Sweden
9	UK	Taiwan	Australia	Canada	New Zealand	UK	Taiwan
10	Taiwan Canada	Netherlands	Sweden	Norway	UK Taiwan	Taiwan	Australia

Table VII-1: Historical Trends of the Rankings

2. Comparison of Rankings by International Organizations

Countries name	IMD (2018)	WEF (2016)	Waseda (2018)	UN (2018)	ITU (2017)	EIU (2018)	Accenture (2014)
Argentina	55	89	58	43	51	32	
Australia	13	18	10	2	14	1	
Austria	15	20	22	20	21	10	
Bahrain	n/a	28	47	26	31	61	

Belgium	23	23	23	27	25	10	
Brazil	57	72	56	44	66	47	10
Brunei	n/a	n/a	46	59	53		
Canada	8	14	16	23	29	15	
Chile	37	38	49	42	56	36	
China	30	59	32	65	80	32	
Chinese Taipei	16	29	9	n/a	n/a	10	
Colombia	59	68	48	61	84	55	
Costa Rica	n/a	44	60	56	60	42	
Czech Republic	33	36	39	54	43	27	
Denmark	4	11	1	1	4	15	
Egypt	n/a	96	62	114	103	71	
Estonia	25	22	4	16	17	15	
Fiji	n/a	n/a	64	102	107	n/a	
Finland	7	2	13	6	22	4	
France	26	24	19	9	15	4	
Georgia	n/a	58	40	60	74	n/a	
Germany	18	15	20	12	12	4	9
HK SAR	11	12	18	n/a	6	10	
Iceland	21	16	15	19	1	n/a	
India	48	91	36	96	134	42	8
Indonesia	62	73	33	107	111	67	
Ireland	20	25	24	22	20	23	
Israel	12	21	42	31	23	20	

Italy	41	45	27	24	47	27	
Japan	22	10	7	10	10	4	
Kazakhstan	38	39	34	39	52	55	
Kenya	n/a	86	52	122	138	71	
Korea	14	13	6	3	2	10	4
Lithuania	29	**29**	50	40	41	26	
Macau SAR	n/a	n/a	29	n/a	26	n/a	
Malaysia	27	31	25	48	63	27	
Mexico	51	76	44	64	87	49	
Morocco	n/a	78	51	110	100	63	
Netherlands	9	6	17	13	7	4	
New Zealand	19	17	14	8	13	15	
Nigeria	n/a	119	63	143	143	n/a	
Norway	6	4	11	14	8	22	2
Oman	n/a	52	43	63	62	n/a	
Pakistan	n/a	110	61	148	148	77	
Peru	60	90	57	77	96	69	
Philippines	56	77	35	75	101	55	
Poland	36	42	37	33	49	27	
Portugal	32	30	26	29	44	36	
Romania	47	66	38	67	58	49	
Russia	40	41	30	32	45	32	
Saudi Arabia	n/a	33	53	52	54	47	5
Singapore	2	1	2	7	18	1	1

Country							
South Africa	49	65	54	68	92	42	
Spain	31	35	28	17	27	23	
Sweden	3	3	8	5	11	1	
Switzerland	5	7	12	15	3	15	
Thailand	39	62	21	73	78	49	
Tunisia	n/a	81	59	80	99	63	
Turkey	52	48	41	53	67	49	
UAE	17	26	31	21	40	n/a	3
UK	10	8	3	4	5	20	7
Uruguay	n/a	43	55	34	42	n/a	
USA	1	5	5	11	16	4	6
Venezuela	63	108	65	106	86	77	
Vietnam	n/a	79	45	88	108	65	

Table VII-2: Comparison of Rankings by International Organizations

3. Indicators of International Organizations

	IMD	WEF	Waseda	UN	ITU	EIU
Report name	The IMD World Digital Competitiveness Ranking	The Global Information Technology Report (GITR)	IAC-Waseda Digital Government Ranking	UN e-Government Survey	ICT Development Index	ICT Globalization index
Target	To assess the extent to which a country adopts and explores digital technologies leading to a transformation in government practices,	Measure e-Government Networked Readiness which assesses the factors, policies, and institutions	To show the progress of e-Government development in a country	Measure e-Government readiness of a country in three pillars [Online Service Index (OSI), Telecommunication Infrastructure Index (TII) and	To represent a comprehensive effort by ITU to provide a snapshot of the status of the information moreover, communication	To provide access to a continually updated set of political, economic and business climate

	business models and society in general.			Human Capital Index (HCI)]	technology (ICT)	
Country coverage	63	143	65	193	192	82
Period	Yearly	2 Years	Yearly	2 Years	Yearly	Yearly
Indicator	9 sub-factors comprise 50 criteria	53 Indicators	10 Main indicators and 35 Sub-Indicators	15 Indicators OSI: 1 indicator for National Portal + 5 indicators for selected e-Services, TII:5 indicators, HCI:4 indicators	14 indicators	8 indicators (access to the internet, the digital economy infrastructure and openness to innovation.)

VIII. Methodology

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

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

Waseda-IAC International Digital Government Ranking is also based on clustering methods by classifying countries according to the group, which has been demonstrated by organizations (APEC, OECD), by the size of population and GDP, by regions (Asia-Pacific, Americas, European, Africa, Middle East, and CIS countries).

1. Formulation

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

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

Raw score is the Score generated by averaging the Score 0 and Score 1; MaxScore is the maximum score of the sub-indicators.

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

No	Indicators	2018
1	Network Infrastructure Preparedness (NIP)	NormScore x 10%
2	Management Optimization (MO)	NormScore x 12%
3	Online Services (OS)	NormScore x 12%
4	National Portal (NPR)	NormScore x 8%
5	Government Chief Information Officer (GCIO)	NormScore x 10%
6	Digital government Promotion (EPRO)	NormScore x 10%

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

Table VIII-1: List of Main Indicators

2. Processes of Evaluation

The following process prepares the rankings
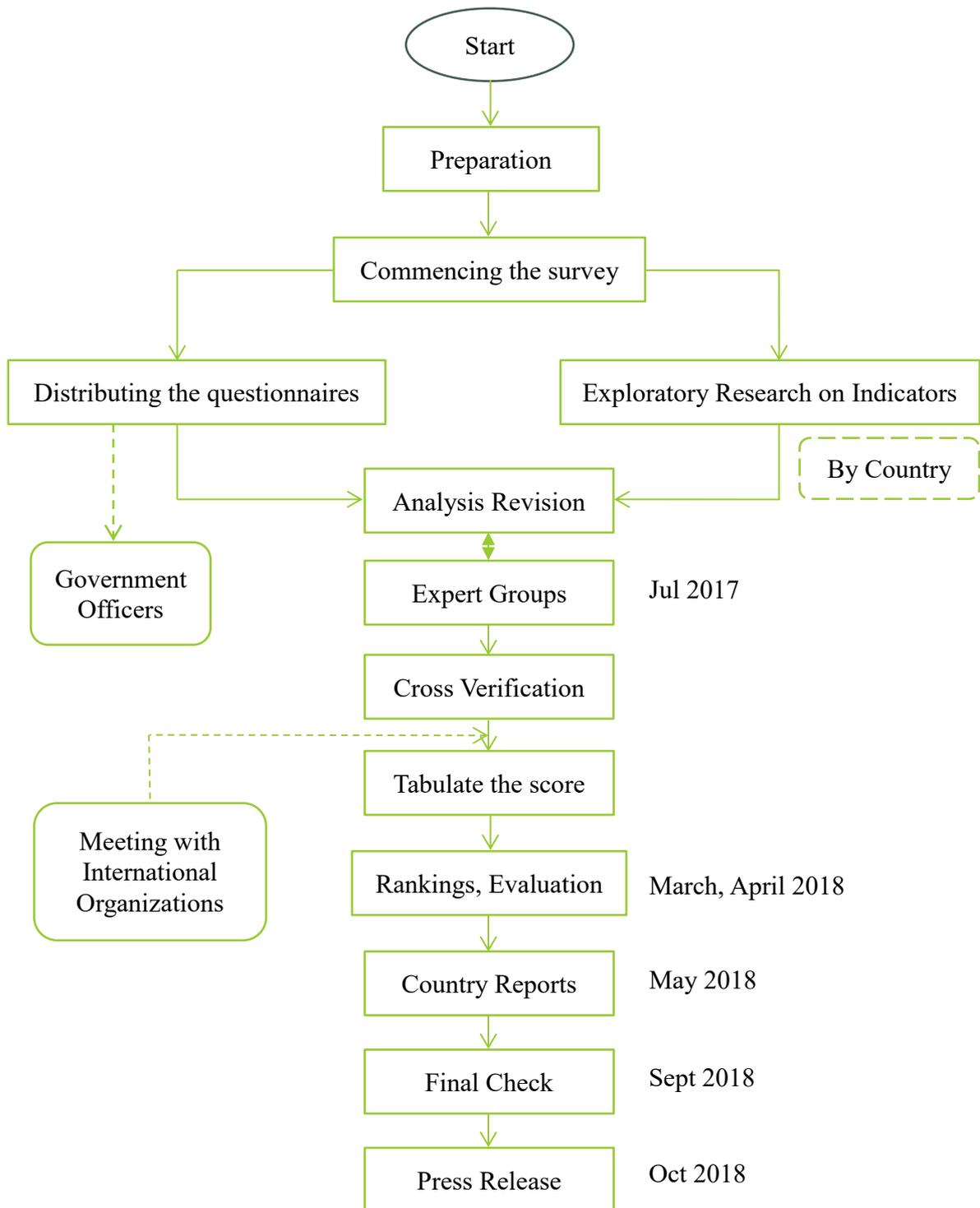
Figure VIII-1: Processes Diagram

IX. Contributors List (● indicate group leader)

1. List of Global Experts Group

● Prof. Dr. Toshio Obi, Chairman, Institute of Digital government, Waseda University, Japan, Honor President, International Academy of CIO, Director of APEC Digital Government Research Center.

- Prof. Dr. J.P Auffret, Chair, MOT/CIO Program of George Mason University, USA.
- Prof. Dr. Lim Swee Cheang, Director, Institute of Systems Science, National University of Singapore.
- Prof. Dr. Luca Buccoliero, Marketing Department Bocconi University, Italy.
- Prof. Dr. Suhono Harso Supangkat, Bandung Institute of Technology, Indonesia.
- Prof. Dr. Francisco Magno, Director, Institute of Governance De La Salle University, Philippines.
- Prof. Fang Chun Yang, Dean, Academy of Digital government, Peking University, China.
- Associate Prof. Dr. Jirapon Sunkpho, Thammasat University, Thailand.
- Prof. Dr. Alexander Ryzhov, Presidential Academy of National Economy and Public Administration (RANEPA), Russia.
- Prof. Dr. Tomi Dahlberg, Information System, University of Turku, Finland.
- Prof. Pin-yu-Chu, Taiwan e-Government Research Center, Taiwan

2. List of Professors and Experts at Institute of Digital Government, Waseda University

● Prof. Dr. Naoko Iwasaki, Waseda University

- Prof. Dr. Takashi Kobayashi, Tokai University

- Prof. Dr. Tatsuyuki Negoro, Waseda University

- Prof. Dr. Yoshio Tozawa, University of Industrial and

- Prof. Dr. Atsushi Kato, Waseda University

- Prof. Dr. Shujiro Urata, Waseda University

- Prof. Kiyohide Higuchi, Waseda University

- Prof. Yukio Kawamura, Waseda University

- Prof. Dr. Hiroko Kudo, Chuo University

3. List of Researchers at Institute of Digital Government, Waseda University

● Dr. Nguyen Manh Hien

- Dr. Yao Yang

- Dr. Pingky Dezar Zulkarnain

- Mr. Bandaxay Lovanxay

- Dr. Nguyen Ngoc Anh

- Mr. Eiji Yamada, NTT Data

- LLC Naoko Mizukoshi, Lawyer

X. Professor Obi as one of the World's 100 Most Influential People in Digital Government

Dr. Toshio Obi, Director of APEC e-Government Research center, Professor Emeritus and chairman of the Institute of e-Government at Waseda University has been named by Apolitical as one of the world's 100 Most Influential People in Digital Government for 2018.

Many congratulations to Professor Obi on being recognized as one of the world's 100 most influential people in digital government – wonderful honor and recognition of Professor Obi's many contributions and ability to build bridges between academia, government, and the private sector.

The list is the first of its kind to show the full international spread of innovative work in the field, celebrating world-beating individuals from every continent. Public leaders from all levels of government appear alongside representatives of the private and third sectors and academia. Everyone included has exerted outsize influence on the transition to digital governments, whether through policymaking, research, advocacy or other means.

Dr. Obi is a founding Director of APEC e-Government Research Center since 2007. He has published over 200 books, articles and policy reports on digital government including the book [A decade of world e-government rankings] (IOS Press, 2015).He sits on the government (MIC)'s e-Government promotion Council as chairperson and is a founding editor of the Waseda World e-Government ranking survey with international experts, which has monitored and evaluated 65 countries (economies) annually since 2005.he is also a founder and honorary president of International Academy of CIO. The fields of his research now cover "AI and Blockchain for digital government" "Capacity building of CIO" "Innovation on Smart Silver City".

The World's 100 Most Influential People in Digital Government were curated from nominations from hundreds of digital government experts from leading organizations, including OECD, the UN, and etc. Apolitical expects the annual list of the 100 Most Influential People in Digital Government to highlight what's working in digital government, and through the work of those named to provide a road map for the future of digital policy.

Apolitical is a global platform for governments that puts the best solutions on topics such as digital government and government innovation https://apolitical.co/lists/digital-government-world100/

XI. The International Academy of CIO and Capacity Building for ICT Leaders (2004–2017)

Introduction

Honoring Professor Toshio Obi's Waseda University retirement and appointment as professor emeritus and his stepping down as president of the International Academy of CIO (IAC) after serving nine years (2008–2017), this article chronicles the development of the International Academy of CIO from its beginnings in 2004 and 2005, founding in 2006 and then to 2017 and its worldwide role and impact. The article reviews the IAC's role in developing and strengthening CIO and ICT Leadership curriculums and programs; providing ICT leadership training to government leaders; highlighting and promoting best practices in Digital Government; and furthering government ICT policies and strengthening government ICT institutions. In addition, the article discusses how the IAC has furthered awareness of the potential for ICT to contribute to addressing major world challenges and three IAC focus areas of ageing society, natural disasters and Smart Cities. The article also discusses IAC's contributions to furthering insight of the potential of ICT for international development as well as risks such as the digital divide and to privacy and security. Lastly, the article discusses recent IAC efforts to pro-mote and increase women in ICT leadership and the new challenges of cybersecurity.

The IAC itself is comprised of people and partnerships and I would like to recognize the contributions and friendships of many thousands from around the world and partnerships with governments and organizations including APEC TEL, U.N., ITU, OECD and World Bank.

While not able to acknowledge everyone, I would like to highlight the following for their special contributions in IAC leadership and initiatives including:

Elena Bellio, Italy; Maksim Belousov, Russia; Zdenek Brabec, Czech Republic; Luca Buccoliero, Italy; Lim Swee Chiang, Singapore; Yang Fengchun, China; Tomi Dahlberg, Finland; Elsa Estevez, Argentina; Mattias Finger, Switzerland; Chan Cheow Hoe, Singapore; Tong-yi Huang, Taiwan; Yuki Imamura, USA; Naoko Iwasaki, Japan; Tomasz Janowski, Poland; Hong-Wei Jyan, Taiwan; Taro Kamioka, Japan; James Kang, Singapore; Pravit Khaemasunan, Thailand; Hiroko Kudo, Japan; Calvin Leong, Macao; Francisco Magno, Philippines; Naoko Mizukoshi, Japan; Ashish Mukherjee, India; Russell Pipe, USA; Alexander Ryzhov, Russia; Sak Segkhoonthod, Thailand; Andrey Semenov, Russia; Alexander Sokolov, Russia; Tatiana Sokolova, Russa; Frank Yu-Hsieh Sung, Taiwan; Jirapon Sunkpho, Thailand; Suhono Supangkat, Indonesia; Amos Tan, Singapore, Pairash Thajchayapong, Thailand; Tran Minh Tien, Vietnam; Jirapon Tubtimhin, Thailand; Kim Willems, Netherlands.

And honor the leadership of one of the IAC founders, Jantima Sirisaengtaksin, who very sadly passed away last year. Ms. Sirisaengtaksin who was always very kind and tremendously welcoming to visitors to Thailand as a host for IAC meetings was a IAC vice president for ten years and was renowned for her leadership in ICT and innovation in the Thailand government.

About the IAC

Before discussing and reviewing IAC history and role and impact some background on the IAC today.

Founded in 2006, the IAC is a global academic and professional society established as an NPO in Tokyo, Japan, with a Secretariat in Bangkok, Thailand and country chapters. From initial co-founders of Japan, USA, Indonesia, Philippines, Switzerland, and Thailand, the IAC currently has active participation from about 50 countries. The IAC engages with governments, private sector, academia and NGOs to further ICT leadership and governance and associated national ICT policies and institutions.

IAC's initiatives include developing and publishing the annual Waseda IAC Digital Government Rankings (https://www.waseda.jp/top/en-news/53182) now in their thirteenth year; and a Global E-Governance book series with IOS Press in Amsterdam and volumes including "ICT and Aging Society," and "A Decade of e-Government Rankings" (https://www.iospress.nl/bookserie/global-e-governance-series/); providing IAC Accreditation for masters' degree CIO and IT executive leadership programs; publishing the Journal of CIO and Digital Innovation; hosting the IAC Annual conference; undertaking research projects including with APEC on ICT Governance and ICT and Aging Society and initiatives including on ICT and natural disasters, women in ICT and Smart Cities. In addition, the IAC works with governments in developing ICT leadership and governance policies and legislation.

Setting the Stage for the IAC–ICT Innovation and ICT Leadership in 2004

With advances in computers and communications from the 1970's to the early 2000's and the development and adoption of corresponding new services, society and governments were becoming in creasingly reliant on ICT. Not only had ICT technical capabilities increased rapidly but unit costs in processing speed, communications speed and computer storage decreased exponentially.

The 3G mobile Internet iMode service launched by NTT DoCoMo in Japan in 1999 was a harbinger of how technology was evolving from large mainframe computers to smaller devices and from enterprise systems to mobile applications. Subsequently, the iPhone launch in 2007 and adoption accelerated these shifts globally.

The ITU World Summit on Information Society (WSIS) held in in Geneva in 2003 and Tunis in 2005 highlighted the potential of ICT for society and governments: "The Tunis Summit represents a unique opportunity to raise awareness of the benefits that

Information and Communication Technologies (ICTs) can bring to humanity and the manner in which they can transform people's activities, interaction and lives, and thus increase confidence in the future". (ITU 2005)

Not only did ICT's have a role though, they had a strategic role: "After many years of rapid growth and demonstration of its tangible benefits, ICT is now accorded a "strategic" role in most economies. This prominence is bringing a greater level of scrutiny of technology infrastructure from various sections of society, as well as international organizations. Ereadiness will advance, but governments should take care to ensure that their countries' digital development proceeds in harmony with their social, economic and political objectives." (Economist Intelligence Unit, 2009).

To further ICTs strategic role, Asia Pacific Economic Cooperation (APEC) economies agreed the Brunei Darussalam goal in 2000 having as an objective effective Internet access for all communities in all APEC economies by the year 2010.

In practice though many ICT projects were not delivering on their potential. While governments were spending many billions of dollars on ICT investment, projects were completed over schedule and over budget and in fact many projects were not utilized as envisioned or completed at all. There were also risks ranging from digital divide within countries or regions to economic, development and competitive risks for countries not adapting and utilizing technology effectively.

Given the potential of ICT and challenges in practice, ICT leadership was not keeping pace with the need. There was an 'ICT leadership gap." In addition, ICT institutions, governance and policy were not keeping pace with the new central role of ICT.

Leading to the IAC Waseda 2004 CIO and e-Government Workshop

With this global ICT and ICT leadership context, Professor Obi organized a CIO and e-Government workshop at Waseda University in Tokyo in November 2004. Attendees and participants were from government, academia and private sector; and from across Asia Pacific and also Europe and the Americas. Discussions focused on country strategies for ICT and ICT in government and associated challenges of leadership and governance. In addition, the conference explored the potential of ICT for contributing to addressing major world challenges such as preparation and recovery from natural disasters, and rapid urbanization.

The Tokyo workshop led to initial partnering amongst the attendees and laid the groundwork for the development and founding of the IAC in 2005 and 2006.

APEC TEL CIO and CIO Institutions Projects

Following on to the Waseda 2004 workshop, participants from the Asia Pacific Economic Cooperation (APEC) economies of Japan, Indonesia, Thailand, U.S., Malaysia, Philippines and Vietnam led by Professor Obi partnered on two CIO related (Asia Pacific

Economic Cooperation Telecommunications Working Group (APEC TEL) projects. The projects "Development and Deployment of APECTEL GCIO Training Model" and "Developing Model GCIO Councils" had the objectives to develop curricula for CIOs and ICT executive leaders and provide training and develop best practices for establishing and governing CIO Councils.

The first project resulted in CIO training materials utilized in Asia Pacific universities and executive education training. The second project resulted in strategies for developing and operating CIO Councils to coordinate ICT policy across ministries within a government including on topics such as enterprise architecture and human capacity building.

Photo 1. Participants at Waseda 2004 CIO and eGovernment Workshop

The Founding of the IAC

With the initial success and interest in academic, government, private sector partnering on CIO, Professor Obi, Jantima Sirisaengtaksin, Thai Ministry of Finance, Jirapon Tubtimhin, NECTEC J.P. Auffret, George Mason and Pairash Thajchayapong, Permanent Secretary, Ministry of Science and Technology, Thailand met in Bangkok in April 2005 with the objectives for planning for the IAC.

Follow on meetings including related to the APEC projects in September 2005 in Tokyo and May

2006 in Fairfax and with Francisco Magno, De Las Salle University, Manila, Suhono Supangkat, Bandung Institute of Technology, Bandung; and Mattias Finger, Ecole Polytechnique Fédérale de Lausanne (EPFL) led to the first IAC Annual Conference and Meeting held in Tokyo in June 2006 and adoption of the IAC charter. Pairash Thajchayapong, Permanent Secretary, Ministry of Science and Technology, Thailand, was elected as IAC's first president (serving 2006–2008). Professor Obi succeeded Dr. Pairasch and was elected president and served from 2008 to 2017 with Dr. Pairash becoming the IACs first Honorary President.

The IAC Charter addresses organization and governance and also outlines the IACs three major mission objectives of: research and partnering on ICT and its impact, role and potential in society; facilitating the exchange of knowledge and experiences on CIO, and developing global standards for CIO and CIO curricula.

Strong academic and research institutions with expertise in CIO education were integral to the IAC since its start with initial institutions comprised of Waseda University, Tokyo; George Mason University (a founding partner of the U.S. Federal Government's CIO University), Fairfax; National Electronics and Computer Technology Center (NECTEC), Bangkok; Ecole Polytechnique Fédérale de Lausanne (EPFL); De La Salle University, Manila and Bandung Institute of Technology, Bandung.

IAC Thematic Areas

The IAC has focused on the following key thematic areas related to CIOs and CIO institutions: CIO and ICT Executive Leadership; ICT Institutions and Policy; ICT and Addressing Major World Challenges; Technology Innovation; and ICT Leadership Partnering and Promotion.

CIO and ICT Executive Leadership

At the center of the IACs mission are initiatives and partnerships to further CIO and IT executive leadership through education and research. With the increasing role of ICT in society and industry, CIO and ICT executive leadership are integral to successful ICT adoption and application. As noted in earlier, there is an ICT leadership gap between the ICT leadership needed for today's ICT role and the number and capability of CIOs. This gap is especially prevalent in developing economies.

The IAC has two broad initiatives on CIO and ICT executive leadership the annual Waseda – IAC Digital Government Rankings and Accreditation for Advanced Education in CIO and ICT Leadership. In addition, the IAC has more focused CIO education initiatives including partnering on the development of New CIO masters' degree programs, in person and distance training, and coordinating week long CIO and ICT study tours including in Japan, Thailand and the U.S.

Waseda - IAC Digital Government Rankings

Since 2014, the IAC has partnered with Waseda University on the annual Waseda-IAC International Digital Government Rankings Report (started by Professor Obi in 2005) which evaluates and pro- vides comparisons of national digital government readiness and development.

The report is developed through surveys of government officials as well as independent research. The methodology is the result of discussions with international and national organizations including OECD, APEC, ITU, World Bank, United Nations DESA and national government ministries and agencies.

The 2017 International Digital Government Rankings Report reviewed 65 counties with ten indicators (and 35 sub-indicators) of:

- Network preparedness / infrastructure,
- Management Optimization / Efficiency
- Online Services / Functioning Applications
- National Portal / Homepage
- Government CIO
- Digital Government Promotion
- E-Participation / Digital Inclusion
- Open Government
- Cybersecurity
- Use of Emerging ICT.

Countries use the Reports to benchmark themselves against peers as well as to identify possible future plans and initiatives to strengthen their digital government readiness and development.

The Waseda - IAC International Digital Government Rankings Survey is overseen by an experts team comprised of a network of professors and institutions including: Japan: Toshio Obi, Naoko Iwasaki and Nguyen Manh Hien, Waseda University, USA: J.P. Auffret, George Mason University, China: Yang Fengchun, Peking University, Finland: Tomi Dahlberg, Turku University, Russia: Alexander Ryzhov, RANEPA School of IT Management, Thailand: Jirapon Sunkpho, Thammasat University, Taiwan: Taiwan E-Governance Research Center, Singapore: Lim Swee Chiang, National University of Singapore, Phil- ippines: Francisco Magno, De LaSalle, Indonesia: Suhono Supangkat, Bandung Institute of Technology, Italy: Luca Buccoliero, Bocconi University, Elsa Estevez, UN University and National University of the South, Argentina and Czech Republic: Zdenek Brabec, Czech Technical University.

Accreditation for Advanced Education in CIO and ICT Leadership

To further the development and quality of CIO and ICT leadership master's degree programs, the

IAC started the Accreditation Program for Advanced Education in CIO and ICT Leadership in 2015. The IAC accredits the master's degree program and accredited master's degree program students receive an IAC CIO program certificate upon graduation.

An IAC review team assesses curriculum; learning outcomes; faculty and staff; student professional experience and academic background; and program financial resources, facilities and equipment for applying master's degree programs. After evaluation, the IAC recommends to accredit, defer or not accredit the program.

The IAC has adopted a set of CIO core competencies and learning objectives to be addressed by the curriculum based on IAC research, IAC member consultation, the two APEC TEL CIO projects and national CIO core competencies and learning objectives. The core competencies and curriculum guidelines highlight the national and local context of IT executive leadership and promote relevant curriculum tailoring.

IAC core competencies are organized by individual, IT organization and business organization perspectives and serve as the foundation for IT course and curriculum development. The motivation is to reflect the multiple perspectives of the role of the CIO in the competency structure and to provide flexibility to incorporate regional, cultural and organizational considerations in tailoring learning objectives to the local context.

Specific competencies within these perspectives include:

Individual / Personal

- Communications
- Systems and Design Thinking
- Service Mindset and Marketing
- Human Relationship Management

IT Departmental

- Project and Program Management
- Cybersecurity
- IT Policy and Organization
- IT Performance Assessment
- Acquisition

Business Organizational

- Strategic Aspects of Information Technology and Digital Business Transformation
- Innovation
- Technology Management and Assessment and Emerging Technologies
- Capital Planning and Investment
- E-Government
- Enterprise Architecture.

In reviewing a curriculum, the IAC considers:

- Curriculum and learning objectives address the generally accepted competencies for CIOs.
- Curriculum design incorporates regional, cultural, political and organizational backgrounds, with learning objectives tailored to local needs.
- Curriculum includes components considering the differences in policies, guidelines and strategies, between government and private sectors.

- Curriculum strives to stay current with the changes in CIO or IT executive competencies.
- Curriculum includes real world case studies and experiences.

As noted above, the IAC also undertakes more focused CIO education initiatives which include consulting and working with universities developing CIO master's degree programs and providing guidance on strengthening related master's degree curricula (for example MBA and Information Systems) to more fully integrate consideration of ICT leadership. The IAC was appreciative of the opportunity to consult and contribute to the development Thammasat University's College of Innovation CIO master's degree program.

In addition to these initiatives and to the IAC university partner CIO master's degree programs, the IAC provides CIO training both in person and by video to partnering countries executive classes as well as organizes CIO delegation country visits including to Japan, Thailand and U.S.

ICT Institutions and Policy

The APEC CIO "Developing Model GCIO Councils" project was a first IAC initiative to contribute to strengthening the capability of CIO institutions and further associated policy and legislation.

The IAC has continued to focus on institutional capacity, policy and legislation in addition to CIO and ICT leadership on a country and regional basis including contributing to:

- Policy and legislation to establish and define the role of the CIO
- Strategies and policies on the development and administration of CIO Councils and government cross ministry ICT coordination
- Policies related to new technology and adoption of technology including on cloud, Big Data, cybersecurity, artificial intelligence and IOT; and ageing society, Smart Cities, eParticipation, environment and healthcare.

ICT and Addressing Major World Challenges

One of the motivations in establishing the IAC was to foster and further ICT leadership education and capability to help bridge the ICT leadership gap and contribute to furthering ICT's benefits.

The IAC has contributed to discussions, policies and initiatives of broad global initiatives such as the Millennium Development Goals (MDGs) and subsequently the Sustainable Development Goals (SDGs) where ICT plays a major role.

In addition, the IAC has focused on major issues of great interest to IAC country members such as ageing society, natural disaster preparedness and recovery, Smart Cities and urbanization, environment and healthcare.

On each of these, the IAC and its members have contributed research, education and training, and policy and legislative recommendations, as well as hosting forums bringing together academia, government and private sector to exchange strategies, approaches and best practices and build awareness.

In a related ICT issue, the IAC has highlighted through research and awareness the need to promote and further the role of women in the ICT leadership. Jantima Sirisaengtaksin led the ICT for Thailand's innovative tax payment and refund system and was instrumental in the IAC's efforts in the women in ICT leadership area. Naoko Iwasaki has combined her CIO and ICT and ageing society re- search with research on women and ICT leadership. Professor Iwasaki is the recipient of the first Jantima award recognizing research and initiatives to further women in ICT leadership.

Technology Innovation

ICTs have progressed rapidly since the initial Waseda 2004 workshop and the IAC has stayed abreast of technology innovations - both potential benefits and challenges for CIOs, CIO institutions, governments, private sector and society. IAC technology related initiatives have ranged from research to practice based projects with APEC and private sector companies to highlighting innovations through conference tracks and sessions at the IAC Annual Conferences. In addition, the IAC has scheduled the IAC Annual Conference back to back with major technology innovation conferences in Tokyo, Bangkok, Singapore and Moscow.

The first two IAC Annual Conferences reflect several of these approaches. The 2006 IAC Annual Conference held in Tokyo had a theme of e-Governance and included technology related sessions such as the development of ubiquitous society in Japan and Korea anytime, anywhere communications and next generation networks.

The 2007 IAC Annual Conference also held in Tokyo was scheduled in conjunction with the 40th Tokyo Motor Show held in Makuhari Messe in Chiba City, Japan. The IAC conference connected to and mirrored several of themes of the Motor Show including innovations in environmental and safety technologies.

As part of contributing to addressing major world challenges and also in regard to the potential and challenges of technology innovations, IAC initiatives and workshops have also focused on robotics, cloud, 4G and now 5G, IoT, and more recently also AI, Big Data and cybersecurity.

ICT Leadership Partnering and Promotion

To extend reach and broaden perspectives, the IAC partners with multilateral organizations, private sector and governments in addition to universities. Multilateral partners include APEC, U.N., ITU, OECD and the World Bank and initiatives have included joint efforts on topics such as CIO (including the two APEC CIO projects),

Digital Government and Ageing Society and joint conferences and workshops. Several examples illustrating the breadth of the partnerships are:

- 2007 World Bank IAC Global CIO Dialog in Washington, D.C. with ICT leaders from Russia, Ukraine, Georgia, Armenia, Ghana, Pakistan and Tanzania joining IAC and World Bank participants by video conference.

- 2013 ITU and IAC e-Government/CIO Forum held in Bangkok in conjunction with ITU Telecom World 2013.

- 2014 IAC workshop on ICT and Ageing Society at the United Nations University International Conference on Theory and Practice of eGovernance (ICEGOV) held in Guimarães, Portugal

- 2015 APEC IAC eGovernment Forum and back to back OECD eLeaders Meeting.

- 2016 U.N. Department of Economic and Social Affairs (U.N. DESA) IAC workshop on ICT and Ageing Society held in New York.

The IAC also engages with and benefits from the insights and contributions of high level government officials including the first IAC president, Pairash Thajchayapong, Permanent Secretary, Ministry of Science and Technology, Thailand. IAC conferences and workshops have been venues for ICT policy makers since the first annual IAC conference held in Tokyo in 2006 which included a session of ICT Policy and CIO Cooperation in Asia with Iwao Matsuda, Minister of ICT, Japan, Timoteo Diaz de Rivera, Commissioner of ICT, Philippines, Rattanapian Pravich, Minister of Science and Technology, Thailand and Djalil Sofyan, Minister of Information and Communications, Indonesia.

Related Initiatives

The IAC has three related initiatives that support the mission themes discussed above: Global E-Governance Book Series with IOS Press, Journal of CIO and Digital Innovation and the IAC Annual Conference and Meeting.

Global E-Governance Book Series with IOS Press

The IAC partners with IOS Press, Amsterdam, Netherlands on a Global E-Governance Book series as a way to disseminate research on ICT leadership and governance and related E-Governance subjects. Kim Willems, Associate Publisher, IOS Press has coordinated the series which now has seven titles:

- E-Governance: A Global Perspective on a New Paradigm, Editor Toshio Obi (2007)

- Global E-Governance, Editors Jirapon Tubtimhin and Russell Pipe (2009)

- The Innovative CIO, Editor Toshio Obi (2010)

- E-Governance: A Global Journey, Editors Mattias Finger and Fouzia Nasreen Sultana (2012)

- Ageing Society and ICT, Editors Toshio Obi, J.P. Auffret and Naoko Iwasaki (2013)
- Postal Services in the Digital Age, Editors Mattias Finger, Bernhard Bukovic and Muqbil Burhan
- A Decade of World eGovernment Rankings, Editors Toshio Obi, Naoko Iwasaki (2015).

Journal of CIO and Digital Innovation

In 2017, the IAC launched and published the first edition of its *Journal of CIO and Digital Innovation.*

The Journal provides insights to CIOs and ICT practitioners on the potential of emerging technology trends and innovations. Within the mission, the journal covers the application of ICT to major societal issues such as aging society, Smart Cities, readiness and emergency response for natural disasters; opportunities, challenges and ramifications of rapidly developing technologies such as robotics, autonomous vehicles and artificial intelligence; and major leadership and eGovernance challenges such as capacity building and cybersecurity. The Journal includes Editors' perspectives, research academic papers, academic research in progress and case studies

The IAC also contributed to the Journal of E-Goverance published by IOS Press and with editor Russell Pipe (who was also an IAC Advisor). The Journal of E-Governance started as I-Ways: Journal of Electronic Policy, Commerce and Regulation in 2005, was rebranded to Journal of E-Governance in 2009 and continued publishing through 2013.

The IAC Annual Conference and Meeting

The IAC holds an Annual Conference and Meeting partnering with a national host and with academia, private sector, government and NGOs. The IAC Annual Conferences focus on CIO and ICT leadership in general and also on current major world challenges and technology themes such as ageing society, natural disaster preparedness and recovery, healthcare, robotics and cybersecurity. The IAC Annual Conferences have been held with the following partners in:

2006	Tokyo	Waseda University
2007	Tokyo	Waseda University
2008	Tokyo	Waseda University
2009	Bangkok	NECTEC
2010	Indonesia	Bandung Institute of Technology
2011	Philippines	De La Salle University
2012	Moscow	Russia CIO Union
2013	Beijing	Peking University
2014	Singapore	National University of Singapore

2015	Tokyo	Waseda University
2016	Milan	Bocconi University
2017	Moscow	Russia Presidential Academy of National Economy and Public Administration (RANEPA).
2018	Kazakhstan	Kazakhstan

In Summary and Looking Ahead

With Toshio Obi's leadership as president from 2008–2017 following Dr. Pairasch, the IAC has contributed greatly to CIO and ICT executive leadership education and institution capacity building and the application of ICT to major world challenges. In addition, Professor Obi's leadership has positioned the IAC well to continue to contribute as ICT innovation and adoption continues and even accelerates.

With academic, government, private sector partners and education and research initiatives on a range of current ICT topics from ageing society to Smart Cities, and current technology issues of AI, robotics and cybersecurity, the IAC continues to engage in current and new issues in CIO and ICT Executive Leadership. And with platforms including the Waseda–IAC Digital Government Rankings, Journal of CIO and Digital Innovation, IOS E-Governance Book Series, Accreditation for Advanced Education in CIO and ICT Leadership, and IAC Annual Conference and Meeting, the IAC is well placed to continue to have an impact as Professor Obi becomes the IACs second Honorary President.

XII. Country Reports

Argentina

1   General Information

Area: 2,780,400 km^2

Population: 43,847,430

Government Type: Presidential Republic

GDP: $22,400

Internet User: 70.2

Wired (Fixed Broadband User): 16.9

Wireless Broadband User: 80.5
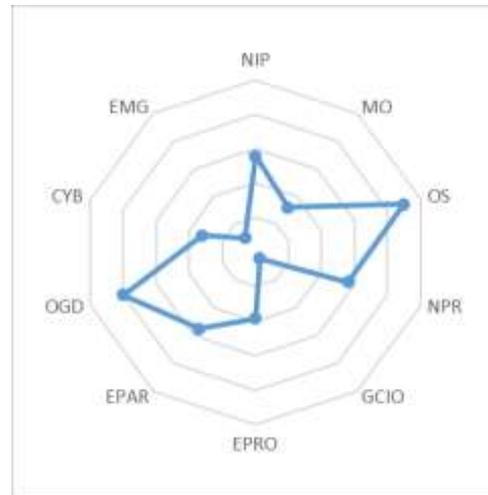
2   Positioning in a Global Organization and a Region

Among American countries, Argentine is superior in the National Portal indicator. Its score is slightly lower than the US. However, other indicators are lower than the average of American countries. This may indicate that in National Portal, some developing countries are more advanced than in developed countries. National Portal could be the indicator in which the performance of developing countries can exceed that of developed countries.
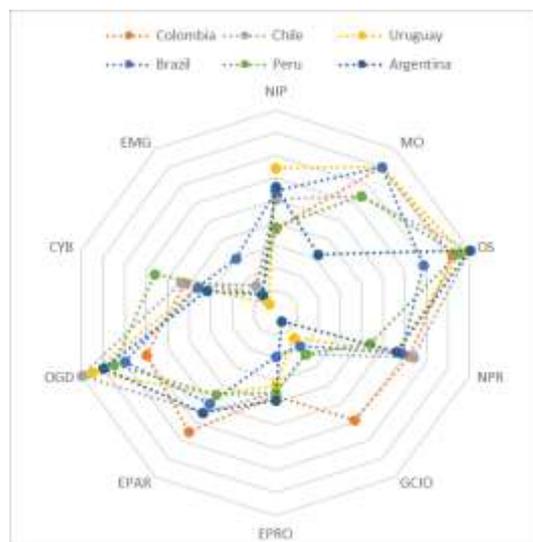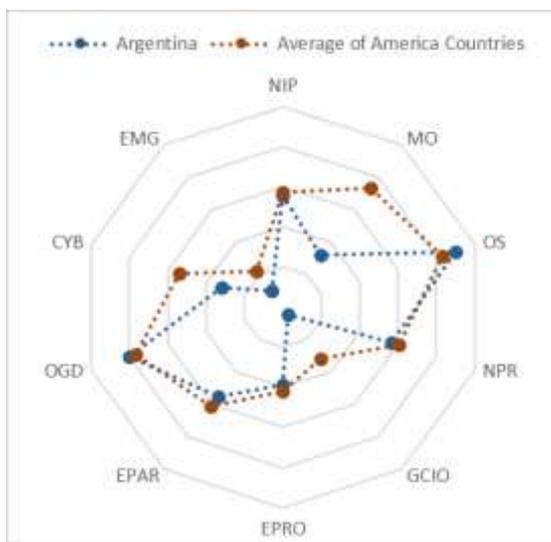
3   Digital Government Development

The G20 Summit will be held in Buenos Aires in November 2018 where heads of state meet for the global partnership in the digital economy and focus on technological change and opportunities for sustainable development. Priorities are on infrastructure development and anti-corruption, in which the former looks at mobilized resources to

reduce the infrastructure deficit and tries to close the gap by motivating private sector involvement, and the latter one focuses on implementing the cooperation with the business community (B20) and civil society (C20) to promote transparency and integrity, enhancing the cooperation among governments at the same time managing conflict of interests and also injects vitality in state-owned enterprises. (2018, Argentina G20 Summit Calendar and Agenda) Another important conference held in Buenos Aires, from 9 to 20 October 2017 was the World Telecommunication Development Conference (WTDC-17) to seek for a unique opportunity for the international community to gather together and discuss the future of the telecommunication and information and communication technologies sector and its contribution to many aspects, including government building. (2017, ITUWTDC, Buenos Aires)

In a word, Argentina is working on providing a platform for sharing the new fruits of Digital Government development and making the Internet a channel for the global governments to corporate.

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

In Argentina, over half the population that is 70.2%, have access to the Internet and the increase can be seen apparently from the previous year. The number of fixed-broadband subscriptions is 16.9 per 100 inhabitants. The number of active mobile broadband subscriptions is 67.3 per 100 inhabitants. Fixed users and mobile users show a clear difference, which implies the trend of people's habits of life have been transformed from relying on locations to flexible mobilization.

4.2   Management Optimization [MO]

As part of government business processes, it focuses on the awareness of optimization, government management architecture, and system. A national Digital Government strategy called "Comprehensive Growth Strategy" in order to achieve robust, sustainable and balanced growth started from 2013. Government improves the allocation of public spending together with the Central Bank in productive and social investment. The expected results are measured by possible quantitative data including employment creation, wage, trade as well as financial statistics. Several first initiatives, containing GSTP (Global System of Trade Preference Among Developing Countries), which is asking for a series of free trade agreements and constructing the dialogue mechanisms, and INDIRA (Customers Records Information Exchange), SAOC (Customers System of Reliable Operators). The periodic evaluation of possible trade revenue growth is up to date, and each participating agency is professionally diving the work.

4.3   Online Service [OS]

Argentina is establishing a B2B e-procurement connection with IBM and can make it easier for government agencies to do business with IBM. Then Argentina CCG5 covers trade regulations, customs, and standards, which can be implemented when certain products categories are imported. Also, the nation-level General Customs Bureau is working on applications, collections and controlling taxes under the Argentine Customs Code. Additionally, it also regulates other taxes on import and export transactions on behalf of other entities. Besides, Argentine one-stop service platform can offer the highest level of services to be user-friendly. Moreover E-health development in Argentina can be called relatively mature because it is not only focused on the regional level, for example, the Regional Strategy and Action Plan from PAHO/WHO represents a significant opportunity, but also at the national level and the initiatives such as Argentina Connected,

the SISA, Plan Nacer, and Remedial + Redes Program is providing the infrastructure and the information base that are essential for the development of relational policies.

4.4   National Portal [NPR]

Argentina's national portal (http://www.argentina.gob.ar) works as a one-stop service website and offers some e-Services to citizens, companies, and foreigners. Aside from two undated PDF documents that provide information in English, the portal site is entirely in Spanish. It does offer a translation widget powered by Google which—while imperfect—makes it easier for non-speakers to navigate the site.

The well-organized portal serves as a platform to help citizens find their desired information through a search option. Moreover, it is simple in design and easy to use. The portal structure is clear, with the most common online services prominently featured.

The portal provides information related to the country and the government, as well as links to other government websites. Furthermore, it offers users the possibility to create an account for managing personal procedures. It is also possible to share information on the website directly on social networks. It is indicated in the top of the portal that it is currently in development, and allows users to send feedback.

In the Open Government National Strategy, 22 Open Data plans for institutions of the National Public Administration were prepared, and the publication of the critical datasets was shown on the National Public Data Portal, datos.gob.ar. From this Portals citizens can have access to public data and in return, analytical services such as maps, apps, and views can be made accordingly.

4.5   Government CIO [GCIO]

Argentina is recovering, and the country has good potential for growth. Under this broad background, the plan of Oficina Nacional deTecnologías de Información (ONTI) cover many characteristics of CIO. Corporate innovation and online innovation management can be done best through Argentine CIO practices. However, degree programs related to CIO of Argentina government are not clear to find, neither the regular course nor training.

4.6   Digital Government Promotion [EPRO]

Argentina has many advertising agencies, and management consultants and the leading agencies are members of the Argentine Association of Advertising Agencies. Argentina's Cristal Government Initiative is working on disseminating online and direct the content of the national portal to all citizens so that Digital Government Promotion can be conducted through the journalists, who are a particularly important audience of the site, as newspapers and televisions enable much wider dissemination and promotion of its contents.

4.7   E-Participation [EPAR]

The Secretariat for Political and Institutional Affairs, Ministry of Interior. Public Works and Housing is mainly in charge of E-participation aimed at enabling a space so that a higher number of citizens can use an active and straightforward tool to participate in the lawmaking process. Technology and innovation are used to promote the favor of the presentation of Popular Initiative proposals and monitor the bills put before the Congress.

4.8 Open Government Data [OGD]

Public participation is one of the thematic focuses of Argentina government, and the Independent Reporting Mechanism (IRM) has evaluated commitment completion overall. In the Open Government National Plan of the Argentine Republic 2017-2019, Open Government is regarded as a national agenda priority, working on transparency, accountability, citizen participation, technology, and innovation as well as other subnational factors.

Transforming the traditional modes of public management and the relationship between the citizens and the Government, more interactional opportunities can be made to articulate collaboration with civil society. In addition to the Open Government National Action Plan other initiatives include Argentina Abirta Forum, the Public Consultation Platform and the Open Government National Round Table.

4.9 Cyber Security [CYB]

As the trend of increasing cyber-attacks in Latin America, the 2013 report of Cybersecurity Trends and Government Responses in the region was documented, and the Trend Labs 2014 Annual Security Reports that numerous organizations worldwide lost customer records and credentials to attackers in the same year. Trend Micro, has observed the trends over last few years and noted malware disguised as valid SCADA applications and malware used to scan and identify specific SCADA protocols.

4.10 The use of Emerging ICT [EMG]

Argentina Big Data Meetup group has been created as a shared initiative of Sociometrist with a single and clear objective "Share your success cases with a well-engaged community of data geeks". The group members contain data scientists and Big Data developers. However, little information concerning the concept of applying Cloud is considered about in Argentine government.

5 Some Highlights

In this new era of knowledge economy, the new constitutions of ICT gradually apply in Argentina's governance practices, and updated news has seen enjoyable results.

Argentina had many of the necessary elements for innovative and dynamic e-Development. Argentina has the highest per capita GDP and second-highest life expectancy in Latin America, with well-trained quality labor force who have high literacy rates, the Argentine government is gradually open its ICT market for competition. "Even though the Argentine Government does not have a clear and proactive vision of ICT development in the country", it has been quite "efficient and responsive". The Argentina government has introduced a broad range of initiatives to increase Internet penetration by much of the government budget was used to build infrastructure to promote non-profit Internet services and so far "500 community technology centers with computers, fax machines, and Internet access" were built. Not surprisingly, the education sector also witnessed the extensive penetration of the Internet. Actually, for Argentina, the recent investment percentage of revenues has been low if compared with other countries, but regarding essential service penetration (fixed & mobile). Argentina is doing better than other countries in the region.

Australia

1 General Information

Area: 7,741,220 km^2

Population: 22,751,014

Government Type: federal parliamentary democracy

GDP: $ 65,400

Internet User: 88.2

Wire (Fixed) Broadband Users: 30.4

Wireless Broadband Users: 130.2
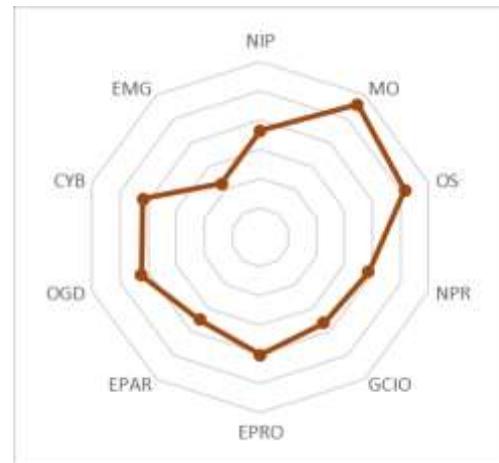
2 Positioning in a Global Organization and a Region

This year, Australia surpassed the worlds and OECD's average score in most indicators, except cybersecurity and e-participation. The country even got a better ranking on management optimization when compared with the USA. A similar phenomenon was witnessed when comparing Australia with APEC economies.
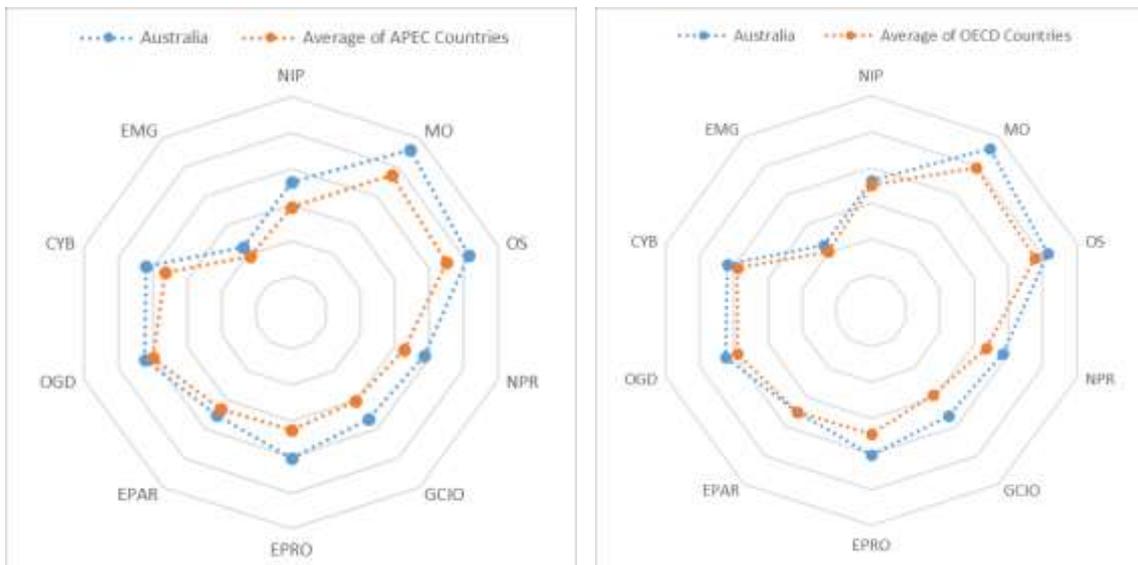
3 Digital Government Development

Australia's e-Government adoption efforts have been clarified under the 2012-2015 e-Government strategy. It shows that Australians continue to embrace the Internet as a way of interacting with the government.

In 2018 the Australian Government introduced six steps to accelerate Australia's digital government, in which The Federal Government has laid out an ambitious goal for Australia to be one of the top three digital governments in world by 2025. As part pf the program, the government (The Digital Transformation Agency) has contracted with IBM to accelerate the uptake of Blockchain, AI and quantum computing. Six steps include:

- Simplify through integration and automation

- Be clear and committed to your strategy

- Letting technology do the heavy lifting

- Focus on what needs fixing

- Ensure cybersecurity is front of mind

- Citizen-driven personalization

Source: https://www.dta.gov.au
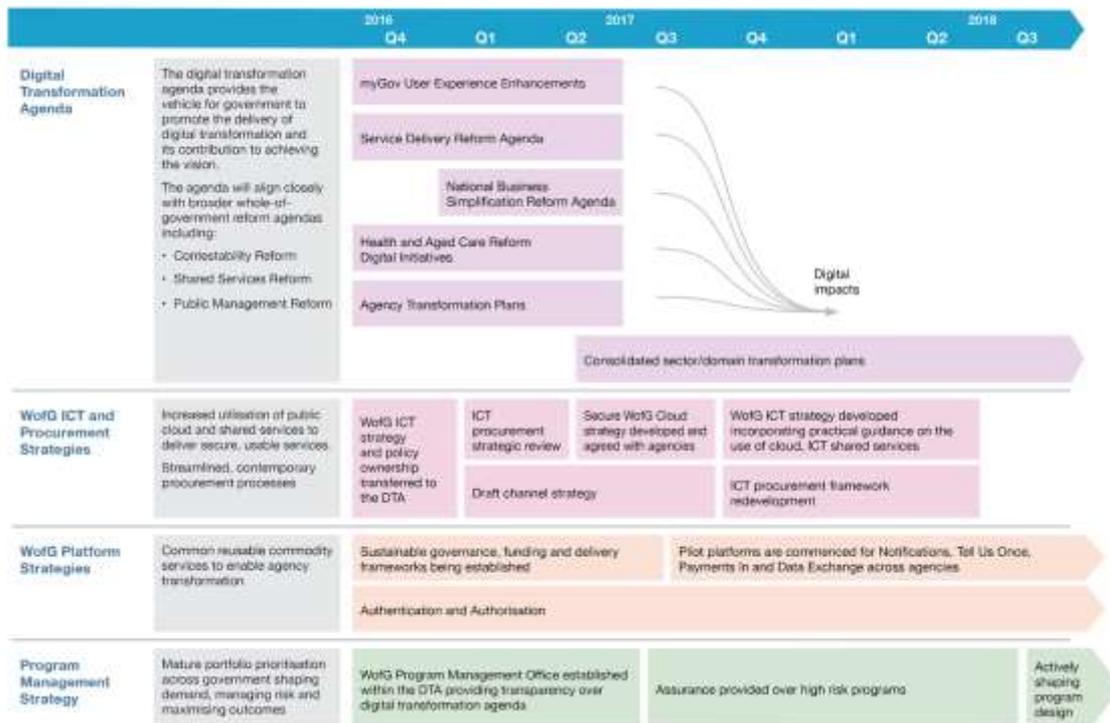
These agenda aligns closely with broader whole-of-government reform agendas including:

- Contestability Reform
- Shared Services Reform
- Public Management Reform

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

Approximately 84.6% of Australia's population were Internet users in 2014, according to the Measuring the Information Society Report 2015 from International Telecommunication Union (ITU). Among them, wired broadband subscribers accounted for around 25.8% while more than 100% of the total population have a wireless broadband connection.

4.2   Management Optimization [MO]

Australian government has issued several policies and strategies related to e-Government development at national scope, addressing various aspects of digital

government such as digital economy (National Digital Economy Strategy), government online services (APS ICT Strategy 2012-2015), infrastructure (Australian Government Data Centre Strategy 2010-2025), and cloud computing (Australian Government Cloud Computing Policy). Australia Government also mandated the collaboration between government entities via the Public Governance, Performance and Accountability Act 2013 (PGPA Act). Under this act, a National Collaboration Framework was created in order to facilitate the collaboration among Commonwealth entities, state, territory and local jurisdictions. In addition, the Australian Government Information Interoperability Framework and the GovShare initiative were put in place to ensure seamless collaboration and information sharing among government agencies.

4.3   Online Service [OS]

The score for Online Service comprises of five sub-dimensions: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. All of those services was investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience.

Regarding complexity level, all Online Services in Australia have reached the transactional level in which users can conduct all of their businesses via an electronic portal. For e-procurement, AusTender (www.tenders.gov.au) is a centralized gateway for publishing information on Australian Government business opportunities, annual procurement plans, and contracts awarded. With the replacement of australia.gov.au accounts by MyGov, the Australian Government aims to link all government services into a single place. By creating a MyGov account, citizens have access to various utilities like MyGov Inbox, MyGov Profile and a growing range of services including Medicare, Australia Taxation Office, Personal Controlled eHealth Record, Child Support.

MyGov2.0 was introduced in May 2017. The MyGov2.0 aims to provide a significant platform re-design to address user needs and known customer pain points. MyGov 2.0 delivered simplified content, improved accessibility and better responsiveness across mobile devices.

4.4   National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. www.australia.gov.au is the national portal of Australia. It presents a wide range of information resources and online services from various government agencies which can be accessed from a single point.

In technical aspect, the result of Google PageSpeed™ Insight showed that the website operates well both from PC and from Mobile Device. The portal also connects to various Social Networks such as Facebook, Twitter, YouTube, and Flickr, plus there is a feature allowing users to receive the update via mail notification. Regarding accessibility, Australia.gov.au is currently compliant to Level A of the Web content accessibility guidelines version 2.0 - external site (WCAG 2.0) standard.

4.5   Government CIO [GCIO]

After just 12 months being the leader of heading up IT governance and whole-of-government IT policy for Federal government, Australian government chief information officer Glenn Archer left his position at AGIMO. In this sense, the federal government will no longer have a chief information officer after deciding not to replace the position. This restructure effort is supposed to reduce the "duplication and unclear objectives for whole-of-government policies".

Although the government CIO role no longer exists at the Federal Government level, the presences of IT champions are still found at other departments and State level governments. For example, the City of Melbourne has appointed PwC partner Michelle Fitzgerald as Victoria's first-ever chief digital officer.

The Corporations Act 2001 imposes some legal responsibilities upon company directors, secretaries and "officers" which is broadly defined to cover COOs, CTOs, CIOs and Information Systems Managers. These requirements suggest, as a director or officer, an obligation to uphold due care and diligence.

4.6 E-Government Promotion [EPRO]

The digital interactions between Australian government with various stakeholders such as citizens, businesses, employees and other governments have been increased through the years. This is the result of the government's continuous efforts to develop and promote digital government. As stated in the Digital First, the Australian Government aims to digitalized end-to-end government transactions by 2017.

4.7 E-Government Participation [EPAR]

With well-established e-Government channels, the rate of interacting with the government has been increased: two-thirds of Australian using e-Government services for their most recent contact (AGIMO, 2011). Australia national portal offers an excellent platform to encourage the citizens to take part in various activities and discussions with the government. Consultation processes supported by a diversity of technologies allow people and communities to be actively involved in designing and developing policy and services.

4.8 Open Government Data [OGD]

After joining the Open Government Partnership on 2013, on 11th April 2016, the Australian Government held the co-creation workshop to develop its first National Action Plan (NAP) for Open Government. Stakeholders from civil society and Government were invited to consult and suggest on the draft of the plan. Around 210 actions were grouped into 18 proposals which were then prioritized by participants and turned into 14 commitment templates.

As of May 2016, the Australian Government's data site data.gov.au includes 8000 datasets from the Australian Government and state and territory governments. This initiative was created under Government's Declaration of Open Government and as a response to the Government 2.0 Taskforce Report.

The data.gov.au and NationalMap platforms host more than 28,000 and 10,000 datasets respectively. In August 2017, approximately 52,000 users visited data.gov.au, and 12,000 users visited the NationalMap.

4.9 Cyber Security [CYB]

Cybersecurity is one of Australia's national security priorities. A new long-awaited national cybersecurity policy was released in mid-2016, establishing five themes of action for Australian Government until 2020: A national cyber partnership; strong cyber defense; global responsibility and influence; growth and innovation; and a cyber-smart nation.

In terms of cybersecurity government entities, Australian Government aims to strengthen its leading role on cybersecurity policy by establishing a new position in the Cabinet: The Prime Minister's Special Adviser on Cyber Security. The national Computer Emergency Response Team (CERT) Australia works in collaborating with over 500

businesses and advises on cybersecurity threats to the owners and operators of Australia's critical infrastructure. The Australian Cyber Security Centre, established in 2014, gathers cyber security capabilities across the Australian Government to enable collaborating and sharing threat information.

Effective cybersecurity, robust risk controls, and strong information management are central to maintaining the confidence and trust of our customers. From individual transactions to critical information sharing across agencies, a robust framework for managing information security and cyber risks is a pre-requisite for any modern digital government.

4.10 The use of Emerging ICT [EMG]

Regarding Big Data, The Australian Public Service Big Data Strategy was developed by the Ministry of Finance and endorsed by the Secretaries' ICT Governance Board to provide a whole-of-government (WofG) approach to big data. In parallel, The WofG Data Analytics Centre of Excellence (CoE) was established by the Australian Taxation Office as a place to build analytics capability across government.

5 Some Highlights

Australia has quickly become one of the leading innovators in this area. The addition of the Digital Transformation Agency this past year was one significant addition in the past year, and it appears to be primed to continue to compete with other top governments in the coming years. Australia is also a leader in e-Participation, and its mandatory voting policy provides an impetus for the government to ensure that it is simple and easy for each citizen to participate fully in the democratic process.

In order to improve the transition digital to 2025, The Digital Transformation Agency (DTA) focus on four strategic priorities:

- Delivery of a Digital Transformation Strategy and Roadmap, looking out to 2025.

- A program of digital capability improvement, including sourcing reform.

- Delivery of whole-of-government digital platforms such as Digital Identity, Notifications, Tell us Once and improvements to myGov.

- Delivery of investment advice, an assurance policy and framework, and whole-of-government portfolio oversight on ICT and digital investments.

Austria

1 General Information

Area: 83,871 km2

Population: 8,711,770

Government Type: Federal Parliamentary Republic

GDP: $47,900

Internet Users: 84.3

Wire (Fixed) Broadband Users: 29.4

Wireless Broadband Users: 88.3
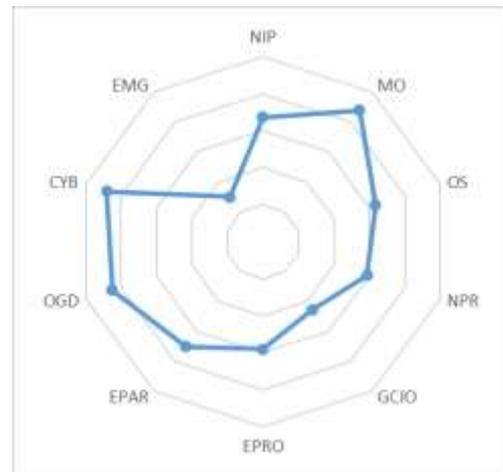
2 Positioning in a Global Organization and a Region

Among OECD Countries, all indicators except the Use of Emerging Technologies for Government (EMG) indicator are above or same with the average score of OECD members. Amongst European countries, Austria is placed below Denmark, the best country in the European region.
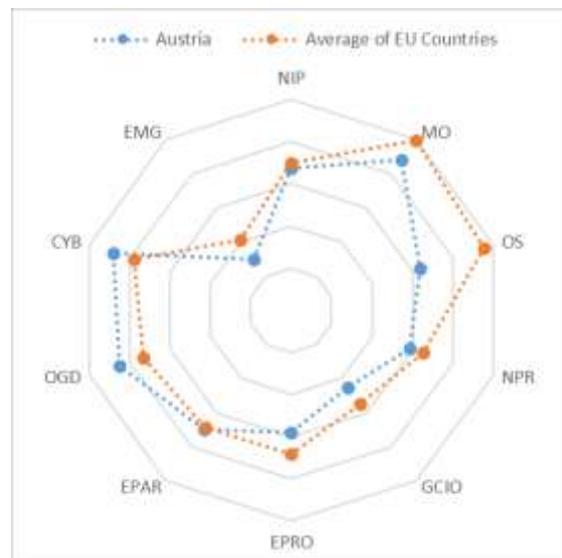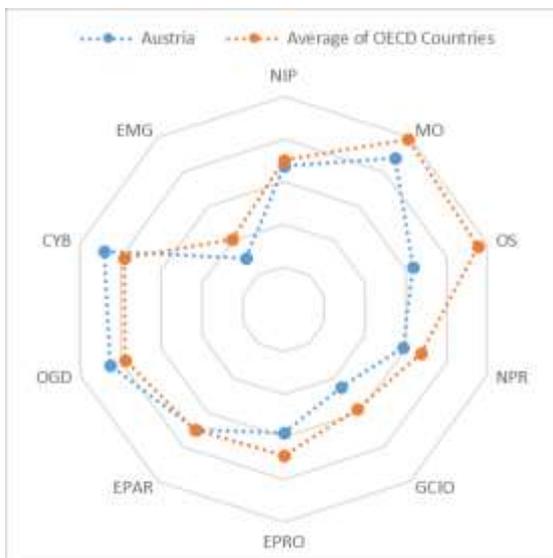
3 Digital Government Development

The Austrian Federal Government has been committed to the implementation and improvement of public services, with the main point concerning the provision to every citizen with access to all forms of eGovernment services to bridge the digital divide. The chairmanship of the Austrian D-Government platform is owned by the Federal Chancellor and involves all the various levels of the government and the business sector. All the D-Government projects and agenda in Austria are coordinated by an inter-administrative platform created in 2005 called "Platform Digital Austria" founded by the Federal Chancellery and directed by the Federal CIO and involves the cooperation of all the

administrative levels of the Country (Federal Government, Provinces, Municipalities and Communities) on standardized government strategy and practice.

The principles of the cooperation in the D-Government field are stated in the "e-Government Vision 2020", a document providing the mission and strategic principles of the D-Government that will be carried out until 2020. The guidelines provided by Vision 2020 are important to achieve the objectives stated in the "E-Government Action Plan 2011-2015" regarding online public services, the focus is on the development of specific areas such as comfort, reliability, security, etc.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

The network infrastructure is necessary for Digital Government implementation and effectiveness. Austria has a competitive telecommunication market with the high diffusion of fixed and mobile services at moderate prices. The percentage of internet users in 2017 reported by STAT (Statistic Austria), an independent and non-profit-making federal institution, is around 87.9%. Austria has the most affordable high-speed internet access and mobile-broadband prices 71% of all households are supplied with fixed high-speed connections (cable, optical fiber etc.) while the 63% of the population make use of mobile broadband connections (UMTS, 4G/LTE, etc.).

4.2 Management Optimization [MO]

The Austrian eGovernment strategy serves as guidelines for the enforcement of electronic services and the creation of a robust infrastructure. Both development and fruition of online public services are one of the exigences of the Austrian Federal Government for digitalization; the primary objective is to ensure every citizen in the community the access to all forms of eGovernment at the federal, provincial and local levels, and secure a secure communication between the parties. All the levels of government work together, from the smallest local authority up to federal ministries, to achieve efficiency in the administrative procedures; the platform Digital Austria is a tool created to ensure the communication and coordination of the government levels which enabled the platform members to develop a successful D-Government cooperation plan and guidelines for future steps contained in the document "Vision 2020".

The Federal Government has also created a Digital Roadmap with the help of experts and other organization, which is the foundation of all further coordinated activities, it provides an overview of the current challenges, existing measures, and works.

4.3 Online Service [OS]

Austrian Government provide a wide variety of online services, the leading five considered to get a full vision on the progress of the D-Government are respectively e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service. All these services allow citizens to fill out and submit all kind of applications 24 hours a day through natural electronic forms present in the webpage of the service they are willing to use; this enables civilian to save time and eliminate unnecessary formalities. However, the Government is continually evolving to provide a better service and other types of online forms in the future. All the online services websites are equipped with security measures such as SSL (Secure Sockets Layer) to ensure that all the data passing between the server and browser remain private, authentication and security password. The One-Stop service concept consists of the interconnection between all public authorities so that the citizens can access public services by a single point even if different authorities provide the services.

This service in Austria has still a window for improvement compared to the other offered, but they are trying to expand the one-stop processes and also work on no-stop processes. In regard to the level of convenience, overall the access to the portals is fast and intuitive. Moreover, the screen width adapts depending on the device used.

4.4   National Portal [NPR]

Austrian National portal "HELP" (HELP.gv.at) offers the necessary information to live in Austria in two languages (German and English). The page offers a series of links to other governmental websites regarding different topics and with their related online services such as tax declaration, car registration, police declaration, certificates, etc.

The portal constitutes communication window between governmental agencies and citizens and the information are easily provided through a user-friendly interface that is fast, intuitive and comfortable to the users. Moreover, some of the governmental portals also provide a news section and newsletter for citizens while there is no use of the blog feature.

4.5   Government CIO [GCIO]

The Federal Government appoints the Federal CIO (Chief Information Officer) and his role is to coordinate all the activities regarding the field of information and communication technologies which pertain to different ministries; in fact, the CIO is the Chair of the platform "Digital Austria" which coordinates all the governmental levels in terms of D-Government solutions. Reinhard Posch currently covers the position of CIO since 2001; he is specialized in "Applied Information Processing and Communications Technology" and committed to the promotion of the Digital Government internationally and in Europe; he also takes part in groups of the European Commission that deal with ICT and security strategies.

4.6   Digital Government Promotion [EPRO]

Austria has implemented laws and regulations to promote the use of D-Government, the act called "eGovernment Act" entered into force in 2008 and had been updated with various amendments in 2010. It is fundamental to regulate D-Government services and the cooperation between the governmental agencies providing e-services to enhance joint work.

Another essential act for promotion is the "General Administrative Procedures Act" which identifies the ways authorities and civilian can establish contact online (emails, web forms, etc.).

4.7   E-Participation [EPAR]

The e-participation in Austria is growing during the years, as reported by the OECD in "OECD Digital Economy Outlook 2017", 60% of the population in Austria is making use of D-Government portal while almost the 40% use the governmental services to send filled forms.

Austria has a suitable ground for e-participation growth and the friendly and intuitive online environment incentivize individual to make use of the services offered. However, there is still a window for improvement in the design, accessibility, and content of the websites.

4.8 Open Government Data [OGD]

Austria has an Open Government Data portal which provides a catalogue on the data availability of the Federal Government, and it is possible for participating organization to enter meta-data themselves; In 2016 more than 21,000 data records were published and many were the contributing organizations.

The Federal Chancellery is making efforts to promote open data, in fact, in 2012 organized the "apps4austria" competition to develop open data of the public administration in a way understandable to users and in 2016 promoted the "Open4data Challenge" along with other organizations to address the topic of open data for citizens and make the data available in a creative way.

4.9 Cyber Security [CYB]

The "ICT Security Portal" is an inter-ministerial web portal dedicated to cyber security which promotes the strengthening of ICT safety and enables the exchange of information and concern regarding online security. Along with the security portal the Austrian Government developed a strategy regarding the issue of cybersecurity that is illustrated in "the Austrian Cyber Security Strategy"; it creates the ground for cooperation at the state level in the field of cybersecurity and focus on the concept of protecting cyberspace and people in the virtual environment, it will improve the security and strength of Austrian infrastructures and create awareness on the issue.

4.10 The use of Emerging ICT [EMG]

To measure the commitment of the governments in the use of emerging technologies three main indicators have been taken into consideration which is respectively: Cloud Computing, Big Data, and IoT. The platform Digital Austria published in 2012 a position paper on the use of cloud computing for governmental services, and the country is now shifting, with the help of BRZ (Austrian Federal Computing Center), to a cloud computing architecture to improve the ease of operation. Regarding Big Data the Austrian Government considers a useful tool to improve the existing services and infrastructure and create new services for the citizenry.

5 Some Highlights

Overall the Austrian D-Government is one of the most efficient and developed in Europe with a reliable infrastructure and a well-developed interconnection between the different governmental levels. The Federal Agencies are committed in the acquisition of the emerging ICT to improve the services offered to their citizen as well as on the issue of cybersecurity to protect private personal information in the cyberspace.

The platform Digital Austria, indeed, is one of the main reason of Austria success in the D-Government development and its vanguard in the D-Government sector at European level, position also remarked in the "13th eGovernment Benchmark" publication.

However, there are still some windows for improvement in the services offered by the Digital Government such as the provision of more information material, official documents and guidelines in English for the immigrants living in Austria and the one-stop service which still has a lower score in comparison to another kind of services.

Bahrain

1 General Information

Area: 760 km^2

Population: 1,378,904

Government Type: Constitutional Monarchy

GDP: $ 50,300

Internet User: 98%

Wired (Fixed Broadband User): 16.8

Wireless Broadband User: 162.1

2 Positioning in a Global Organization and a Region
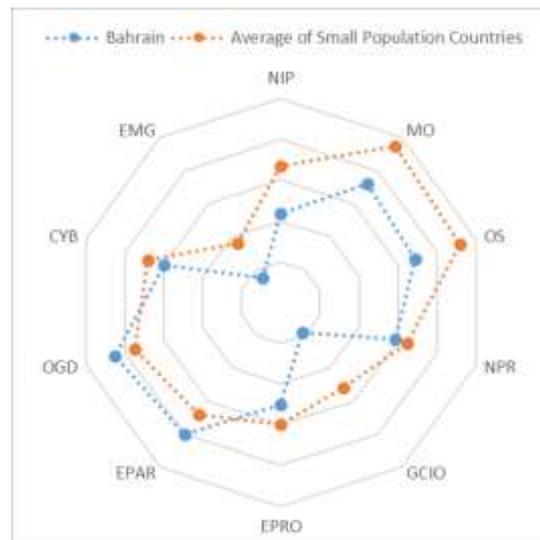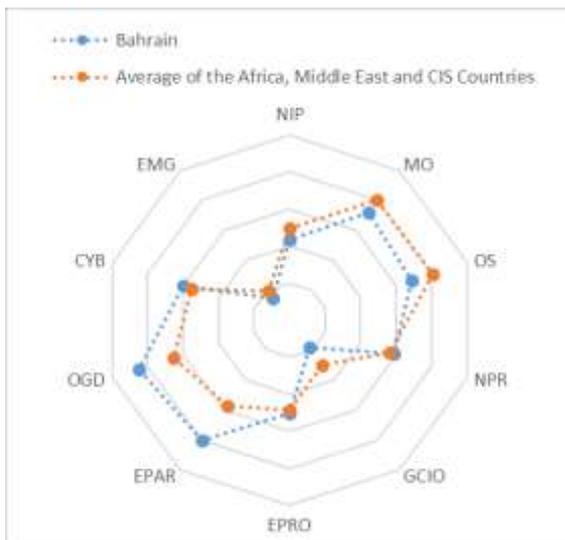
Among GCC Countries, Bahrain has a better score than the average score of GCC Countries in necessary infrastructure, National Portal, Open Government Data, and Cyber Security. As shown in the above picture, Bahrain is very low on the e-Government Promotion indicator. Furthermore, the lack of e-Government Promotion in Bahrain can be considered as one of the reasons for the similar situation on Online Service or even on Management Optimization which is below the average of GCC Countries.

Achievement in some indicators also reflects the position in the Asian region in which Bahrain is considerably approaching Singapore, the best in the Asian region, at the underlying infrastructure and National Portal.

3 Digital Government Development

E-Government development in Bahrain was started in 2009 when the Bahrain delegation attended the first GCC e-Government Conference in Oman. In 2011, the Kingdom of Bahrain launched the new e-Government Strategy 2012-2017. Kingdom of Bahrain develops e-government using CObIT as the reference for ICT Governance. The

policy contains seven elements that represent the objective of the strategy. Picture 1 illustrates the ICT Transformation and Governance Framework of the Kingdom of Bahrain.

As part of the strategy, 32 government agencies actively participated in an e-Readiness study for the development of e-Government Bahrain. Moreover, the e-Government Authority has identified thirteen initiatives with high priority. These initiatives are the flagship that will enable further development.

These 13 agency programs are Case Management System, Customs and Ports, Education, e-Health, e-Office, e-Procurement, G2B Portal, G2E Portal, National Employee Programme, National Data Set, Real Estate Services, Social Information System, and Tourism Services.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

According to the measuring, the Information Society Report 2017 from International Telecommunication Union (ITU), approximately 98% of people in Bahrain were Internet users in 2016. About 16.8% have fixed-broadband subscriptions, and wired broadband subscription has reached 162.1%.

4.2   Management Optimization [MO]

The Kingdom of Bahrain has launched a New D-Government Strategy, titled "National eGovernment Strategy 2020". Unfortunately, it has not been published on the national portal yet. Based on previous D-Government Strategy, National eGovernment Strategy 2012-2016, the strategy is equipped with several initiative strategies, and its achievement is measured using several Key Performance Indicators (KPIs). Furthermore, Action Plans and Agency Involvement are stated clearly in the old strategy. Bahrain has developed its Enterprise Architecture, which is named "National Enterprise Architecture Framework" (NEAF). In order to streamline the data exchange between government agencies, Kingdom of Bahrain established National Data Center Consolidation (NDCC). Albeit its strong presence in this indicator, Bahrain still lacks the presence of an integrated financial information system.

4.3   Online Service [OS]

In order to calculate the score for Online Service indicator, this report use five critical online services, namely e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and their URL Address. Bahrain lacks the presence of e-Tax system. All of the available services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience.

Among the available Online Service, e-Customs and e-Health have the lowest score, compared to the other online services. In term of complexity level, all of Online Service in Bahrain has reached a transactional in which user can start the transaction from applying to receiving the service through the portal. Regarding the security measures which was measured using indicators namely implementation of SLL, Site Authentication, and Password Protection only e-Procurement and One Stop Service is already implementing all of the three measures. For measuring the level of convenience, the third party application result has shown that only e-Procurement has considerably high access speed. All other accessible online services scored below average, hence made them slow to access. The third party application for assessing the portal is the application from Google named Google PageSpeed™ Insight on

https://developers.google.com/speed/pagespeed/insights. In addition to that, all clickable objects on the portals are working fine.

4.4 National Portal [NPR]

The Kingdom of Bahrain National Portal can be accessed through https://www.bahrain.bh. The scoring system for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. The National Portal contains all much-needed information for all citizens. Information related to Bahrain is widely available on the portal. The user can find information related to culture and heritage, demographic, and government. In the technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is below average from the PC, while it is considered mobile friendly when accessed from Mobile Device. Albeit its strong performance in the indicator, the National Portal is still hardly accessible for people with special needs.

4.5 Government CIO [GCIO]

Kingdom of Bahrain has established a national D-Government Authority, named IGA (Information and e-Government Authority), as a GCIO Office. IGA is the merger of the previously responsible e-Government Authority with Central Informatics Agency. The responsibility of Head of IGA, or previously EGA, is similar to the GCIO. Albeit the presence of formal GCIO in national and some in ministerial levels, the presence of GCIO at the formal level, nor any documentation of the presence is hardly found. In the education front, University of Bahrain is offering Master's course related to GCIO function.

4.6 Digital Government Promotion [EPRO]

D-Government Promotion is the indicator which the Kingdom of Bahrain scores lower compared to the other indicators. Bahrain only uses a form of e-Magazine which is accessible through the National Portal. In the collaboration front, the presence of EGA and collaboration, in the PPP model, with a local bank to produce kiosks in public places is helping Bahrain to gain some points in this indicator. Nonetheless, Bahrain still needs to improve their efforts in promoting D-Government if Bahrain wants to use the system seamlessly.

4.7 E-Participation [EPAR]

Considering the monarchy system which is implemented by Bahrain, Bahrain performed strongly in this indicator. Bahrain head of state, which is a King, has his own and royal family website which is accessible through http://houseofkhalifa.com. In order to gain citizen's expressions, Bahrain uses two methods, pooling through https://www.bahrain.bh and Tawasul Program through http://services.bahrain.bh.

4.8 Open Government Data [OGD]

The Kingdom of Bahrain performs actively in this area even though the absence of Law which stipulate the Freedom of Information. Bahrain has set up Central Informatics Office (CIO) and appointed them as the responsible entity to establish and manage Bahrain open data initiative, which could be accessed through https://www.data.gov.bh. CIO includes a regular submission of information for the portal as a KPI in each of government agency in order to avoid the risk of irrelevant and not-up- to-date data.

4.9   Cyber Security [CYB]

Bahrain has ratified several laws related to cybersecurity. Some of them are as follow:

- Cyber Crime Law No. 60/2014

- Data Protection Act 1998

- Law No. 16 of 2014 concerning Protection of State Information and Documents

- Regulation 9 of 2009 concerning Lawful Access

- Cyber Crime Law No. 60/2014

- Law No. 28/2002 about Electronic Transaction

- Law No.(34) of 2017 concerning amending certain provisions of legislative decree No.28 of 2002 concerning electronic transactions

- Law No. 2 of 2017 for Ratifying the Arab Agreement in Combating IT Crimes

- Resolution No (5) of 2017

In addition to the above-mentioned laws, Bahrain has established The General Directorate of Information Security, a general directorate in CIO. The general directorate responsibility is including implementing a national cybersecurity strategy, policy, and roadmap. In addition to that, Bahrain has created Bahrain CERT for monitoring and solving Internet Security problems.

4.10   The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). Bahrain has attempted to implement Cloud Computing for Public Sector. Some provisional programs have been launched such as the National Gateway Interface, National Authentication Framework, and Project Management Toolkit for governmental entities, and National Payment Aggregator.

5   Some Highlights

Among the indicators used to measure the D-Government level of Kingdom of Bahrain, the National Portal, E-Participation, and the Management Optimization scored as the highest score based on this study. This indicates the importance of Governmental support and action plan in achieving full D- Government capability.

Albeit it is low score on D-Government Promotion, Bahrain Government is already built an adequate infrastructure needed by its citizen. D-Government Promotion is essential in the sense that it is an effort connecting the citizen to the services the lack of such promotion could make the infrastructure built by the government as a futile attempt. Bahrain also scores quite low in the use of emerging ICT. Albeit Bahrain initiative to build a cloud computing infrastructure, lack of effort on the other fronts, namely Big Data utilization and IoT makes Bahrain left in a lurch for emerging ICT usage.

Belgium

1   General Information

Area: 30,528 km^2

Population: 11,323,973

Government Type: Federal constitutional monarchy

GDP: $44,100 (2015)

Internet User: 81.5

Wired (Fixed Broadband User): 38

Wireless Broadband User: 66.7
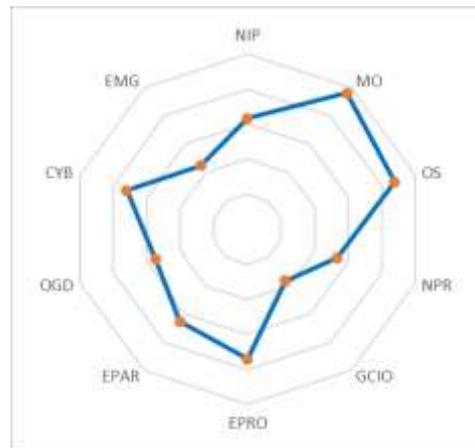
2   Positioning in a Global Organization and a Region
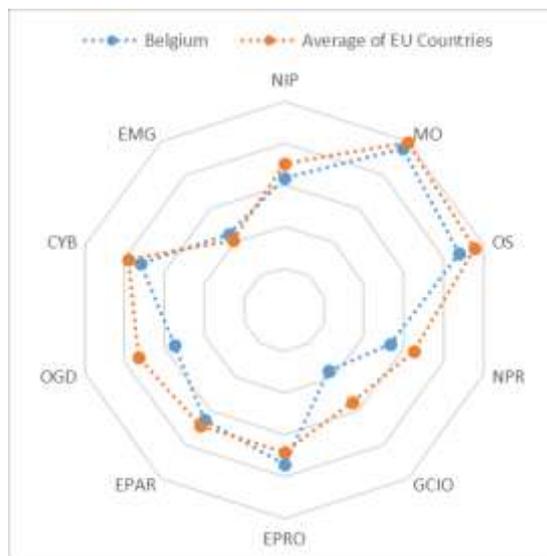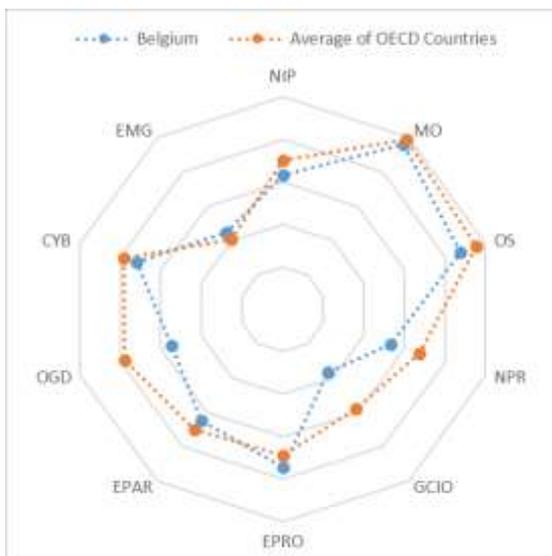
3   Digital Government Development

Although in the past the Belgian government had lagged in providing online public services, it is catching up with online services such as tax filings and medical report on the national portal website. The Belgian government is also updating its electronic procurement structure so public tenders can now be submitted online. It is expecting to launch soon its completed online-procurement system for purchasing goods from approved suppliers. Now a citizen can manage all personal information online by using the national portal and the G-cloud provided by the federal government.

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

Belgium has well-developed ICT infrastructure, for the Internet connection it's ranking among the top countries in the world regarding a total number of Internet users, fixed broadband users, mobile broadband users, and Internet hosts. The Belgian ICT market is mature and sophisticated, yet open, innovative and highly competitive. According to the ITU, Internet Usage Statistics in Belgium is about 81.5% penetration.

The number of broadband connection in the household is about 88% while the number connection in enterprises is 97%.

4.2   Management Optimization [MO]

The governmental structure in Belgium contains three layers. The top layer is the Federal State, the Communities, and the Regions. They are equal in law and rule different part of the country separately. The second layer consists of all provinces, which are under the jurisdiction of the Federal State, the Communities and the Regions. On the third layer, the communes connect people and authorities in the upper layers. The structure has not changed in the past year.

4.3   Online Service [OS]

Like other developed countries in Europe, e-Government services in Belgium are divided into e-Government for citizens and e-Government for businesses. The e-Services for citizens are focused on health care, social security service, and education. E-Services in Belgium are provided through one-stop services (portal). Belgium has more developed systems considering that they now have 20 essential public services, but in this ranking, Waseda focuses on 5 groups of services, which are e-tax, e-customs, e-health, e-procurement, and one-stop services.

E-procurement (https://enot.publicprocurement.be) was introduced in 2008; the Belgian public procurement portal provides links to portals and platforms which currently cover three of the main aspects of the procurement process, namely, e-Notification, e-Tendering, e-Awarding, and e-Catalogue. It is available in English, French, Dutch, and German.

Now, Belgian citizens can manage their records of identification, tax report, pension plan, unemployment benefit, and medical history online via www.belgium.be. One can also reach to all federal public service departments online. All services are provided in both French and Dutch.

4.4   National Portal [NPR]

The federal portal (www.belgium.be) was introduced in 2002. A new version of the portal was released in 2008. This portal is one-stop services for all citizens and businesses. The information in the federal portal is introduced by Dutch, English, French, and German. The design of the portal is user-friendly and easy to use. A significant section of the new portal links to all the available public services online. Users looking for a specific service can refine their search by theme, target group and level of Government involved. Several of these e-Services are secured and require authentication.

The portal shows up much information on Justice, healthcare, mobility, environment, economy, tax, education, and social services. From this portal, guests can know overview Belgium information. It is available in four languages, and it has a link to typical social media such as Facebook, and Twister, through this portal, we can access to all government agencies, ministries, and others Belgian departments.

There is not much change in the national portal www.belgium.be in the last year. The website consists of contents classified by five geological regions and topics including the economy, employment, environment, family, taxation, law and justice, health, and mobility. The information is provided in both French and Dutch.

4.5   Government CIO [GCIO]

There is no change in this indicator compares the ranking last year. There is no specific law or mandate in Belgium creating the CIO position in the government. In Belgium, the Waseda ranking found the CIONET. It is a network of CIOs, CTOs and IT managers with offices in many European countries.

The CIO Forum is a part of a passionate community, but it only related to Belgian business, not government section. The CIO forum is created to organize networking events and provide an interactive social platform to bring IT professionals together in an open and trustworthy community in Belgium.

Belgium government provides the national portal www.belgium.be for citizens to manage their family, justice, mobility, health, environment, housing, employment, tax, education, and economy record.

4.6   Digital Government Promotion [EPRO]

During one year of evaluation, there is not much information relates to e-Government activities even Belgium is divided into Federal government and three regions. In the Flanders region, they created Flanders Information Agency in 2015. It promotes the use the use of open data standards by public administrations in the Flemish region by aligning the existing and future business processes involving open data with European linked open data standards, and with advances foreseen in the use of these standards.

The Belgian government is encouraging people and companies to manage their information via the national portal. However, besides the national portal itself, there is not much promotion in other channels.

4.7   E-Participation [EPAR]

The Federal Government of ICT set a strong focus and increased efforts on e-participation and e-Inclusion plans. Recently, the utilization of Social Networking Services (SNS) promoted the participation of citizens in providing feedback to the government and reception of government information efficiently through Social Media such as Facebook and Twitter. ICT policy and e-Inclusion policy in Belgium is in no small extent demand and sector-driven. This is partially explained by the institutional arrangements that govern the country. In social affairs, many institutional channels exist through which social organizations and pressure groups can express their concerns.

Same as other nations in the EU, Belgium has an even and vibrant participation on e-democracy. Since 2012, the tool named Smartmatic is used in Belgian provincial and municipal elections. In recent years, there have been videos on YouTube helping people cast their votes.

4.8   Open Government Data [OGD]

The federal government departments and institutions made open data available on "Data.gov.be", in October in 2008. This portal enables all government bodies to make available their data to citizens and businesses by using the information provided. For the first time, Data.gov.be went from only 60 datasets to more than 4900 datasets. The datasets cover many fields, including Agriculture and Fisheries, Culture and Sports, Economy and Finance, Education, Energy, Environment, Health, International, Justice, Population, Public sector, Regional, Science and Technology, and Transport.

Most of the datasets are free, each federal department or federal government institution itself determines the terms and conditions governing access to and use of the data. The datasets are also divided into three languages, English, Dutch, and French.

Each year, the Belgian federal government publishes dozens of brochures, folders, and reports on topics including government officials, laws, and both online and offline securities issues. These reports are available in French and Dutch. Besides, all governmental decisions and movements are also announced on the national portal www.belgium.be. One can easily reach to any federal public services in Belgium online.

4.9 Cyber Security [CYB]

Cybersecurity is highly emphasized in Belgium. Around ten Belgian institutions offer bachelor or master education program on cybersecurity in English, Dutch or French.

The Belgian government has adopted the Cyber Security Strategy in 2012 and published A Strategy for Defense in 2014. The Centre for Cybersecurity Belgium (CCB) was created by Royal Decree of 10 October 2014 for a national Cyber Security policy and to encourage all relevant Belgian governmental departments to make an adequate and integrated contribution. Thanks to it, now individuals and organizations can learn about cybersecurity via the cyber guide. In the past, two in three companies do not report on cybersecurity in their annual report. Now more than half companies have preventive measures for cybersecurity risks.

Since the General Data Protection Regulation (GDPR), the new European law on data protection will come into force in 2018, Belgium is encouraging small and medium organizations to prepare and take the GDPR checkup to protect users' data.

4.10 The use of Emerging ICT [EMG]

Since 2015, the G-Cloud was released as the public social cloud, which is provided and managed by federal organizations and social security systems. Private companies are also welcomed to use it for better national development. The G-Cloud has won the eGov Awards in 2016.

5 Some Highlights

Smart cities are one of the highlights of Belgium Digital Government development. Six dimensions including smart environment, smart governance, smart living, and smart mobility are leading the two hundred projects of smart cities in Belgium, among which public authorities promote eighty percent. Now eleven municipalities have a concrete smart city strategy. As one of the cities with the best digital facilities, Brussels has adopted the city play program since 2016. Now citizens in Brussels can reach to any screen in the street for information including weather, traffic, etc.

Brazil

1   General Information

Area: 8,515,770 km^2

Population: 204,259,812

Government Type: Federal presidential republic

GDP: $15,800

Internet User: 59.7

Wired (Fixed Broadband User): 13

Wireless Broadband User: 89.5

2   Positioning in a Global Organization and a Region
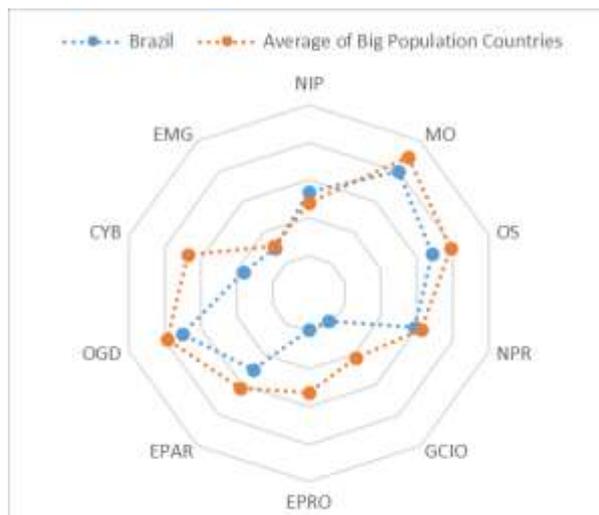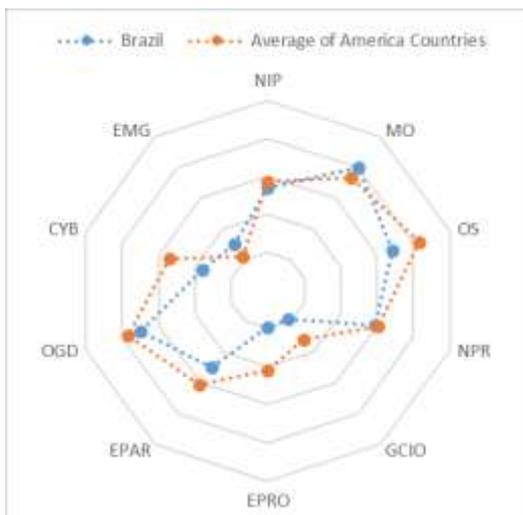
3   Digital Government Development

Brazil Digital Government progress has been developed swiftly in the 1990s within three different levels: the federal, state and municipal government. Brazil has a long history of E-government development. The first E-government project in Brazil was E-Brazil project which started from the 33rd National Seminar on Public Informatics. In recent years, the Brazil government emphasizes developing three specific topic field on transporting from E-Government to Digital Government (1) Focusing on strengthening governance and institutional frameworks. (2) Increasing the institutional capabilities on carrying out and usability of digital government strategies. (3) Fostering service delivery capacity and openness.

The most difficult issues for Brazil in developing Digital Government is how to provide better and efficient service to the public. It is hard to give the opportunity to citizens to access government information and to participate in some political,

administrative decisions. Due to this issues, the Brazil government is trying to run a program of the electric system to encourage more people using E&D government service.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

The ICT in Brazil grows swiftly. The government is trying to improve the network services and infrastructure since the 1990s. Thanks to the economic opening up process, until now, more than 59% of the population use the internet. The number of fixed-broadband subscriptions in 13 per 100 inhabitants and the number of active mobile broadband subscription is 89.5 per 100 inhabitants. On the other hand, more and more people start to use the smartphone and computer, especially in the Brasilia area.

4.2 Management Optimization [MO]

Brazil has worked on developing management optimization for many years. Due to the lack of knowledge and technology on management optimization, the progress of developing management optimization is plodding. According to Digital Government strategy for the period 2016-2019. The document defines 10 Strategic objectives in many areas such as access to information, services, and social participation. At 2017, the Brazil government has made some progress on access to information and services. For example, more public websites have been established, and people can access information much more comfortable than before. On the other hand, the government has built more public facilities with better and more efficient services.

4.3 Online Service [OS]

The Waseda University considers 5 services for every country: e-procurement, e-tax, e- customs, one-stop service, and e-health. The Brazil government has established a dedicated website for information and services related to D-Government and open data (http:// www.governoeletronico.gov.br). This website provides many services include lots of government

Information, public database, e-tax and customs, some one-stop service and E-procurement. Some websites are beneficial with a high evaluation. For example, the E-procurement had a high score via evaluation. The one-stop service site is also a prominent national portal for the population. However, the slow developing on e-health and e-health service is one of the issues. During 2017, the Brazilian government opened a 60.4 mn-real tender for a public cloud platform which will support e-government for bodies within the federal administration. The tender is for a solution in the software-as-a-service (SaaS) model.

4.4 National Portal [NPR]

The National Portal is a one-stop service website (http://www.brasil.gov.br) which was established in 2013 as an essential website to provide citizens access to public information. This website increases public participation on services and the internet. The website itself is compelling. It shows lots of information such as governmental activities news, latest economic information, legislation, and Digital Government services for business and citizens.

On the other hand, the website provides E-electric system for election. However, the website does not renew that fast. It does not include some necessary information on the country. Also, the website only provides English, it lacks on providing e-services such as passport and visa for the citizen. At 2017, the Brazil government add more feature on e-tax services to the website but doesn't work very well.

4.5　Government CIO [GCIO]

The Brazil government does not include a department with the Government Chief Information Officer [GCIO] position. There is one similar position called Ministry of Planning, Budget and Management perform the quests of CIO in Brazil.

4.6　Digital Government Promotion [EPRO]

The National D-Government Strategy for the period 2016-2019 planned to promote the utilization of ICT in public administration. The Brazil government used legal aspect, survey, supporting, enabling and assessment aspects to evaluate the promotion to Digital Government. The issue is there is very limited information could be found to evaluate these aspects. Because, Brazil has no private entities which could involve at the national level and local government. Furthermore, there has no information could be found on international or PPP and internal collaboration involved.

4.7　E-Participation [EPAR]

The Brazil government improved their provision of information through SNS and online services for many years. Citizen now can access information on government structure, legislation, officials and budgets. On the other hand, Citizen can also send messages to the local government and the federal government via the official website.

4.8　Open Government Data [OGD]

The Brazil government has already opened an open data site (http://dados.gov.br/). It provides public access to the database from public agencies. It is also a tool which provided by the government to everyone so people can find and use the data. The website is organized but straightforward, easy to access, use and find information. The goal of this website is improving society.

4.9　Cyber Security [CYB]

The cybersecurity is one of the most essential issues in Brazil. Since 2000 the Brazilian government put more effort into cybersecurity and especially after 2010, the government strengthens the cybersecurity for the Olympic game. The cyber threats are increasing because of fast development on internet usage. In 2017, Brazil has several meeting on cybersecurity and ensure they government will spend more money and human resources for building better cybersecurity. One interesting point is the creation of "HackerLab", a place where volunteer coders can use their capacity to visualize legislative data in ways that are appealing for the public.

4.10　The use of Emerging ICT [EMG]

Although the usage of internet and IoT rise a lot in recent years. The use of emerging ICT is still fresh in concept with low usage. The low usage caused by lack of knowledge, shortage of applications and traditional personality. The government are encouraging private providers to design more applications and now using more cloud computing services.

5　Some Highlights

One significant highlights from 2018 is the creation of "E-Democracia". The government is encouraging people to use Digital Government for election. On the other hand, the Brazil government hope people can do more online surveys to provide opinions on administrative work and issues. The creation of "HackerLab" give volunteer coders chance to use their skills to visualize legislative data in ways that are appealing to the public.

Brunei Darussalam

1   General Information

Area: 5,765 km^2

Population: 436,620

Government Type: Absolute Monarchy (Sultanate)

GDP: $79,70010

Internet Users: 75

Wired (Fixed Broadband Users): 8.3

Wireless Broadband Users: 116.6

2   Positioning in a Global Organization and a Region
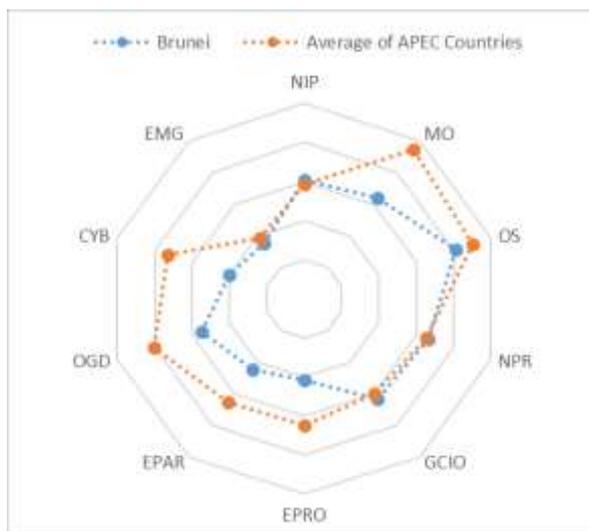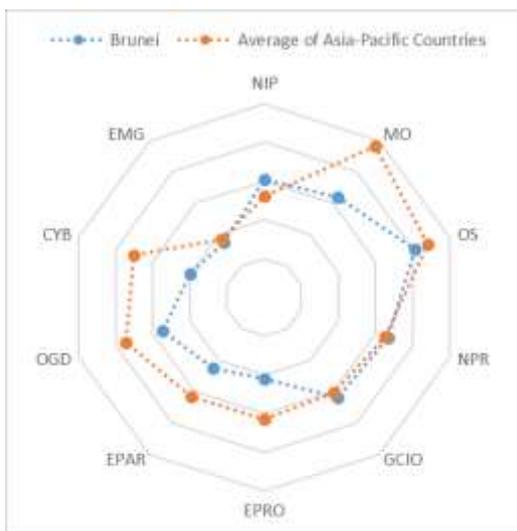
Among ASEAN Countries, Brunei has a better score than the average score of APEC in the National Portal and the use of the Emerging ICT. As shown on the above picture, Brunei is very low on the e-Participation, e-Government Promotion, and Network Infrastructure. Considering that Brunei is a rich small country similar to Singapore, its lack of necessary infrastructure is questioning. The government type of Brunei, which is an absolute monarchy, may contribute to the low score on e-Participation and e-Government Promotion. The positioning of Brunei in ASEAN countries is similar to its position in Asian countries.

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[10] https://www.cia.gov/library/publications/the-world-factbook/rankorder/2147rank.html

3   Digital Government Development

Digital Government in Brunei is formally led by e-Government National Center (EGNC). EGNC provide both government institutions and government officers with

Source: Brunei e-Government Center

https://www.brunei.gov.bn/en/Pages/unused/About-e-

various services. EGNC offers One Government Network and One Government Cloud to government institutions to reducing their capital expenditure on ICT infrastructure. For government officers, EGNC provides ONEPASS, a secure Digital Identity, for gaining the benefit of online collaboration among government officers.
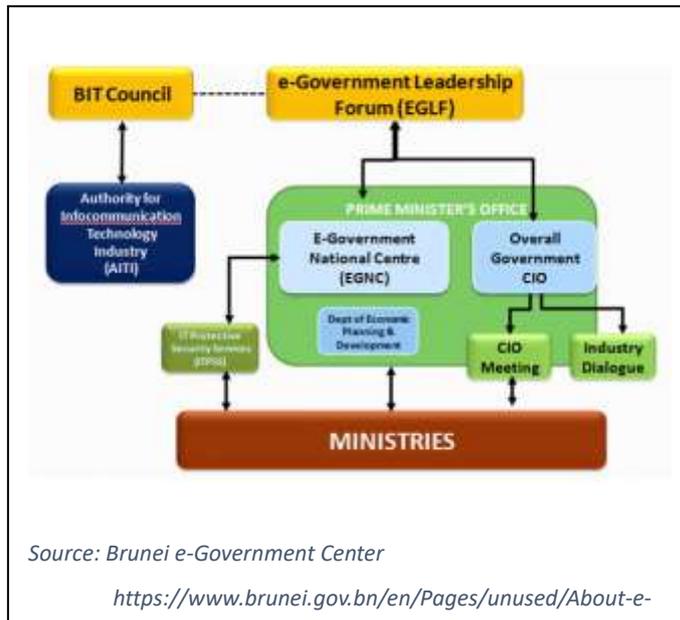
Government CIO is distinguished as the critical factor of leadership in e-government development. Brunei government established the e-Government Leadership Forum (EGLF) to strengthen the

leadership in the area of e-government development. Deputy Minister at the Prime Minister's Office chaired the forum to expose the strong commitment to e-Government development. This is the highest body for approving and monitoring the progress of e-government development. All CIO in government institutions are involved in the forum. The Co-Deputy Chairman from the Prime Minister's Office appointed as the Overall e-Government Chief Information Officer (Government CIO).

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

Approximately 75% of people in Brunei were Internet users in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). About 8.3% have fixed-broadband subscriptions, and the penetration of Wireless Broadband Users is 116 %.

4.2   Management Optimization [MO]

In 2014, Brunei launched the Digital Government Strategy 2015-2020. The ultimate goal of this strategy is the Digital Government. Six pillars embody the Digital Government. These are Service Innovation, Security, Capability & Mindset, Enterprise Information Management, Optimization, and Collaboration & Integration.

To support these pillars, Brunei has developed One Government Network (OGN). The OGN is targeted to provide government agencies and other parties to establish inter-connectivity with other government agencies.

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 its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Among these five Online Service, e-Tax and e-Health is the best Online Service during the period of the survey.

In term of complexity level, most of investigating Online Service in Brunei has reached a transactional in which user can start the transaction from applying to receiving the service through the portal. In contrast, e-Procurement in Brunei is still very simple and less complicated than another online service. Except for the e-Procurement, all Online Service has implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services.

To measure the level of convenience, the third party application result has shown that all portal is above the average in term of speed. The third party application for assessing the portal is the application from Google named Google PageSpeed™ Insight on https://developers.google.com/speed/pagespeed/insights. In addition to that, all clickable objects on the portal work as they should do.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. National Portal of Brunei (https://brunei.gov.bn) contains proper information for local citizens and foreigners. Information about Brunei is available on the portal. The user can find information about culture and heritage, demographic, and government. In technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is above average both from PC and from Mobile Device. The portal also provides the user with some functionalities such as searching, sitemap, and Social Network integration.

4.5 Government CIO [GCIO]

Brunei government established the e-Government Leadership Forum (EGLF) to empower the leadership in the area of e-government development. The Deputy Minister chairs the forum at the Prime Minister's Office. All CIO in government institutions are involved in the forum. The Co-Deputy Chairman from the Prime Minister's Office appointed as the Overall e-Government Chief Information Officer (Government CIO).

There is a quarterly dialog meeting among GCIOs to share the members' experience during the e-Government Program/Projects. The output of the meeting will be discussed in the EGLF. The Permanent Secretary usually chaired the CIO Dialog Meeting.

4.6 E-Government Promotion [EPRO]

There is small trace in Brunei that indicates any initiatives related to promoting e-Government for citizens. Although the Digital Government Strategy includes initiatives to increase the awareness of citizens on e-Government, the program and the activities to support the promotion strategy are hard to find. In addition to that, there is no information whether Brunei regularly evaluated their e-government development or not.

4.7 E-Participation [EPAR]

E-Participation in Brunei is relatively low, compared to other indicators. It is susceptible to the absolute power of Sultanate. Most of the government portal use Twitter and Facebook as the only channel for citizens to give some idea or comment. There is no evidence about how the government proceeds the citizens' comment.

4.8 Open Government Data [OGD]

During the research period, Open Data in Brunei is still at the initial stage. Most of the data are about education and religion-related. Despite the limitation of a variety of dataset, Brunei has appointed EGNC as the responsible institution for Open Data website.

4.9 Cyber Security [CYB]

Brunei has ratified several laws related to cybersecurity. Some of them are as follow:

- Chapter 197 Anti-Terrorism (Financial and Other Measures) Act
- Chapter 194 Computer Misuse Act
- Chapter 153 Official Secrets Act
- Chapter 108 Evidence Act

In addition to these laws, Brunei has strengthened organization capacity for cybercrime countermeasure by setting up National ICT Security Policy Authority and Bru-CERT.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). Brunei has started to implement Cloud Computing for running One Government Private Cloud (OGPC). OGPC offers Infrastructure-as-a-Service (Iaas) for government agencies. E-Government National Center maintains this Cloud Computing Services. Other emerging technologies are still immature and no evidence to prove that Brunei implemented Big Data and IoT.

5 Some Highlights

Among ten indicators in the current ranking, the National Portal and Online Service are the top two indicators in Brunei. National Portal Brunei contains useful information for local and also foreigners such as country information, tourism, and link to available e-services. Online service on Healthcare is one of a vocal point in Brunei in the year 2016 with its slogan "One Patient One Record". Using ID-Card, a citizen can enjoy the Bru-HIMS using PC or using a mobile device.

In this release, Brunei has a low score on e-Government Promotion and e-Participation. It is hard to find any pieces of evidence or traces about the campaign or other initiatives for promoting e-Government Services. E-Participation is considered very low in Brunei. The government system of Brunei may contribute to the implementation of e-Participation.

Canada

1   General Information

Area: 9,984,670 km^2

Population: 35,099,836

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

GDP: $45,900

Internet Users: 89.8

Wired (Fixed Broadband Users): 37.8

Wireless Broadband Users: 66.1
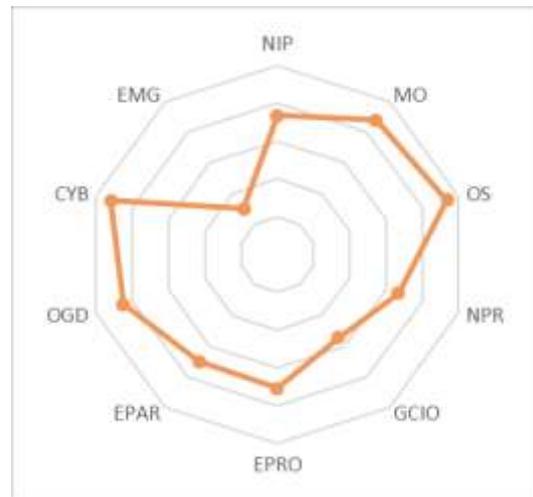
2   Positioning in a Global Organization and a Region

Canada has achieved high performance on all the indicators exceeding the average level of both America economies and OECD countries. The highest scores of the ten indicators are the Open Government Data and Management Optimization and e-Participation, especially full score on the OGD.
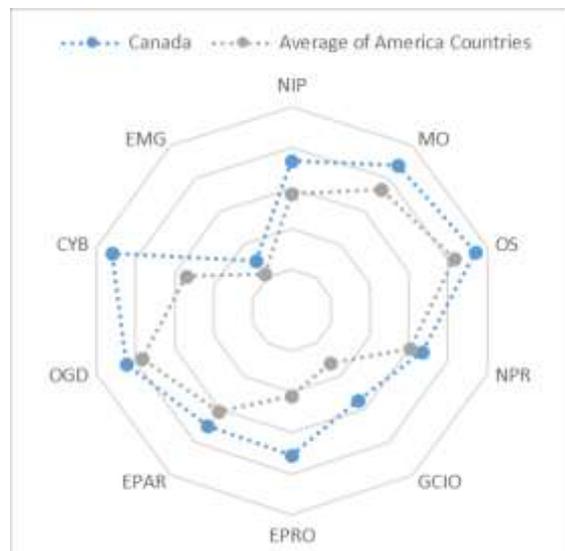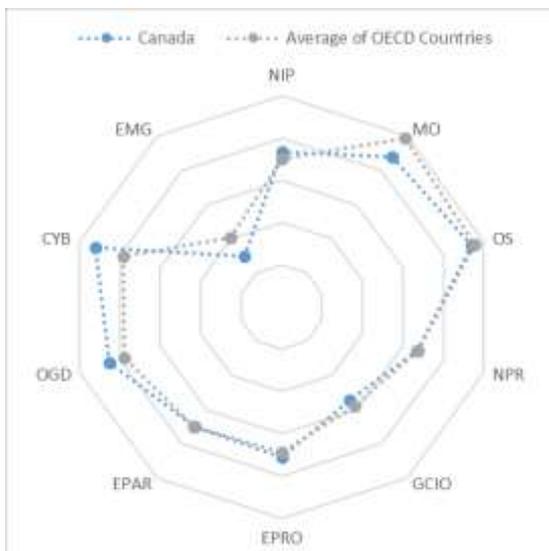
3   Digital Government Development

Digital Canada 150 is the overall ICT strategy for a nation which was launched in 2014. The Digital Canada 150 is aimed to take the full benefit of digital opportunity for Canadian. It is expected that in 2017, in the 150th anniversary of Canada, Canada will thrive the digital Canada which accentuates five pillars; connecting Canadians, protecting Canadians, economic opportunities, digital government, and Canadian content. By releasing the Digital Canada 150, Canadian government endeavors a new challenge for connecting the Canadian, that is shifting e-government to the digital government where the government service is digital by default.

To lead and take control of information management, Canada has set up The Chief Information Officer Branch (CIOB) in the secretariat organization. According to the official explanation, "The Chief Information Officer Branch (CIOB) provides strategic direction and leadership in the pursuit of excellence in information management, information technology, security, privacy and access to information across the Government of Canada. To facilitate this work, CIOB also provides support and guidance on capacity building and project management and oversight."

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

Approximately 89.8% of people in Canada are internet users according to the report released by ITU. 37.8% are fixed-broadband users, and the wireless-broadband users are 66.1%.

4.2   Management Optimization [MO]

In 2014, the Canadian government launched Digital Canada 150. The Digital Canada 150 is aimed to take the full benefit of digital opportunity for Canadian. It is expected that in 2017, in the 150th anniversary of Canada, Canada will thrive the digital Canada which accentuates five pillars; connecting Canadians, protecting Canadians, economic opportunities, digital government, and Canadian content. Canada has created Shared Service Canada for consolidating government back office system to save money, streamline the process, and deliver better services. The initiatives are continuing to support and stimulate the app economy by creating an open data ecosystem in Canada. By releasing the Digital Canada 150, Canadian government endeavors a new challenge for connecting the Canadian. The country will provide the Canadian with the digital government services. In other words, the Canadian government will shift from e-government to digital government where the government service is digital by default.

4.3   Online Service [OS]

Among five investigated online services, e-procurement, e-tax, one-stop-service are better than the rest online service. These four online services provided the citizen the two-way interaction with government, including e-payment, security, and automation. E-Health and E-Customs do not provide two-way interaction so far. Public Works and Government Services Canada manage e-procurement portal of Canada. E-tax system offers various services related to taxation for citizens including business enterprises. Canada Revenue Agency manages it. NETFILE supports the system as an electronic tax-filing system. E-Customs Canada offers the facilities to monitor the process of trading from checking the document to releasing the goods. It is equipped with Customs Automated Data Exchange (CADEX).

4.4   National Portal [NPR]

The national portal of Canada (www.Canada.gc.ca) is integrated with the one-stop service, a gateway to improving the communication experience between the government and the public. The national portal of Canada has the primary interface for stakeholders to contact the government electronically.

Moreover, it provides information that helps the public to understand government structure better. The well-organized portal serves as a platform that assists the public to find desired information. To improve users' browsing experience, the portal also allows users to create government accounts that allow each user to customize the portal as they desire. The website contains accessibility features statement and allows configuration of

the visual presentation by using a client-side Cascading Style Sheet (CSS) file. The portal is available in official languages---English and French. National Portal of Canada have been using Web 2.0 technology and combining SNS features as well as being user-friendly, and the portal have easy-to-use electronic services and services for finding information. Portal can also access via mobile phone also.

4.5   Government CIO [GCIO]

The CIO of the government of Canada is responsible for establishing strategies, directions and policy for the Government in the areas of Information Technology, Information Management, Security, Privacy and Access to Information. This role involves working collaboratively and often in partnership with all Federal Government Departments & Agencies, industry, other Canadian jurisdictions as well as on the international. There has the Chief Information Officer Branch (CIOB) which provides strategic direction and leadership in the pursuit of excellence in information management, information technology, security, privacy and access to information across the Government of Canada. The office also provides support and guidance on capacity building and project management and oversight.

4.6   E-Government Promotion [EPRO]

Canada has been a pioneer in providing access to electronic information, political agendas and cultural/linguistic sensitivities have significantly hindered the implementation of bias-free policies for the dissemination of information and promotion of e-government, so the implementation of e-Government in Canada is an effort of both public and private entities. For example, the Digital Economy in Canada consists of members from the government and private companies. The primary driver of the e-Government promotion is the Government Online (GOL) entity, which is also the supervisor of the IM/IT plans. The responsibility for coordinating the implementation of GOL lies on the Information Technology Services Branch at Public Works and Government Services Canada (PWGSC). The Government of Canada tried to promote Legal Mechanism Enabling Mechanism Support Mechanism, Assessment Mechanism by providing up to date Government announcements, news, contact, services, and daily life information.

4.7   E-Participation [EPAR]

In Canada, e-services online services, online information, and online citizen engagement are organized by category and not on a department-by-department basis, which makes it user-friendly and responsive to citizen demands. In order to gauge the efficacy of their services, the government uses a unique Canadian outcomes analysis approach called 'Citizens First' in the case of individuals and families, and 'Taking Care of Business' in the case of companies, So it enables everyone to use an electronic form of services very quickly. The Government of Canada offers a variety of applications, accounts, tools, and services to allow citizens to complete tasks online.

4.8   Open Government Data [OGD]

Canada's commitment to open government is part of the federal government's efforts to foster greater openness and accountability, to provide Canadians with more opportunities to learn about and participate in government, to drive innovation and economic opportunities for all Canadians and, at the same time, create a more cost-effective, efficient and responsive government. The Government of Canada first launched its Open Government strategy in March 2011, and then further enhanced its commitment

by announcing its intention to join the Open Government Partnership in September 2011. Canada has consulted Canadians on both the development of a Digital Economy Strategy and on Open Government. Canada`s Action Plan on Open Government sets out Canada commitments to Canadians and for the Open Government Partnership, which Canada will achieve over a three-year period through the practical and prudent use of resources. It is structured along the three streams of our Open Government Strategy: Open Information, Open Data, and Open Dialogue. The portal site http://open.canada.ca/ is one of the best practices among the countries.

4.9 Cyber Security [CYB]

Canada has made several regulations and Acts related to Cybersecurity, such as the Personal Information Protection and Electronic Documents Act (PIPEDA). The National Cyber Security Strategy by the Ministry of Public Safety. Canadian researchers have been at the forefront of making cyberspace a reality. This same ingenuity must continue to be applied to predicting, detecting and defeating the cyber threats of tomorrow, and exploiting cyberspace to further Canada's national interests. The cybersecurity strategy will be implemented by the departments and agencies most directly responsible for securing the Government's cyber systems. Canada will work with our provincial and territorial partners, as they are jointly responsible for protecting much of the critical infrastructure in Canada.

4.10 The use of Emerging ICT [EMG]

The government of Canada has regarded the merging ICT as essential elements into its Digital Economy Strategy, discussing how to utilize Cloud Computing and IOT to benefit the citizens and industries. The government has established a shared service provider and put Big Data into their internal agencies practice. However, there has no specific strategy about emerging ICT or regulations so far, proper utilization through policy still needed to be discussed.

5 Some Highlights

Canada has kept its pioneer position among other countries in providing advanced e-services to citizens, which has a splendid one-stop service system endeavoring to embrace all the information and services that citizens or enterprises need at one centralized place. Massive contents have been divided into very understandable and concise catalogs, and users can always go to the destination directly through the humanized introduction. Also, citizens are easier to interact with government agencies due to straightforward communication channels. That is why Canada has excellent performance on the indicators of "Online Service" and "E-participation". As one of the leading nations in e-government area, Canada is still expected to get more scores on the latest indicator for the usage of new technologies, which is to have an efficient model of adopting emerging technologies such as Cloud Computing or IOT for developing countries to learn from in the future.

Chile

1 General Information

Area: 756,102 km^2

Population: 17,508,260

Government Type: Presidential republic

GDP: $23,800

Internet Users: 66%

Wired (Fixed Broadband Users): 16

Wireless Broadband Users: 69
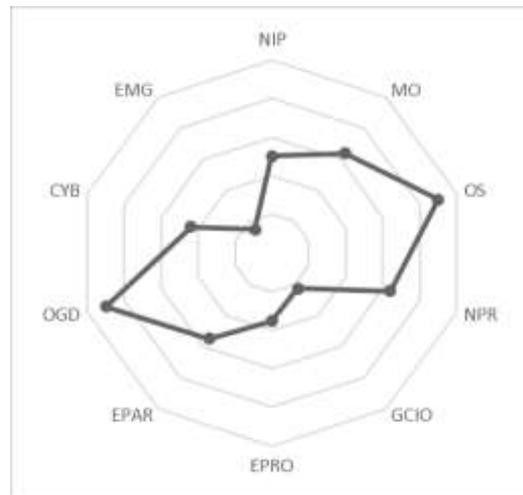
2 Positioning in a Global Organization and a Region
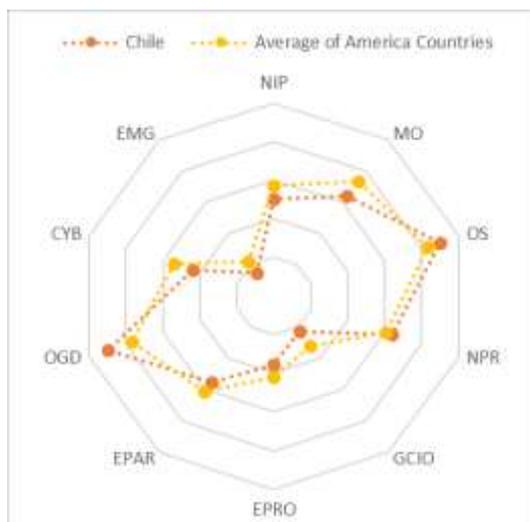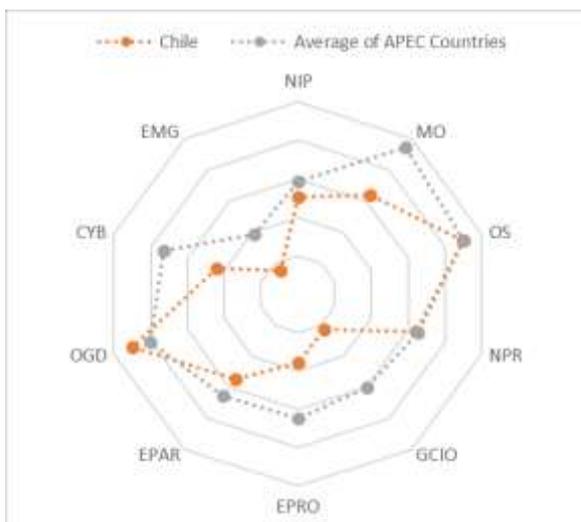
3 Digital Government Development

With the development of information technology, it has been used to improve the services of the government worldwide and let more people enjoy the high-quality information in time. Chile has made many achievements in digital government in the past several decades. Ministry of Transportation and Telecommunication of Chile is now technically regulating the Internet. The situation in details is listed as follows.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

Chile has a relatively high GDP per capita in South America which lays an excellent economic foundation for network development. Chile's broadband penetration is higher than other countries in South and Central America, except Uruguay. People are more likely to use mobile broadband than fixed broadband. It is also a significant trend for the future development. People are easy to accept new technologies. Movistar, an operator, is dominant in the broadband market. It is convenient to use Broadband in Chile since it

is not so expensive as other countries in Latin America and the speed is fast. Chile's mobile penetration has decreased because some subscribers stop using multiple SIM cards. However, it is believed that the mobile penetration rate will rebind in 2018 due to the introduction of LTE networks and more services.

4.2 Management Optimization [MO]

Management is crucial in e-government development. Chile is in a leading position on the Internet in South American countries. Some problems should not be neglected. Chile should complete the policies and make efforts to solve technical problems.

4.3 Online Service [OS]

Nowadays, people can enjoy online services through various websites. Among, one-stop service is popular which means that people can enjoy efficient services in a place rather than wasting time in different institutes. It also avoids some government departments to shirk responsibility. For example, Chile has done an excellent job in e-tax. It is hoped that one-stop services can be applied to more aspects of people's daily life.

4.4 National Portal [NPR]

From the national portal (http://www.gob.cl/), we can see news and documents of the government. The government has opened several social network accounts, including Facebook, Instagram, Twitter, Telegram and YouTube. It has more than one hundred million followers in twitter and less than ten thousand followers on Instagram and YouTube. It is good that the government has opened an information and had many interactions with the public through its official SNS accounts. People can follow them to know the latest activities of the government and give them comments. No all the information is presented in English when choosing the English language. Users can access the websites of other ministries by clicking the links. It just provides people with information but without services.

4.5 Government CIO [GCIO]

It seems that Chile has not participated in any activities related to CIO. Government CIO can apply information technology to public services. It can share information more efficiently and promote the cooperation between different departments significantly. Many developed countries have adopted Government CIO. They have made many achievements in providing better services. Though we have not seen Chile's efforts in Government CIO, it is supposed to make use of this way to improve the government management.

4.6 Digital Government Promotion [EPRO]

An essential document for D-Government is Digital Agenda 2020 which was launched in 2015. According to the Ministry of Presidency, Chile has completed 27 of its 67 Digital Agenda targets for 2020 by 2017, 42.8 percent of the total. It emphasizes the role of the national government rather than the role of the local government. There is an official website called Agenda Digital 2020 which offers related information.

4.7 E-Participation [EPAR]

The E-participation is closely related to the Open Government Data. The government has opened information on its official websites, and it has launched social network accounts which make the interactions between government and the public more

convenient. People can know the plans and activities about the government by checking their cell phones. They can also comment and express their opinions on the internet.

4.8 Open Government Data [OGD]

The public has the right to be informed of the activities of the government. It is crucial in a democratic society. Opening government data can keep the transparency of the government. It provides a chance for the public to participate in the policy-making process. Supervision from the government is also an effective way to fight against corruption. Chile has opened date from two portals. One is http://gobiernoabierto.gob.cl, and the other one is http://datos.gob.cl/. It has also published Chile Open Government Action Plan 2016-2018 which focused on ensuring the accountability of the government. This Action Plan is also a prerequisite becoming a member of Open Government Partnership. It has set specific objectives for various institutes and hopes they could coordinate and cooperate. For example, for the Ministry of General Secretariat of the Presidency, its goal is to create an institute to be responsible for the issues of the Open Government Partnership and monitor the process of the plan. While for the Ministry, its task is to increase public participation in issues regarding energy.

4.9 Cyber Security [CYB]

Chile has published a national cybersecurity policy (2017-2022) to protect the cybersecurity. Chile believed that a national cybersecurity policy could not only protect people and country's security but also promote cooperation and coordination between institutions. The policy objectives by 2022 are that the country will have complete information infrastructure ready to face risks, people's rights can be protected, there is a good cybersecurity culture and Chile can have better cooperation with other countries. There are articles and regulations related to cybersecurity in Political Constitution of the Republic of Chile and other laws.

4.10 The use of Emerging ICT [EMG]

The Chilean government has not used emerging ICT technologies including Big Data, Internet of Things and Artificial Technology. Internet of Things means using devices to monitor and control every single object. All objects are connected to establish the internet. People can know the real-time situation of things immediately. Internet of Things ensures the immediacy of information in the Information Age. When information from large objects is gathered, we get big data. Through analyzing big data, we can get much useful information, such as, the demand of customers which is challenging to be found from a small amount of data. Big data consists of too much data which is impossible for the human brain to calculate and analyze. At that time, Artificial Technology can come into use. It can do a complicated calculation which cannot be done by human beings and then offers us valuable information. In this information explosion age, how to filter information and get the really useful messages are of great importance. IoT, Big Data and AI technologies are the trends of future development. If the government begins to use these lasted technologies, it can know to get and analyze information in seconds and offer better services to public according to the public demand and specific requirements of individuals.

5 Some Highlights

Chile has ranked 49th in overall 2018 ranking and 3rd in American countries according to the above 10 indicators. It is showed that Chile had done well in digital government development. The stable economic development has provided a good

environment for technological development. People are open-minded and willing to accept innovations. In addition, Chile has made many well-organized periodical plans, such as, Action Plan for 2004-2006, IT Development for 2010-2014 and Digital Agenda 2020, which indicate directions for Chilean Digital Government development. It is also an important reason that Chile has a pleasant and efficient mechanism to monitor and regulate the implementation of G-government policies. Though Chile has made significant progress in g-government, it should make improvements in some aspects, such as one-stop services and CIO government. The goal of the g-government is to offer better services to the public. It will become meaningless if the public does not use or do not know how to use it. Therefore, the government should also advocate and teach the public to use the internet to participate in Digital Government.

China

1   General Information

Area: 9,596,960 km^2

Population: 1,367,485,388

Government Type: Communist State

GDP: $14,300

Internet Users: 53.2

Wired (Fixed Broadband Users): 22.9

Wireless Broadband Users: 66.8

2   Positioning in a Global Organization and a Region
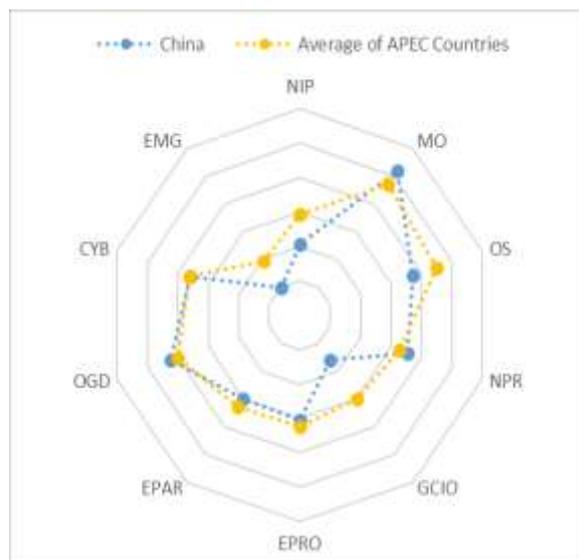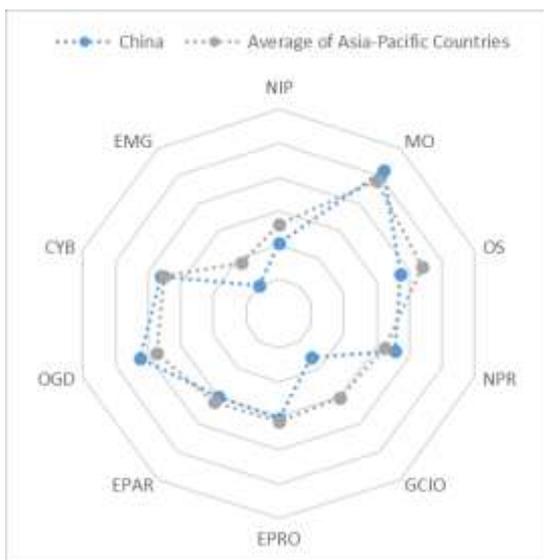
China has still shown his weak points compared with other Asia countries and APEC members. On indicators of E-Participation for instance, relatively low within its economic status. By comparison, Indicators of Open government data seem remaining progress in recent years. Many areas in China are exploring open government data to the outside world. Such as Beijing, Shanghai, Guizhou, and other provinces and cities have built a dedicated data open website. The government can jointly rich resources, advanced technology of large data companies, to provide customers with data resources, massive data processing tools, and technical training, and cultivate a large number of big data enterprises.

3   Digital Government Development

In 2016, the general offices of the Central Committee of the Communist Party of China and the State Council have jointly issued the Outline of National Informatization Development Strategy (the "Outline"). According to the Outline of National

Informatization Development Strategy", by 2020, the total information consumption will amount to CNY6 trillion, and the scale of e-commerce transactions will reach CNY38 trillion; by 2025, the two figures will reach CNY12 trillion and CNY67 trillion, and a number of large cyber-tech multinationals with strong international competitiveness will emerge; in the middle of the 21st century, China will play a more significant role in leading the global information development. The Outline determines three primary strategic missions including strengthening the development capacity, promoting the extensive application and optimizing the development environment, which consists of 56 specific tasks in 14 aspects. Specifically, with respect to strengthening informatization development capacity, it is required to deepen the reform on the system for public offerings and review, implement the policies on extra deduction of research and development expenses of enterprises, and to improve public service systems covering intellectual property, technical standards, commercialization of scientific achievement, testing and certification, appraisal of industrialized investment, and other aspects.

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

At present, China's Internet users reached 53.2%, in the meantime, 22.9% are broadband access users and 66.8% are wireless users.

4.2   Management Optimization [MO]

In early 2017, General office of the State Council issued Notice of guidelines for construction Internet plus government service system, Considering the online government service content is not standardized, the service is not convenient, Online government service platform interoperability, data sharing, online and offline Unicom is not smooth, government service of higher standardization is not enough. To further strengthen the overall design requirements of the integration of "Internet plus government services to technology and service system, and continuously improve the online government service level in various regions and departments.

4.3   Online Service [OS]

The score for Online Service is based on five investigating online services, i.e., e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Among these five Online Service, e-One-Stop Service and e-Health have the lowest score, compare to other three online services. According to Notice of guidelines for construction Internet plus government service system, the Chinese government would pay more and more attention To further strengthen the overall design requirements of the integration of "Internet plus government services to technology and service system, and continuously improve the online government service level in various regions and departments.

4.4   National Portal [NPR]

The Chinese national portal www.Gov.cn provides a global gateway for users to access and search information published by the government. The national portal allows users to link to the portals of local governments, departments, and agencies and also provide popular E-services. The national portal includes information from government documents to government structures. Moreover, the portal is provided in multiple languages (simplified Chinese, traditional Chinese, and English). The portal contains pages that allow users to download application forms, search for information, and

provides a platform for administrative departments to exchange information with each other. There are also video feeds and other multimedia contents in the portal. The national portal includes 8 topics which are government structures, news, State Council, Premier, policies, services, seeking advice for administration, data, and national conditions. Through the topic of seeking advice for administration, users can upload their opinions, advice, and comments. There are also a sub-topic named I have a word to the premier in which people can express their views directly to the Premier. Furthermore, the national portal also provides online social media platform such as Microblog and WeChat where citizens can share their opinions and inquiries while the government is responding them effectively (Microblog and WeChat are two of the most popular social media in China). (The Microblog and WeChat account of government are mainly posting and publishing the government's policies and news, not for sharing and responding).

4.5   Government CIO [GCIO]

At all levels of government in China, there is no explicit setting up of CIO positions and departments, but the CIO has always been the responsibility of the corresponding departments. Governments at all levels to assume the responsibility of the Department of CIO are all levels of Office on the Cyberspace Affairs, government office, e-government office, information office, development, and Reform Commission, industrial (commercial) and information management department, etc. Specifically, in the central government, Office of the Central Leading Group for Cyberspace Affairs, National Development and Reform Commission, General office of the State Council and the General Office of the CPC Central Committee, are held in their respective areas of responsibility of the informatization construction and management; in the local government, CIO responsibilities were borne by the above 1 or several departments, Settings of each CIO mechanism differs significantly from place to place.

GCIO exists in less public sectors like the General Administration of Customs, the State Administration of Taxation, the Ministry of land and resources, etc. and not exist in most other government sectors. On Feb 27, 2014, China established another leading group which named The Central Leading Group on the Cyberspace Affairs, which is led by Chinese president Xi Jinping.

4.6   E-Government Promotion [EPRO]

According to "The United Nations e-government survey report 2016 (Chinese Edition)", Chinese e-government international ranking steadily rising, China's e-government development index (EGDI) was 0.6071, ranked sixty-third, compared to the previous survey increased by 7, the current level of E-government in China has been in the global average level.

4.7   E-Participation [EPAR]

Despite several developments in China, e-participation is still lacking as a platform bringing the Chinese citizens on board as primary stakeholders in the promotion of ICT. Even though the government provides blogs or any other means of interaction, there is still a long way to go for Chinese e-Government to develop its E-participation for online users to entirely have a decision make stake at the national level.

4.8   Open Government Data [OGD]

In August 31, 2015, the State Council issued the "Outline" to promote the development of big data, based on the reality of China and the need to promote the development and application of big data in the next 5 to 10 years to achieve the following

objectives: to create a new social governance model of governance, precise multiparty collaboration. To establish a stable, safe, and efficient operation mechanism. Build a new system of people's livelihood and benefit the people. Open the drive new pattern of innovation and entrepreneurship, innovation of the public. Foster the development of high-end intelligent, emerging prosperity of the new ecological industry.

4.9 Cyber Security [CYB]

On December 27, 2016, approved by the Central Leading Group for Cyberspace Affairs, the Cyberspace Administration of China issued a "National Cyberspace Security Strategy", pointed out that China topped the list of the number of Internet users and the size of the network world. To maintain good cyberspace security is not only the needs of China, but it is also of great significance for the maintenance of global network security and world peace. China is committed to safeguarding the sovereignty, security and development interests of the national network space, to promote the benefit of the Internet for humanity, and promote the peaceful use of cyberspace and shared governance. There is no national security without cyberspace security, no modernization without informatization. Cyberspace security and informatization are the two wings of one body, two wheels of the driver.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). The evidence show that local governments in China are eager to implement Cloud Computing or Big Data into their public sectors, especially the economically advanced cities and provinces such as Beijing, Shanghai and Guangdong Province. Moreover, the central government becomes more and more active in making policies and plans for emerging technologies.

5 Some Highlights

Compared with other economics, China has a comparatively slow process on e-Government development. Except for the indicator of "Management Optimization", performance on all the segments of ranking could be considered backward than advanced nations. The absence of GCIO not only pares down the scores for evaluation but more importantly, has influenced the execution of ICT plans in each government level. According to China's strategy, e-Government has been regarded as a tool for administrative reform and government process re-engineering rather than developing e-Government itself. More and more online service comes to the phase of the transaction, although the lack of e-decision making. However, some megacities in China has promoted advanced e-Service and data share process to citizens (For example Beijing, Shanghai, Guangzhou), which continues to pull ahead of the gap with under developed areas. The gap of wealth has affected every aspect of the societies in China, and the implementation of better e-Government is no exception. China's Internet users reached 688 million; Internet penetration rate reached 50.3%, Internet users, broadband access users ranked first in the world. The future of Open government data in China is promising just like its e-commerce developing.

Colombia

1 General Information

Area: 1,138,910 km^2

Population: 46,736,728

Government Type: Presidential Republic

GDP: $14,000

Internet Users: 52.6

Wired (Fixed Broadband Users): 10.3

Wireless Broadband Users: 45.1
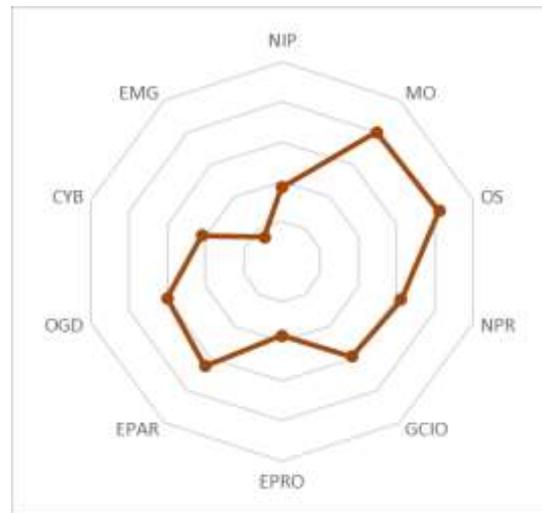
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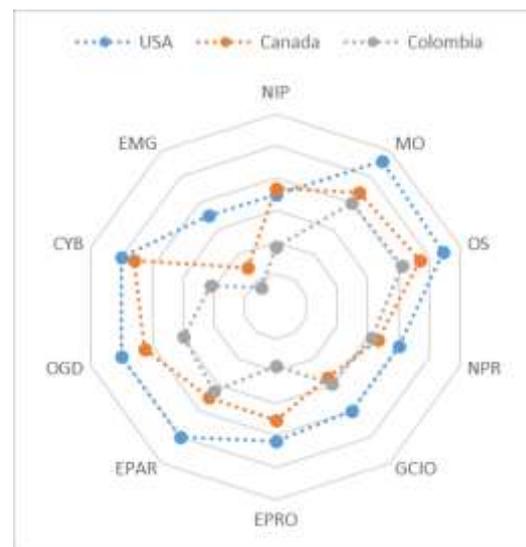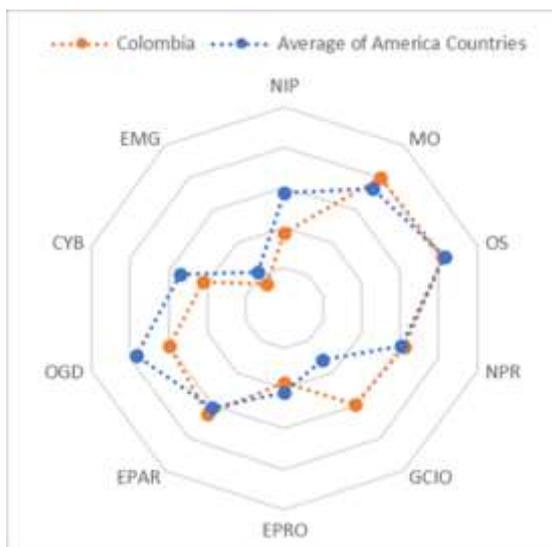
3 Digital Government Development

Colombia is making great strides in some areas, but the overall trend has not been positive in recent years. In the United Nations' E-Government Development Index, Colombia slipped from 31st to 50th place from 2010 to 2014. Much of this change can be attributed to a much more competitive and crowded e-Government environment as more countries develop their ICT infrastructure. However, recent efforts to enable and promote e-government in the country indicate that the governments have recognized its importance. Also, it should be noted that Colombia continues to be a top-twenty country in the area of e-participation.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

As of 2018, 52.6% of the population uses the internet. The number of fixed-broadband subscriptions is 10.3 per 100 inhabitants (World Development Indicators,

2018), while the number of active mobile broadband subscriptions is 45.1 per 100 inhabitants.

4.2   Management Optimization [MO]

The government of Colombia has created an Online Government Manual, which includes different goals the government is looking to complete. These goals include ICT for administration, services, open government, and information and security. The government of Colombia also has an online website which is called Online Government Strategy, where links and news in regards to the above-named goals are provided.

4.3   Online Service [OS]

In regards to E-Procurement, E-Customs, E-Tax, One-Stop Service, and E-Health, the government of Colombia has websites for all these services. Some of these sites are limited in what you can do, however overall each of them has necessary information easily accessible. For Taxation, the government of Colombia is starting e-invoicing for businesses, with mandatory compliance for all businesses by 2019. This could reduce tax evasion rates, save more money for private and public sectors, and modernize tax compliance.

4.4   National Portal [NPR]

The national portal of Colombia happens also to be the official page of the President of Colombia. Using PageSpeed Insights by Google however shows that the official site of the Colombian government is rated at an 11/100, which is very low considering it to be the first page of the government. On the page, there is recent information about what the government has completed, as well as what the president has done. There is also an excellent social media presence by the government of Colombia, with there being links to many different social media applications for people to use. There are also links to the different ministries in Colombia, with the site itself being user-friendly, if not a bit slow to load each new page loaded. Finally, there is a link to have an English version of the site, although limited in comparison to the Spanish version; with it providing information about who the president of Colombia is, links to the different ministries, as well as the senior presidential advisor and secretaries.

4.5   Government CIO [GCIO]

In Colombia, as per the Ministry of Information Technology and Communications, the government CIO is performed by the vice minister of IT. No other information is provided in regards to the Government CIO.

4.6   Digital Government Promotion [EPRO]

The Colombian government is continuously looking to promote the usage of D-Government through its Ministry of Information Technology and Communications. MinTIC has provided tools and supports to regions inside Colombia, such as web and open data platforms, as well as workshops and webinars.

4.7   E-Participation [EPAR]

Regarding E-Participation, Colombia continues to do well ranking 27th in a 2016 United Nations D-Government Report. There is also a website provided by the government called "Urna de Cristal", or Crystal Urn http://www.urnadecristal.gov.co/. This website provides information about problems, gives citizens access to participate with the government, and provides links to different departments within the Colombian

government. The government is also wanting people to comment through social media and engage in conversation with the government, which is doable through this site.

4.8   Open Government Data [OGD]

The Government of Colombia has a website called http://www.datos.gov.co/ which provides citizens open data about 6943 datasets from over 937 institutions. The website itself is also available in English, with reports available in pdf, excel, and word formats. Through this, we can see that the Colombian government is looking to help increase its Open Data and to have a system in place for citizens to use.

4.9   Cyber Security [CYB]

Colombia has a government agency called colCERT, which handles all incidents relating to cybersecurity. There are also laws in place to protect privacy and information, data, security, etc. More and more is being done by the Colombian government to ensure cybersecurity, with examples being joint operations with other South American countries, where Colombia is taking the lead in showing how to deal with potential cyber threats and how to ensure cybersecurity.

4.10   The use of Emerging ICT [EMG]

No evidence of emerging ICT found in regards to cloud computing, Internet of Things, or Big Data.

5   Some Highlights

Colombia has a good chance of becoming a leader in Digital Government in South America, with its government creating the right steps to establish a proper network for future use.

Costa Rica

1　General Information

Area: 51,100 km^2

Population: 4,872,543

Government Type: Presidential Republic

GDP: $ 16,100

Internet Users: 66

Wired (Fixed Broadband Users): 11.6

Wireless Broadband Users: 109.5
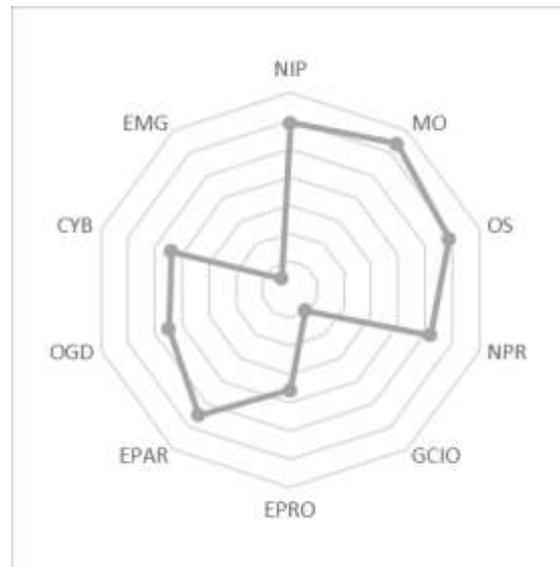
2　Positioning in a Global Organization and a Region
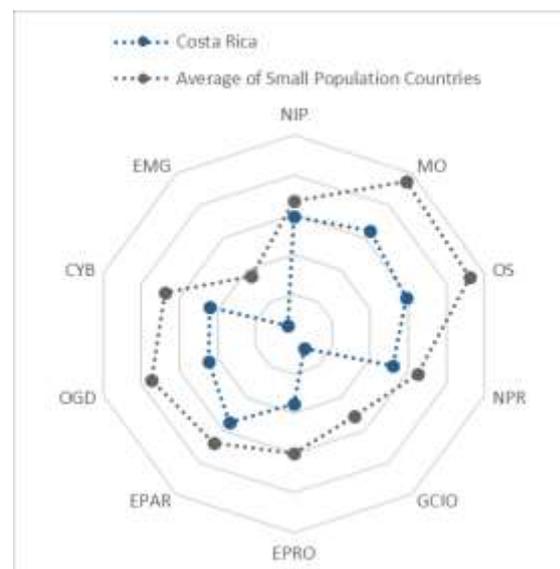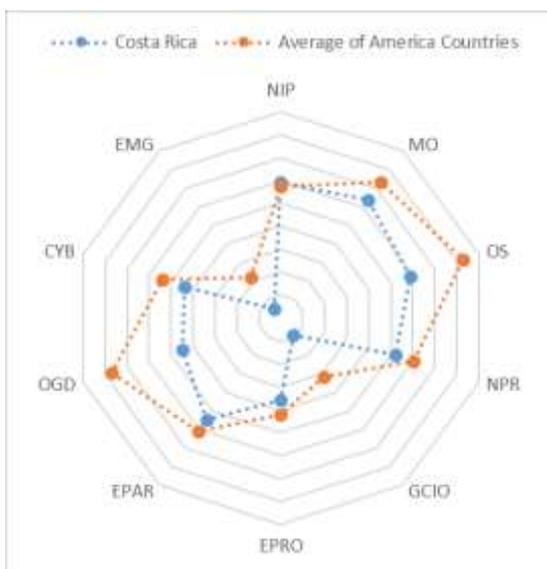
Among America Countries, only Network Infrastructure Preparedness (NIP) indicator is above with the average score of America region. Moreover, Costa Rica is placed below the USA, the best country in America region.

3　Digital Government Development

The Costa Rican government is just finishing its Digital Government Master Plan 2011-2014. This plan was put into place after the previous Digital Government Action Plan 2008-2010. The country's digital government planning began in earnest with Executive Decree No. 33147-MP, issued in May 2006. This proposed that a plan to digitize the Costa Rican government be drafted and implemented with cooperated to the South Korean Government. This master plan has the mission statement: "Improving the national competitiveness with environmental responsibility through providing transparent

and high-level services to the citizen based on interconnected government and ICT development".

Digital Government Master Plan 2011-2014

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

Approximately 66% of people in Costa Rica were Internet users in 2017, according to the Measuring the Information Society Report 2016 from International Telecommunication Union (ITU). About 11.6% have fixed-broadband subscriptions, and wired broadband subscription has reached 109.5%.

4.2   Management Optimization [MO]

The Costa Rican government is just finishing its Digital Government Master Plan 2011-2014. This plan was put into place after the previous Digital Government Action Plan 2008-2010. However, now, there is no evidence about the new version of ICT strategy or e-Government plan. In all, Costa Rica has achieved the haft score in Management Optimization domain.

4.3   Online Service [OS]

The score for Online Service is based on five investigating online services, 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 Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Costa Rica is only providing e-Procurement, e-One-Stop Service and e-Health. Among these Online Services, e-Health has the highest score, compared to other online services. The number of available e-Services continues to grow, but many of the designs operate using different platforms and are not well-integrated. Regarding complexity level, most of Online Service in Costa Rica has reached only information provider in which user can start the find the information through the portal.

For measuring the level of convenience, the third party application result has shown that three portals are the same with the average considerably regarding speed. The third party application for assessing the portal is the application from Google PageSpeed™ Insight.

4.4 National Portal [NPR]

The Costa Rican government's main portal site "http://gob.go.cr/" is only available in Spanish and is not compatible with most major translation services. It offers a lot of links to information, services, and data, but many of the options take the form of long lists of links, rather than intuitive menus. In the technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is below the average both from PC and from Mobile Device. However, the portal does not provide the user with some functionality such as searching, site map, and an inquiry form.

4.5 Government CIO [GCIO]

Alicia Avendaño Rivera has served as the Director of Digital Government since 2009, and this is the closest analog to a CIO position in Costa Rica. The Director has administration over the three Digital Government divisions, Projects, Technology, and Digital Inclusion.

4.6 E-Government Promotion [EPRO]

The Costa Rican government's e-Government promotion plan was laid out in its Digital Government Master Plan 2011-2014. The prior plan succeeded in establishing a base structure for e-Government.

4.7 E-Participation [EPAR]

According to the United Nations E-Participation Index, Costa Rica is the leading country in Central American and 14th in the world for e-participation. This is a significant improvement from 2005, in which they placed 90th. This indicates that the government's ICT initiatives have succeeded in making the population more connected, and providing a platform those appeals to users. For instance, parliament member has their website and provides the information to citizens that can contact them.

4.8 Open Government Data [OGD]

The Technical Secretariat of Digital Government operates an open data site populated with data from Costa Rica's other online services, including Mer-link (public procurement), Controls (operated by the Ministry of Public Security), Register it (Ministry of Health), and CrearEmpresar (National and Municipal Registry) among others. The U.S.-based open data platform Junar powers the database. However, the data is not yet as voluminous, standardized, or searchable as it could be. Also, data from previous years have not been uploaded.

4.9 Cyber Security [CYB]

As a member of the Organization of American States (OAS), Costa Rica approaches many cybersecurity issues in collaboration with fellow OAS member states. The OAS Inter-American Committee against Terrorism (CICTE) developed and passed the OAS-Cyber Security Strategy in 2004. Since then, OAS member states have collaborated on increasing cybersecurity in each country, and in the region. There are still significant weaknesses.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and Internet of Things (IoT). Costa Rica has a plan to implement Cloud Computing for Public Sector. However, the evidence

shows that it is not officially launched. Other emerging technologies for government agencies are still nullity in Costa Rica.

5 Some Highlights

This year is the 4th year of ranking; Costa Rica still has the weakness. The use of emerging technology and Government CIO are the weak points of Costa Rica. Director of Digital Government is the closest analog to a CIO position in Costa Rica. The Director has administration over the three Digital Government divisions, Projects, Technology, and Digital Inclusion. Moreover, Costa Rica also has a low score on Cybersecurity. Even if Costa Rica is a member of the Organization of American States (OAS), Costa Rica approaches many cybersecurity issues in collaboration with fellow OAS member states.

Czech Republic

1   General Information

Area: 78,867 Km^2

Population: 10,644,842

Government Type: Parliamentary Republic

GDP: 31,500$

Internet Users: 81.3

Wired (Fixed Broadband Users): 27.9

Wireless Broadband Users: 76

2   Positioning in a Global Organization and a Region
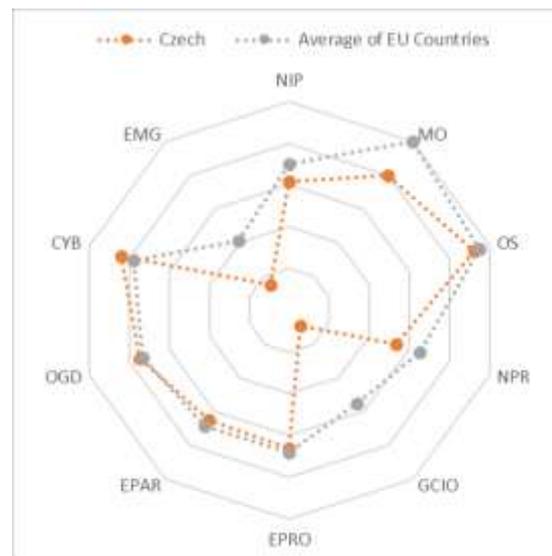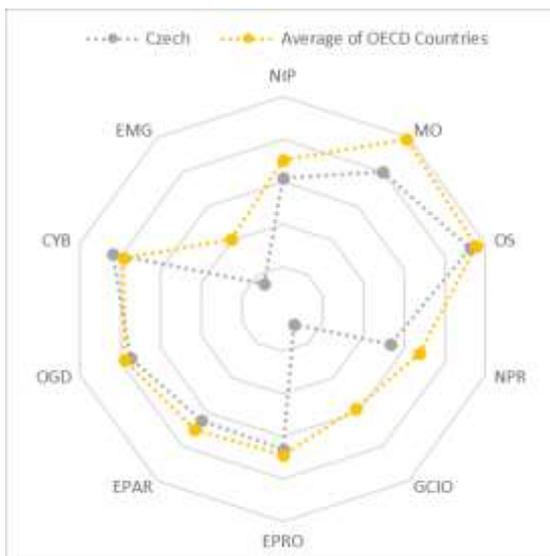
3   Digital Government Development

Since the late 1990s, the Czech Republic had strategic in promoting information technology, one of them known under the name "State Information Policy". This policy defined eight priority areas for the development of the information society, including e-Government and e-Democracy. This strategy can be considered as the first ICT project to promote e-Government services in the Czech Republic. In 2006, the Czech government issued "State Information and Communication Policy" or "e-Czech". The main objective of this project is to maximize the use of ICT by improving e-Government services, e-Procurement, and e-Health. In 2007, e-Government concept was associated with the modernization of public administration. This project called "Smart Administration Strategy".

From 2008 to 2012, Czech published Strategy for the development of Information Society services for the period 2008 - 2012. This was a strategy for the development of

services in an open, democratic society. The strategy divided into five program: (i) Basic registers and identification; (ii) Universal point of contact; (iii) Secure communications; (iv) Digitization of data archives; and (v) Personalized Information Society services.

The State Policy in Electronic Communications - 'Digital Czech Republic' was adopted in early 2011 and aims to assess the current overall status of accessibility and development in selected areas of electronic communications which have the highest growth potential.

In 2014, the Czech government introduced GeoInfoStrategy 2014 - 2020. The Strategy draft has been designed in a strong connection to other national strategic documents, i.e., the Strategy of international competitiveness of the Czech Republic for 2012-2020, the Czech Republic's National reform program, a Strategic framework for the public administration development for 2014 -2020 and other critical national strategic documents.

In 2015, the national government of the Czech Republic approved the Strategy for ICT Services Development in Public Administration. This document provides an updated overview of e-Government status in the Czech Republic.

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

The KIVS (Public Administration Communication Infrastructure) enables the interconnection of all Public Administration (PA) bodies (e.g., ministries, central administrations, regional authorities, municipal offices, labor offices, revenue authorities, and public libraries), ensures secure and cost-efficient data and voice communications, as well as access to central information resources.

Czech POINT is a network of one-stop access points to e-Government services intended to prevent citizens from visiting several offices, thus significantly reducing excessive administrative burden.

4.2   Management Optimization [MO]

In the Czech Republic, the issue of ICT is under the responsibility of two ministries. Electronic communications are under the responsibility of the Ministry of Industry and Trade URL: http://www.mpo.cz/en/e-comm-and-post/ and e-Government issues are under the responsibility of Ministry of Interior URL: http://www.mvcr.cz/mvcren/scope-of-activities-e-Government.aspx

The latest version of the National e-Government Development Strategy was published in the form of a government decision "Resolution of the Government of the Czech Republic 889/2015 to the further development of ICT services in public administration" from November 2, 2015. URL (in Czech only): http://www.mvcr.cz/clanek/vestnik-vlady-pro-organy-kraju-a-organy-obci-717579.aspx; pages 206 – 228)

Another significant governmental material is a document, the Digital Czech Republic v. 2.0 –The Way to the Digital Economy". This is a program of the state policy on electronic communications in the Czech Republic - material was published in May 2014.

4.3   Online Service [OS]

The Czech Republic has a centralized e-Procurement system based on a national platform managed by the Public Procurement and Public-Private Partnership Department of the Ministry for Regional Development.

The Czech electronic health record (elektronická zdravotní knížka - EZK, in Czech) is a highly secure, free-of-charge summary of patient health information in electronic form, accessible 24 hours a day via the Internet and smartphones. It is a safe environment that links healthcare providers, patients, and health insurers. It can be used to transmit and sharing in real time medical information between the doctor and patient or between different doctors. In the Czech Republic, there is no alternative system of real-time information sharing in this field. The two regions where the number of health records stored on the IZIP system is growing the most are Vysočina and Karlovy Vary.

4.4 National Portal [NPR]

In Czech, the public administration portal is developed by Ministry of Informatics. Citizens can access (www.portal.gov.cz) for getting data, information or other publication from the government. Besides the national portal, a local self-government portal (ePUSA) is an information system that contains an up-to-date database of self-government entities in the territory of the Czech Republic. The system enables the selection of required data according to different criteria.

Towns and Communities Online Portal (TCOP) is a nationwide teledemocracy website, which supports e-information exchange between local government and Czech citizens. Portal for data boxes was first launched in 2011. It provides a more comprehensive service to users of Data Boxes.

4.5 Government CIO [GCIO]

In the e-Government is in the ministry in charge (Ministry of Interior) responsible for the e-Government matters the Department of the e-Government in the section of Information and Communication Technologies. Each ministry has its CIO, who is responsible for the (development) of ICT in the area of responsibility.

4.6 E-Government Promotion [EPRO]

The opportunities for greater engagement with citizens through e-Government channels will continue as the introduction of high-speed broadband, and the increased use of new communication technologies provide the Czech Government with greater flexibility in delivering better services to people, communities and business, as well as improved government operations. Significant increases in The Czech are accessing the web via mobile phone or similar portable devices and making phone calls over the Internet. There was also continuing growth in the use of social networking sites and SMS

4.7 E-Participation [EPAR]

The Czech government and ICT companies provide e-information, e-consultation services, forms, articles and resources about trends and issues related to citizens participation in democratic government processes using the Internet, mobile communications, and other information and communications technologies.

The aim is to provide a one-stop shop for individuals and organizations to obtain information on and communicate directly with the Czech authorities. The Ministry as the site's administrator and Czech Post as the technology provider completely revamped the look and felt of the previous Public Administration Portal as well as its functioning, to make navigation easier, faster and more intuitive. The portal's target audience is made of: Czech citizens; foreigners living in the Czech Republic; entrepreneurs and businesses; public authorities.

4.8 Open Government Data [OGD]

A national data portal is available at http://opendata.cz/. It includes 73 datasets, which come from 1 organization. In government agencies, they have a local portal, to provide open data in each government agency (http://data.mfcr.cz/en). Most of the necessary data is produced from the tax payer's money. The data is even often available on the web. The Government of the Czech Republic fully supports attempts to remove regulatory and technical barriers to access to information, and its goal is to enable the general public to share, combine and freely use the available data.

4.9 Cyber Security [CYB]

Czech National Security Authority Cyber Security was established according to the Decision n. 781/2011 of the Government of the Czech Republic. The name is National Cyber Security Centre (NCSC) and it is headquarter is in Brno. The main task of the NCSC is the coordination of cooperation on both national and international level to prevent cybernetic attacks, to propose and adopt measures for incident solving and against ongoing attacks.

In 2015, the Director of the National Security Authority submitted to the government the new strategy with significant focus on the national cybersecurity of the Czech Republic for the period of the upcoming five years and marks a significant milestone for the Czech Republic regarding cyber-security.

4.10 The use of Emerging ICT [EMG]

The Czech Republic works on consolidation of data centers of various government offices with the target to launch the government cloud.

5 Some Highlights

Compared to last year, this year Czech receives a lower score in most of sub-indicator. Especially in Government CIO and Management Optimization. In most of the questions to evaluate Government CIO, Czech Republic had no information to evaluate CIO and management optimization sub-indicator.

In 2015, the Czech government introduced a strategy for ICT Service development in public administration. The strategy focuses on national cybersecurity until 2020 and also introduces the idea to legislatively delegate to the Department of Chief architect of the e-Government at the Ministry of the Interior the role of "watchdog" to oversee the efficiency of public spending in public administration ICT area. The strategy includes a list of improvement opportunities that should lead to better nation-wide governance of ICT services in public administrations.

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Denmark

1 General Information

Area: 43,094 km^2

Population: 5,581,503

Government Type: Parliamentary Constitutional Monarchy

GDP: $45,800

Internet Users: 97

Wired (Fixed Broadband Users): 42.8

Wireless Broadband Users: 124.2
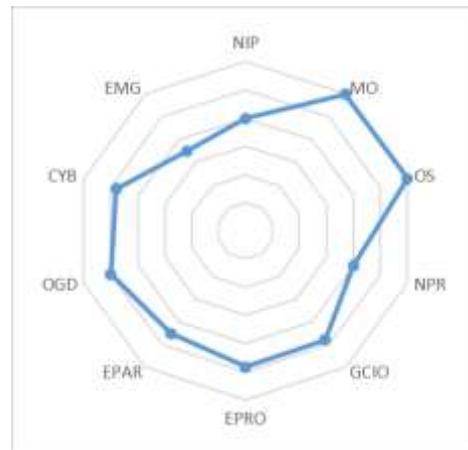
2 Positioning in a Global Organization and a Region
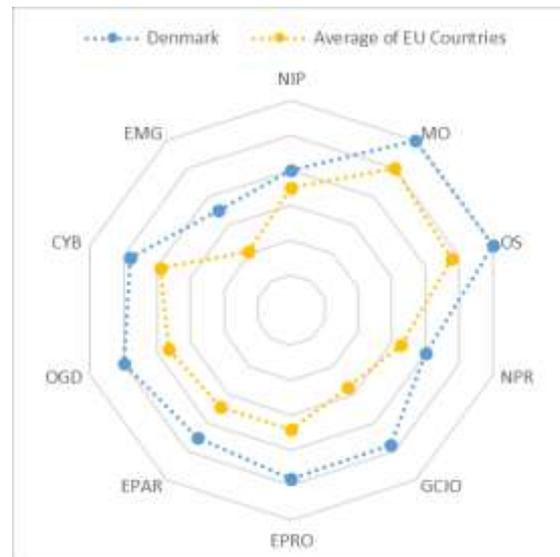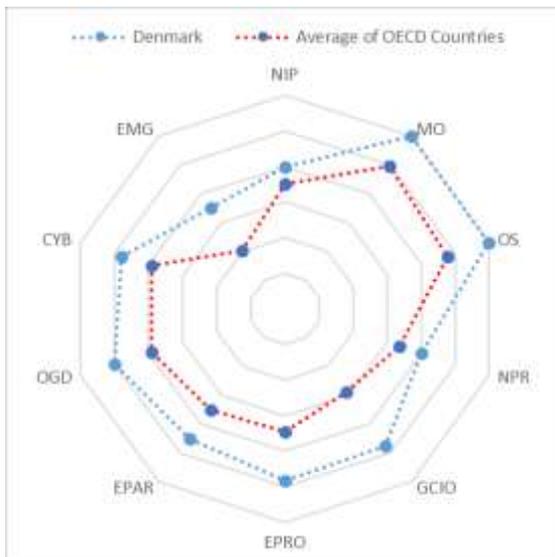
3 Digital Government Development

In 2016, Denmark transitioned to its new Digital Strategy 2016-2020. This ambitious strategy sets Denmark on a course to rapid development and competition with other comparable governments. As part of its efforts on countering the digital divide, Denmark is promoting the enhanced accessibility of its public websites. Denmark's new mandatory digital mailbox is an intriguing development. It allows the government to communicate instantly and securely with businesses in an official manner. As part of its e-Inclusion efforts, public documents on the information society recognizes the needs of at-risk (of exclusion) groups. The USO (Universal Service Obligation) in Denmark has provisions for a PC based text telephone service and access to the Internet. In the area of ICT and aging, Denmark has established drop-in centers for the elderly to learn new ICT skills.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

The current Danish e-Government strategy, published in August 2011, is entitled 'The Digital Path to Future Welfare: e-Government Strategy 2011-2015.' The strategy

proposes that the central government, regions, and municipalities cooperate in order to accelerate the adoption of digital solutions in the public sector. The report emphasizes that the government must capitalize on its leading position and continue to be a digital government leader well into the future.

4.2   Management Optimization [MO]

The strategy is divided into three main tracks, each covering a different area or theme:

- No more Printed Forms or Letters

- New Digital Welfare

- Digital Solutions for Closer Public Sector Collaboration

According to the report, "the adoption of digital solutions and new technology will provide DKK 3 billion [about $500 million] every year by 2020 in gains." The national government has also passed a Digital Post law requiring all businesses to establish a digital mailbox address. This mailbox is of equivalent legal status to the physical mailbox, meaning that businesses have the responsibility to read all of their digital mail. This system allows the public sector to communicate with businesses and to send official notifications more efficiently, and it allows businesses a quick and secure channel to respond.

4.3   Online Service [OS]

Denmark has a healthcare portal, Sundhed.dk. The site is a public, Internet-based health portal that collects and distributes healthcare information among citizens and healthcare professionals. It is unique in bringing the entire Danish healthcare sector together on the Internet and providing an accessible setting for citizens and healthcare professionals to meet and efficiently exchange information. From the main portal, all Danish citizens have access to sundhed.dk and everyone has a personal page, which reflects the specific needs of the individual

4.4   National Portal [NPR]

Borger.dk (borger is Danish for 'citizen') is where Danish citizens can find all public information and self-service options on a one-stop basis. This is a single entry point to the public sector for all citizens. A single sign-on is made available for citizens to access services of different agencies without having to repeatedly log-on.

Denmark also has an official website, Denmark.dk, from which both citizens and non-citizens can access public information and services. The portal supports many foreign languages including English, Spanish, French, German, Chinese, Arabic and more. It also has SNS features on the homepage, such as Facebook, Twitter, and Google Plus to enhance citizens' participation with blogs, and provides information for foreigners who want to study and work in Denmark. Denmark also has a business portal which delivers fully digital public services for the benefit of companies. The portal includes more than 200 e-forms, some of which may be filled out and signed with an OCES signature.

4.5   Government CIO [GCIO]

While there are similar government CIO-type officers at the national and ministry levels, information about CIOs at lower levels of government is not available. There is no single CIO position for the Danish government. However, the Steering Committee for Joint-Government Cooperation (STS) is responsible for coordinating e-Government initiatives throughout the public sector. This committee reports its findings twice each

year. There is no current legislation regarding the CIO position in government。 As interviewed by our team found that Minister of Finance is top commander and Director General of the Danish Agency for Digitization is top e-Government executive with STS.

4.6 Digital Government Promotion [EPRO]

[Digital Strategy 2016-2020] is now implementing. The New Strategy contains the following focus fields:

Better use of data and quicker case processing

A user-friendly and straightforward digital public sector

Public sector data protection

Robust digital infrastructure and digitalization for everyone

Having an efficient utility sector

Having public sector data as a growth driver

More cohesive welfare services

A better framework for the business community

The new strategy sets clear and binding goals for e-Government implementation of the e-Government solutions established in recent years, which not only require a strong capacity for decentralized implementation capacity but also demands a centrally focused coordination effort.

According to news from epractice.eu, the Danish Government, supported by the Local Governments Association (KL) and the Danish Regions has recently created a public plan for the digitization of health care for 2013-2017. The strategy aims to create better cross-sector relationships and safe treatment based on the individual's resources and needs.

4.7 E-Participation [EPAR]

The Danish government's web portals demonstrate a developed understanding of e-participation. Information and services delivered online to encourage a high level of social responsibility and accountability. For instance, the portal for citizens (borger.dk) functions as a national debate and voting portal enabling citizens at all levels of society to participate in debates and participate in polls and elections organized at the local, regional and national levels. Moreover, the hosting of blog services creates the opportunity to comment on the Danish lifestyle and encourages foreigners to participate.

ROSTRA is an online system for public debate and expression of opinions through voting facilities based on the Danish Digital Signature. The tool is a part of the Danish citizens' portal developed by the Danish National IT and Telecom Agency. It functions as a national "debate and voting portal" allowing citizens, businesses, politicians, and journalists to participate in debates and votes organized by levels of government, subject, etc. The tool can handle debates and votes at the local, regional and national levels and it is possible to confirm your identity through login with the Danish Digital Signature.

4.8 Open Government Data [OGD]

The National Action Plan has been divided into five themes:

- Local democracy and participation

- Full digital communication - and inclusion

-   New forms of collaboration and involvement

-   Open data - innovation, transparency, and enhanced efficiency

-   The promotion of open government

4.9   Cyber Security [CYB]

Denmark is one of the most digital countries in the world, and digital solutions are key to the development of the public sector and for the growth and competitiveness of private businesses. With the 2018-2023 Defence Agreement the government and the parties responsible for the agreement significantly reinforced measures to protect Denmark against cyber threats. The government launch 25 initiatives and six targeted strategies addressing the most critical sectors' cyber and information security efforts to enhance the technological resilience of digital infrastructure.

The Danish cyber and information security strategy 2018 – 2021 is the newest cybersecurity strategy, in which the Danish government defined three clear benchmarks for becoming stronger and more digitally secure over the coming four year. The benchmarks include (1) Everyday Safety for Citizens and Businesses, (2) Better Competencies, and (3) Joint Efforts.

4.10   The use of Emerging ICT [EMG]

The Danish government has been using a domestic standard for information security called DS 484 for over a decade. Government institutions are required to abide by Information Security ISO/IEC 27001, an international standard. The Ministry of Finance's Agency for Digitization is tasked with enforcing this standard and "developing tools, templates, seminars, and workshops to support [its] implementation and maintenance."

5   Some Highlights

Denmark has shown marked development in D-Government projects, but there are few available resources on e-Government related promotions particularly at the local level. The Danish authorities followed a successful e-Government strategy, which included a large-scale communication campaign to raise citizens' awareness of D-Government services. The OIO Committee for Architecture and Standards (OIO Committee) has the mandate to support the strategy to facilitate the work of D-Government in the state, regions, and municipalities, with particular emphasis on ensuring interoperability between IT systems across organizational boundaries.

The government released its e-Government strategy 2016 - 2020 on in May, and it outlines 33 projects for the government to accomplish in the coming years. The government is always trying to establish online services that are simpler and more effective. In order to do this, the government will establish horizontal cooperation throughout local, regional and central governments. Institutions for education, knowledge or culture can still apply for funds to provide their users with free Internet access. The funds are used to prioritize Internet connectivity and use. The government also invests 500 million. DKK and municipalities invest up to 1 billion. DKK tailoring teaching in public schools for future needs.

Egypt

1   General Information

Area: 1,001,450 km^2

Population: 94,666,993

Government Type: Presidential Republic

Internet Users: 39.2

Wired (Fixed Broadband Users): 6.4

Wireless Broadband Users: 52.6

2   Positioning in a Global Organization and a Region
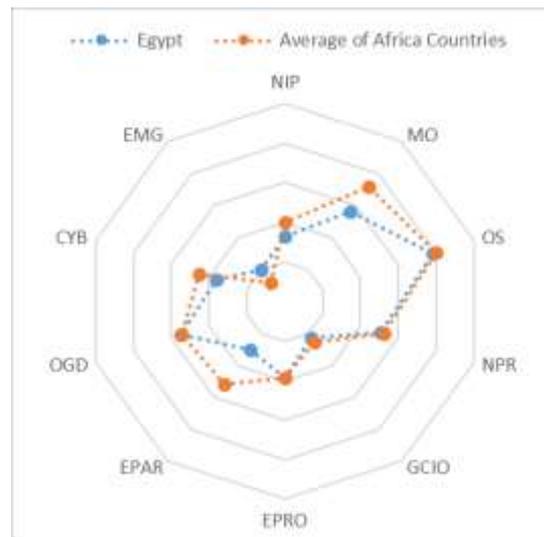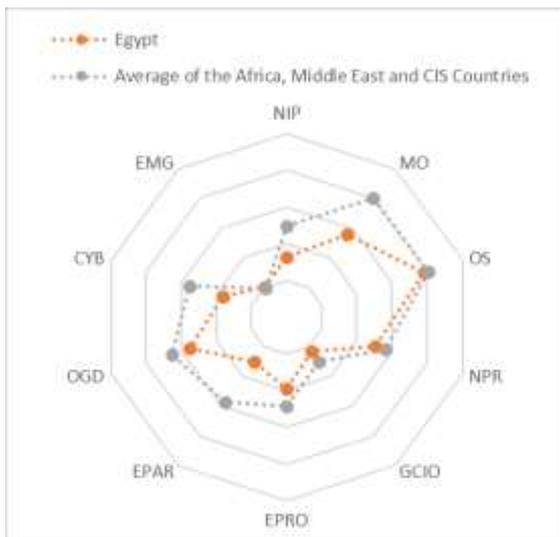
Among Africa Countries, only Management Optimization (MO), e-Government Promotion (EPRO) and the use of Emerging Technologies for government (EMG) indicators are above with the average score of Africa region. In addition, the use of Emerging Technologies for government (EMG) indicator of Egypt is better than those of South Africa, the best country in the Africa region.

3   Digital Government Development

Firstly, the Cabinet Information and Decision Support Center (IDSC) was established by the Egyptian government in 1985 to build up Egypt's IT industry and governmental decision supporting infrastructure. IDSC has successfully implemented many IT projects in legislative reform, public sector reform, human resources development and job creation, access to the Internet, commercial registration, natural resources management, cultural heritage preservation, urban planning, and sectoral development projects at the ministerial and governorates level, among many other areas.

The Ministry of Communications and Information Technology was formed in 1999 to facilitate Egypt's transition into the global Information Society. MCIT's projects are geared towards supporting and empowering the Information Society in Egypt in close coordination with relevant government agencies and with the private sector. These commitments have been translated into developing and expanding the telecommunications infrastructure, establishing hundreds of information technology clubs, expanding the pool of IT skilled labor and creating national information systems and databases. The National Plan for Communications and Information Technology has paved the way for the initiation of the Egyptian Information Society Initiative (EISI) from 2013 to 2017, which has been structured around seven major related tracks, each designed, when fully implemented, to help bridge the digital divide and facilitate Egypt's evolution into an Information Society.

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

Approximately 29.84 million people in Egypt were Internet users, according to measuring the 2017 Year Report from MCIT. The number of fixed line subscriptions users was 6.29 million, 6.4% in Sep.2017. The mobile penetration percentage reaches 110.06%. 4G LTE services were under trials, officially launched in 2016. Egypt currently has 4 companies offering cellular services. eMisr National Broadband Plan was launched in 2011 to increasing broadband internet penetration for the development of digital society. By December 2016, TE-Data and Nile Online (NOL) finished installing broadband connections to 1087 institutions affiliated to more than 11 ministries and government entities across Egyptian governorates.

4.2   Management Optimization [MO]

The Egyptian government's goal which synchronizes Egypt's latest government technology with the world is considered to be an essential milestone in the successful implementation of the Egyptian reform structure and adjustment plan (ERSAP). The process of modernization will create a better atmosphere for service provisions, form a better service delivery mechanism, meet the needs of citizens, and improve efficiency and speed. The Ministry of State Administration Development has established an e-government website, https://www.egypt.gov.eg/English/Home.aspx, which efficiently provides services for citizens, companies, and investors, and deploys new ideas and work mode of government under E mode.

The Egyptian government has launched some programs to carry out information and communication skills, such as providing technical training for young people, families, and employees. Moreover, many new technology enterprises have emerged over the years. Egypt strongly supports the expansion of the giant data center, which is intended to make the country a global hub. In January of this year, specializing in the design of advanced data and Information Center, construction and management of the NTRA and GPX global system company signed a five-year renewal license. Rely on the license; the company can carry out business investment, new investment in the Egyptian market, provide new employment opportunities for the construction and management of data and Information Center in the field the young man.

4.3   Online Service [OS]

The score for Online Service is based on five investigating online services, i.e., e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. In Egypt, users can download and submit application forms through the portal. Citizens can get law

services, university enrollment, and health consulting service online. The government also provides one-stop service in getting some personal documents.

4.4 National Portal [NPR]

E-Government portal demonstrates well-structured navigation and interface features. The existing government portal provides some necessary documents and online service to people in Egypt. Citizens can find a government department directory, law, and reports from the website. A Cabinet e-portal will be launched soon, in seeking to communicate with the public and provide them with accurate information on the activities of the Egyptian Cabinet. The government is also building e-portal for Ministry of Emigration and Egyptian Expatriate Affairs, Egypt travel and Egypt healthy.

4.5 Government CIO [GCIO]

Yasser Elkady was appointed the Minister of Communications and Information Technology on 19 September 2015 in Sherif Ismail's cabinet. Elkady has been in the IT and Telecom industry for over 25 years with substantial experience in strategic planning, technology integration, business development, and organizational transformation. However, the Egyptian public administration at the national and local levels does not appoint clear CIOs or equally influential positions within its legal framework.

4.6 Digital Government Promotion [EPRO]

From 2016 to 2017, the Egyptian government had made great efforts in cooperation with other departments and established channels of communication with the public. MCIT developed a strong mobile application. The project agrees with the use of information technology; it disseminates health awareness by sending short messages and promotes communication between mobile applications and patients. In addition to controlling and reducing the spread of non-communicable diseases such as diabetes, blood pressure, hepatitis and so on, in order to raise awareness of diabetes mellitus, as a trial stage, seven million and one hundred thousand messages have been sent to patients, which was completed in July.

4.7 E-Participation [EPAR]

In general, Egyptian government websites demonstrate interactive functionality and functional design, but it is lack of a channel for public engagement. Compared to last year, there is still no ICT app or social media for users to participate in government operation discussion. However, the Ministry of Communications and Information Technology (MCIT) is endeavoring to empower society members, particularly youth, and equip them with necessary skills and tools in order to move toward a knowledge-based society.

4.8 Open Government Data [OGD]

This year, the Egyptian Government is working on Anti-Corruption for a development project. The project, which relies on the information technology tools, aims to provide officials with indicators and reports to fight corruption using data warehouse that has analytical methods to detect corruption within different government bodies, thus identifying irregularities that need further investigation. But there is still ample space for the government to improve data transparency and in time.

4.9 Cyber Security [CYB]

The Egyptian government has made many efforts to improve cybersecurity. Egypt spends money on technical research and training programs. Egypt took part in the Arabia

regional summit, with the theme of "unlimited cooperation and unlimited protection", aiming to enhance cooperation and solve the global challenges in the field of network security. In December, MCIT, represented by the National Telecommunications Authority (NTRA), participated in the Egyptian delegation's visit to New Delhi, India, to discuss a framework for cooperation in the field of network security. The two countries signed Memorandum of Understanding (MoU) and recooperate with the security of the network. The Egyptian government put online safety priority among priorities at home and abroad to protect the security of citizens. MCIT seeks risk prevention by promoting tools and methods in the virtual network world. It will take firm measures to establish an interactive platform to share relevant information, best practices, concerns, and resources.

4.10 The use of Emerging ICT [EMG]

The government has launched a database integration project. The database connection integration project aims to create an information technology environment that can accommodate dense national databases, and build up a modern service platform serving the government and individuals and integrate with all the agencies of the state. This will help the one-stop system, facilitate data assessment and improve data quality, and help the government to take the right policy. This is to save the time, energy and financial resources of the country, in addition to the establishment of a unified registry of citizens. The project was launched in 2016, has been successfully equipped and upload 16 databases, including supply, education, government documents, telephone, payroll, tax and free occupation, social insurance, the new city community, identity, social security, small and medium-sized enterprises (SMEs), pension and death. Another hosting and cloud computing services seek to reduce the time frame for implementing Information Technology (IT) projects by providing hosting services through virtual server technology. This is in addition to promoting those services and making them available in government bodies and reducing cost and effort while allowing citizens to request additional services. In 2016, hosting services for 70 e-portals of government bodies were made available.

5   Some Highlights

In 2016, the Egyptian government was keen to promote the development of e-government and its services, paying close attention to the citizen's digital rights and the concept of fair and affordable knowledge acquisition. The state has made notable achievements in the national information and communication technology industry and has kept pace with the latest development of the world, and in the process of transforming into a knowledge-based society.

In 2016, the Ministry of communications and information technology (MCIT) continued to work out a robust regulatory framework for the ICT industry through continuous cooperation and development plans with other ministries, authorities, academia, civil society, and the private sector. The year 2016 is a year for the development of the information and communications technology industry to contribute to further development, to increase productivity and to promote community development. The introduction of mobile services by 4G technology will help to improve the speed of the Internet, improve the quality and price of the existing business, and provide new services for the citizens to seek welfare. In addition, some modern financial services have been developed in 2016. This is the first stage of completing the comprehensive database project in addition to developing the network security strategy, to integrate the national institutions and improve the data quality, and thus move towards the digital society in Egypt.

Estonia

1 General Information

Area: 45,228 km^2

Population: 1,251,581

Government Type: Parliamentary Republic

GDP: $31,800

Internet Users: 87.2

Wired (Fixed Broadband Users): 31.1

Wireless Broadband Users: 125
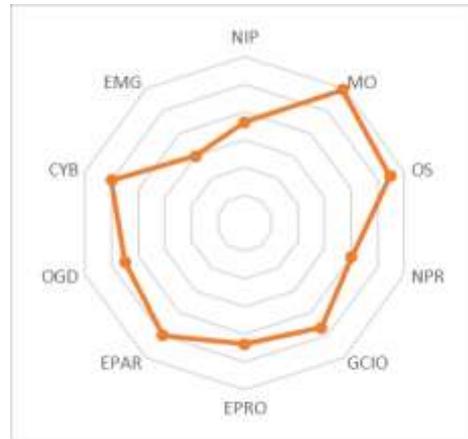
2 Positioning in a Global Organization and a Region

Among OECD Countries, all indicators except the use of Emerging Technologies for government are above the average score of OECD members. The Management Optimization (MO) indicator of Estonia gets the better score than that of the United States, the best country in the global ranking and also in OECD.

Amongst European countries, Estonia is posted below Denmark. However, the e-Participation and Government CIO of Estonia are better than those of Denmark, the best country in the Europe region.

3   Digital Government Development

Source: Estonian Information System Authority

https://www.ria.ee/public/publikatsioonid/x-
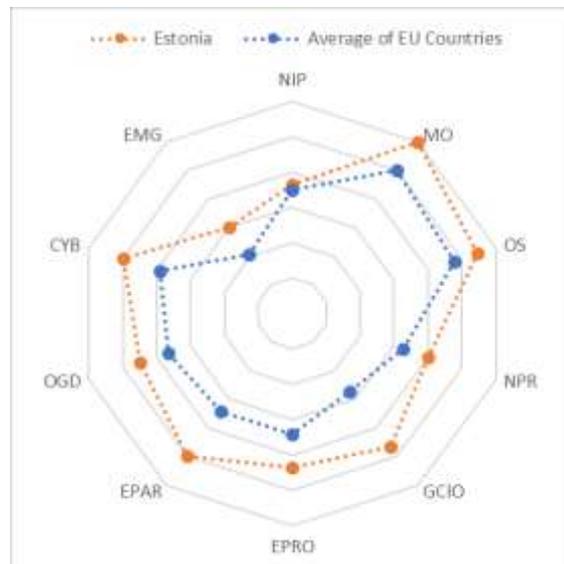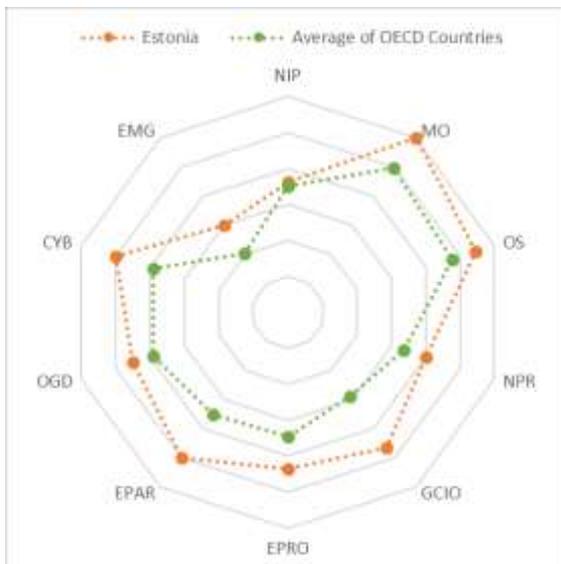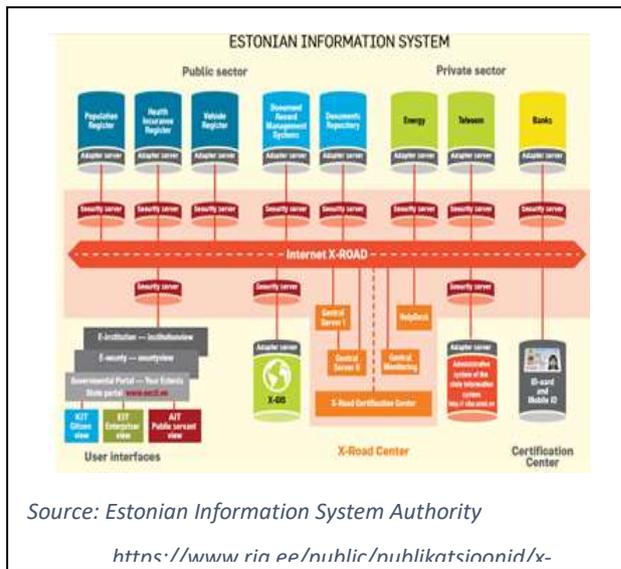
E-Government in Estonia has reached the connected stage. Since 2001, Estonia has implemented X-Road as the core of government information system integration. Hitherto, X-Road is considered as a symbol of Estonian e-Government. It is the core of the e-government system in Estonia. Using X-Road, public and private sector agencies can share their information, thus, enabling them to offer e-services without redundancy. E-Tax system in Estonia is one of the online services utilize the presence of X-Road. Estonians enjoy the simple procedure for filling tax report in which they merely click four to six button for completing the procedure. It is not necessary to input the similar data time over time because the data is already there. Hence, everything is prefilled. Unless something is wrong, they do not need to fill anything.

In 2017, over 900 domestic institutions provide 1,500 kinds of electronic public services, more than 570 million inquiries are processed during the year of 2016, and "820 It is said that it had the effect of reducing the working hours of the year ".

In parallel with the introduction of X-ROAD, services for banking and tax reporting systems and ministerial and civil servants were also electronized.

To expose the position of Estonia to become a world-class public e-service, Estonia joined with the United Kingdom, South Korea, Israel, and New Zealand to establish a Digital 5 (D5) Cooperation. The first D5 Meeting was held in London in December 2014. Tallin hosted the second summit in November 2015.

Strong commitment to ICT is inherent in the part of the prime minister and senior government officers. Prime Minister chaired E-Estonia Council, which lead the making and execution of national digital agenda in the country. In 2018, people can register a company online in minutes. Over 95 % of citizens have a digital ID, including digital signature, enabling the use of e-services. Digital signatures alone save 5 days in a year for every working person. 32 % of votes in the Municipal council election in 2017 were cast over the Internet.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

Approximately 87.2% of people in Estonia were Internet users in July 2016, according to the world fact book. About 31.1% have fixed-broadband subscriptions, and wireless broadband subscription has reached 125%.

4.2   Management Optimization [MO]

In early 2014, Estonia has launched the Digital Agenda 2020. The ultimate goal of this agenda is not merely an ICT use in daily life and business. The current plan

emphasizes the improving economic competitiveness, the well-being of people and the efficiency of public administration. Some priorities have been set on the agenda such as completing the next generation broadband network, generating greater control over personal data, and utilizing data analytics in public sectors.

In all, Estonia has fully achieved the maximum score in Management Optimization domain. Contribution from operationalization of X-Road is very significant in this area. X-Road is the information exchange layer comprising the central databases of the Republic of Estonia.

4.3   Online Service [OS]

The score for Online Service is based on five investigating online services, i.e., e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Currently, the e-Health service is provided as an e-Health record. That service is a nationwide system integrating data from Estonia's different healthcare providers to create a standard record every patient can access online. Functioning very much like a centralized, national database, the e-Health Record retrieves data as necessary from various providers, who may be using different systems, and presents it in a standard format via the e-Patient portal. For assuring the integrity of retrieved electronic medical records as well as system access logs, blockchain technology is being tested and will be implemented shortly. 99% of patients have a countrywide digital record.

In term of complexity level, most of Online Service in Estonia has reached a transactional in which user can start the transaction from applying to receiving the service through the portal. In addition to that, all Online Services have implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services.

For measuring the level of convenience, the third party application result has shown that three portals are above the average considerably in term of speed. The other two portals, i.e., e-Health and One-Stop Service are slightly above the average. The third party application for assessing the portal is the application from Google named Google PageSpeed™ Insight on https://developers.google.com/speed/pagespeed/insights. In addition to that, all clickable objects on the portal work as they should do.

4.4   National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. National Portal of Estonia (http://estonia.eu) contains proper information for local citizens and foreigners. Information about Estonia is available on the portal. People can find information about culture and heritage, demographic, and government. In technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is above average both from PC and from Mobile Device.

The website of Estonian Government (https://www.valitsus.ee/en) has opened a site that is compatible with accessibility, keyboard-only navigation, zooming in and out, changing colors and screen reader.

4.5   Government CIO [GCIO]

Estonia government has clearly defined the need for ICT leadership on e-Government. The Digital Agenda 2020 stated the role, the mandate, and the position of CIO in central

and local authority. The agenda also mentioned the need to establish GCIO Network among them. In addition to that, to provide a formal education that focused on CIO Competency, Tallin University has opened CIO program as one of Master Degree program.

4.6 E-Government Promotion [EPRO]

The Estonia Government establish e-Estonia Showroom. It is an executive briefing center. Their goal is to inspire global policymakers, political leaders, corporate executives, investors, and international media to kick-off the digital transformation by sharing the successful example of e-Estonia and build links to the IT sector. The e-Estonia Showroom has become a must-see destination, and we host over 10,000 international decision-makers every year.

4.7 E-Participation [EPAR]

Culture and society in Estonia have been created as a high-tech society. These factors have driven Estonia to the next horizon of e-Government. Citizens and the government can take the benefit of ICT in their daily life. For instance, parliament member has their website and provides the citizens with the alternative channel to communicate. The presence of e-participation portal (osale.ee) contributes to the high achievement of Estonia in this indicator.

4.8 Open Government Data [OGD]

In 2000, Estonia launched Public Information Act 2000 to participate in the Freedom of Information Act movement around the world. To strengthen the implementation of these acts, Estonia has established Open Data Portal (http://pub.stat.ee) to provide public with government information. To keep up to date information, the Estonian government uses data submission procedure through eSTAT system.

4.9 Cyber Security [CYB]

Estonia has ratified several laws related to cybersecurity. Some of them are as follow:

- State Secrets and Classified Information of Foreign States Act
- Public Information Act
- Personal Data Protection Act 2003
- Database Act 1997
- Information Society Act

In addition to these laws, Estonia has strengthened organization capacity for cybercrime countermeasure by setting up CERT-Estonia and give a mandate to Information System Authority (RIA) to supervise the continuous application of security measures in regards to the information systems used for the provision of vital services.

CERT Estonia deals with security incidents that occur in Estonian networks, start there, or which it has been notified about by citizens or institutions either in Estonia or abroad.

It must assist Estonian Internet users in the implementation of preventive measures in order to reduce possible damage from security incidents and to help them in responding to security threats.

The support provided by CERT Estonia depends on the type and severity of a security incident, on the number of users potentially affected by it and on resources available for the organizations.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). Estonia has attempted to implement Cloud Computing for Public Sector.

The Estonian public institutions will gradually transit from existing legacy systems to a new Government Cloud solution, which has been developed by the national IT Security Standard (ISKE), to ensure the compliance with safety and quality requirements.

In Digital Agenda 2020, it is mentioned that new infrastructure component required for the development of information society is a standard (i.e., share between the public and the private sector) service space, the core of which is the state information system. Although the basic service infrastructure (X-Road, eID, state portal, etc.) has been systematically developed, rapid technological change forces us to continue updating the infrastructure or replace its components.

Moreover, what is important is that there is a need to assess the impact of the most important current technology trends (cloud technology, social media, mobility and increased volume of information) and future innovations (IoT, advanced analytics and big data)

5   Some Highlights

The operationalization of X-Road has brought the Management Optimization as the best indicators for Estonia. X-Road enables secure Internet-based data exchange between the state's information systems. Not only the state's information system but also the private sector can take the benefits of X-Road. In addition to that, citizen uses X-Road seamlessly by using Citizen ID, because interaction with government is considerably simple through Online Participation Portal. As a result, the e-Participation indicator for Estonia places the second-best performer. The situation is similar to Online Service indicator that sets the third-best performer.

Estonia Online Participation at http://www.osale.ee

With the excellent score on these three best indicators, Estonia has the challenge to use the emerging ICT. Also, this new technology; Cloud Computing, Big Data, and IoT are the new tools for creating a government.

Fiji

1 General Information

Area: 18,274 km^2

Population: 909,389

Government Type: Parliamentary republic

GDP: $8,800

Internet Users: 46.5

Wired (Fixed Broadband Users): 1.4

Wireless Broadband Users: 54.3

2 Positioning in a Global Organization and a Region
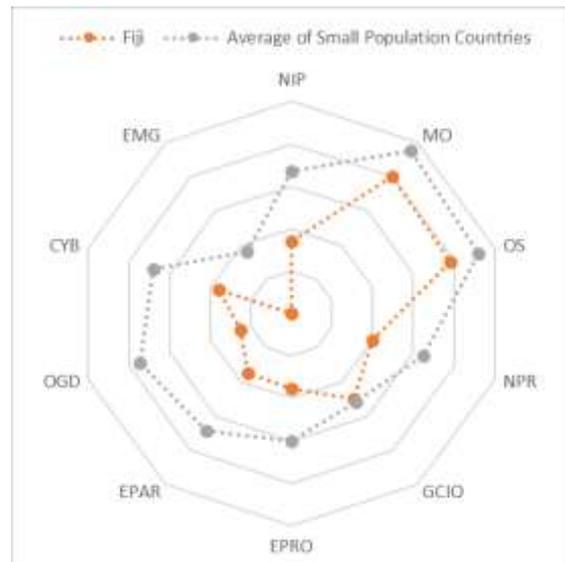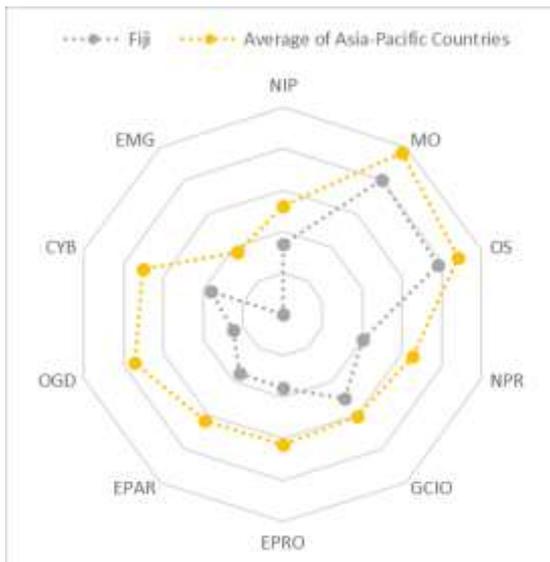
3 Digital Government Development

The e-Government program is the single most massive ICT project for the Fiji Government. With the Fiji government facing the challenge of using technologies to fundamentally transform government service delivery with a vision to provide citizen-centered and integrated. The following critical success factors or e-Government strategic thrusts are needed to achieve the national objectives: (i) Implement financially sustainable service delivery models; (ii) Reinvent services delivery model to provide citizen-centric outcomes; (iii) Enhance operational efficiencies within and across government agencies; and (iv) Enhance ICT skills competency of government employees at all levels.

Compared to last year, this year Fiji has made one step to improve digital government by introducing and using e-Payments. It made Fiji became the newest government to join

a UN alliance of governments and organizations committed to accelerating the transition from cash to digital payments in order to reduce poverty and drive inclusive growth.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Approximately 46.5% of people in Fiji were Internet users in 2017, and there is 54.3% have wireless broadband subscriptions, but only 1.4% of the population has a wired broadband connection. Fiji is an island nation, so it is difficult in the deployment of ICT infrastructure to serve the development of e-Government.

4.2 Management Optimization [MO]

One of ITC Service's strategic priorities is to transform or re-engineer government services across all government agencies through the realization of the e-Government strategy. This holistic strategy adopts the three-legged stool approach, focusing on People, Processes, and Technology. In collaboration with other Government agencies, cooperate sectors, NGOs and other stakeholders, ITC Services will develop, promote, coordinate and support strategies that foster service excellence through the utilization of e-Government Application tools.

In 2016 the Fijian Government used e-cards pre-loaded with approved amounts to assist families who had lost their homes. Under this Help for Homes Initiative, recipients were able to purchase building materials with the e-cards from selected hardware stores. In the same year, Fiji completed its first medium-term financial inclusion strategy and is embarking on the second "National Financial Inclusion Strategic Plan 2016 – 2020″ with a target of increasing access to formal financial services to at least 85 percent of the adult population by 2020. The goal of the strategy is to elevate digital financial services. The strategy aims to increase the percentage of adults using digital payments from eight to 15 percent over the next five years.

4.3 Online Service [OS]

E-Services online provides Government Services over the Internet. There are 3 Clusters in which the Government will provide services. These are (i) G2G Cluster, This cluster focus on the exchanging of data between Government Ministries and Departments where necessary. These services are only available to government officers; (ii) G2B cluster: This cluster focus on providing Online Services to Investors and business that need approval from the concerned Government authorities. These services require free business user registrations and login; (iii) G2C cluster: This cluster focus on providing Government Services online to the Fiji Citizen. Whereby a citizen will be able to access and extract the required information from the Government Departments. Also, citizen will be able to submit applications online to relevant authorities should the services are available online. These services require free citizen user registrations and log in.

Compared to other countries in a region, the e-Government services in Fiji has no good position. There are some services which are provided to citizens such as e-tax, e-health, and e-procurement but there are no transactional services. The level of complexity is only dynamic. Fiji government has a national portal, but this portal is not integrated e-services inside.

4.4 National Portal [NPR]

www.fiji.gov.fj is one of national portal. This portal together with one other government portal, egov.gov.fj, so-called the citizen portal, collectively makes up the Fiji

Government Online (FGOL) presence. The national portal demonstrates a consistent page layout and navigation with English as the primary language used. There is also an option for users to quickly increase the sizes of the letters or decrease them which very convenient for those with bad eyesight. There is a clear lack of citizens` participation mechanisms such as blogs, polls and forums but citizens can access and follow the Government activities through Facebook through a link on the national portal services.

4.5 Government CIO [GCIO]

The Minister of Information was appointed to the position of CIO. Fiji National ICT Governance Structure comprises of a CIO Council which reports directly to the e-Government Steering Committee on all e-Government matters and is responsible for implementing the e-Government Master Plan at the agency level. However, there are further requirements to penetrate the CIO concept within the government.

4.6 E-Government Promotion [EPRO]

In Fiji, there are some private companies, which provide a holistic range of IT and communications engineering solutions to support our customers' business goals throughout their technology life-cycle.

In order to increase and deliver services to citizens, the Fiji government is interested in recruiting from the Fiji Volunteer Service (FVS). They are promoting the regional component of the FVS as part of Fiji's Development Co-operation initiative and that it be mutually beneficial to participate countries.

4.7 E-Participation [EPAR]

In order for e-participation to develop there needs to be more improvements and efforts placed on infrastructure and capacity building. Fijian Government national portal still lacks features to confirm the engagement of citizens in the decision-making process.

Some government officers in Fiji has their website, such as Prime Minister. Universal access to information and greater public awareness of Government programmes including a broad-based appreciation of Government is achieved through cyberspace modality. This is the essence of the Ministry's website to bring to all and the world his vision and of his Government on where and how they want to take Fiji as per the aspirations of the people in the Charter.

4.8 Open Government Data [OGD]

Official Fiji Government website with information about departments, ministries, news briefs, and press releases, this portal is a gateway to share information on e-health, e-tender system but nothing found on open government data.

4.9 Cyber Security [CYB]

The increased availability and use of computers in Fiji has led to a corresponding growth in international data transmission requirements. The cyber environment in Fiji includes licensed operators, telecoms, as well as the ISPs, TAF, Commerce Commission, and other organizations and is linked to an Internet ecosystem. One of the challenges in Fiji is that there is not sufficient awareness amongst stakeholders within the cyber-environment of the stakeholders within the Internet ecosystem and how each relates to each other.

4.10 The use of Emerging ICT [EMG]

There is no emerging ICT in Fiji

5 Some Highlights

In Fiji, the e-Government program involves three (3) main streams: Public Contact Center (PCC), Government Information Infrastructure (GII) and E-Applications. These 3 streams address the tasks of handling inquiries or complaints from the public, connection of government offices to the network and managing and developing various government online applications for the e-Government SharePoint Framework respectively.

E-Services Fiji is one stop portal providing services to be delivered online on a real-time basis to users be it citizens, visitors to Fiji, individuals/companies local or foreign setting up businesses in Fiji or Government department employees providing various services and performing various back office functions.

The users, based on the access rights granted, will have access to various services from a single services platform that are required to perform various activities in the day to day life of the user. Compared to last year, Fiji goes down one step and ranks at 64. It made Fiji is still standing in a low position on e-Government development.

Finland

1 General Information

Area: 338,145 km^2

Population: 5,476,922

Government Type: republic

GDP: $41,200

Internet Users: 97.2

Wired (Fixed Broadband Users): 31.7

Wireless Broadband Users: 153
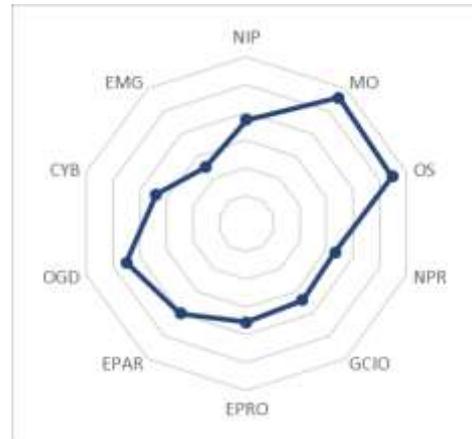
2 Positioning in a Global Organization and Region

Among European countries, Finland scores lower than the average in Government CIO, E-government Promotion, e-Participation, and Emerging Technologies. A similar result was observed in comparison with other OECD countries meanwhile Finland has surpassed the region's average in most of the indicators except these ones above.
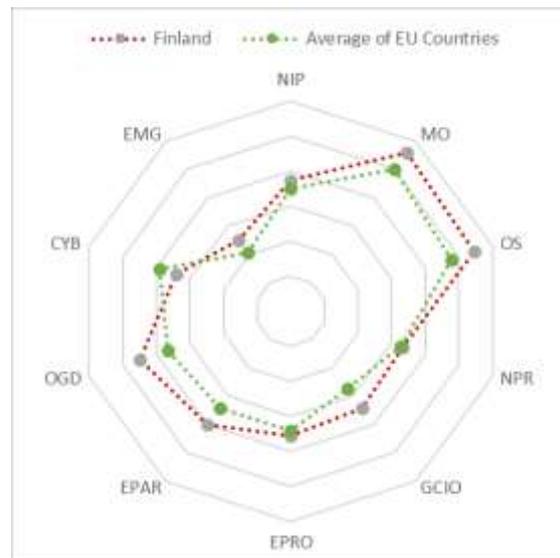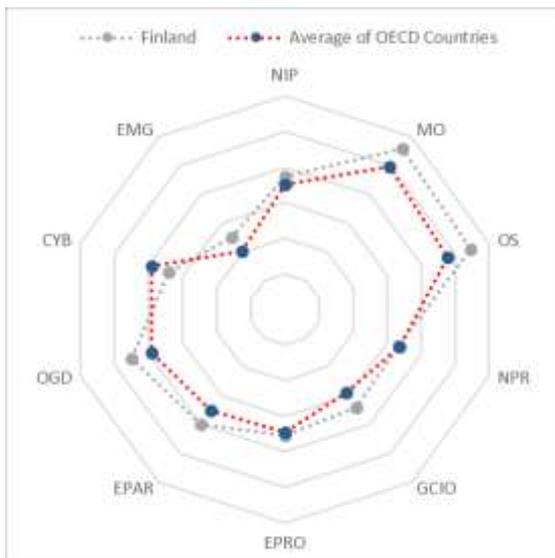
3 Digital Government Development

Finland has one of the highest broadband penetration rates in Europe. Finland is also one of the early adopters of e-government initiatives within the OECD and has achieved impressive results based on international comparisons. (OECD, 2010). In Finland, responsible for e-government, information society portfolio and participation policy collaborate across three ministries – the Ministry of Transport and Communications; the Ministry of Finance and the Ministry of Justice. The Ministry of Finance has central policymaking responsibilities for public administration reform and development of general ICT and e-government strategies. Within these responsibilities, Public Sector ICT dep., as part of the Ministry, is leading the overall e-government development, e.g. by promoting cooperation between central and local government on common information

management, formulating common functional and technical solutions and methods, and developing information and data security in public administration.

In order to maximize the cooperation among government bodies, Finland established the Ubiquitous Information Society Advisory Board which involved of representatives from significant ministries, agencies, business and academicians and headed by the Minister of Transport and Communication.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

There are more than 97% of people in Finland were Internet users in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). Among them, only 31.7% have a fixed-broadband connection while the portion of the total population has a wireless subscription is 153%.

4.2 Management Optimization [MO]

Digitalization becomes the top priority in Finnish Government's agenda, marked by the announcement of the Government Programme in May 2015, which specifies that public services should be developed primarily as digital. In the efforts of accelerating e-services provision, Finland adopted Estonia's X-Road system, the data exchange layer which provides a standardized method for exchanging information and data among public sector organizations and connecting different national datasets.

The Ministry of Finance has launched The National Architecture for Digital Services which is considered as a compatible infrastructure for facilitating information exchange between organizations and services. The programme consists of several components such as: "a national data exchange layer, the shared service views required by citizens, companies and authorities, a new national e-identification model and national solutions for the administration of roles and authorizations for organizations and individuals".

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. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. For e-Procurement, due to the high decentralization in Finland, e-Procurement initiatives were not provided on a single national platform. Information on public tendering, however, is provided via Hilma service (https://www.hankintailmoitukset.fi/fi/). Tax and Customs are the two services reaching the highest complexity level, with various security mechanisms are fully implemented.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. Finland's national portal (http://finland.fi/) was designed in the blog style, with articles being categorized into different topics (culture, lifestyle, politics, and so on). There are different social networks integrated with the portal. However, this portal does not include the information about Government, although there is a link to Suomi.fi where government's services are provided. Regarding technical aspects, the portal operates well with different browsers and devices, with acceptable loading speed (according to the Google Speed Test result).

4.5   Government CIO [GCIO]

Each ministry and government agency has its chief information officer, although the formal title and precise job description may vary. There is no law mandating the presence of CIOs in each ministry and government agencies, but the CIO position is decided based on each organization's internal process.

The mandate and role of CIOs are currently changing, particularly at the ministerial level. In the past, they have been responsible for all the ICT technology within their organization. Nowadays, because infrastructure services (or sector-independent ICT services) are provided by a Government ICT Centre Valtori (established in 2014), the operative tasks of CIO are decreasing, and the mandate is becoming more strategic oriented. The most critical tasks in this new role include designing and managing enterprise architecture, defining ICT strategy and information and cybersecurity strategy. It should be noted, however, that this changing role of CIOs in government agencies are still transition process which may take a few years.

4.6   E-Government Promotion [EPRO]

The Ministry of Finance plays perhaps the most critical role in the horizontal co-ordination of e-government. It has a central policy-making function and helps the government to translate its vision and principles into useful guidelines and related e-government strategies.

At the national level, the Association of Finnish Local and Regional Authorities (AFLRA) plays a significant role in representing the interests and perspective of local government partners. The Association of Finnish Local and Regional Authorities seeks to promote the opportunities of the local government sector to make efficient use of ICT.

According to the Act on Information Management Governance in Public Administration, major central government IT projects (projects costing over EUR 5 million) shall be reviewed by the Ministry of Finance before the investment decision is made. This review process ensures that major IT projects are compatible with overall enterprise architecture and thus meet statewide interoperability requirements. Cost-benefit analysis (business case) is also required.

The National Audit Office occasionally scrutinize, and reviews selected IT projects. These reviews, however, are entirely up to the NAO that what, when and to what extent it wishes to review and scrutinize government's reform programme (including IT) or single IT projects.

At an agency or project level each government agency is responsible for evaluating its projects. Ministry of Finance recommends usage of a common evaluation framework for projects costing more than 1 million euros.

4.7   E-Participation [EPAR]

Several initiatives were established to facilitate the interacting between citizens and government. This enables citizens to participate in various government activities. For example Public consultation: lausuntopalvelu.fi; Questionnaires, polls: otakantaa.fi and Citizen Initiatives; kansalaisaloite.fi. These initiatives are the components of the e-participation environment project 2010-2014, which is a part of the Ministry of Finance's Action Programme on e-Democracy and e-Services.

4.8 Open Government Data [OGD]

Regarding Open Government, the Finnish Government has cooperated with other Nordic countries such as Denmark, Sweden, and Norway to share their open data strategies and promote for opening up data.

Led by the Ministry of Finance, the Open data Programme – 17 May 2013 to 30 June 2015 – was eliminating obstacles to the re-use of public data as well as creating the preconditions for open data within the public administration. The Open data policy for 2015 – 2020 covers the proposals of the programme for the key goals and actions in the field of open data in the public administration in Finland.

4.9 Cyber Security [CYB]

The Government of Finland released its Cyber Security Strategy as a Government Resolution in 2013, defining the vision and the key objectives of the government for protecting society and its vital functions against cyber threats. Finnish Government took a further step in securing government network by introducing the Act on the Government security network which came into force early 2015. By doing this, the communication of state administration's leadership could be secured in all situation.

The Ministry of Finance is responsible for the steering and development of the state's information security. The Security Committee was established on February 2013 with the role is to assist the Government and ministries in matters relating to comprehensive security. There is also an incident response team called VIRT (Virtual Incident Response Team) which is a national network consist of 50 cybersecurity professionals, with the duties are to plan and prepare co-operation and responses to major cybersecurity incidents encountered by the Finnish Government agencies.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT).

Internet of Things was mentioned in the new Government Programme as a key project to coordinate the ministries' activities. This will be a joint effort by businesses and the public sectors in order to "create a favorable operating environment for digital services and new business models". An implementation plan for leveraging big data and for piloting My Data will be drawn up (based on the Big Data Strategy of the Ministry of Transport and Communications, 8/2014).

5 Some Highlights

In Finland, the newly appointed government - Sipilä's Government – has published its Government Programme, focusing on overarching reforms with five strategic priorities and 26 key projects. Among these, digitalization is a cross-cutting theme which is appeared in most of the critical projects of the Government. These efforts contribute to the increase of Finland's score on Management Optimization and Online Services this year.

Being one of the most developed information societies who is functioning heavily relies on digitalized networks and services, Finland has already been the target of various types of cyber threats. That explains why Finland is giving high priority to information security; however until 2013, the first national Cyber Security Strategy was published as a Government Resolution.

With an advanced e-government development level, the e-government promotion activities of the Finnish Government are no longer surrounded the matter of citizens' awareness. Instead, the target is focusing on how to improve users' experience with government digital services due to the increase in citizens' expectation. More attention need to be paid to the utilizing of emerging technology such as internet of things or big data within government agencies.

France

1   General Information

Area: 643,801 km^2

Population: 66,836,154

Government Type: Semi-Presidential Republic

GDP: $42,400

Internet Users: 85.6

Wired (Fixed Broadband Users): 42.4

Wireless Broadband Users: 109.2

2   Positioning in a Global Organization and a Region

Among OECD Countries, all indicators except GCIO, Cybersecurity (CYB) and the use of Emerging Technologies for government (EMG) indicators are above or same with the average score of OECD members. Amongst European countries, France is placed below Denmark. However, the e-Participation (EPAR) and Open Government Data (OGD) indicators of France are better than those of Denmark, the best country in the Europe region.
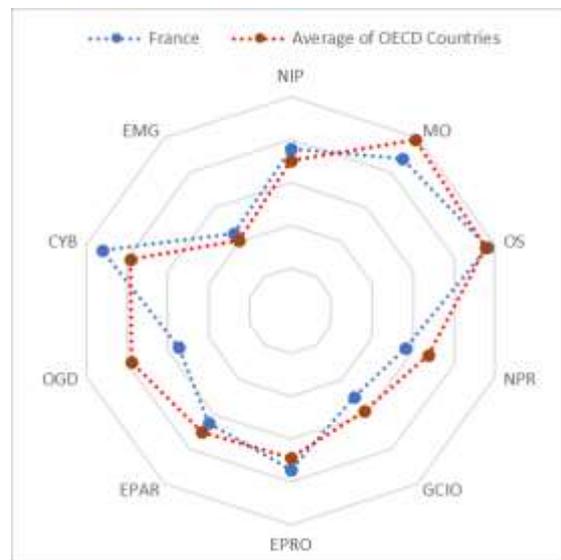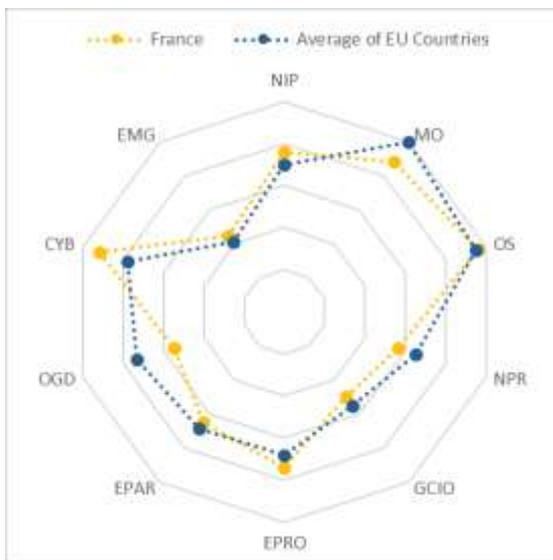
3   Digital Government Development

In France, there was a development plan called the "Digital Economy by 2012". This was France's national e-Government strategy aiming to make France a digital nation by 2012. The plan was comprised of 150 actions centering on four major priorities 1) access to all digital networks and services 2) production and supply of digital contents 3) diversification of digital services and 4) governance modernization of the digital economy. Moreover, On November 2011, the Minister of Industry, Energy and the Digital Economy

presented the results and prospects of the "Digital France Plan 2012-2020", with 57 new priority targets to develop the digital economy by 2020.

The Inter-Ministerial Directorate for Information Systems is building the foundations of the "ETAT PLATEFORME" (State platform), an architecture supporting the creation of a new kind of digital public services. This strategy of transforming the state information system presupposes, itself needs to bring together the various data of the user necessary for its purposes, and offers in return almost ready-to-use services. It deals with services centered on its needs, and not from the organizational carving of administrative structures. The main principles of the State platform are the opening of API by large public providers of data, the flow of data between administrations, and the flow control by users through France Connect. Open up data for exchange between agencies, but give end users control over how information of a confidential nature is exchanged, such as personal data. Besides France Connect, the platform will offer other State resources. Including a store to reference the available APIs, the type of data that covers and related service contracts. A blacksmith will also be available to developers to encourage the reuse of software components required for the construction services. Finally, the General Repository for Interoperability and Architecture Framework of the State Platform API will enable developers to rely on the same exchange protocols.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Approximately 85.6% of people in France were Internet users in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). About 42.4% have fixed-broadband subscriptions, and wired broadband subscription has reached 109.2%.

4.2 Management Optimization [MO]

Prime Minister's services lead the National e-Government strategy of France "Government as a platform" on behalf of the Ministry for State Reform and the Ministry for Digital economy. Moreover, on February 2013, the government presented its Roadmap for the Digital Economy. This strategy revolves around three pillars, which are to 'Provide opportunities for youth', 'Reinforce competitiveness', and 'Promote our values in society'.

4.3 Online Service [OS]

The score for Online Service is based on an investigation of five online services:., e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Among these five Online Service, e-Procurement, e-Tax, e-Customs, and One-Stop Service are the best performer among five online services. Furthermore, there are various fully transactional e-Services provided in France. Users can file taxes, search for jobs, apply for social benefits, register vehicles, request certificates, and access many other services by searching as a category.

Regarding complexity level, all online services have reach interaction level where the citizen can obtain the service without necessarily visit to the government office. The initial stage of interaction with the government through the portal. In addition to that, all Online Service has implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services.

To measure the level of convenience, the third party application result has showed that all five online service portals are above the average considerably regarding speed. E-Procurement and e-Health (personal medical account - 'dossier médical personnel': DMP) are the only portals that scored about the same with average. The third party application for assessing the portal is the application from Google PageSpeed™ Insight.

4.4   National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. National Portal of France "https://www.service-public.fr/" contains proper information for citizens. Information about France is available on the portal, and there is another government portal "http://www.gouvernement.fr/" that provide many government information and service. In technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is well on PC, but it is about average on from Mobile Device. However, from the user experience aspect, this website is tremendous.

4.5   Government CIO [GCIO]

There are also other established organizations responsible for e-Government policy/strategy development and coordination: The Council for the Modernization of Public Policies (CMPP) and the Directorate-General for State Modernization (DGME). The members of the council and the directorates carry out e-Government responsibilities in an in the termsinisterial/departmental setting. The Head of the Interdepartmental Agency for Digital Projects and Information System of the Government (Direction in termsinistérielle du numérique et du système d'information et de communication de l'Etat, DINSIC) - is at the same time GCIO, Government Chief Digital Officer and Government Chief Data Officer.

4.6   E-Government Promotion [EPRO]

France is committed to making the country a major digital power through e-Government promotion. Various mechanisms are being strengthened to boost development such as laws and legislation, plans and strategies, public and private collaborations, and transforming to electronic administration.

4.7   E-Participation [EPAR]

The official French website for e-participation is "http://www.gouvernement.fr/". This e-participation promotes French citizens to get online, and 'e-democracy' is aimed at involving the citizen and hearing their voices in significant areas of democratic governance. Moreover, it can follow the government action which the progress and any related to it. Political and ideological debates are opened online to the citizens, which serve as a dialogue avenue with political officials. More ever there are have personal information and contract for each parliament member that citizen can write an opinion, and also see more information about public meeting for each parliament activity.

4.8   Open Government Data [OGD]

France has released the beta version of its open government data website, "http://data.gouv.fr/". Following the wave of open government data portals around the world and the Commission's Open Data Strategy the French open data portal is one step towards a new governance model which aims to be more open, participative and Internet-driven. France became the first country to appoint a national Chief Data Officer

(Administrateur général des données - AGD). Moreover, according to the site, there are currently over 24,638 datasets hosted on the site on in late February 2017.

4.9 Cyber Security [CYB]

To meet the growing challenges posed by cyber-attacks and in light of the recommendations made in the White Paper on Defense and National Security, the French Network and Information Security Agency (ANSSI) was set up in July 2009. ANSSI is an interdepartmental agency operating under the authority of the Prime Minister.

As part of the reinforcement of cyber defense capabilities at the Ministry of Defense, the post of Cyber Defense General Officer was created in 2011, with responsibility for coordinating the Ministry's cyber defense activities and acting as the primary interface in the event of a cyber-crisis. The Ministry of Foreign Affairs ensures the consistency of French positions on cybersecurity within the various international organizations and supports the development of international collaboration to address this issue.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). The government of France issued the "Guide to Cloud Computing" that guide government uses the Cloud computing that is one of enterprise architecture of e-Government. For example; Interdepartmental Agency for Digital Projects and Information System of the Government (DINSIC) and Interdepartmental Purchasing Department (DAE) purchase cloud computing solutions for all departments. Moreover, Etalab team (part of DINSIC) have been employing data scientists for two years to develop predictive analytics use cases of big data.

5 Some Highlights

Among ten indicators in the current ranking, the E-Participation, Management Optimization, Open Government Data, and Online service are the best among other indicators in e-Government France. Moreover, also National Portal score is high, with "http://legifrance.gouv.fr/" and "http://vie-publique.fr/" gives citizens to legal texts and knowledge about the public policies. France's national portal provides a gateway for users to access government information easily. The national portal of France also provides online forms and services. The portal also provides several media contents including videos, audios and photo galleries. There is also help functions to guide users' browsing experience. The main aim of the portal is to simplify routine relation between government and citizens.

The weak point in France is about Government CIO and the use of emerging ICT. On 24th September 2015, the nomination of Henri Verdier for the new CIO of French was officially announced, he is at the same time GCIO, Government Chief Digital Officer and Government Chief Data Officer. Moreover, the use of Cloud Computing on government should be increased after "Guide to Cloud Computing" was progress.

Georgia

1   General Information

Area: 69,700 km^2

Population: 3,713,804

Government   Type: Semi-presidential
republic

GDP: $9,172

Internet Users: 50

Wired (Fixed Broadband Users): 15.8

Wireless Broadband Users: 57.7

2   Positioning in a Global Organization and a Region
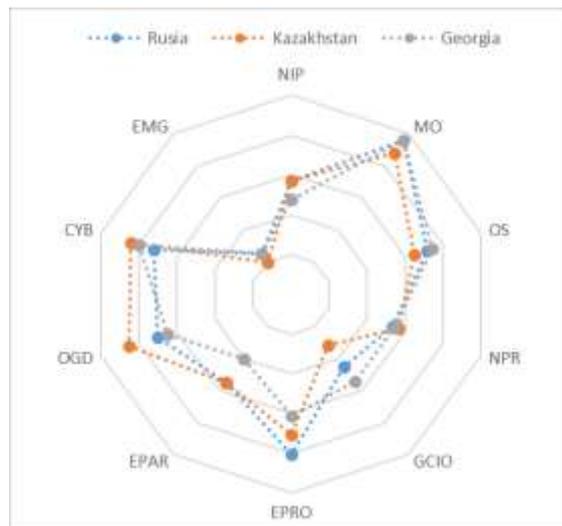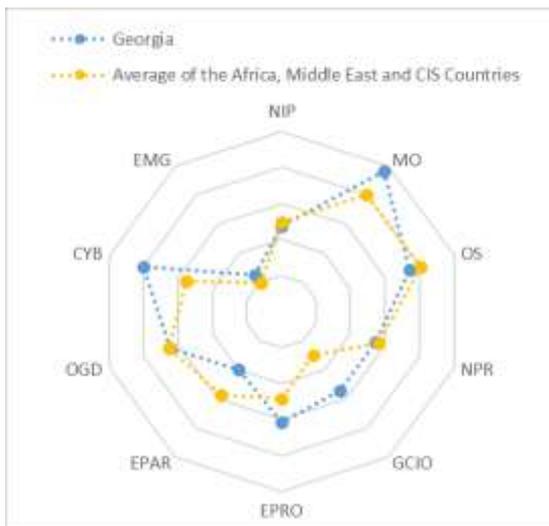
3   Digital Government Development

During the processes of evaluation, most D-Government services such as E-tender, Social Security Services, Civil Registration Services, Consular Services, and Labor-Related Services are provided at static websites available. E-payment and e-voting services are not available yet. E-health is being actively promoted by the Georgian Telemedicine Union, whose activities include telepathology, education, and development of policy for particular scenarios, such as e-consultations for conflict regions. It also developed a proposal for the creation of a national e-health network in Georgia.

E-Georgia strategy and action plan were introduced for the period 2014-2018. This strategy aims to develop Georgia as IT-based governance state which implies the increase of access to e-services for businesses as well as for citizens, strengthening of transparent and open governance, defining the role of information-communication technologies in the process of administrative reform. The vision for the e- Georgia strategy reflects this broader scope and is defined as "Georgia will become a more efficient and effective

public sector offering integrated, secure, and high-quality e-Services. Improved usage and participation enable ICT-driven sustainable economic growth."

E-Georgia focuses on ten thematic priorities, e-Services, e-participation and Open government, e-health, public finance management system, e-business, ICT-hub Georgia, infrastructure, e-security, skills and e-inclusion, and Enabling frameworks and governance. In this year, they have done within the framework of Component 4 of the twinning project "Promote the strengthening of E-Governance in Georgia (D-Government Georgia)"

The government is creating a portal for electronic petitions ichange.gov.ge. The purpose of the portal is to ensure that society is included in the public policy, ensuring transparency of decisions and government activities. According to the government's decision, all citizens of Georgia are eligible to initiate an electronic petition to the government, and all adults of Georgia have the right to subscribe to the electronic petition.

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

According to ITU, about 50% of people in Georgia have used the Internet in their daily life. Moreover, about 15.8% are fixed-broadband users, and the wireless-broadband users are 57.7%.

4.2   Management Optimization [MO]

The newest document "A Digital Georgia: e-Georgia strategy and action plan 2014-2018" defines the path leading to a modern Georgia and provides a comprehensive framework for societal changes enabled by ICT. It focuses on those potential fields, where the public sector can take measurements and to set frameworks to exploit the full potential of ICT. The eGeorgia strategy is, however, not limited to the activities covered under the term D-Government.

The vision for the e-Georgia strategy reflects this broader scope and is defined as "Georgia will become a more efficient and effective public sector offering integrated, secure, and high-quality e-Services. Improved usage and participation enable ICT-driven sustainable economic growth."

In 2018, Georgia began to develop a project to harmonize the Silk Road from China to Europe with a single regional digital market (https://news.rambler.ru/caucasus/39380264-gruziya-prezentovala-proekt-garmonizatsii-shelkovogo-puti-s-edinym-regionalnym-tsifrovym-rynkom/). Within the framework of the project, Georgia, located in the center of the Silk Road, will accelerate its digital development in order to become a leader in the region and a significant player in commercial electronic technologies. In order to implement the program, an international technology consortium with leading companies will be established shortly. The creation of a technological platform will begin, which will link the participating countries of the project throughout the region.

4.3   Online Service [OS]

There has been very little progress in Georgia regarding the provision of D-Government services. Most of D-Government services such as E-tender, Social Security Services, Civil Registration Services, Consular Services, and Labor-Related Services are provided at static websites available. E-payment and e-voting services are not available yet. E-health is being actively promoted by the Georgian Telemedicine Union, whose activities include telepathology, education, and development of policy for particular

scenarios, such as e-consultations for conflict regions. It also developed a proposal for the creation of a national e-health network in Georgia. However, this has not yet been implemented. This year there is no information change in this indicator In Georgia, the government focusses on a useful public service channel strategy with the aim to move interaction from the analog realm of physical, telephone and written service requests to the digital world. All services from e-Georgia strategy focus on the supply side that is: Planting the seeds of sophisticated G2C, G2B and G2G e-Services, i.e. ensuring the availability and supply of user-friendly and accessible electronic services.

To date, the central e-services in Georgia are focused on the development and implementation of digital services for the issuing of passport, ID and residency, life event services related to marriage, divorce, birth adoption, and change of name, death, and power of attorney. As for business services, the government introduced some services such as e-Notifications, e-Tendering, product catalogs, qualification profiles, e-Orders, e-Invoices, and e-Payment. The Government is discussing the idea of "Digital customs", but there is no information about the program or projects in this area.

4.4 National Portal [NPR]

The Georgian national portal http://government.gov.ge/ provides fundamental functions for users. The National portal links to all government agencies' websites. Information provided in the portal seems to be targeting foreign visitors and business who want to know more about the country. The portal is available in Georgian official language and English. There is not SNS feature in the National Portal.

The Georgian government separated e-services to citizens and business by introducing my.gov.ge portal. This portal combines all services, but it is only in the Georgian language.

4.5 Government CIO [GCIO]

The official CIO position is still absent in the Georgian bureaucracy. Policy development in ICT areas comes from the Telecommunication and Information Technology Department of the Ministry of Economic Development. However, the Ministry does not have a published forward-looking strategy for development across the industry.

4.6 E-Government Promotion [EPRO]

Georgia is short of the legal framework for e-Government development. There are no legislation, strategies, policies or plans regarding e-Government. International organizations sponsor most e-Government projects.

To promote the strategy, the government cooperates with Data Exchange Agency of the Ministry of Justice of Georgia and EU TWINNING creates a project aiming to promote the strengthening of E-governance in Georgia are in the process of finalizing e-Georgia strategic paper.

4.7 E-Participation [EPAR]

E-Participation in Georgia is still limited at offering information to the citizen through the government website. Web 2.0 tools are not yet being used to allow more interaction between government and citizen. However, a citizen can contact with government officials through feedback forms or email addresses available at some government websites.

E-participation in Georgia focusses on four areas: feedback on e-Services, (co-)design of e-Services and open data, transparency and open government and decision-making and policy-making. To get feedback from users, the government develops many feedback mechanisms such as through social media networks, chat rooms, discussion forums and blogs, and survey online or consultations. "Provide your suggestion" is one of the most ideal to collect feedback from users. This mechanism is integrated into my.gov.ge portal, and it is very easy for using.

At the initiative of the University of Business and Technology and the National Museum of Georgia, a new social campaign "Become the Digital Ambassador of Georgia" starts in the country. The project provides for large-scale dissemination of information on Georgian monuments of cultural heritage, history, geographic diversity and other sights of Georgia in digital media and social networks. The goal of the social campaign is to popularize the national heritage of Georgia in the world. In the network, the social campaign will take place with the hashtag #shareGeorgia (in English, "Share Georgia", "Spread Georgia").

4.8 Open Government Data [OGD]

In April 2012, the country's government presented a relevant Action Plan which is focused on improving public services, increasing public integrity, managing public resources effectively, and creating safer communities. The implementation of these commitments is currently coordinated within an NGO forum created under the Ministry of Justice. The Georgian government had no specific plan to engage civil society and the private sector in the development of OGP commitments.

Georgia's OGP action plan is structured around four grand challenges: improving public services, increasing public integrity, managing public resources more effectively, and creating safer communities. The OGP requires countries to undertake at least one grand challenge of its list of five grand challenges, so by undertaking four Georgia is going beyond this requirement.

Data.gov.ge is operational, but it is a navigation portal linking to information provided by different public sector institutions rather than an open government data portal, where actual data can be retrieved. With the Institute for Development of Freedom of Information (IDFI - http://www.idfi.ge) and Transparency International Georgia (http://www.transparency.ge) very active NGOs exists that carry out research projects on Freedom of information, public information (e.g., http://www.opendata.ge), e-Participation and preventing corruption in Georgia.

Starting from October 2017, Georgia has been serving as lead co-chair of the OGP – an international initiative of 75 countries and 15 cities that strive to achieve deeper democracy. Georgia will host the 5th OGP Global Summit in Tbilisi, Georgia, on July 17-19, 2018. However, the real situation can be different from the official one.

On 1 September 2015, the Institute for Development of Freedom of Information (IDFI) launched an Open Data: Source for Changes and Innovations project with the financial support from the Good Governance Initiative (GGI) in Georgia project of the United States Agency for International Development (USAID), within the framework of which the following study – Access to Open Data in Georgia – has been prepared.

IDFI's research has revealed that the open data (117 databases) currently available through the open data portal does not match with the actual open data resources available at the public institutions. This observation is further supported by the fact that IDFI was able to select 162 datasets from the information that the 72 public institutions provided

regarding the databases and registers under their administration, that to date are not, but should be, published to the open data portal (https://idfi.ge/en/access-to-opena-data-in-georgia, https://idfi.ge/en/category/open-government-partnership-georgia).

4.9 Cyber Security [CYB]

The Government of Georgia publishes its Cyber Security Strategy for the first time in 2008. It has demonstrated that the national security of Georgia cannot be achieved without ensuring the security of its cyberspace. The National Security Concept of Georgia defines cybersecurity as one of the principal directions of its security policy. Georgia aims to set up a system of cyber security that will facilitate resilience of cyberinfrastructure against cyber threats as well as will represent an additional factor in the economic growth and social development of the country.

Georgia aims to develop a system of information security that can minimize harmful effects of any cyber-attack and allows rapid recovery of information infrastructure to be fully operational in the aftermath of such attacks.

The Government established a Cyber Security Bureau in 2014. The aim of Legal Entity of Public Law (LEPL) Cyber Security Bureau is to establish and develop stable, useful and secure Information and Communication Technology systems for the Civil Office of MoD of Georgia, structural sub-divisions of Military Forces of General Staff and LEPLs under MoD. LEPL Cyber Security Bureau has started provision of its tasks and responsibilities on February 28, 2014.

4.10 The use of Emerging ICT [EMG]

There is no emerging of using ICT in Georgia government.

5 Some Highlights

A "Georgia Health Management Information System Strategy" was already developed by the Ministry of Labour, Health and Social Affairs in 2011. The e-Health action plan is a vital part of the e-Georgia strategy.

Through 7th years of evaluation and based on the methodology of Waseda D-Government ranking, Georgian D-Government ranking is decreasing, especially this year. The official CIO position is still absent in the Georgian bureaucracy. Policy development in ICT areas comes from the Telecommunication and Information Technology Department of the Ministry of Economic Development.

There has been very little progress in Georgia regarding the provision of D-Government services. Most of D-Government services such as E-tender, Social Security Services, Civil Registration Services, Consular Services, and Labor-Related Services are provided at static websites available. E-payment and e-voting services are not available yet.

Georgia was among the first group of countries to join the Open Government Partnership (OGP). In April 2012, the country's government presented a relevant Action Plan which is focused on improving public services, increasing public integrity, managing public resources effectively, and creating safer communities.

Georgia adopts New Cyber Security Strategy that will be the primary document defining state policy and establishing basic guiding principles in the cyber security field. It should be mentioned that strategy considers cyberspace protection equally crucial as the inviolability of land, air and maritime boundaries.

Germany

1   General Information

Area: 357,022 km^2

Population: 80,722,792

Government Type: federal republic

GDP: $48,200

Internet Users: 89.6

Wired (Fixed Broadband Users): 38.1

Wireless Broadband Users: 109.2

2   Positioning in a Global Organization and a Region

Among OECD countries, Germany's Government CIO and Cyber Security are ranked higher than the global, Europe and OECD's average scores. Especially for GCIO, Germany secures the top position in European countries. Meanwhile, the country stands below the world and OECD regarding utilizing emerging technologies.
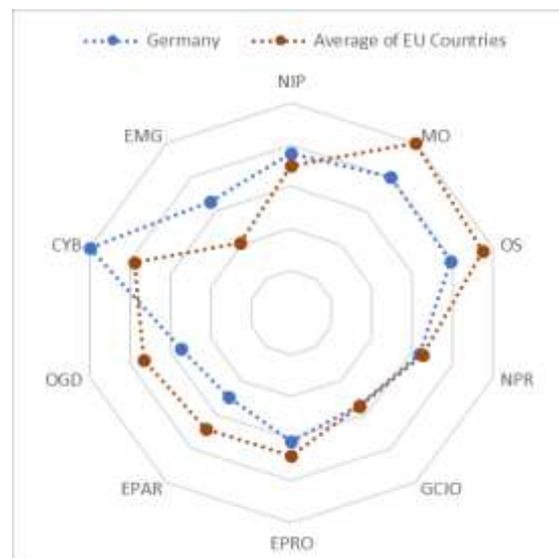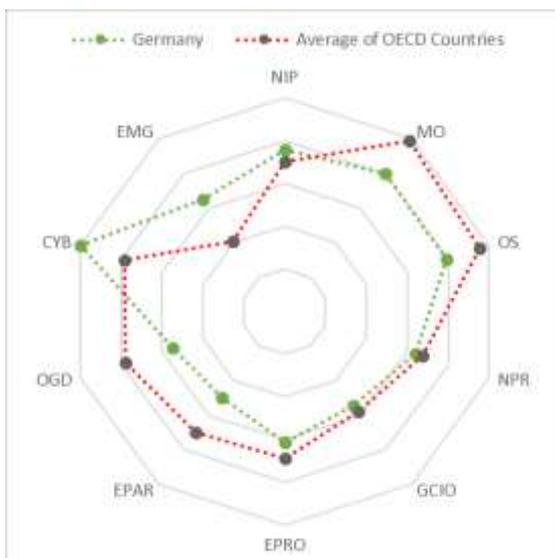
3   Digital Government Development

Germany, being a developed country, has significant experience with e-Government and as such has very evolved e-Government plans, policies, and goals.

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

Approximately 89.6% Germany's population were Internet users in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). Among them, wired broadband subscribers accounted for around 38.1% while more than 109.2% of total population have a wireless broadband connection.

4.2 Management Optimization [MO]

The Germany Federal Government approved the Digital Agenda 2014-2017 on August 2014. This agenda was planned by the joint efforts of by the Federal Ministry of the Interior, the Federal Ministry of Economic Affairs and Energy and the Federal Ministry of Transport and Digital Infrastructure. With its Digital Agenda, the Federal Government aims to three targets: to further exploit the innovative capacity for economic and employment growth; to expand the national networks and improve digital literacy for public access and participation; and to enhance IT systems and services' security and safety, thus increase trust among the public and the business sector.

In addition, the Federal Government's "Digital Administration 2020" programme establishes an overarching framework for the federal administration of the future, where potential benefits of digitalization are utilized to enable the administration reform, targeting to effectiveness, transparency, efficiency, accessibility, and responsiveness to the needs of individual citizens and businesses.

In term of government network, the project "Netze des Bundes" was implemented to consolidate a cross-departmental communication infrastructure with the highest level of security. All existing federal administration's networks are planned to be fully migrated to this infrastructure.

4.3 Online Service [OS]

The score for Online Service comprises five sub-dimensions: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. The online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience.

In term of complexity level, almost Online Services in Germany have reached the transactional level in which users can wholly conduct their businesses via an electronic portal. For e-procurement, in line with the new European procurement law, German Federal Government plans to make electronic procurement binding for the federal administration by April 2016. 'XVergabe' is a project initiated in 2007 to provide a standard interface for data exchange formats and data exchange processes of all electronic tendering platforms in Germany. Regarding customs, since 2006 the German Federal Government bring the Electronic Customs Tariff (EZT) system to the internet, known as "EZT-online". In addition, users can switch to an alternative solution provided by the European Commission – the Integrated Tariff of the European Community (TARIC) information system. With both systems, users can look up the importing/exporting code and customs duties. For healthcare, there is a telemedicine portal launched by the Federal Ministry of Health as a part of the eHealth initiative which was initiated in mid-2010. The portal provides a nationwide looking up on more than 200 projects involving telemedicine applications and telemonitoring in Germany. In addition, as of December 2015 the "Act on secure digital communication and applications in the healthcare system" - E-health Law - came into effect, establishing a framework for utilizing ICT into healthcare area. From 2018 onwards, patients can choose to have the relevant emergency data stored on their healthcare.

To measure the level of convenience, the third party application Google PageSpeed™ Insight has shown that all services have a good access speed.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. Deutschland.de is considered as the national gateway of Germany. It presents a wide range of information resources about different aspects of Germany, from politics to culture. However, government services were not provided on this portal.

In technical aspect, the result of Google PageSpeed™ Insight showed that the website operates well both from PC and from Mobile Device. The portal also connects to various Social Networks such as Facebook, Twitter, YouTube, and Flicker as well as there is a feature allowing the user to receive update mail notification.

4.5 Government CIO [GCIO]

Under the new strategy, the future development of federal IT will be in charge by the Chief Information Officers Council together with the Federal IT Management Group led by the Federal Government Commissioner for Information Technology.

In 2015, Klaus Vitt, head of IT at Germany's Federal Employment Agency was appointed by the German federal government to become the new IT Commissioner of the federal government. By the German federal government.

CIO-equivalent positions were also found in federal states' agencies.

4.6 E-Government Promotion [EPRO]

The Federal Ministry of the Interior is in charge of the strategic orientation and development of e-government in Germany. The IT Planning Council is the main body for managing federal and state IT. The council consists of the Federal Government Commissioner for Information Technology and the representative of 16 German states. The IT Planning Council has a clear directive: facilitating mandatory cooperation among federal, state and local governments on IT and e-government, with the target of delivery user-centric electronic public services and cost-effective, efficient and secure IT operations for public administration.

In August 2013, the federal E-Government Act was enacted, establishing the regulatory framework for digitization in the federal administration. The Act mandates the deadlines for adopting electronic access for individuals, businesses and the public administration, which enforces the federal administration to follow in order to ensure the successful implementation of e-government programs.

Initiative D21 is a nonprofit organization based in Berlin. It represented the most significant public-private partnership in Germany for the Information Society. Two of projects supported by Initiative D21 are the E-Government Monitor and the Digital Index for Germany which is published annually.

4.7 E-Government Participation [EPAR]

In 2015 there is a pilot project titled "Digital Voluntary Social Service Year" (FSJ-digital) launched to gather and summaries best-practice experience about how young people can offer their skills and talent in managing and applying new media to help non-profit organizations. No evidence has been found regarding electronic voting in e-government.

4.8   Open Government Data [OGD]

In 2014, the Federal Government issued the National Action Plan to implement the G8 Open Data Charter to define measures for facilitating access to government data. This Action Plan takes into consideration the results already achieved in previous programs: the Federal Government's "Transparent and Network-Based Administration" program, the IT Planning Council's "Promoting Open Government" program, and the prototype development for the data portal GovData (http://www.govdata.de/).

In line with the national plan, the Federal Government seeks to strengthen the legislation for publishing government data by amending the Act on Access to Geodata (GeoZG); the E-Government Act; the Environmental Information Act (for environment information); the Freedom of Information Act and so on.

4.9   Cyber Security [CYB]

The Federal Ministry of the Interior works with the Federal Office for Information Security (BSI) to provide appropriate IT security. Germany's Cyber Security Strategy was adopted on 23 February 2011. This strategy called for establishing the National Cyber Response Centre and the National Cyber Security Council, among other things.

Laying a comprehensive legal foundation for cybersecurity is the target of the German Government. The Federal Government stated in the digital agenda that it would aim to modernize European data protection law in the digital market by adopting the General Data Protection Regulation by 2015. The National Cyber Response Centre will be assigned a greater coordination role in responding to cybersecurity incidents and improving cooperation between specialized authorities.

4.10   The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). The Federal Government is pursuing to boost up the development and introduction of cloud computing facilities by issuing the new Cloud Computing Action Programme.

There is a research project known as THESEUS, aiming to utilize The Internet of Services and the Internet of Things. With this project, the German Federal Government is seeking to utilize semantic technologies and creating new standards for the Internet of Services.

5   Some Highlights

In the attempts to promote for publishing government datasets and information, early 2015, German Government presented 'The General Government's National Action Plan to implement the G8 Open Data Charter'. By doing this, the government put into action one of its pledges to maintain the top position in Open Government ranking indicator.

Cyber Security is another strong point in Germany. With the presence of a Cyber Security Strategy alongside a comprehensive, frequently amended legislation framework (Federal Data Protection Act (2003), Digital Signature Act (2001), Electronic Commerce Act (2001), Act on the Federal Office for Information Security 2009), German Government demonstrates a strong commitment to fight against cybercrime.

With a relatively low score in the National Portal (https://www.deutschland.de), it is recommended that the government should put more efforts on providing more

information about the country, the government, and available services for citizens and businesses.

Although German Government has planned to use cloud computing (ICT strategy of the German Federal Government 2015) but no evidence of actual usage in Federal Government has been found. The government should pay close attention to all challenging aspects such as cloud security and standards to put cloud computing plan into action.

Hong Kong

1　General Information

Area: 1,108 km^2

Population: 7,141,106

Government Type: limited democracy

GDP: $57,000

Internet Users: 87.3

Wired (Fixed Broadband Users): 35.5

Wireless Broadband Users: 107

2　Positioning in a Global Organization and Region

Hong Kong has achieved comparatively high scores on most of the indicators compared with other APEC members and ASIAN countries, especially on the indicator of Management Optimization, Online Service, Government CIO, and Emerging Technologies. HK has shown their efforts to deliver high-quality e-Service and reform on the governmental structure to implement e-Government strategy.
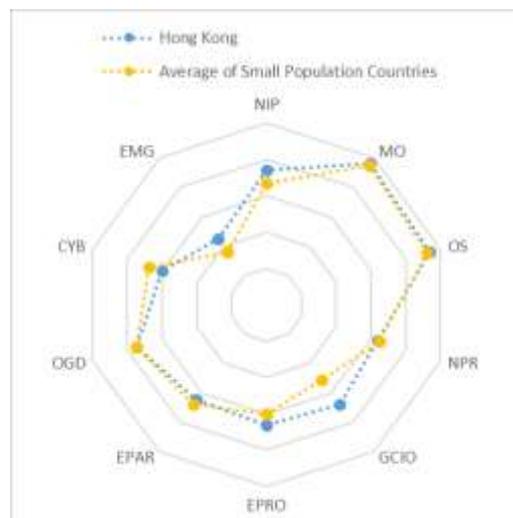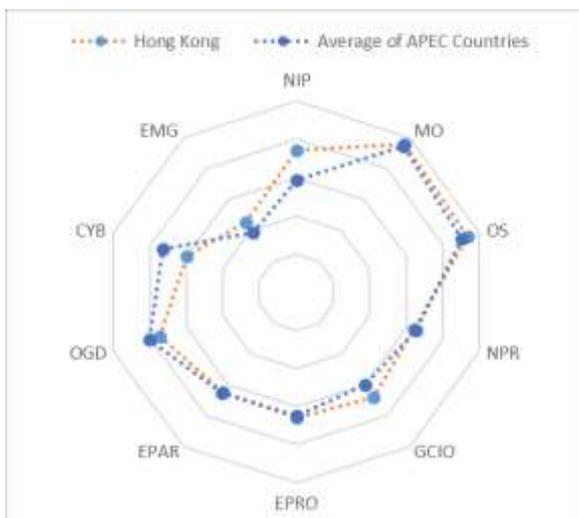
3　Digital Government Development

The 2008 digital 21 strategy is the latest document for ICT development in Hong Kong which has updated regularly to adopt technological advancement and changing needs of the society. The Office of the Government Chief Information Officer (OGCIO) has been set up to serve as GCIO of Hong Kong, taking the responsibility to lead ICT strategy implementation and providing measures. As the primary goal of the strategy is to build a digital world city, OGCIO also actively collaborate with industries, organizations, and academics to seek the best IT solutions for the whole society. Recently the government has constructed cloud computing motel energetically and provided government cloud platform for e-service. It contains "in-house private cloud" "outsourced private cloud" and "public cloud" to respond to different needs and functions.

The HK government expects economic advancement with supporting and creating the best IT environment for business and individuals.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

According to the report of ITU, 87.3% of people in HK were Internet users, about 35.5% have fixed-broadband subscriptions, and wired broadband subscription has reached 107%. HK has a well-established infrastructure construction and penetration among Asia countries.

4.2 Management Optimization [MO]

Hong Kong's Digital 21 Strategy is the blueprint for the development of information and communications technology (ICT) in Hong Kong. It is updated regularly to take into account technological advancement and changing needs of the society. Two administrative applications have been established; one is the e-Payroll & Benefits System established by the HK Treasury via which users can make an online inquiry on their overall payroll, personal, appointment, payment-related and housing benefit information. The other one is the e-Leave System provided by the Civil Service. Bureau which is to support leave applications and the associated processing, recording, and monitoring of leave taken by civil servants The Hong Kong Government will also be adopting the Cloud Computing model to meet rising public demands and community expectations on e-government services and reap the benefits of emerging technologies. To be in accordance with the general strategy, HKG has launched continuous initiatives in the Policy Address and Budget such as "Innovation and Technology" in 2016 Policy Address.

4.3 Online Service [OS]

HK has got a comparatively high score on the indicator of Online Services among Asia area. The e-service system also has won several awards especially the one-stop service portal. The Electronic Transactions Ordinance was enacted in 2000 and updated in 2004. It was the foundation of e-applications, which allowed HKG to develop further e-services for users. So far, HKG has established e-Tax, e-Payment, and consular services at the transactional level; e-Tender and civil registration services at two-way interactions level, while social security and labor-related services allow downloading of documentation. All e-services in Hong Kong are interactive and doing by two-way transaction or dynamic website.

4.4 National Portal [NPR]

As for a national portal, the HKG launched a new portal (http://www.gov.hk) in 2008, which is no longer in cooperation with a private company but operated solely by the HKG itself. The new portal provides many kinds of services not only citizens but also enterprises and foreigners. Generally speaking, it has an excellent navigation function, and an easy to understand interface. In the portal, there are three languages options: English, simplified Chinese, and traditional Chinese. Almost all web pages and documents can be found in these three language options. However, it is surprising to find that mobile version and accessible version started this year. Through mobile version, people could read text-only versions which can match the various screen size. Moreover, an accessible version which provides several tools like non-text content, audio-only, video-only, no keyboard trap, is convenient for all the people including disables. In addition, HKG organized the Web Accessibility Recognition Scheme to show appreciation to businesses and organizations that have made their websites accessible,

with an aim to encourage adoption of web accessibility to facilitate access to online information and services by all segments of the community including persons with disabilities.

4.5 Government CIO [GCIO]

The HKG established the OGCIO in 2004. Mr. Allen Yeung has assumed the role of OGCIO from 2015. Moreover, there are two Deputy Government Chief Information Officers (DGCIO) who support OGCIO in daily work. The DGCIO is responsible for two major areas of responsibilities: Policy & Customer Service, and Consulting & Operations. The main task of OGCIO is to provide leadership for the development of ICT within and outside the Government. In Hong Kong, while many universities provide CIO related courses, but there are few CIO related organizations in academia and the private sector. Headed by the Government Chief Information Officer (GCIO), the OGCIO provides a single focal point with responsibility for ICT policies, strategies, programmes and measures under Digital 21 Strategy, in addition to providing information technology (IT) services and support within the Government. OGCIO is playing an important role under the Digital21 Strategy in five action areas: 1. Facilitating a digital economy; 2.Promoting innovation and technology; 3. Developing Hong Kong as a hub for technology and trade; 4.Development of the next generation of e-government services; 5. Fostering a digital inclusive Society.

4.6 E-Government Promotion [EPRO]

OGCIO plays the leading role in enabling e-government promotion, such as in producing video material and pamphlets for example. Moreover, the Digital 21 Strategy Advisory Committee is the leading supporter for the Digital 21 Strategy, while the Commerce and Economic Bureau provides the budget for e-government implementation and promotion; 4.5 billion HKD in 2008 for example. As for an assessment mechanism, the HKG established an e-Government Steering Committee to assess the performance of the e-government program.

4.7 E-Participation [EPAR]

Hong Kong is highly ranked regarding the e-Participation indicator. In the Hong Kong national portal, there are many kinds of online services, not only for citizens but also for business and foreigners. It is also effortless to navigate and find information in the portal. This also acts as a one-stop service center for citizens. The HK portal uses web 2.0 technologies such as RSS, online forums and blogs to facilitate communication between citizens and Government. In the portal, there is also information about how the Government takes the opinions of citizens in decisions making processes.

4.8 Open Government Data [OGD]

The Code on Access to Information states that the government exists to serve the community well within available resources. It recognizes the need for the community to be well informed about the Government, the services it provides and the basis for policies and decisions that affect individuals and the community as a whole. This Code defines the scope of information that will be provided, sets out how the information will be made available either routinely or in response to a request, and lays down procedures governing its timely release.

4.9　Cyber Security [CYB]

The Hong Kong police launched the Cyber Security Center on December 7, 2012, in order to boost Hong Kong's Internet security. The center provides round-the-clock services under the bureau's Technology Crime Division. The center will strengthen coordination between Police, government departments, and local and overseas stakeholders when major information systems come under attack. Now HK also has Computer Emergency Response Team Coordination Centre (HKCERT) and Government Computer Emergency Response Team Hong Kong (GovCERT.HK). The latter responds to cybersecurity incidents that affect public agencies. On the other hand, the Cyber Security and Technology Crime Bureau CSTCB) is responsible for handling cybersecurity issues and technological crime investigations, and so on.

4.10　The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). The evidence show that HK government has put effort to implement Cloud Computing or Big Data into their public sectors, such as they create government cloud environment to serve the communities and IT industry, benefiting government themselves as well. Cloud Computing remains one of the critical government ICT strategies by OGCIO. The government values the use of emerging technologies, to keep its leading position in Digital Government area among Asia.

5　Some Highlights

Since the HKG has enabled one-stop service portal GOVHK ((http://www.gov.hk), citizens could get public services and information through the website promptly. The portal site has won several international awards due to the convenience and enhanced contents, well-designed columns which help citizens to find what they what without complicated introductions. More than that, GOVHK has upgraded the accessibility for people with special needs. The high score on the indicator of "Online Service" could prove its significant improvement. With the penetration of mobile devices, mobile e-government has shown its importance increasingly. HKG keeps promoted its user-friendly e-services on smartphones, followed by measures to assist the implementation created by OGCIO.

Perhaps HK has a high rate of usage and awareness of e-government, and there is no need to conduct active promotion, citizen's engagement is the fundamental element for e-government itself. In addition to that, legal framework preparedness for cybersecurity and emerging technologies is the next task for HK e-government, if its objective is to maintain the first-class IT area in Asia, even around the world.

Iceland

1 General Information

Area: 103,000 km^2

Population: 331,918

Government Type: Parliamentary Republic

GDP: $46,600

Internet Users: 98.2

Wired (Fixed Broadband Users): 37.6

Wireless Broadband Users: 104

2 Positioning in a Global Organization and a Region
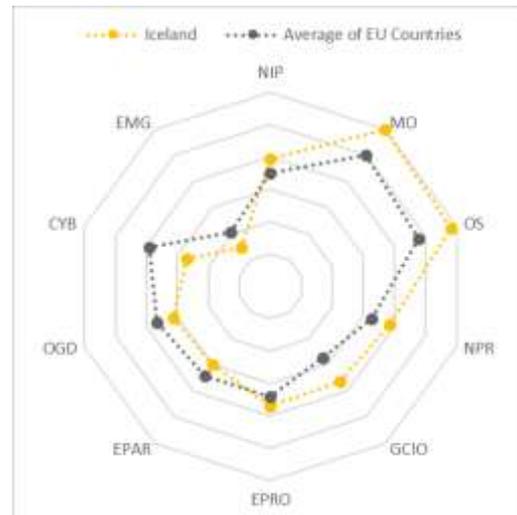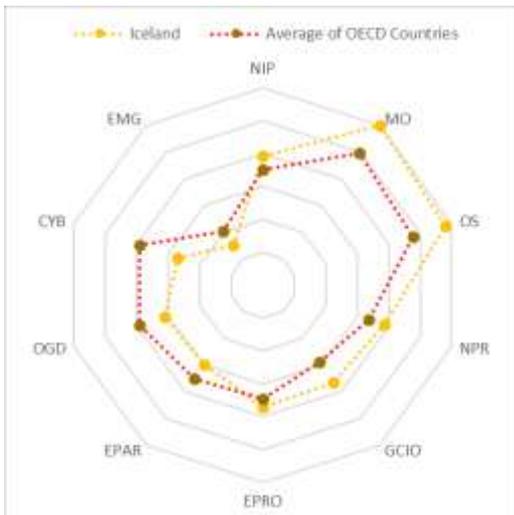
3 Digital Government Development

Iceland had a single election in 2016 in that one of the main parties ran on a platform of unprecedented digital participation in the political system. It has made great strides in the past few years to improve its e-Government services and infrastructure, and it has become one of the top performers in Europe by many measures. The government has also been using tools like social media in innovative ways. In 2012, for example, the government created accounts on social media sites like Facebook or Twitter to solicit feedback for the world's first 'crowdsourced' constitution. While the constitution was never formally adopted, this effort represented Iceland's approach to engaging its citizens and utilizing new platforms in unique ways. The Icelandic government will need to redouble its efforts if it wishes to reach its goal of becoming a top-ten e-Government and e-participation country by 2020.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

Iceland's development and implementation of ICT services and infrastructure is among the most advanced in the world. It has been ranked fourth in the world for ICT

Development by the International Telecommunication Union (ITU) for the past three years. With a usage rate of 96.5%, Icelandic citizens are more likely to use the Internet than the citizens of any other country. 35.1% of citizens had wired broadband subscriptions in 2013, and 74.7% had wireless broadband access, placing the country within the top five for this metric.

4.2 Management Optimization [MO]

Iceland's current e-Government development strategy is a critical component of the Iceland 2020 initiative, and it is based in large part on the previous Icelandic Government Policy on Information Society 2008-2012. The goal of this initiative is to place Iceland within the top ten countries in the United Nation's e-Government Development Index (it ranked 19th in 2014).

4.3 Online Service [OS]

Icelandic citizens have had the option of submitting their annual income tax declarations electronically since 1999. Citizens can also calculate their future pension payments, and personalized access accounts are about social security, and health insurance benefits at the portal www.tr.is. Citizens can also apply for unemployment benefits, passports, driver's licenses, and other documents entirely online. Businesses also have a wealth of online services available to them, including various tax and employee contribution declarations, customs' declarations, and procurement services. Many of these e-Services can be completed entirely online. Others provide forms and information on how to complete the process.

4.4 National Portal [NPR]

Iceland's national portal is located at www.island.is. From this portal, citizens can receive news and information, access a wide array of e-Services, sign or post petitions, access public data, find local government websites, and more. The site is available in both Icelandic and English (though the English version is limited). From this portal, citizens can sign up or log in to My Pages, which allows citizens and business to "easily find personalized information from public sources." The portal has a simple front-end user interface but provides an array of information, forms, and services.

4.5 Government CIO [GCIO]

While Iceland does not have a specific CIO position, the Ministry of the Interior is responsible for e-Government development. Ólöf Nordal began serving as the Minister of the Interior on December 4th, 2014, so she currently has oversight over the development of ICT infrastructure and e-Services.

4.6 E-Government Promotion [EPRO]

The government of Iceland has laid out several important goals and policies to promote the use and development of e-Government. Some key goals are to become an 'e-Nation' that offers one-stop online service for all citizens and businesses. They also plan to increase efficiency and eventually become a world leader in e-Government.

Iceland also has a broad legal framework on e-Government and open information issues, especially since the 2012 passage of its new Information Act, which outlined the public's right to national data and the government's responsibility to provide it promptly. Iceland also has laws in place regarding digital privacy, e-commerce, and e-procurement.

4.7   E-Participation [EPAR]

Iceland has improved markedly in this category over the past few years, moving from 135th in 2010 to 65th in 2014 in the United Nations' E-Participation Index Ranking. The Iceland 2020 Initiative aims to place within the top ten by 2020 in this ranking. The Icelandic government continues to promote the usage of its e-Services to increase efficiency and reduce costs. As of April 2014, "over 90 % of Iceland's taxpayers file electronically."

4.8   Open Government Data [OGD]

Accessible directly from its main government portal, Iceland's open government database (http://www.opingogn.is/) provides data collections and packages from several government ministries and offices. Geographic, economic, and statistical data packages are publicly available through this portal, with more datasets added on a regular basis.

4.9   Cyber Security [CYB]

The Republic of Iceland is at an established stage of maturity regarding the National Cybersecurity Strategy factor. The Ministry of the Interior has published the Icelandic National Cyber Security Strategy (NCSS) 2015-2026 together with three years Plan of Action. The strategy covers the years 2015–2026, setting out a vision for 2026 but also providing a 3-year Action (2015-2018). The objectives of this strategy include (1) Capacity Building, the Government should have knowledge, skills, and equipment to prevent the threats, (2) Increased resilience, and the aim is to raise the resilience of Iceland's information systems and preparation to enhance co-operation and making security, (3) Strengthened legislation, and (4) Tackling cybercrime.

4.10   The use of Emerging ICT [EMG]

Iceland's Skilriki service (http://skilriki.is/) allows citizens and businesses to create personalized electronic certificates to provide secure authentication and signatures. Authentication can be set up to use a card or a mobile phone for validation. Citizens and businesses can also apply for an IceKey—a password directly linked to the official identification number of an Icelandic citizen or legal entity—which adds layer of security to online transactions.

5   Some Highlights

As mentioned, the Pirate Party received the third-most number of seats in the Icelandic government in late 2016. This party is organized by engaged voters participating digitally on a micro level on all of the decisions the party made, and they promised to make the government run similarly. While this has not yet occurred, it would be a significant experiment in using digital government as a leading force in governance, and it could serve as a model for other governments throughout the world.

Iceland's government portal, www.government.is, continues to provide information, news, and resources, including links to each ministry. Visitors from around the world can access information about how the government is structured, biographies and contact information for various officials, and past publication from each office and ministry.

There is also a separate portal for foreigners, http://www.iceland.is/. This portal is presented in English and contains information about travel and tourism in Iceland, investment opportunities, arts and culture, and the latest news and events.

India

1   General Information

Area: 3,287,263 km^2

Population: 1,342,512,706

Government Type: Federal Republic

GDP: $6,700

Internet Users: 29.5

Wired (Fixed Broadband Users): 1.4

Wireless Broadband Users: 16.8
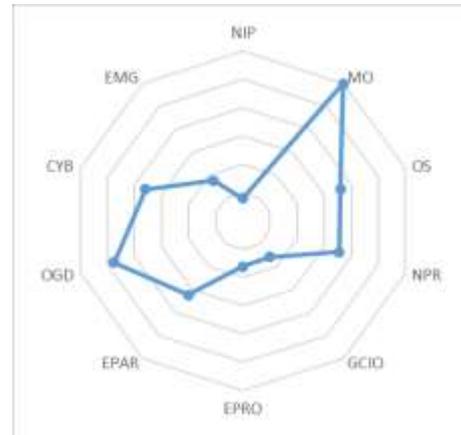
2   Positioning in a Global Organization and a Region

Among Asian Countries, India has a better score than the average score of Asian countries in Management Optimization. As shown in the above picture, India is very low on the necessary infrastructure. However, despite the lack of necessary infrastructure, India has been trying to take the benefit of emerging ICT such as Cloud Computing, Big Data, and IoT. Only Singapore can beat India under the Use of Emerging Technology indicator. In addition to that, Open Data is one of the attractive program in India to respond to the demand for more data for empowering the society.
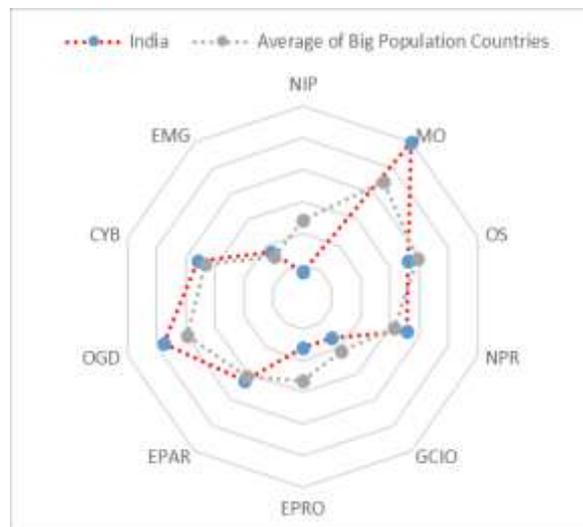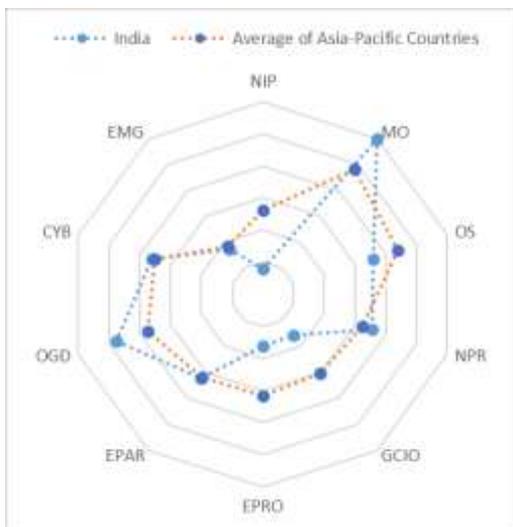
3   Digital Government Development

The government of India has been focusing on D-Government Development by improving the governance using ICT; e-governance, though India still needs huge investment and demands on expanding the telecommunication infrastructure aiming for business opportunities that are very much challenged to achieve. The digital divide is also a concerned problem in India that coexisted about the gap between North-and-South and as well as West-and-East. Nonetheless, the country's Digital India 9 pillars launched by the Prime Minister of India Narendra Modi on 2 July 2015 with an objective of connecting

rural areas with high-speed Internet networks and improving digital literacy, has aimed certainly quantified programs and targets. Programs are consisting of the followings:

Pillar1: Broadband Highways Broadband for all Rural: Coverage: 250000 GP, Timeline: December 2016 CAPEX: Rs. 32, 000 Cr; Urban: Virtual Network Operators for service delivery. Mandate communication infrastructure in new urban development and buildings. Changes in Rules to facilitate. National Information Infrastructure Coverage: Nationwide Timeline: March 2017 Cost: Rs. 15, 686 Cr. To be implemented in 2 years.

Pillar2. Universal Access to mobile connectivity Universal Access to mobile connectivity Coverage: Remaining uncovered villages (~42, 300 villages) Timeline: FY 2014 - 18 Cost: Rs. 16, 000 Cr. Ongoing Program Increase network penetration & coverage of gaps.

Pillar 3. Public Internet Access Program National Rural Internet Mission CSCs made viable, multifunctional endpoints for service delivery Coverage: 2, 50,000 village (now 1, 30,000) Timeline: 3 Year –March 2017 Cost: Rs. 4750 Cr, Ongoing program reach of Govt. services to all GPs. Post office to become Multi-Service Centers Coverage: 1, 50,000 Post Offices Timeline: 2 Years

Pillar 4. e-Governance: Reforming Government through Technology, Government Business Process Re-engineering using IT to improve transactions, Form Simplification, reduction Online applications and tracking, Interface between departments. Use of online repositories, e.g. School certificates, voter ID cards, etc. Integration of service and platforms- UIDAI, Payment Gateway, Mobile Platform, EDI Electronic Databases - all databases and information to be electronic, not manual Workflow automation inside government Public Grievance Redressal – using IT to automate, respond, analyze data to identify and resolve persistent problems-largely process improvements. To be implemented across government-critical for transformation.

Pillar 5. E-Kranti Electronic Delivery of Service Technology for Education- e-Education, All School connected with broadband Free Wi-Fi in all schools (2,50,000), Digital Literacy program MOOCs- develop pilot massive Online open courses, Technology for Framers Real-time price, Online ordering of inputs Online cash, loan, relief payment with mobile banking. Technology for Health-e-Healthcare Online medical consultation, Online medical records, Online medical supply, Pan-India exchange for patient information, Pilots-2015; full coverage in 3 years Technology for Financial Inclusion Mobile banking Micro- ATM program, CSCs/Post Offices, Technology for Planning GIS-based decision making National GIS Mission Mode Project, Technology for Security Mobile Emergency services, Technology for Justice e-Courts, e-Police, e-Jails e-Prosecution, Technology for Security National Cyber Security Co-ordination center.

Pillar 6. Information for All Online Hosting of Information & documents: Citizens have open, easy access to information Open data platform, Government pro-actively engages through social media and web-based platforms to inform to citizens. myGov is 2-way communication between citizens and government. Online messaging to citizens on special occasions/programs mainly utilize existing infrastructure – limited additional resources needed.

Pillar 7. Electronics Manufacturing Target NET ZERO IMPORT by 2020 Target NET ZERO Imports is a striking demonstration of intent Ambitious goal which requires coordinated action on many fronts Taxation, Incentive Economies of Scale, Eliminate cost disadvantages Focused areas – Big Ticket Items FABS, Fab-less design, set-top

boxes, VSATs, Mobiles, Consumer & Medical Electronics, Smart energy meters, Smart cards, micro-ATMs Incubators, clusters Skill development Government procurement There are many ongoing programs which will be fine-tuned. Existing structures inadequate to handle this goal. Need for strengthening.

Pillar 8. IT for Jobs Train people in smaller towns & villages for IT sector jobs Coverage: 1 crore student Timeline: 5 year Cost: Rs. 200 Cr for a weaker sec. Nodal Agency: DeitY New scheme IT ready workforce IT/ITES in NE Scope: Setting up of BPO per NE State Coverage: NE States Nodal Agency: DeitY ICT enabled growth in NE Train service delivery Agents to run viable businesses delivering IT services Coverage: 3, 00, 000 Timeline: 2 year Nodal Agency: DeitY Ongoing Skilled VLEs and viable CSCs Telecom service providers to train rural workforce to cater to their own need Coverage: 5, 00, 000 Timeline: 5 Years Nodal Agency: DoT Telecom ready workforce

Pillar 9. Early harvest Programs IT platform for messages Coverage: Elected representatives, All Govt. employees 1.36 Cr mobiles and 22 Lakh emails Mass Messing Application developed Targeted Mass messaging since July 14 Government Greetings to be e-Greeting Basket of e-Greeting templates available Crowdsourcing of e-Greetings thru MyGov e-Greetings Portal ready by 14 August 2014 1st e-Greeting from PM on 15th August 2014. Biometric attendance Coverage: All Central Govt. Offices in Delhi Operational in DeitY & initiated Urban Development On-boarding started in other depts. Procurement of devices – tender issued

Targets are depicting as the following picture:

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

Approximately 29.5% of people in India were Internet users in 2016, according to the Measuring the Information Society Report 2017 from International

Telecommunication Union (ITU). About 1.4% have fixed-broadband subscriptions, and wireless broadband subscription has reached 16.8%.

4.2   Management Optimization [MO]

In early 2010, India has launched a Digital India Program, a flagship program of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. The program required all government institutions to leverage their ICT capacity. This program also adopts Public-Private Partnership approach for supporting the success of Digital India. The program has identified priority areas; Digital Infrastructure with target of 112.871 Km of optical fibre laid for high speed connectivity, 105 Crore people have registered under the Aadhaar program, 19.3 Lakh users registered on MyGov platform, 81 Lakh people enrolled under Digital Shaharta Abhiyan (DISHA), 105.2 Crore Phone users, Governance and Service on Demand, and Digital Empowerment. These areas were cascaded into specific actions and measurable targets.

India has chosen centralization for D-Government initiatives and as part of centralizing D-Government initiatives is the State Data Center. Additionally, India has set an e-governance infrastructure to ensure the alignment among D-Government projects with national strategy. To increase interoperability, India also prepared a Government Application Program Interface in open state or open API.

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 its URL Address. 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-Procurement are perfect regarding fast speed and efficiency. The e-Tax and One-Stop Service Portals are such considerably in doubt regarding speed that may cause the access speed considerably slow to access. The e-Health is still the only online service in India that cannot be investigated during the period of the survey. For a certain extent, all Online Services have implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services. In addition to that, all clickable objects on the portals work as they should do best for the e-Customs and e-Procurement and do an average for the rest.

4.4   National Portal [NPR]

The score for National Portal (https://india.gov.in/) is based on three factors, i.e., Information (Content), Technical, and Functionality. In this end, India earned above the average point in the high score zone. Regarding Information publishing on Country Information on Government, Demographic, News, Contact, Term of Use/ Privacy Statement, Link to Government Websites either Central or Local Government are all available as it should do. In these Technical regards, Page Speed measurable by Google PageSpeed™ Insight was average while Compatibility with popular browsers; Internet Explorer, Chrome, and Firefox was also available. Mobile friendly was provided, and Functionality was almost bound for perfect score that including provision of Search Capability, Sitemap / Index, Social Network Capability, Newsletter/ Inquiry Form, Support multiple languages (English is mandatory), Link to available Online Services,

Secure transmission; SSL and Accessibility for people with special needs were all existing. The provisional Blogs on the portal was not on appearance.

4.5 Government CIO [GCIO]

India' s Department of Electronic and Information Technology under Ministry of Communication and Information India (DEITY) took a significant role for providing sponsorship and leadership on D-Government in India and considered as a GCIO hub nation-wide as the role of head of DEITY is similar to the role of a CIO. To support the CIO development program, there is a CIO Academy offered by Srini Raju Centre for IT & Networked Economy (SRITNE) and the Centre for Executive Education at the Indian School of Business (ISB) in partnership with the CIO Association of India.

4.6 E-Government Promotion [EPRO]

Under current Digital India's Pillar 4-5 the government is promoting and showcasing activities/ programs under D-Government including reforming, transforming and enhancing services from government to citizens. These activities/ programs were hosted by DEITY and related entities under National D-Government Plan (NEGP). In addition to that, to ensure the fairness and sustainability of D-Government projects, India government still use a third party auditor do so.

4.7 E-Participation [EPAR]

Culture and society in India have long been recognized as a high-tech adoption society while government officers, as well as citizens, can take the benefit of ICT for supporting their mission and business. Parliament members have their website and provide the citizens with the channel to communicate with. Still, the absence of e-Participation portal for gaining citizen's expression reduces the quality of e-Participation in India so far. In all, India gains scores mainly from the presence of GCIO and organization while development programs are also accountable.

4.8 Open Government Data [OGD]

In implementing the 2001 Freedom of Information Act, India has launched Open Data Portal (https://data.gov.in) to provide the public with accessible government information presented over the Government Open data platform. National Informatics Center maintains the portal. To keep updating information, India government uses a module for contributing data catalogs by various government agencies, thus, making those available on the front end website after a due approval process through a defined workflow.

4.9 Cyber Security [CYB]

Under ratification of several laws and regulation related to cybersecurity which included IT Act 2000, IT (Amended) Act 2008, Trusted Company Certification, Security incident - Early Warning & Response, Cyber Security Assurance Framework and National Cyber Security Policy, presently, some measures and projects are on running such as installation of Biometric attendance Coverage for all Central Government Offices in Delhi Operational in DeitY & initiated Urban Development On-boarding started in other departments and Provisional Technology for Security to National Cyber Security Co-ordination center for strengthening cybercrime countermeasure and for solving Internet Security problems under Indian-CERT of which all are under National Security Council.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). India has continuingly implemented Cloud Computing for Public Sector named "GI Cloud" namely "Meghraj" hosted by National Informatics Center. Infrastructure-as-a-Service is one of Cloud Computing Services available for government agencies. Besides, India has formally implemented IoT under individual supervision of the state government of Andhra Pradesh aiming for a significant share of the Indian IoT market which has to be proven of evidence.

5 Some Highlights

Over the years, a large number of initiatives have been undertaken by various State Governments and Central Ministries to usher in an era of e-Government. Sustained efforts have been made at multiple levels to improve the delivery of public services and simplify the process of accessing them. Through e-Governance, India has steadily evolved from the computerization of Government Departments to initiatives that encapsulate the more excellent points of Governance, such as citizen centricity, service orientation, and transparency. Lessons from previous e-Governance initiatives have played an essential role in shaping the progressive e-Governance strategy of the country.

Ministry of Electronics and Information Technology hosts some vital digital projects including e-Pramaan (native name for National e-Authentication service) and G-I cloud which incorporated all angle of development, i.e. government, private sector, and community in every building effort of cloud initiative; consumer, auditor, provider, developer, and R& D, that will ensure the benefits of cloud computing for e-Governance projects.

Also the Bangalore city hosts as "IoT Hub" for IoT Community in India and government IoT Center of Excellent in partnership with NASSCOM to support the IoT development. Big Data is in a certain extent of an initial stage focusing especially on Big Data Analytics for Public Sector in India. The country's digital development still has a long way to go was still inequitable and inconsistent for far too long because of societal complexity with challenges of foreseeable digital disruption to be addressed through administrative humility and entrepreneurial determination for the long-term benefits.

Indonesia

1   General Information

Area: 1,904,569 km^2

Population: 258,316,051   Government Type: Presidential Republic

GDP: $11,700

Internet Users: 25.4

Wired (Fixed Broadband Users): 1.9

Wireless Broadband Users: 67.3
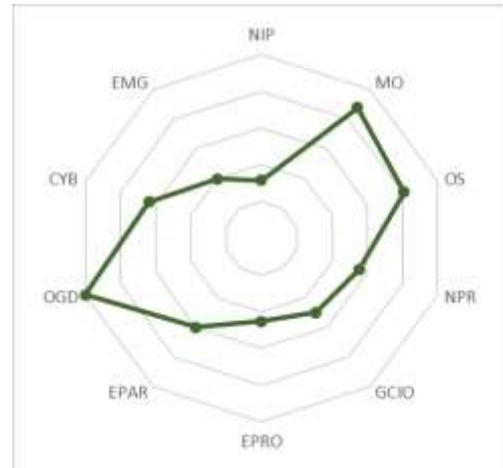
2   Positioning in a Global Organization and a Region
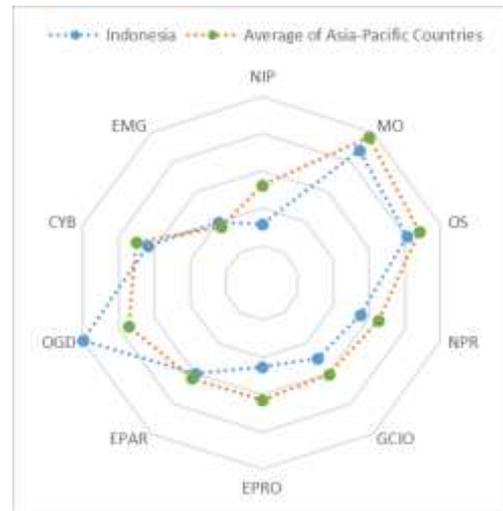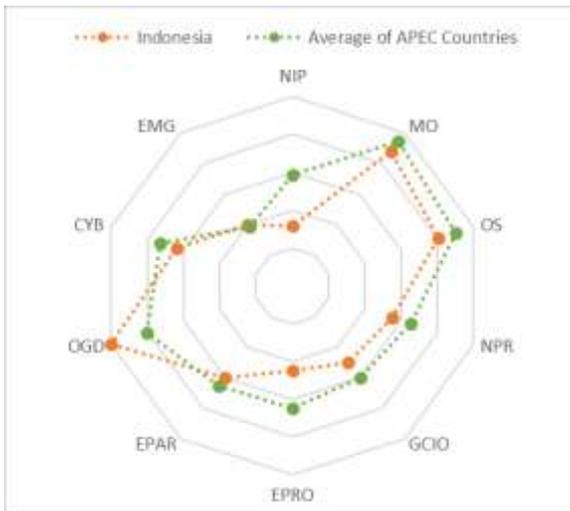
Among APEC Countries, Indonesia has a better score than the average score of APEC in Open Government Data, Government CIO Institutionalization. As shown in the above picture, Indonesia is very low on the necessary infrastructure. However, despite the lack of necessary infrastructure, Indonesia has been trying to take the benefit of emerging ICT such as Cloud Computing, Big Data, and IoT. Some progress in the area of emerging ICT has led Indonesia to get a better position than the average of APEC Countries.

These achievements also reflect the position in the Asian region in which Indonesia considerably approached Singapore in the Open Data and the use of emerging ICT.

3 Digital Government Development

Digital Government in Indonesia has been initiated formally since 2003 along with the ratification of Presidential Instruction No. 3/2003 about the implementation of e-Government in Indonesia signed by the 5th President of Indonesia. Since 2014, there are two ministries responsible for e-government, i.e., Ministry of Communication and Information (Kominfo) and Ministry of Apparatus Empowerment/ Bureaucratic Reform (MenPAN-RB). Kominfo deals with the technical aspect and MenPAN-RB take responsibility on policy and procedure.

Source: National Development and Planning Agency, Indonesian Broadband Plan

Digital Government in Indonesia is scattered all over government agencies both central and local. Most of them are not connected nor interoperable each other. The major theme of e-Government in Indonesia is improving public service for reducing corruption. Many e-Government applications are addressed to curb corruption such as e-budget system in Jakarta Province, e-Participation application provided by Presidential Task Force, and collaborative monitoring portal by Bandung City.

This year, Indonesia government is still processing the improvement for National e-Government Roadmap 2016-2019. This plan is aimed to optimize the use of information and communication technology in improving the public satisfaction of government services, promoting the economic growth, increasing the public engagement and trust, as well as improving the performance of public services.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

Approximately 25.4% of people in Indonesia were Internet users in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). About 1.9% have fixed-broadband subscriptions, and wireless broadband subscription has reached 67.3%.

4.2 Management Optimization [MO]

In 2016, Indonesia is still processing the National e-Government Roadmap 2016-2019. The ultimate goal of this agenda is the optimization of the use of ICT that will address the public satisfaction of government service, economic growth, and public engagement. The strategy was designed for supporting President's Vision named NawaCita 2016-2019. E-Government is the embodiment of mission no. 2 of NawaCita; "to ensure that the government is clean, efficient, democratic and trusted".

For supporting the inter-government interoperability, Kominfo has launched guidance named "Handbook for inter-government document interoperability". In addition to that, there is one case that Indonesia has a centralized government financial information

system which integrates local and central government financial system named "State Treasury and Budgetary System" (SPAN).

4.3 Online Service [OS]

The score for Online Service is based on five investigating online services, i.e., e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Among these five Online Service, e-One-Stop Service and e-Health have the lowest score, compare to other three online services.

In term of complexity level, most of Online Service in Indonesia has reached a transactional in which user can start the transaction from applying to receiving the service through the portal. In addition to that, all Online Services have implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services. As for the One-Stop-Service, Indonesia adopts the decentralization in which all government agencies, especially the local government, have the right to develop their e-government solution for improving the public services.

For measuring the level of convenience, the third party application result has shown that all portals, except the e-Health, are above the average considerably in term of speed. The third party application for assessing the portal is the application from Google named Google PageSpeed™ Insight on https://developers.google.com/speed/pagespeed/insights. In addition to that, all clickable objects on the portal work as they should do.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. National Portal of Indonesia (http://www.indonesia.go.id) contains proper information for local citizens and foreigners. Information about Indonesia is available on the portal. People can find information about culture and heritage, demographic, and government. In technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is inferior, which is far below average both from PC and from Mobile Device. In addition, the portal does not provide the user with some functionalities such as social network integration, and an inquiry form.

4.5 Government CIO [GCIO]

Indonesia government has clearly defined the need for ICT leadership on e-Government. Major ministries have CIO as the proper role in part of their structure. CIO in ministerial level is not necessary ahead of the ICT-related bureau. Most of them are a high rank officer which is one level below the Minister. However, it depends on the size of the organization; some organizations attach the role of CIO to the head of ICT-related bureau which is two level below the Minister. For the GCIO development program, Bandung Institute of Technology and Gadjah Mada University offer a Master Degree program specializing on CIO.

4.6 E-Government Promotion [EPRO]

There is very few evidence to get the assurance that there were several programs in Indonesia related to the promotion of e-Government. However, two regular efforts in Indonesia are aimed to measure the Indonesia e-government development. These efforts are Indonesian e-Government Ranking (PeGI) and ICT Pura. Moreover, Indonesia has

established National ICT Council (Detiknas) that consist of government, business enterprise, and academia.

4.7 E-Participation [EPAR]

Indonesia enjoyed the young society whose demand for utilizing ICT is huge and active. These factors have driven Indonesia to equip e-government with the mobile-friendly application. Despite its lack of necessary infrastructure, e-participation related application is widely spread around the young generation. For instance, some government leaders have their website and provide the citizens with an alternative channel to communicate. The most interesting e-participation portal in Indonesia is lapor.go.id which is a portal for citizens to report any wrong-doing found in government service. This portal is maintained by Presidential Task Force and redirected to all government institutions.

4.8 Open Government Data [OGD]

In 2008, Indonesia launched the Freedom of Information Act (UU No. 14/2008) to participate in the Freedom of Information Act movement around the world. To strengthen the implementation of these act, Indonesia has established Open Data Portal (http://data.go.id/) to provide public with government information. Jakarta City also developed Open Data at http://data.jakarta.go.id. To keep updating the information, the Indonesian government involves the community in the area of Open Data to standardize and reformat all exciting data available on the government website to be displayed on the Open Data Portal.

4.9 Cyber Security [CYB]

Indonesia has ratified several laws related to cybersecurity. Some of them are as follow:

- Electronic Transaction Act No. 11/2008
- Electronic Transaction and System Provider Regulation No. 82/2012
- Information Security Guideline
- GOV-Cert
- ID-SIRTII
- ID-CERT
- ID-SIRTII

In addition to these laws, Indonesia has strengthened organization capacity for cybercrime countermeasure by setting up CERT-Indonesia and give a mandate to ID-SIRTII to supervise the continuous application of security measures.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). Indonesia has officially launched a Software-as-a-Service solution called SiMaya by Circular of Ministry of State Apparatus Empowerment and Bureaucratic Reform No.5/2013. The service is hosted by the Ministry of Communication and Information. Moreover, it is available for all government agencies that need such a service.

Jakarta Provincial Government has been implementing Big Data in Jakarta Smart City applications. Data on the application is taken from reports on public complaints on several social media and also Qlue, a social media community reporting. Reports from

the public then digitally mapped and integrated with smartcity.jakarta.go.id pages and Quick Response on Public Opinion (CROP) application. The city government officials are required to install this application on their smartphones, especially the officials responsible for residential areas, the local leader. Moreover, Internet of Things has been applied in most areas and government institutions such as CCTV monitoring for traffic and public facilities by Local Police Agency (TMC Polda Metro Jaya) and Bus Rapid Transit System in Jakarta.

5   Some Highlights

Among ten indicators in the current ranking, the Open Government Data, National Portal, and Cybersecurity are the top three indicators in Indonesia. Indonesia has sharpened the Open Data Initiatives so that the community can take the benefit of it such as more empowerment, more informed, and more expressive. The focus of advancing the Open Data is to create demand for Internet, hence, encourage the telecommunication company to increase the quality of

Source: National Development and Planning

telecommunication infrastructure. National Portal Indonesia contains useful information for local and also foreigners such as country information, tourism, and link to available e-services. To increase the trust of citizens for using e-Government service, ensuring the security of digital transactions has been taken into account in e-Government Development in Indonesia.

Despite its lack of necessary infrastructure, the Indonesian government decided to strengthen government capacity in ICT by utilizing the emerging ICT. Some examples of current implementation are SiMaya for Cloud Computing Service, Bus tracking and IP CCTV for IoT implementation, and Public Report Analysis for the Big Data implementation. In addition to that, Indonesia government has decided to extend the Palapa Ring Project under the Indonesia Broadband Plan (IBP) 2015-2019. Two procurements have been announced, and the bid winner was appointed in 2015. It is expected that in 2019, the telecommunication infrastructure will be improved significantly.

Ireland

1   General Information

Area: 70,273 km^2

Population: 4,892,305

Government Type: republic, parliamentary democracy

GDP: $54,300

Internet Users: 82.4

Wired (Fixed Broadband Users): 28.5

Wireless Broadband Users: 98.2

2   Positioning in a Global Organization and a Region
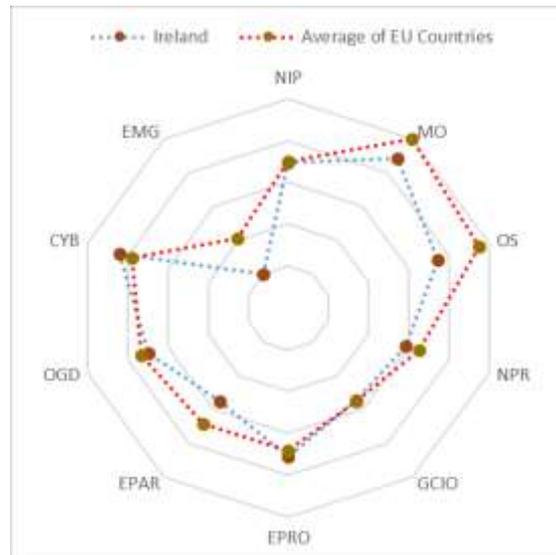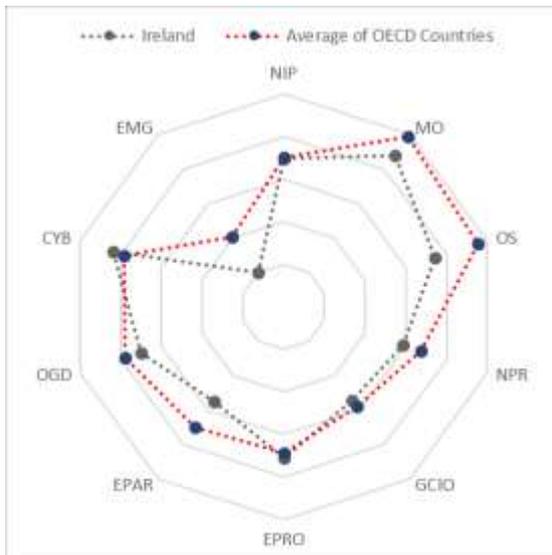
It is the second time for Ireland to be evaluated in Waseda e-Government ranking. Compared to other Europe countries, Ireland has got better performance on the indicator of Network Preparedness, E-Government Promotion, and Emerging Technologies, especially on new technologies applications. The strengths have remained among OECD countries as well.

3   Digital Government Development

The e-Government 2012-2015 Strategy set out a step change approach that would see Ireland make ever greater use of Digital and ICT to improve the experience of citizens and businesses transacting with Government. The 2015 Public Service ICT Strategy then set out how Ireland would further develop its use of innovation and technology to meet the growing needs and expectations of its people. Draft Open Government Partnership National Action Plan 2016-2018 commits Government among other things to increased citizen engagement, increased transparency, and open data. E-Government Strategy 2017-2020, has been developed to build upon e-Government 2012-2015 with the aim of presentation of services, secure online identification, underlying infrastructure, and

appropriate skilling. The new strategy also takes note of the contextual changes that have taken place in Ireland, such as technology innovation, civil services, and developments across the EU, particularly in the areas of data protection, the e-Government Action Plan and the Digital Single Market.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Approximately 82.4% of people in Ireland are Internet users according to the report released by ITU. 28.5% are fixed-broadband users, and the wireless-broadband users are 98.2%.

4.2 Management Optimization [MO]

Administrative guidelines for implementation of related Government Decisions are issued by "Circular". The Department of Public Expenditure and Reform's conducts the overall responsibility for the e-Government policy and the provision of central e-Government infrastructure and services. A new Public Service ICT Strategy has been developed by the Office of the Government Chief Information Officer (OGCIO) in collaboration with the Public Service Chief Information Officer (CIO) Council. The Office of the Comptroller and Auditor General is tasked with audit and assurance, assuring the system of internal financial control put in place by each body.

4.3 Online Service [OS]

Ireland government launched MyGovID, an online identity for online services, in March 2017. MyGovID gives citizens a single sign-on their public services. It's built on the Public Services card, linking citizens' identity to online identity. It can already be used to access Revenue's "myAccount" services and "myWelfare" online services. Besides, from five online investing services, e-Procurement, e-Tax, e-Customs, one-stop-service, and e-Health, all of them are in good progress, providing with two-way-interaction with government and listing the categories of each service with a brief introduction.

4.4 National Portal [NPR]

The National Portal is integrated with the one-stop-service portal, which has stuck to its succinct rule to keep information delivery simple and easy for users. Almost every social service can be easily found on the National Portal. There is no much change in 2017. Still, for foreign users, it is not so friendly at the basic introduction to the nation and only English and Irish language are presented in the website.

4.5 Government CIO [GCIO]

The Office of the Government Chief Information Officer (OGCIO) is responsible for developing and implementing an ICT Strategy for Government that ensures an integrated approach to the exploitation of ICT across all Departments and Public Service Bodies. The Public ICT Strategy consists of five streams: build to share, digital first, data as an enabler, improve governance, and increase capability. In the second degree of a government agency, Health Service Executive, the Office of Chief Information Officer (OCIO) has been launched to turn e-Health Ireland Strategy into reality, ensuring technology supports healthcare.

4.6 E-Government Promotion [EPRO]

The latest e-Government strategy 2017-2020 has a detailed introduction to each aspect of strategy. Ireland has a clear picture of the e-Government promotion structure.

There is a collaboration with private companies to examine its e-government performance every year. In 2017, the government is to launch a €200,000 radio and online advertising campaign to promote the public services card. Some 2.8 million cards have been issued since 2011, and the government expects to have 3 million issued by the end of 2017.

4.7 E-Participation [EPAR]

From the scores of e-Participation, it elaborates that Ireland grabs the trend of making Internet application more citizen-centric. The remarkable one-stop-service in Ireland has enabled citizens to interact with government via a simple portal. Ireland government has made efforts to achieve better online usage experiences. In the feedback process, the government portal provides a completed list for complaints on various issues.

4.8 Open Government Data [OGD]

After the launch of Freedom of Information Action, Ireland has kept its excellent work on open government. In 2016, the Department of Public Expenditure and Reform launched a process to consult the public and civil society groups in preparing Ireland's Open Government Partnership National Action Plan 2016-2018. To the open data website, there are 5,327 datasets and 100 publishers. However, there is a little dataset of online public service, which remains to be improved.

4.9 Cyber Security [CYB]

Based on the National Cyber Security Strategy, 2015-2017, Ireland government has kept moving forward to a more secured cyber usage environment. Three guiding principles in the yearly strategy were the rule of law, subsidiarity and risk-based approach, which are indeed critical indicators of cybersecurity. The new Consumer Protection Cooperation Regulations were passed on November 2017, with the goal of providing enforcement authorities to combat unlawful online practices. Besides, Engineering and Physical Sciences Research Council and the National Cyber Security Centre funded a Research Institute in secure hardware and embedded systems at the end of 2017.

4.10 The use of Emerging ICT [EMG]

Cloud Computing Strategy, 2012 locates cloud technology at the core of e-Government to develop procurement frameworks that would be available to all public bodies and to conduct general applicability across all of the public services. However, the government canceled the Government Cloud Services Catalogue (GCSC) in March 2015 because the economic and technical requirements for it had fundamentally changed. The Department of Public Expenditure and Reform had approved a new ICT strategy for the public service that included a "build to share" objective which envisages a Government "cloud" to provide standard IT systems and infrastructure across the public sector. It said work on developing this was underway and that the only costs incurred were internal resources to develop and evaluate the framework and responses. The legal framework of big data seems to be improved, but the regulations on the use of IoT are still unclear.

5 Some Highlights

From the e-government strategy and policy, the improvement of Ireland government is highly related to the development of the European Union, for example, the e-government strategy would follow the EU e-government Action Plan. Ireland has a strong motivation to well develop its e-government due to the government type and prosperous business in Information of Technology and Information Communication Technology. The e-government strategy is changeable and revisable in different development process. In

2015, Ireland government paused the cloud computing strategy and decided to combine it with "build to share" ICT strategy. In 2017, Ireland government seems to be improved in data protection and cybersecurity because of the new regulations released. In addition, except for the outstanding one-stop-service, Ireland has launched MyGovID to make public online services a further step, an online identity for online services since 2017, which built on the Public Services card, linking citizens' identity to online identity.

Israel

1   General Information

Area: 20,770 km^2

Population: 8,793,000

Government   Type: Parliamentary Democracy

GDP: $37,486

Internet Users: 79.8

Wired (Fixed Broadband Users): 28.1

Wireless Broadband Users: 93.4
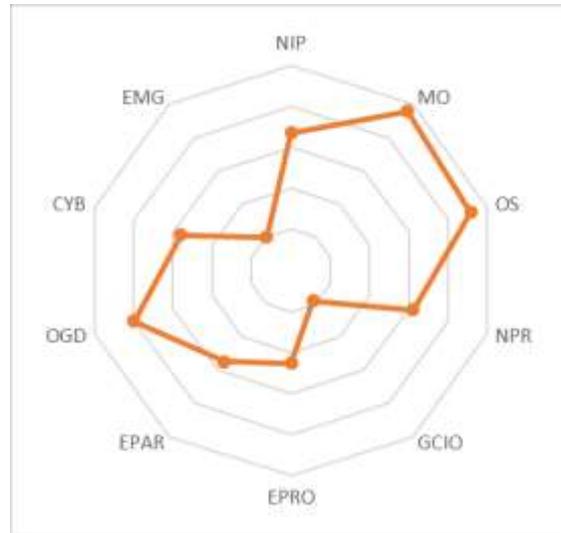
2   Positioning in a Global Organization and a Region
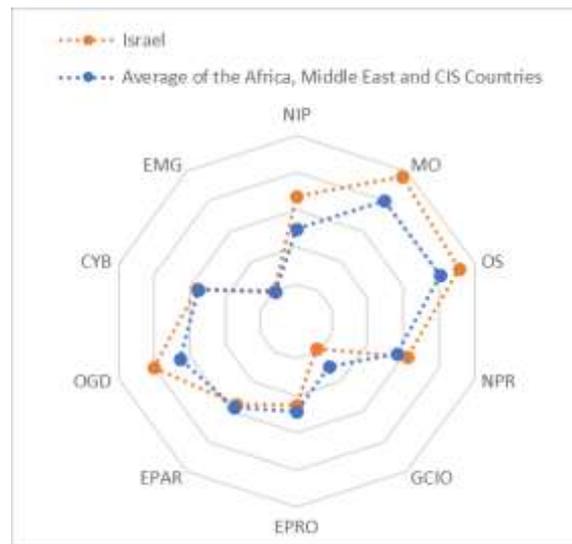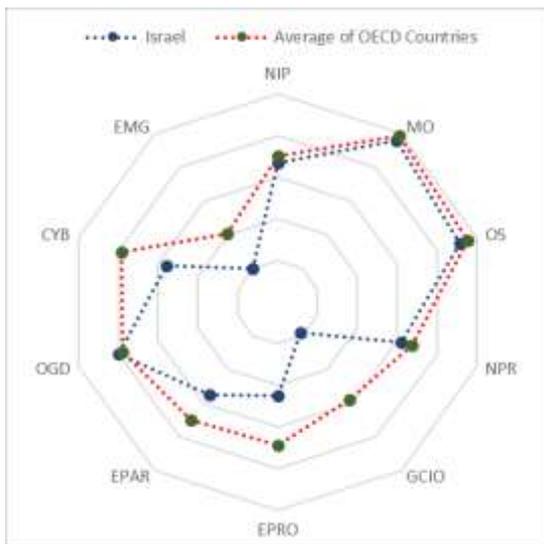
3   Digital Government Development

Israel is an early adaptor of D-Government, with the establishment of its E-government unit in 1996 and its subsequent "Tehlia" e-Gov infrastructure project in 1997. The unit became a part of the Government ICT Authority following the Authority's establishment in 2012. As of January 2015, the Authority has been operating under the management of the Prime Minister's Office, indicating the significance of D-Government within the national initiative. Moreover, the country ranked 20th in the world with a "Very High" E-Government Development Index on the United Nations E-Government Survey 2016. Based on the 2017 Waseda D-Government rankings, Israel also continues to lead in D-Government development within the Africa, Middle East, and CIS Countries region. This appears to be a result of the country's continued efforts in developing and improving a secure infrastructure to facilitate open information and accessible online government services to the public, as well as streamline communication and operations within its ministry. The focus for the coming year includes enhancing and expanding the new gov.il

portal platform, creating cross-channel, cross-agency platforms and services, establishing a national SOC (Security Operations Center), developing SLA regulations and service awareness, promoting open government and open data, and strengthening information security technologies. In addition, the Ministry for Social Equality has been tasked in 2017 with the Digital Israel National Initiative in utilizing digitization to alleviate socio-economic gaps, improve economic activity, as well as enhance government efficiency and administration.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Governed via parliamentary democracy, the State of Israel is situated along the Mediterranean Sea's southeastern shore in the Middle East and covers an area of 22,142 km2. Neighboring countries include Jordan at its east, Egypt on its southwest, Lebanon at the north, and Syria at its northeast. Census data report a population of 8,793,000 at the end of December 2017. Since 2014, Israel is a founding member of the Digital 5 (D5), a network comprising of countries with preeminent digital governments with a focus on enhancing the digital economy by improving connectivity and teaching the youth how to code. At present, 79.8% of its population has access to the Internet while 28.1% enjoy a broadband subscription, and the wireless broadband users is 98.4%

4.2 Management Optimization [MO]

Beginning in 1996 with the establishment of the e-Government Unit, the Israeli government has been on the forefront of D-Government development with the secure Tehila online infrastructure, Tamar crucial public infrastructure, Shoham payment service infrastructure, and Merkava inter-government ERP digital organization system. The country's D-Government is developed under the General Accountant in the Ministry of Finance's Five Layers Model. Current applications include e-smart cards to facilitate secure transfer of e-signatures and forms, e-access to tax and judicial systems, and development of biometric smart ID cards. Israel remains one of the world's top performers in D-Government services with its well-developed organizational infrastructure and prioritization of digital services over non-digital communication channels.

4.3 Online Service [OS]

Regarding Online Services, laws on E-signature, Data Communication, and Anti-spam continue to govern the fair and safe use of D-Government applications. The new one-stop government portal www.gov.il is now live, providing citizens with easy access to a range of services from electronic tax and payments, form downloads, to license registration. While there is a national portal in place, numerous government websites reduce ease in information access. In some cases, transfer between the portal site and the applicable department have not been optimized, as well as between English and Hebrew pages, resulting in error pages. Moreover, there is yet to be the establishment of a wholly streamlined online transaction experience, as some applications require users to download forms and email or send them to their respective departments.

4.4 National Portal [NPR]

The Israel government portal http://www.gov.il/firstgov/ is part of the e-Government project; its goal is to improve and reinforce ties and communication between citizens and government institutions. The portal is the single gateway to all the government ministries and services on the Internet. The portal provides the entire range of services and

information supplied by the government to citizens of the state Citizens can access information on government services in several ways: by the target audience, topics and life events. Citizens can also use the portal's electronic identity management feature 'My Gov.' to filter content that interests them and to access the full range of online government services and make online payments.

The website presents information in five major categories: Ministries and Authorities (Information from the websites of Government Ministries), Guides (Information tailored to key target audiences such as tourists, students, immigrants, and investors), Subjects (Information regarding historical events of the state), Forms and Payments. It also has a column with links to the gov.il forum, the tourism website and about Israel; and provides weather and exchange rate information for citizens. Despite the availability of the website in Hebrew, English, and Arabic; mobile services, SNS and blog features are only available on the Hebrew website which is also more abundant in contents than the other language websites. The website also updates information about governmental activities and new e-Government initiatives.

4.5 Government CIO [GCIO]

In 2012, Mrs. Carmela Avner was appointed the country's first national CIO as a director under the Finance Ministry. However, there have been no mentions of a successor since Avner's resignation at the end of 2013 within English-language reports. At present, there continues to be little to no focus on the subject of CIO within the country's education system, while CIO roles, panels, and forums in the private sector remain at large.

4.6 E-Government Promotion [EPRO]

As mentioned in the previous report, the URL and logo to the national government portal site www.gov.il is included in any official publication, under the direction of the Accountant General. As of 2012, the Israeli government has been a member of the International Open Government Partnership for Promotion of Open Government Policy. The main aim of which is to promote transparency, citizen participation, and accountability. According to the country's Midterm Self-Assessment Report, one of the preeminent goals of 2017 is to promote awareness of the government's Open Government engagements. An interactive Open Government website to increase public understanding regarding this area is reported to be in the works.

4.7 E-Participation [EPAR]

One of the cross-organizational values of the Israeli government, in their commitment to an open government, is the promotion of freedom of expression and public participation. Through ongoing endeavors to improve the accessibility of public sector data, the government hopes to encourage citizen participation in decision-making procedures. As such, contact information of ministers is made public via the official website of The Knesset at www.knesset.gov.il. There are official websites for both Prime Minister and President of Israel roles, with links to updated social media sites including Twitter, Facebook, YouTube, and Flickr. However, there is yet to be a standard or department responsible for the assessment of public satisfaction of D-Government services.

4.8 Open Government Data [OGD]

The ICT Authority is currently mapping existing metadata, expanding the number of datasets available, as well as upgrading the technological platform on www.data.gov.il using open code (ckan). The mapping is being performed following consultation with

public and private entities, such as Google and the Hebrew University. Ten major databases are said to be made accessible by the end of 2017, with over 100 databases updated for accessibility since 2016. Databases were chosen based on their potential contribution to economy and transparency. As of 2016, the Authority is also in the process of implementing explicit guidelines regarding open data access as well as creating an official position with which to aid citizens in acquiring data from the government's online repositories.

4.9 Cyber Security (CYB)

As a result of concurrent military and civilian instability, Israel has long-established national cybersecurity operations. The Israeli National Cyber Bureau (INCB) was set up in 2011 to centralize civilian cybersecurity. In February 2015, the INCT established the National Cyber Security Authority (NCSA) operative government body for cyber defense. 2017 was reported to see the joining of both institutions under a National Cyber Directorate (Ma'arach) that will oversee both policy and operational defense endeavors. While no cyberterrorism law is in place, a counter-terrorism law was enacted in August 2016 which can be interpreted to encompass cyber-attacks.

4.10 The use of Emerging ICT [EMG]

A joint venture established in 2014 between the Israeli National Cyber Bureau, Ben Gurion University of the Negev, Beer Sheva Municipality, and prominent cybersecurity industry leaders, the CyberSpark Innovation Initiative project is a non-profit organization that aims to be a key organizer in global cyber security furthering collaborations between academia and industry. The organization co-founded the multi-stakeholder. Global EPIC (Ecosystem Partnership in Innovation Cybersecurity) with 13 other world partners in October 2017 as well as hosted the inaugural launch of the Smart Mobility Analysis and Research Test Range (SMART Range) in October 2017.

5   Some Highlights

Published in late 2015, the Policy of Regulating Cyber Security Professions in the State of Israel policy document by the National Cyber Bureau (NCB) proposes that regulation of said professionals will enhance cybersecurity by ensuring a certain degree of ethics, expertise, and dependability.

The policy, which is projected to be implemented by 2021, establishes five categories of cyber-security professions, stipulating prerequisite professional knowledge and training, as well as regulation using recurring examinations and enrollment in a national registrar. As such, the Israeli Government continues to take an innovative, pioneering approach towards cybersecurity as an opportunity for national advancement, multi-disciplinary collaboration between sectors and positioning itself as an international hub for IT development.

Italy

1 General Information

Area: 301,340 km^2

Population: 62,007,540

Government Type: Parliamentary Republic

GDP: $36,300

Internet Users: 74.6

Wired (Fixed Broadband Users): 31.5
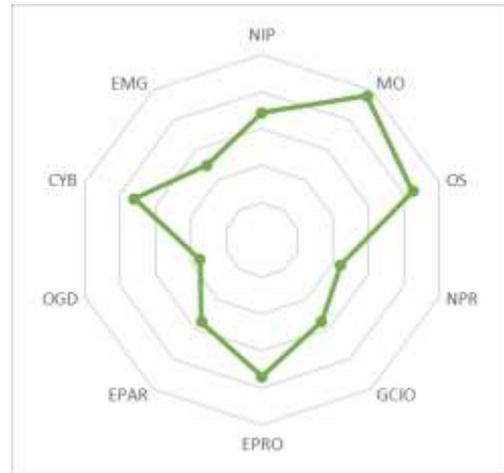
Wireless Broadband Users: 109.2

2 Positioning in a Global Organization and a Region
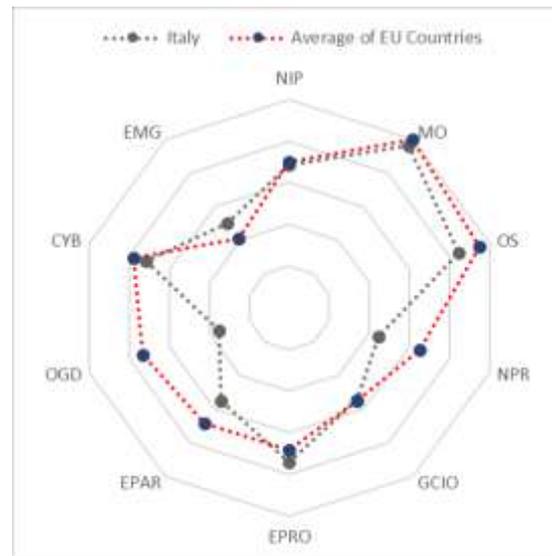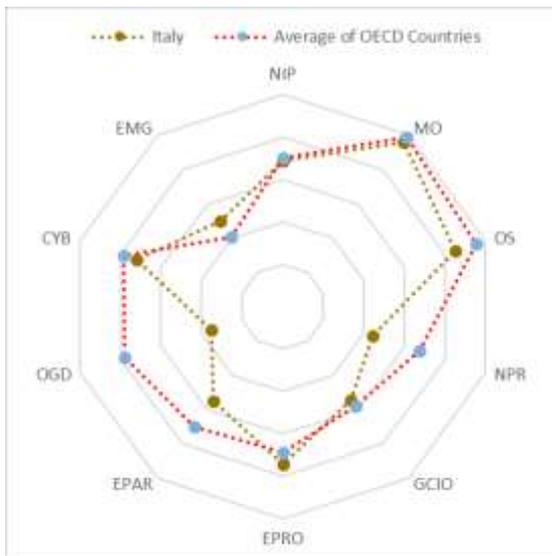
Among OECD Countries, all indicators except the GCIO indicator is above or same with the average score of OECD members. GCIO indicator of Italy get the worst score in European countries and also in OECD. Amongst European countries, Italy is placed below Denmark. However, the e-Participation (EPAR) indicator of Italy is better than those of Denmark, the best country in the Europe region.

3 Digital Government Development

The Agency for Digital Italy (L'Agenzia per l'Italia Digitale: AGID) has been set up with the task of monitoring the implementation plans for ICT in public administrations in line with the Digital Agenda for Europe, thus creating the "Italian Digital Agenda" in line with the Digital Administration Code (Codice dell'Amministrazione Digitale, CAD) at the end of March 2014. Moreover, AGID also reminded public administrations that they are obliged by a 2014 law to offer electronic payment solutions. AGID is offering support, by organizing meetings with municipal and regional administrations across the country, explaining the benefits of e-Payment solutions, and introducing possible solutions and

solution providers. Offering e-Payment to citizens and companies is key to the growth of e-Government services, AGID writes.

In addition to legislative measures for general profiles and strategy in the field of digital agenda, the Council of Ministers has approved the Digital Growth Plan 2014-2020 and the UltraWideband Plan. Both plans have been defined by AGID and the Ministry of Economic Development under the coordination of the Prime Minister.

The national plan for ultra-wideband is synergistic to the Strategy for Growth Digital. The strategy has a dynamic character, to be able to adapt gradually to the scenarios in the reference period 2014-2020. This strategy aimed at growing digital citizens and businesses, also using the levers public. Integrate what has been achieved in a subsidiary or under construction in both the public sector, both in private and must be realized a complete synergy with other public strategies in place, is attributable to the national government is a regional responsibility, to put helpfully "to system "objectives, processes and results.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

Approximately 74.6% of people in Italy were Internet users in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). About 31.5% have fixed-broadband subscriptions, and wired broadband subscription has reached 109.2%.

4.2 Management Optimization [MO]

This "Italian Digital Agenda" guideline provides operational guidance for Italian public administrations towards the implementation process of the national strategy for improving public information assets. Among other topics, organizational and operational schemes are proposed, technical standards and best practices are highlighted, and cost and licensing aspects are considered.

4.3 Online Service [OS]

The score for Online Service is based on an investigation of five online services: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Among this five e-Tax, and e-Customs are the best performer among five online services.

Regarding complexity level, only e-Tax, and e-Customs have reach interaction level where the citizen can obtain the service without necessarily visit the government office. Other services have the downloadable form and like to another service. In term to enable citizens to access e-Services securely, the Italian Government has also developed the National Services Card (CNS). It is a smart card allowing for the secured identification of citizens online.

To measure the level of convenience, the third party application result has shown that e-Tax, and e-Customs and One-Stop Service portals are above the average considerably regarding speed. The third party application for assessing the portal is the application from Google PageSpeed™ Insight.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. The "http://www.governo.it/" government portal provides a gateway for users to access government information easily, and "http://www.agid.gov.it/" is the Italia Digital Agenda which provides single-window access to information and government services to citizens and organizations/businesses. Moreover, "http://www.impresainungiorno.gov.it/" is e-Government portal for business which has been offering useful information on a wide range of topics that are of interest to businesses. In the technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is below average on both from PC and from Mobile Device. Moreover, also from the user experience aspect, this website is not much functionality.

4.5 Government CIO [GCIO]

There is no dedicated GCIO post. There are no specific laws or mandates for CIO positions in Italy. AGID under the Prime Minister's Office is the leading institution for Digital Italy and is responsible for the provision of technical support and consultancy for the Italian Public Administration and the Italian Government. Moreover, Director of AGID is partly addressing the GCIO position.

4.6 E-Government Promotion [EPRO]

The passage of the e-Government Code (Codice dell'Amministrazione Digitale) in 2006 marked a milestone in Italian e-Government efforts. Passage of such legislation heralded stronger emphasis on e-Government in Italy. This also provided the legal framework for succeeding e-Government initiatives both at the national and local level. Moreover, this situation is similar to the one in any developed countries where the IT Culture has been embraced in society.

4.7 E-Participation [EPAR]

Having web forums to enable citizens to participate in e-discussions is one of the remarkable functions that central and local Italian government is seeking to deploy at length. Moreover, Polls delivered via the national portal allow citizens to express their views on topics raised by some administrators. Generally speaking, Italy has a certain level of understanding of e-participation in decision-making policies. On May 2016 The Italian Council of Ministers has approved a Transparency Decree providing for access to information. "The first Italian FOIA" has just entered into force and still has some handicaps, like the lack of sanctions for public bodies that illegitimately refuse to disclose documents and the absence of an ombudsman in many Italian regions.

4.8 Open Government Data [OGD]

The "http://www.dati.gov.it/" is e-Government portal for open data that is promoted by the Ministry for Public Administration and Innovation in order to enable the access to the data of all the Italian authorities, both at the national and local level. It contains links and descriptions for about 10,338 datasets produced by 76 governments including Geographical data and 695 Statistical data as one the end of February 2017. The data available any citizen intending to use it to develop applications for analysis or study purposes, in a complete, quick and accessible to all format. In local level such Roma, also has open data "http://www.opendata.provincia.roma.it/" however it is not much of data set.

4.9 Cyber Security [CYB]

In Italy, since 2013 following the adoption of the Prime Minister's "Decree Containing Strategies Guidelines for the National Cyber Protection and ICT Security", the Cybersecurity Working Group was established under the Committee for the Security of the Republic, and chaired by Department for Intelligence and Security (DIS) and developed the National Strategic Framework for Cyberspace Security 2013. In addition, the Ministry of the Interior established the National Anti-Cybercrime Center for the Protection of Critical Infrastructure (Centro Nazionale Anticrimine Informatico per la Protezione delle Infrastrutture Critiche - CNAIPIC) as a particular unit within the Postal and Communication Police Service.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). Italian Digital Agenda have approved the strategy for implementing Government Cloud. Along with the implementation of Government Cloud, it started the second phase of the Consip tender for the supply to the PA central and local cloud computing services and were sent invitation letters to competitors who have pre-qualified, responding to tender. In addition, Italy's Revenue Agency used the computer system to compare taxpayers' income declarations with their expenditures; it works under the concept of Big Government meets Big Data.

5 Some Highlights

Among ten indicators in the current ranking, the Open Government, e-Participation and Online service are the top indicator in Italy. However, the weak point in Italy is about the use of emerging ICT for government and GCIO. In June 2015, AGID launched a new version of the National Open Data portal: "http://www.dati.gov.it/" in order to promote the quality of the data published. The new portal ensures uniformity of the contents of the catalog, which now includes metadata that describe open data held by the public authorities involved. Moreover, it publishes only the metadata of data available in formats recognized as open and associated with open licenses compatible with the definition of open data.

Public System for Digital Identity Management (SPID) is a unique personal code that certifies the digital identity of citizens and businesses. SPID can be used to access and enjoy all the telematic services of the PA which a unique identification code. The launch in April 2015 within the system SPID is one of the priorities set by the President of the Council of Ministers. In addition, the Italian electronic identity card grants access to secure e-Government services requiring electronic identification, and the possibility to perform related online transactions. Strictly for electronic use, they also have the National Services Card (NSC). Online interfaces are also provided for citizens to access e-Procurement, e-Tax, and e-Customs, which have implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services.

Japan

1   General Information

Area: 377,915km^2

Population: 126,919,659

Government Type: a parliamentary government with a constitutional monarchy

GDP: $38,200

Internet Users: 93.3

Wired (Fixed Broadband Users): 31.5

Wireless Broadband Users: 131.9
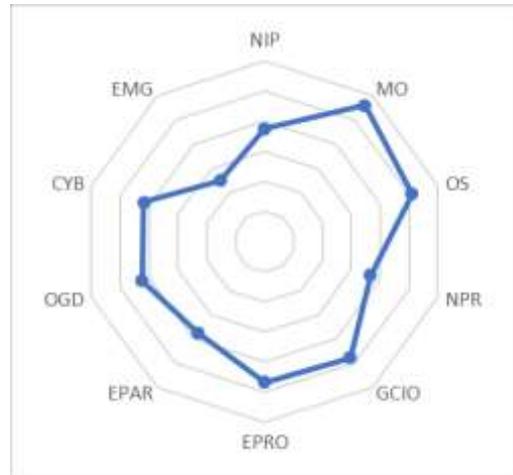
2   Positioning in a Global Organization and a Region

Japan has comparatively high performance on most of the indicators than the average level of APEC and OECD members, except the indicator of National Portal. Besides, Japan has better scores of Network Preparedness and GCIO.
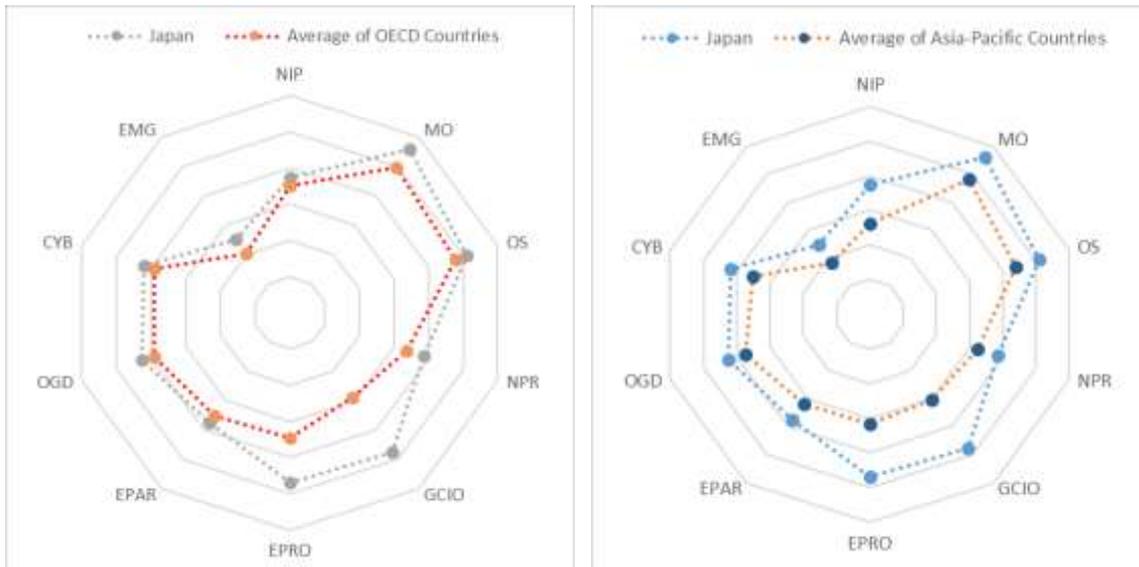
3   Digital Government Development

E-government strategies in Japan have gone through several stages along with the technical and social change; the latest e-government initiative remains the "declaration to be the world's most advanced IT nations" published in 2014. Japan founded a comprehensive system for decision and implement in e-government plan; the participating sectors include IT strategic headquarters, Government program management office, Government CIO, CIOs Council, etc. It is very complemented of Japan's meticulous e-government initiatives which cascaded nation's objectives into different plans, such as the promotion of the online use of administrative procedures and optimization of work and systems, local e-governments and so on. Legible and distinguished goals from different initiatives possess their policy evaluation, in order to

confirm the best implement on each phase. Moreover, Japan has established the GCIO system in each level of government to ensure the implementation of ICT strategies into organizations and societies.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

Approximately 93.3% of people in Japan have used the internet in their daily life. According to ITU's report, about 31.5% are fixed-broadband users, and the wireless-broadband users are 131.9%. Internet penetration in Japan has reached a high level compared to other countries.

4.2   Management Optimization [MO]

Japan is one of the earliest countries to push the integrated government systems and has made lots of progress such as the GPKI (Government Public Key Infrastructure) and "Kasumigaseki one" system. Most of the 87-optimization target areas are in the implementation phase. IT Headquarter started "The most advanced IT Nation" Strategy to implement e-government as the priority area productivity and efficiency.

4.3   Online Service [OS]

Most of the online application systems such as e-Tax, e-Payment, and social security services provide transactional operations (covering all the service processes including requests, payments, decisions, and delivery). There are many various online services by e-government, but the e-government development in local level has been lack of usage. It may be related to the reality of super-ageing society faced by Japan that most of the residences are aging people in the local area who are not familiar to the e-Service systems. Therefore, the online service sites are less designed and regularly updated.

4.4   National Portal [NPR]

National Portal of Japan (http://www.japan.go.jp/index.html) is a public site for introducing Japan to people, mainly for the non-citizens. It contains proper information about different aspects of Japan. The portal has provided the latest national news, demographic information, political initiatives, cultures, government agencies introduction and so on. It also has presented the official Japanese Gov APP to deliver users up-to-date information about Japan including photos and videos.

4.5   Government CIO [GCIO]

Each central ministry has a CIO who is appointed among senior staff within the ministry (mainly Director General of administration) and an assistant CIO who is an expert recruited externally. Federal CIO Council composed of Ministry CIOs has the authority to decide many rules on in-house ICT installation and online services. The percentage of CIO appointments at the prefecture level is over 90%, and 87% is at the city level. The government established a Government CIO as a core of all Ministry CIOs in November 2012. Mr. Akihisa Miwa, a former EVP of Obayashikumi, Construction Company was appointed to the 2nd government CIO after Mr.Endo has worked very efficiently with Federal CIO Council.

4.6   E-Government Promotion [EPRO]

There are four organizations behind the promotion of e-Government in Japan. Namely: The e-Government Evaluation Committee; the Government Promotion and Management Office of IT Policy Office of Cabinet Secretariat, the Administrative

Management Bureau of the Ministry of Internal Affairs and Communications; and the Program Management Offices (PMO). They are responsible for creating a new set of priority policies every year to identify crucial issues that must be solved during the short-term time and also analyze its contribution to the long-term benefits. The IT Strategic Headquarters develop the national IT strategies and the frameworks of action plans. It has subordinate organs, which include the CIO Council consisting of all the CIOs and their assistants in each Ministry. MIC created the National e-government promotion council and had made various PR activities.

4.7 E-Participation [EPAR]

2016 is the first year for the Japanese Government adopting the Social Security and Tax number system (My number) This system needs e-participation by all Japanese citizens and companies to develop efficiency in administration and enhance public convenient. How to encourage citizens to join the system is one of the big problems for government agencies now in Japan since the diffusion rate of ID card by My Number system is meager than the government forecast. The government must revise the strategy on this scheme.

4.8 Open Government Data [OGD]

In October 2013, Open data charter action plan was announced, and then the government has released using standard version1.0 for open data in 2014. Open data has become one of the Central topics of IT policy in Japan. The data site (http://www.data.go.jp/) has over than 15,000s datasets presented. Users can search information by publishing government agencies, groups, tags and formats.

4.9 Cyber Security [CYB]

Japan boasts the world's highest level of telecommunications infrastructure. The increased use and application of information and communication technology means, the Japanese government successively prepared and revised strategies, annual plans, sector-specific policies, and other measures in pursuit of ensuring cybersecurity, and based on these strategies and measures, forged cooperation among industry, academia and government stakeholders in addressing these challenges. Japan is dedicated to utilizing these extensive experience and knowledge in promoting international cooperation. Japan will promote initiatives for international cooperation and mutual assistance in cybersecurity based on this strategy under the common understanding shared among all domestic stakeholders including those from industries, academia, and the government. The just renamed National Centre of Incident Readiness (NCIR) and Strategy for Cyber Security serves as the secretariat for Japanese governments' cyber-security strategy headquarters.

4.10 The use of Emerging ICT [EMG]

Japan has moved fast at the emerging ICT application into public sectors. There are already some national plans such as Smart Cloud Strategy, Big Data in Government, etc. Cloud computing in a governmental platform is at the ongoing phase. The Ministry of Economy, Trade, and Industry also has sponsored to public projects which have been selected to facilitate the IoT utilization. The next stage should be making the draft for a legal framework on emerging technologies applications such as AI and Blockchain.

5   Some Highlights

As one of the advanced e-government nation, Japan keeps its leading impetus at the TOP 10 of ranking. As the aforementioned situation, Japan government has built a sophisticated promotion system for e-government initiatives and precise GCIO regimes into every rank of government (Central and local government; different government agencies) to assure the implementation and evaluation process of e-government initiatives. It can be reported on high scores on "Government CIO" and "E-government Promotion". Japan also continues to update its online service system as the objective of initiatives to simplify administrative procedures and working systems. However, the National Portal seems to be the need of improvement action for e-government in Japan[11]. Some necessary information including demographic data and introduction to Japan political situation has been provided at the site, but it still needs much more necessary functions to serve visitor's needs rather than providing information only. In consideration of the coming Tokyo Olympic Games that massive visitors would choose national portal as a reference, it is a chance and challenge at the same time for the Japanese government to reconsider that what is the appropriate way to provide information and deliver e-service to Japanese and non-Japanese through the internet.

Japanese nation-wide strategy called [Society 5.0] is a society that can be expected to facilitate human prosperity. Such a society is capable of providing the necessary goods and services to the people who need them at the required time and in just the right amount; a society that is able to respond precisely to a wide variety of social needs a society in which all kinds of people can readily obtain high-quality services, overcome differences in age, gender, region, and language, and live vigorous and comfortable lives.

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[11] http://www.japan.go.jp/

Kazakhstan

1 General Information

Area: 2,724,900 km^2

Population: 18,157,122

Government Type: Presidential Republic

GDP: $25,669

Internet Users: 76.8

Wired (Fixed Broadband Users): 13.7

Wireless Broadband Users: 71
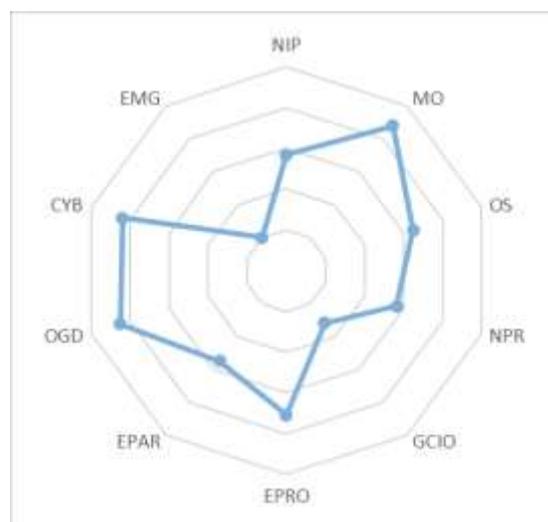
2 Positioning in a Global Organization and a Region
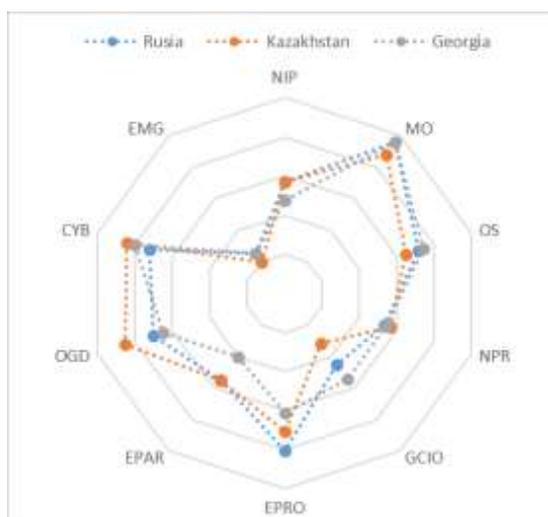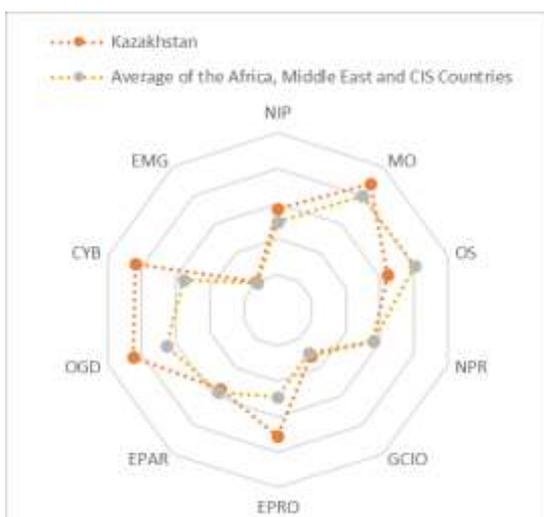
3 Digital Government Development

New State Program "Digital Kazakhstan" was approved by the Decree of the Government of Kazakhstan No. 827 of December 12, 2017 (Ministry of Communications - https://www.zakon.kz/4894821-gosprogrammu-tsifrovoy-kazahstan.html)

The main mission of the program is to improve the quality of life of residents and the competitiveness of the country's economy, through the use and development of digital technologies. The program is planned for two vectors of development: "Digitalization of the existing economy" in the medium term and "Creating a digital industry of the future" in the long term. 120 planned events of the program will form the basis of the digital sector as a new branch of the economy and will be implemented in five directions: "Digitalization of economic sectors", "Transition to a digital state", "Realization of the digital Silk way", "Development of human capital", and "Creation of an innovative ecosystem".

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As a result of measures taken in the framework of the project, in addition to increasing productivity growth by industry, it is planned to increase the share of electronic commerce in the total retail trade to 2.6% by 2022; creation of up to 300 000 new jobs due to digitization; an increase in the proportion of Internet users to 82%, and the level of digital literacy of the population to 83%.

Since the program affects all spheres of life and is aimed at improving the standard of living of every resident of the country, the beneficiaries of its implementation will be citizens, business entities and government agencies of the Republic of Kazakhstan.

According to preliminary estimates, the direct effect of the digitalization of the economy by 2025 will create an additional value of 1.7-2.2 trillion tenges.

According to the Government vision, the implementation of the program can become a critical factor in achieving the goal set by the President of the Republic of Kazakhstan in the Kazakhstan 2050 Strategy on Kazakhstan's entry into the list of the 30 most competitive countries in the world by 2050.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

According to ITU, about 76.8% of people in Kazakhstan have used the Internet in their daily life. Moreover, about 13.7% are fixed-broadband users, and the wireless-broadband users are 71.0%.

4.2 Management Optimization [MO]

The State Program "Digital Kazakhstan" was approved by the Decree of the Government of Kazakhstan No. 827 of December 12, 2017.

The primary mission of the program is to improve the quality of life of residents and the competitiveness of the country's economy, through the use and development of digital technologies. The program is planned for two vectors of development: "Digitalization of the existing economy" in the medium term and "Creating a digital industry of the future" in the long term.

4.3 Online Service [OS]

http://egov.kz/ is one-stop service. It is divided for citizens and businesses, The popular e-Services in Kazakhstan are payment for tax on vehicles, get the certificate of the registered legal entity, Registration of persons driving vehicles on the basis of power of attorney, except for the registration which is carried out by the Ministry of Agriculture and payment of the fee for traffic regulations violations.

www.goszakup.gov.kz is a central facility for all public sector contracting authorities to announce procurement opportunities and award notifications. It provides information about coming, accepted and current tenders and allows online submission of tenders. Some e-Services were introduced with the full transaction, but most of them are at the level of information provision and downloading forms and will be gradually enhanced to reach a transactional level in the coming years.

http://invest.mid.gov.kz/ru/kategorii/odno-okno-dlya-investorov is a central entry point for investors. It provides a lot of analytical papers, law (special economic zones, a map of industrialization, etc.), investor's visa support, and contacts with investment's ombudsman and responsible government structures.

Similar service developed for the customs. The platform has access to the module for the issuance of permits and is currently undergoing certification (planned for operation in May 2018).

4.4   National Portal [NPR]

The government one-stop-shop portal www.egov.kz was launched in 2006. The portal services are available in 3 languages: Kazakh, Russian and English. D-Government of Kazakhstan (www.egov.kz) provides 2,000 information services, 219 interactive and transaction service online. The portal provides an online counseling service, allowing citizens to address any government agency concerning specific issues. Registered users may have access to a broader range of services including "Mail me" functions, simple scheduling and e-mail accounts. The portal also provides information on the national D-Government development program and its projects and allows access to the reports on D-Government implementation results.

The portal also lacks accessibility features: it does not allow changing font size of the text and spacing between words, and no text vocalization is provided. More advanced content and functions such as multimedia shows, sharing, tagging, podcasts are still to be introduced, but SNS feature is also introduced.

4.5   Government CIO [GCIO]

There is no official designated Government CIO. However, there are a de-facto two government organizations that share the responsibilities of the CIO: National ICT Holding Zerde and JSC National Information Technologies.

4.6   E-Government Promotion [EPRO]

Kazakhstan government has put much effort into reducing the digital divide among the population and government employees. Public Internet access points were opened all over the country in order to connect citizens to the web. Classrooms for providing computer literacy were opened in several regions to promote the capacity development of public sector employees. To facilitate continues development of D-Government in the country the government of Kazakhstan organizes annual international conferences called "D- Government initiatives". In addition, individual national competitions are announced on an annual basis with nominations for the best website in the official language, best known e-Service at the central and regional levels, best public managers promoting D-Government, best mass media coverage of D-Government project etc. Awareness surveys and opinion polls are posted on the one-stop shop portal to capture user feedback and to improve the quality of provided e-Services.

According to the Government's vision, the implementation of the State Program "Digital Kazakhstan" can become a critical factor in achieving the goal set by the President of the Republic of Kazakhstan in the Kazakhstan 2050 Strategy on Kazakhstan's entry into the list of the 30 most competitive countries in the world by 2050.

4.7   E-Participation [EPAR]

http://e.gov.kz/ includes features that increase citizen engagement. The site has a formal online consultation section, online web conference between government officials and citizens, where the government receives feedback from its citizens on government policies and services. A schedule of citizen reception by the heads of State Bodies is also available on the website. All of the cabinet members have their blogs in

http://www.blogs.e.gov.kz/, the official government blog platform, where citizens can comment, ask questions, or send suggestions.

4.8 Open Government Data [OGD]

www.data.gov.kz is an open data portal and introduced in 2013. It contains 763 types of official information helpful to citizens and businesses are posted. Accessing the government agencies' data sets allows the programmers' developing a variety of applications and directories. Information posted on the portal is classified by such areas as transport, education, statistics, culture, health, second-tier banks, KazPost.

As the first country in Central Asia to develop an e-government initiative, Kazakhstan has been a regional leader promoting open government and open data for the past several years. Today there are more than 3.7 million users registered on the "electronic government" portal (www.e-gov.kz) and on average Kazakhstani people receive nearly 40 million different electronic services a year (https://blogs.worldbank.org/opendata/open-data-business-kazakhstan). Open data is an integral part of the country's open government policies around accessibility to citizens, transparency of public administration, and corruption control. The development of an open data platform was reflected in the "Information Kazakhstan – 2020″ State Program. With 200+ datasets published on their data portal in XML and JSON formats, the Kazakhstani Government is now looking to rapidly encourage and expand the use of their growing open data portal.

Microsoft Kazakhstan together with the Business Incubator MOST and JSC "NIT" launches the Intensive program of acceleration Open Data Kazakhstan.

This is comprehensive support for beginning entrepreneurs, developing projects using open data and cloud technologies Microsoft. The program includes training, mentoring and access to funding for the Business Angels Association at MOST. Hackathon will be the first stage of the Program, following which a pool of participants will be formed. The participants and winners of the hackathon will be able to pass the accelerating program, get support from Microsoft in the promotion of the project and become a partner of the company. The program starts in May 2018.

4.9 Cyber Security [CYB]

Cybersecurity in Kazakhstan is overseen by the Committee on National Security and the Ministry of Internal Affairs. Both bodies are responsible for legal, regulatory and enforcement activities in the area of cybersecurity (including prevention and counter-measures). These bodies work closely with telecom infrastructure providers, including fixed and mobile telecoms

In 2017 the government of Kazakhstan has approved an action plan, on October 28, 2017, to implement the country's cybersecurity concept—"Cyber Shield"—by 2022 (Zakon.kz, November 1). The document outlines key areas of state policy that will be required to build a modern yet reliable system to mitigate and prevent cyberattacks and threats from hybrid ("new type") warfare - https://jamestown.org/program/kazakhstan-launches-cyber-shield-concept/.

Cyber Shield document defines several new institutions, but these require further clarification. According to the 2022 action plan, the Ministry of Defense and Aerospace Industry will establish a Council for Cybersecurity in March 2018 (Profit.kz, November 7). Policymakers are also considering establishing a National Coordination Center for Information Security (Zakon.kz, November 1). However, it is still unclear how the two

proposed bodies will co-exist. Moreover, the country needs to create both national and sectoral operations centers for information security.

Kazakhstan has been working to integrate itself into the global information community at an impressive pace. Moreover, even though the just-adopted Cyber Shield concept sounds quite ambitious, it is necessary so that Astana will be able to minimize risks to the country in the cyber domain as well as strengthen its cybersecurity capabilities in the defense and security sector. In today's world, these are essential prerequisites for any country seeking to navigate modern geopolitical challenges.

4.10 The use of Emerging ICT [EMG]

The Government of Kazakhstan is in the process of creating Government Cloud Infrastructure that will allow providing cloud-based services to Government bodies and citizens. The initiative is called G-cloud. Plans for IoT implementations will be reflected in the new Digital Kazakhstan strategy, especially in the Smart Cities section. The government is running a pilot Big Data project within NITEC aimed at analysis of social networks.

As a dynamic country in e-Government area, Kazakhstan tries to provide necessary support for beginning entrepreneurs, developing projects for the public sector. For example,

Microsoft Kazakhstan together with the Business Incubator MOST and JSC "NIT" launches the Intensive program of acceleration Open Data Kazakhstan. The program starts in May 2018.

5 Some Highlights

The Presidential Administration and Office of the Prime Minister receive regular reports on the implementation and status of D-Government initiatives submitted by the National ICT Holding Zerde and National Information Technologies. However, since these are the agencies responsible for implementation as well, this evaluation can be biased.

The State Program "Digital Kazakhstan" will be a driver in digitalization for the country for several years. "Cyber Shield" program will improve cybersecurity in Kazakhstan.

Kenya

1   General Information

Area: 580,367 km^2

Population: 46,790,758

Government Type: Presidential Republic

GDP: $ 3,400

Internet Users: 45.6

Wired (Fixed Broadband Users): 0.3

Wireless Broadband Users: 26.2
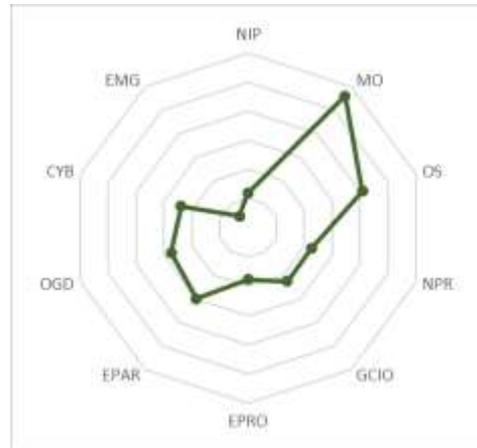
2   Positioning in a Global Organization and a Region

Among Africa Countries, only Management Optimization (MO) and e-Participation (EPAR) indicators are above with the average score of the Africa region. However, the Management Optimization (MO) and e-Participation (EPAR) indicators of Kenya is better than those of South Africa, the best country in the Africa region.
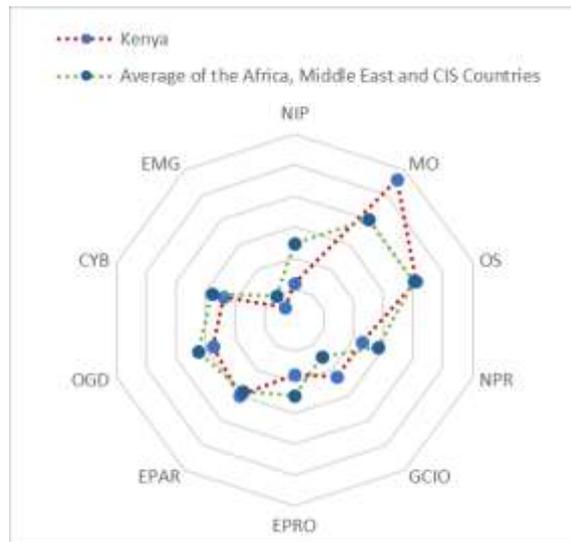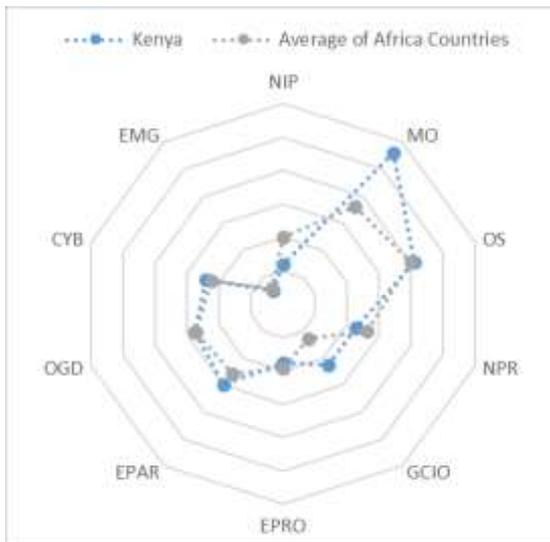
3   Digital Government Development

The Kenya government have been put the effect in the D-Government Development since June 2004. Adoption of ICT into everyday life is widespread in Kenya. The government produced its first National ICT Policy to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services. The Ministry of Information, Communications, and Technology (MOICT) is responsible for the development of Digital Government in Kenya. The role of the Ministry is to facilitate the development of the Information, Communication, and Technology sector in Kenya.

The Ministry of Information, Communications and Technology have launched the ICT Strategic Plan 2013 – 2017 on April 2014. Kenya launched its national long-term

development blueprint: The Vision 2030. ICT has a critical role in Vision 2030, and the vision of the National ICT Master Plan (2013/14-2017/18) is "Kenya as an ICT hub and a globally competitive digital economy" with the following six guiding principles: partnership; equity and non-discrimination; technology neutrality; environmental protection and conservation; good governance; and incentivizing.

The National ICT Master Plan (2013/14-2017/18) has three foundations and three pillars. The first foundation of this Masterplan is ICT human capital and workforce development, the second is integrated ICT infrastructure, and the third is integrated information infrastructure. The first pillar of this Master Plan is E-Government services, the second pillar is ICT as a driver of industry, and the third is developing ICT businesses.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

The population in Kenya in 2017 is about 48.5 million. According to the Communications Authority of Kenya, for the period July to September 2017, about 41 million have mobile subscriptions and over 71 million for fixed subscriptions, about 30.9 million have data/Internet subscriptions, and the total available international bandwidth is over 2900Gbps.

Mobile data subscriptions are about 30.6 million, contributed 99% of the total data/Internet subscriptions, terrestrial wireless data subscriptions is about 64 thousand, while the number of fiber optic subscriptions (fiber-to-the-home and fiber-to-the-business) is over 90 thousand and the number for fixed cable modem subscriptions is about 99.6 thousand.

The estimated Internet penetration level stood at 112.7%. Moreover, the country is now under the deployment of its nationwide fiber-optic network infrastructure.

4.2   Management Optimization [MO]

Kenya produced its first National ICT Policy in 2006, and the Ministry of Information, Communications and Technology has launched the ICT Strategic Plan 2013 – 2017and implemented the National ICT Master Plan (2013/14-2017/18) under the guidance of the Ministry. The Master Plan was implemented in April 2014 and the vision of it is "Kenya as an ICT hub and a globally competitive digital economy".

The Ministry of Information and Communications Technology has been working on the development and drafting of a National ICT policy in 2016. The new version of the ICT policy will provide the policy framework for the development of the ICT sector for the next five years. The policy is under review procedures by the Kenya government according to the Ministry of Information and Communications Technology's information in January 2017. It will provide the policy framework for the development of the ICT sector for the next five years with the sectoral working group championing it also including infrastructure issues, applications, and content creation.

Though the Master Plan has already exceeded the time limit, so far no further plan for ICT can be seen in the Ministry of Information, Communications, and Technology website.

4.3   Online Service [OS]

The score for Online Service is based on five investigating online services, i.e., e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using

three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Among this five e-Tax has the highest score, compared to other online services. The electronic procurement and payment system was launched in August 2014. This e-Procurement system is an automated business process which includes procurement planning, management of suppliers, requisitions, quotations, contracts, and receipts will be shifted to a more effective and cost-efficient online transaction. Also, the Kenya Revenue Authority (KRA) provides KRA Online service and iTax Online e-Services as an e-tax service.

Regarding complexity level, most of Online Service in Kenya has reached the two ways interaction in which user can download and submit application form through the portal. In addition, only e-Tax and One-Stop Service have implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services.

For measuring the level of convenience, the third party application result has shown that all portals are below the average considerably regarding speed. The third party application for assessing the portal is the application from Google PageSpeed™ Insight.

4.4   National Portal [NPR]

The Kenyan D-Government portal (http://www.mygov.go.ke/) offers public information related to countries and government affairs with some additions information from the government and the First Lady.

The homepage of Mygov of Kenyan government does not seem to be improved when compared to 2017. Tough it offers much information, the result of Google PageSpeed™ Insight showed that the website performance is poor from PC and not friendly from Mobile Device. The portal does not provide the user with some functionality such as searching, link to available Online Services as well as accessibility for people with special needs.

The Mygov portal also has a Facebook page and a twitter account, with an update in a considerable regular frequency at 3 or 4 times in a month.

4.5   Government CIO [GCIO]

There are no specific laws or mandates for CIO positions in Kenya. The State Department of ICT and Innovation is under the Ministry of Information, Communications and Technology, the department's functions are drawn up national ICT policy, promote e-government and ICT agency, provision of ICT technical support and so on. The ICT Authority and Communications Authority of Kenya is a state corporation under the Ministry.

4.6   E-Government Promotion [EPRO]

The State Department of ICT and Innovation is under the Ministry of Information, Communications and Technology is responsible for the promotion of Digital Government.

The Kenyan government has built a framework for its D-government in its Vision 2030, and some terms in Kenya Information and Communications Act adopted in 2013, and the National ICT Master Plan(2013/14-2017/18) have mentioned the Digital Government promotion.

4.7   E-Participation [EPAR]

Kenya is a leading country in Africa in the sector of e-participation. The government provides the communication platform using the ICT and has put the effect in the

infrastructure for ICT. For example, Mygov portal has the reply function that the public can communicate with government officers. Moreover, the government also have its official social media account; this also provides a way of e-participation.

4.8 Open Government Data [OGD]

Kenya launched the Open Data portal "https://opendata.go.ke/" since 2011.the portal provides various data including agriculture, education, environment, energy, finance, governance, government accounts, health, infrastructure, population and census and water and sanitation about the country. Now there are over 300 datasets; more data are needed.

4.9 Cyber Security [CYB]

The Kenya government implements the Cyber Security Strategy in April 2016. The Strategy defines Kenya's cybersecurity vision, key objectives, and ongoing commitment to support national priorities by encouraging ICT growth and aggressively protecting critical information infrastructures. Moreover, the draft version of wireless broadband spectrum policy was released by the Ministry of Information, Communications, and Technology.

The Communications Authority of Kenya (CA) has established the National Kenya Computer Incident Response Team Coordination Center (National KE-CIRT/CC) that response to cybersecurity incidents and to collaborate with relevant actors when incidents happen.

4.10 The use of Emerging ICT [EMG]

The Communications Authority of Kenya (CA) implements the Big Data interpretation and Analysis from 2016, and the government has been work with international enterprises such as IBM. The International Telecommunication Union is already working with CA in the development, collation, and analysis of ICT indicators statistics & other areas of capacity building. Kenya has no strict privacy law, and the Kenyan data protection Bill has provisions for mandatory data sharing with government agencies, so the Kenyan government still needs to improve its legal system.

There are no clear plan and action about Cloud Computing and Internet of Things in Kenya, but the Kenya government has already considered them.

5 Some Highlights

Kenya is developing rapidly in D-Government, the ICT helps grow of economic and technologies in Kenya. When compared with the situation in 2016, things do not change in some degree. The UN D-Government ranking shows that Kenya ranked 119 within 193 countries all over the world in 2014 and stays in the same position in 2016. The same trend can be seen in the 2017 Waseda-IAC International Digital Government ranking headed by Prof. Dr. Toshio Obi. The historical ranking for Kenya in the past four years is 58, 63, 60 and 61 within 65 countries which the Waseda ranking takes into consideration.

The implement of e-government is associated with infrastructure, policy, security of information, human capitals and social factors. As Gichuki et al. pointed out in 2017, there are many barriers to the adoption and diffusion of Kenya's Digital Government development. He argued that there is no clear policy framework for implementing fully functional e-government, and the security of e-government systems is not adequate.

Lithuania

1   General Information

Area: 65,300 km^2

Population: 2,884,433

Government   Type: Semi-Presidential
Republic

GDP: $28,000

Internet Users: 74.4

Wired (Fixed Broadband Users): 28.7

Wireless Broadband Users: 76.8
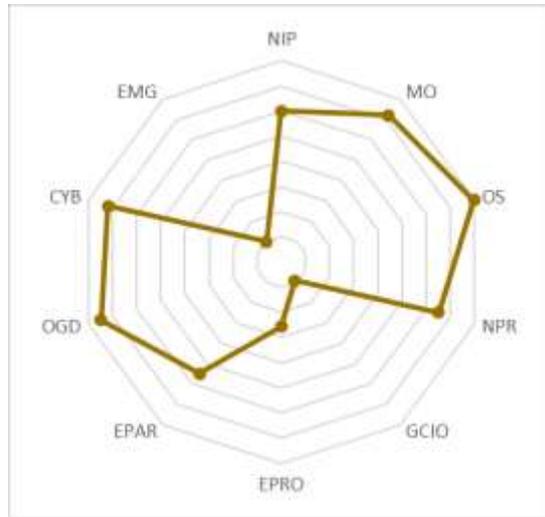
2   Positioning in a Global Organization and a Region
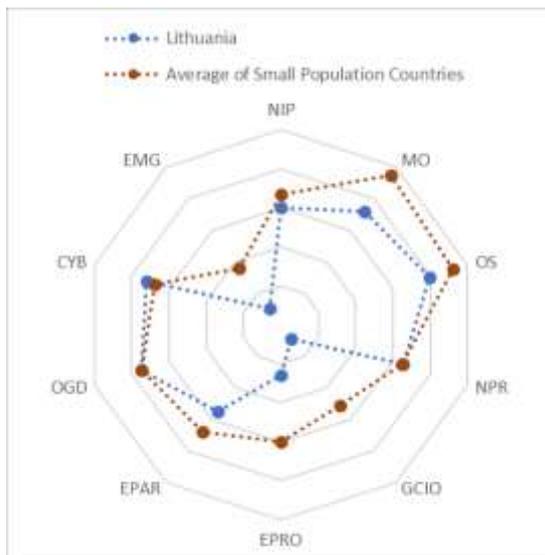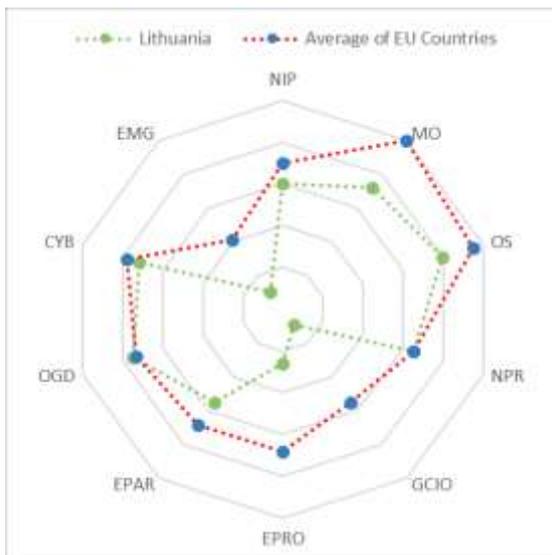
3   Digital Government Development

This is only Lithuania's second year in the ranking. The official government web portal can be located at www.lrv.lt, and they also have additional web portals with information and news about the country in English. The country's official web presence is polished and professional, but, as it is a country with a deficient population, its online offerings are relatively limited. For example, while Lithuania is a member of the Open Government Partnership, it is difficult to find detailed, downloadable open data sets from an official source. There are ongoing efforts to remedy this situation by promoting open data and start-up culture, but the extent of these programs are limited or entwined with cooperation from other countries in the region.

4　By Indicators
4.1　Network Infrastructure Preparedness [NIP]

In Lithuania, approximately 66% of households have access to the Internet. This is about 15% less than the EU average, but the number has been going up, particularly in recent years. Furthermore, nearly 100% of businesses are connected to the Internet, and about 70% of the population uses the Internet once a week or more. Broadband connections lag the EU average at 65%, and only 19% of individuals have ordered a product online within the past three months, less than half of the EU average. These numbers suggest that while NIP is improving in Lithuania, it still has some room to grow relative to other nations in the region.

4.2　Management Optimization [MO]

The Lithuanian government is more than halfway through the implementation of the Lithuanian Information Society Development Programme (2011-2019). This is a multi-pronged program, but there are two overarching goals. The first goal is to improve the skills and IT literacy of the Lithuanian people. This is to be accomplished by providing training (online and in-person), and funding IT careers in both rural and urban areas. The second goal is to continue developing and enhancing a robust and user-friendly series of government services available on the World Wide Web.

4.3　Online Service [OS]

Lithuania offers a diverse array of services available to citizens and businesses on the Internet. They offer an online procurement portal for government agencies to make purchases efficiently. They also offer a host of services for citizens, including e-Tax, online social security, and unemployment benefits system, license and certificate applications, notification of change of address, etc. Lithuania is not leading the way forward regarding innovative online services, but it indeed is not far behind its counterparts in Europe.

4.4　National Portal [NPR]

Lithuania's national portal, the e-Government Gateway, was launched in 2004. It offers a single source of information, services, and communication between citizens and government. The portal offers information to both citizens and foreigners in several languages. There is also a Login feature so that citizens can customize their experience on the portal. The portal contains links to all of the necessary features for citizens with a simple, organized, user-friendly style.

4.5　Government CIO [GCIO]

The closest role to a GCIO in Lithuania is the Advisor of the e-Government Policy Division. Dr. Vytautas Krasauskas currently hold this position. He reports to the Minister of the Interior, which is currently Tomas Žilinskas. They are responsible for all e-Government strategy, implementation, and development.

4.6　E-Government Promotion [EPRO]

The Lithuanian government's newest strategy to promote a connected, information-based society is the Ministry of Transport and Communication's 2014 decision to allocate funds to improve IT services in the nation. These funds will serve to promote the nation's e-Services by enhancing awareness and technical literacy among the population.

4.7 E-Participation [EPAR]

The Lithuanian government promotes online participation mainly through its national portal, which provides links to blogs and social media accounts for agencies and individual government officers. These measures are meeting increased success as a larger proportion of the population is now using the Internet regularly and feeling more comfortable interacting with others online.

4.8 Open Government Data [OGD]

As early as 1996, Lithuania had a law requiring the government to disclose information to the public. That law was strengthened in 2000 and is still in force today. Individual agencies within the Lithuanian government do publish datasets to the public. For instance, data sets regarding the federal budget, legislation, census information, election results, and more are available, but they are not presented together in a single portal. This is a significant obstacle to citizens' ability to find the information they need without undue effort, and steps toward a more robust OGD portal should be taken.

4.9 Cyber Security [CYB]

The Lithuania Cyber Security Strategy was introduced in 2011, with a plan covering for the period 2011-2019. The main objectives are (1) the security of state-owned information resources, (2) an efficient functioning of critical information infrastructure, and (3) Cybersecurity of Lithuanian residents and persons staying in the country.

In July 2015 a Lithuanian Cyber Security Centre was established with the aim of ensure centralization of cyberspace protection at national level. After one year, Lithuania officially launched its National Cyber Security Centre (NKSC) amid increased efforts by Eastern European countries to protect themselves against potential cyber-attacks. The main goal of the NCSC is to consolidate the efforts of public institutions, spread the ideas of cyber-awareness and provide help in dealing with cyber-incidents on government networks[12].

In August, 2018, the Lithuania's government approved a new national cyber security strategy. This document identified five goals, which includes bolstering cyber resistance and defense capabilities, stepping up fight against online crimes, promoting a cybersecurity culture and innovations, promoting closer cooperation between the private and public sectors and strengthening international cooperation[13].

4.10 The use of Emerging ICT [EMG]

Recently, Lithuania developed the Secure State Data Communication Network (SSDCN), which allows sensitive data and communication to be transmitted securely. Furthermore, Lithuania aspires to be a regional leader in the Internet of Things or IoT. The government has made efforts to attract state-of-the-art tech companies that are researching new consumer electronics that rely on IoT technology.

5 Some Highlights

The Lithuania government offers a public procurement site at www.cpo.lt. This site provides users (in this case, mostly governmental institutions) with an easy way to order

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[12] https://cyberwiser.eu/lithuania-lt
[13] https://www.nrdcs.lt/file/repository/resources/Lithuania_Report_10_8_2017_FINAL.pdf

and receive goods and materials that they need from more than 450 different suppliers. This site eliminates a significant amount of inefficiency and lowers costs for procurement.

There is also an online customs website available in several languages at www.cust.lt. This site mostly provides information regarding the customs process, but it also provides some helpful tools to help businesses and individuals predict the customs process before they import or export goods. The site is well-organized and very user-friendly.

The Lithuanian government continues to place e-Government development as a high priority. Despite the country's relatively small size and population, it has established a useful and user-friendly online presence for itself well within the top tier of countries, and it only shows signs of improvement in the days ahead.

Macao

1 General Information

Area: 30.4 km^2

Population: 644,900

Government Type: limited democracy

GDP per capita: $69,300

Internet Users: 81.6

Wired (Fixed Broadband Users): 30

Wireless Broadband Users: 332
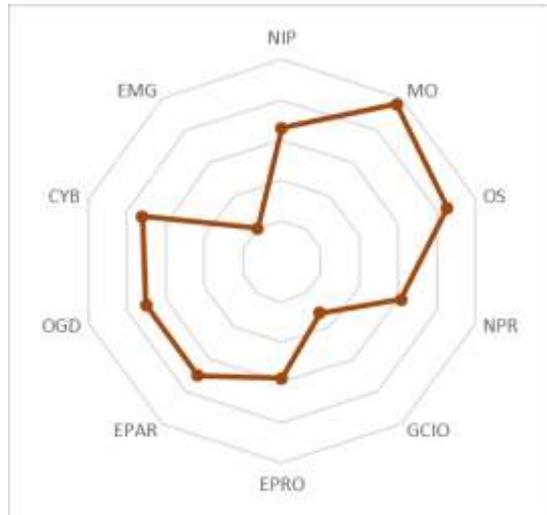
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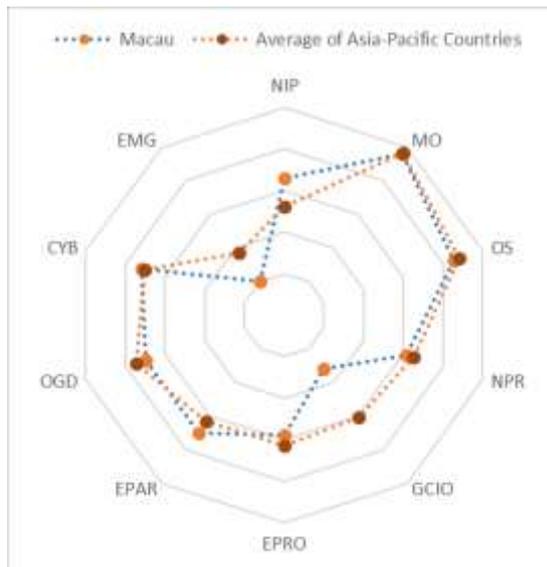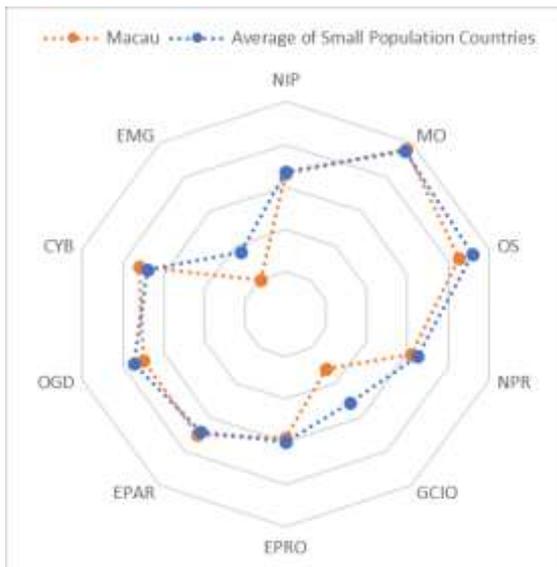
3 Digital Government Development

The development orientation of Macao is clearly defined in China's Thirteenth Five-year Plan. The formulation and execution of the plan will speed up the process of developing Macao into a world tourism and leisure center, as well as an economic and trade co-operation platform for China and Portuguese-speaking countries ("One Centre" and "One Platform"). Realizing moderate diversification of economic development, strengthening competitiveness so as to achieve sustainable growth, and continuously improving people's livelihood. In 2016, the Macao SAR Government announced the Five-year Development Plan of the Macao SAR (2016-2020), with one of the goals being turning Macao into a smart city, and electronic governance is an essential tool for achieving that goal.

Macao SAR has published the latest e-Government strategy called "Macao SAR Electronic Governance General Plan 2015-2019" in 2015, drafted by Public

Administration and Civil Service Bureau (SAFP). The new strategy is to make a response to the overall governance plan of Macao in which the development orientation has been set up as "One Centre" and "One Platform". In support of the Five-year Development Plan of the Macao SAR (2016-2020), strengthened efforts have been made in electronic governance in support of the development of a smart city, especially in the areas of open data and big data. According to the government's information, The EGOV General Plan was approved by the Chief Executive, and The Secretariat for Administration and Justice is responsible for the overall coordination of the plan. Representatives from the Chief Executive's and all five secretary offices, SAFP, and other agencies composed the Coordination Committee of Public Administration Reform to supervise the implementation of e-Government plan. SAFP serves as the GCIO of Macao. Meanwhile each government agency owns a working team in which the agency leader, IT head and personnel of its IT and related business units have been included to guarantee the internal management and collaboration among agencies. The Coordination Committee of Public Administration Reform and the GCIO, through supervision and coordination, ensure the successful implementation of the EGOV General Plan.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

According to the most recent ITU report, 81.6% of individuals in Macao were Internet users, and 86.3% of households have Internet access. Active mobile phone subscription has reached over 300%. There are four mobile network operators, and there are more than 2,800 WiFi hotspots, covering most of the 30.4 km2 area. With the liberalization of public telecommunication market since 2013, Macao now has two network operators providing fixed public telecommunication network and broadband services, resulting in healthy competition and steady growth of the telecommunication market.

4.2   Management Optimization [MO]

The Macao SAR Government realizes the importance of management optimization, and it is achieved by the optimization of service procedures and internal management, and the development of various information systems to support the optimization.

To form a basis for the optimization of service procedures, in 2015, 752 public services approved by the Public Service Evaluation Committee were analyzed. It was found out that, first, about one-third of those services contain cross-agency service procedures that require supporting documents/certificates. Second, around one-fourth of those services are of high usage rates and most concerned by the citizens. Based on the result of the analysis, the approach taken by the SAR Government was to first optimize and digitize those services without amendment to laws or regulations.

The SAR Government has formulated a plan to optimize and digitize cross-agency service procedures that require supporting documents/certificates. By 2020, more than 70 of those cross-agency service procedures will be optimized. In 2016, eighteen service procedures relating to the application of administrative permits/licenses have been analyzed and optimized as planned. For those services that are of high usage rates and most concerned by the citizens, at least 110 of them will be fully digitized by 2019. For the optimization of those service procedures that require the amendment of laws or regulations, a plan will be formulated in 2017. The optimization and digitization of the above cross-agency service procedures and services that are of high usage rates and most concerned by the citizens will speed up the provision of e-services of Macao.

The Macao SAR Government, as a whole, has developed common platforms and modules that provide a solid foundation for the optimization of internal management, cross-agency work procedures, and provision of e-services. For example, in 2015, the Macao SAR Government deployed the Civil Servant Management and Service Platform to be used as a standardized tool for internal management. It provides services that are strictly tight to the civil servants' needs, simplifies daily work procedures, and increases transparency.

Next, the Civil Servant Management and Service Platform will be enhanced to include more functionalities, including various functions for human resources management, finance management, inventory management, and knowledge management, etc. The aim is to replace the various internal management systems being used by government agencies, thus lowering development and maintenance costs while improving internal administrative efficiency.

4.3 Online Service [OS]

The SAR Government is currently providing some diversified two-way interactive online services through the Internet, satisfying the needs of various stakeholders, and covering areas such as education, employment, healthcare, social welfare, transportation, among others.

Based on the solid foundation laid down by the optimization and digitization of work procedures as outlined in the EGOV General Plan, in 2016, the SAR Government has built common platforms and modules that can be used by different government agencies, creating favorable conditions for e-services development. For example, a consolidated government service account is created to provide a safe and legal service. Personal profiles are used as storage for personal information. Also, a standardized e-service management platform is used by government agencies to manage their services and data exchange. Together, they provide the foundation for developing personalized e-services.

Take the unified government recruitment in 2016 as an example. The whole application process can be done online. With appropriate legislative support, the applicant can log in using a legally active online account from the desktop or using a mobile app, fill in the necessary information and upload the required documents, completing the whole application process online. The applicant can also check the status of the application as well as the result of the application through the website or by a mobile app when it is known.

The whole process for digitizing government recruitment is typical to all other public services. Common platforms and modules already developed such as the unified online account, personal profile, and service management platform, etc., can be used as necessary tools for future e-services development, thus helping facilitate the overall electronic governance development of Macao.

E-services in Macao are delivered through different channels such as websites, mobile apps, kiosks, etc. Macao is a small city and has among the highest population density of the world. Using this as an advantage, the SAR Government has set up some multi-function kiosks at various locations, offering to its citizens a wide-range of self-services such as permanent identity card renewal, contact information change, voter registration, tax inquiry, application for various records, etc.

4.4   National Portal [NPR]

The aim of the Macao SAR Government Portal (www.gov.mo) to provide to the public an easy to use and centralized window for government information and services. Contents are in traditional and simplified Chinese, Portuguese, and English. It has both a desktop as well as a mobile version, and it contains certain accessibility features for disabled users.

The portal offers government news, city information, service formalities, and e-Services and has areas for citizens, tourists, and merchants. It is also a useful gateway to the public sector, with links to all government agencies and committees. 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, which are mainly providing documents and searching, applying and paying. Through the deployment of these software applications, the government expects to streamline its internal processes, ultimately to improve its overall efficiency.

Reconstruction of the Government Portal is underway. The revamped website will be service-oriented, with improved functionalities and a more comfortable to use interface to provide personalized service. The user, with the use of the unified government service account, will be able to view ongoing government applications, receive personalized reminders, etc. In addition, the organization of the contents of the website, including e-services, service formalities, or government information, will be redesigned so that it will be more natural for the user to find the services or information they need. The user will able to find the services they need without any knowledge of the agency that provides the service.

4.5   Government CIO [GCIO]

To form a regularized and systematic mechanism at the operation level, and to strengthen cross-agency collaboration, a dedicated working team which includes the agency leader, IT head, and personnel of its IT and related business units has been formed in all government agencies. This will ensure there is enough coordinating and execution capability to support the effective operation of the cross-agency collaboration mechanism. The working team is responsible for promoting the optimization and digitization of internal management and external service related works such as work procedures and public services, improving the internal operations while at the same time facilitating cross-agency collaboration.

The GCIO system of Macao is divided into two levels: government and agency. SAFP, with its coordination role in EGOV development of Macao, assumes the role of GCIO for the whole government. The leader of the working team of each government agency is similar in role to the GCIO for the agency. Moreover, in order to equip team members with the skills of a GCIO, a GCIO training program is created for the team members. Training for the agency leader and IT heads will be tailored towards the capacity of a modern GCIO. Training for IT personnel will be emphasized on current trends and technologies in EGOV, and those for business personnel, training will be emphasized on the business aspects of EGOV. The goal of the training is to support the effective implementation of the EGOV General Plan.

Also, the Coordination Committee of Public Administration Reform, chaired by the Secretariat for Administration and Justice and with representatives from the Chief Executive's Office and all secretary offices, will supervise the implementation of the

EGOV General Plan, including the GCIO system of Macao, and the optimization and digitization of service procedures.

4.6 E-Government Promotion [EPRO]

The Macao SAR Government is in charge of e-promotion in Macao. Promotion is both within and outside the government. Within the government, training, seminars, and workshops are provided to the directors, chiefs, IT personnel and related business personnel of public organizations, government agencies, and entities to raise the overall awareness of civil servants of various levels on the tasks of the EGOV general plan. Meanwhile, all government agencies are encouraged to organize internal training on information security and crisis management strategies and related practical operations, raising the knowledge of the related strategies and handling of practical operations of the civil servants of various levels.

As for the public services, electronic promotion governance is done by using dedicated websites, organizing seminars, exhibitions, and publicity means, etc. and through the use of multimedia (both social and traditional) such as to publicize electronic governance projects. For example, some government agencies use WeChat to announce and promote their new services.

The awareness level, as well as participation of the public, is also raised by providing them with easy to use and quality e-services and application so that the services become part of their daily lives.

In addition, The Science and Technology Development Fund held by the Macao Government, provides financial assistance for education, research, and projects that are related to science and technology policy objectives. At the same time, through multiform conferences, forums, training, publications, the government tries to improve the e-Government promotion.

4.7 E-Participation [EPAR]

Government agencies use different channels to connect to the public, including websites, mobile apps, social media (WeChat, Facebook, YouTube, etc.), and traditional media in order to reach a broader audience. Different levels of the governments, such as the office of the Chief Executive, and offices of the five secretaries are all using dedicated websites to communicate with the public. Also, the SAR Government has a mechanism for the dissemination of news. To use a single platform, government agencies can submit news to be delivered to the public through different channels.

To realize the "sunshine government" policy and to facilitate a deeper discussion of public policies, the SAR Government has a guideline that requires public consultation to be done before the formulation of major policies. Some government agencies use the government portal, their agency website, or a dedicated website for policy consultation. The government portal also has a "Policy Consultation" page for that specific purpose, allowing easy access to policy consultation information for the public.

To further facilitate e-participation, the first stage of the Consultation Service Management Platform has been completed. It will be integrated with the government portal to become a single entry point for public consultation and opinion collection. The platform will be disseminating information about consultations through the government portal, agency websites, mobile applications, social media accounts. It will also provide relevant agencies with a means to manage and monitor consultation activities. Moreover,

for the organizers of consultation activities, the platform will also provide essential services for consultation such as a standardized survey template and statistical tools.

4.8   Open Government Data [OGD]

Currently, the SAR Government has already opened up its geographical, transportation, and tourism data such as maps, carparks, buses, etc. to the industry in order to enhance public services and to satisfy the needs of the citizens. A study in open government data is being done. The result of the study will help develop an open data policy and a long-term plan. This will not only satisfy the needs of the people but will also drive the development of the local IT industry and facilitate the development of talents.

Regarding opening up internal government information, according to the EGOV General Plan, the government portal is being revamped to organize better the information provided. As the first phase of the open government information initiative, a dedicated website that contains information about business trips by government officials has been created so that the public can better monitor the government, thus improving transparency. Other government information which is currently being provided in the government portal is consultation and government recruitment information.

4.9   Cyber Security [CYB]

The Macao SAR Government has placed heavy emphasis on information security to reduce the risk of data leakage and cyber-attacks. Works have been done in the following three aspects: organization and management, laws and regulations, and promotion and education.

In the organization and management aspect, "Office for Personal Data Protection" was established in 2007 to supervise and coordinate the public implementation of and compliance with the Personal Data Protection Act (Law 8/2005), and devising professional secrecy regulations as well as supervising their implementation. On the other hand, the Judiciary Police is responsible for preventing and combating against cybercrime. The Computer Forensic Division was established in 2010 to enforce criminal investigation and forensic science respectively on cybercrimes.

The Macao SAR Government has put in substantial efforts on the construction of network infrastructure. To ensure information security within the government, InforMac, the government intranet, has been in use since 1996. It is a closed network environment that provides secure and fast data transmission within government agencies. The first Government Data Centre started its operations in 2010 to provide network infrastructure services to government agencies, which aims to manage the security of the network infrastructure and the applications centrally. On the other hand, in order to enforce the effectiveness of cybersecurity information sharing, a mechanism for the notification of information incidents which involves SAFP, Office of the Government Chief Information Officer (OGCIO) of Hong Kong SAR, Hong Kong Computer Emergency Response Team Coordination Centre (HKCERT), and Macao Computer Emergency Response Team Coordination Centre (MOCERT) has been established, raising the level of information security of both regions.

In the laws and regulations aspect, to reduce risks arising from the rapid development of information technology, the Macao SAR Government has introduced legislation such as Macao's National Security Law, Personal Data Protection Act, Combat Against Computer Crime Law, and Electronic Documents and Signatures Law, etc. These laws play critical roles in maintaining secure operations of the Macao SAR. In addition, in

2009, SAFP issued the Information Security Policy Guidelines and Information Security Management Framework documents to regulate the information management of government agencies. Currently, legislation work is currently underway in the area of cybersecurity.

In the promotion and education aspect, the Judicial Police, Office of Personal Data Protection and SAFP organize conferences, seminars, and workshops regularly to raise public awareness and promote ethics on information security. The Training Centre for Public Services, under SAFP, also provides information security-related training courses to civil servants.

In order to measure the information security level of the SAR Government, SAFP together with MOCERT conducts the annual Macao Information Security Survey to examine and analyze the shortcomings in the overall information security of the SAR Government.

A cross-secretariat team chaired by the Chief Executive and coordinated by the Secretariat for Security was formed in 2015 to facilitate works on cybersecurity. Representatives from the Chief Executive's Office, all five secretary offices, and related core agencies facilitate cybersecurity works using a top-down approach. SAFP, as the agency responsible for the promotion of EGOV within the government, has developed the optimization plan for information security and crisis management for 2016-2019.

4.10 The use of Emerging ICT [EMG]

According to the EGOV General Plan, the Macao SAR Government is continuously enhancing its software and hardware infrastructures through Cloud Computing Strategy. In terms of hardware infrastructure, firstly, using cloud computing's features of efficient deployment and stability, together with information security and crisis management, gradually equip the Government Data Centre with cloud computing capabilities offering network infrastructure services with high performance, high scalability, high stability, and high security—Cloud Infrastructure as a Service (IaaS). At the same time, we will make use of the IaaS for the sustained development of various platforms—Cloud Platform as a Service (PaaS), such as Public Services Management Platform, Data Exchange Platform, and Open Information Service Platform, etc. On top of the PaaS, a series of software applications, services, together with the Common Application Module Library—Cloud Software as a Service (SaaS), will be provided to citizens and government agencies. The construction of the second Government Data Centre will be completed in 2019 and using the lessons learned from introducing cloud computing functionalities in the first phase; the two data centers will be complementary to each other. This way, on the one hand, cloud infrastructure services can be effectively expanded; and on the other, a high availability mechanism will be developed across the data centers, thus realizing seamless expansion, and providing a solid foundation for the development of cross-agency information systems, resource integration and sharing, and collaboration.

Regarding the data mentioned above centers and the Cloud Computing Strategy, firstly, the development of internal administrative management will be facilitated, and more public e-services will be delivered. Secondly, cross-agency data exchange will be enforced. It also enables an opportunity to open up data from public sectors to encourage innovation on using and reusing the data, which will lead to building sustainable economic diversification and delivering better public e-services.

The SAR Government has also started some big data and Internet of Things (IoT) initiatives. For example, big data technologies are being used at the Macao Customs, and

also by the Health Bureau in the form of electronic exchange of medical records. IoT technology is being used in tourism area to improve tourist experience.

5   Some Highlights

Macao has among the top network infrastructures with a strong emphasis on cybersecurity. Progress has been made according to its EGOV General Plan, which emphasizes on services and coordination, especially in the optimization and digitization of service procedures and public services. As a result, with the development of common platforms and modules, and relevant legislation, Macao is performing well on "Management Optimization" and "Online Service".

The Macao SAR Government Portal is being revamped to be service-oriented and to provide improved personalized e-Services to all kinds of needs of citizens, non-citizens and business. With the role of GCIO clearly defined and also the formation of dedicated working groups in the agencies, Macao's GCIO system is steadily progressing. Promotion of e-government is done through training, publicity, and provision of quality services such that e-government is reaching out better to the public. Public participation has increased due to online policy consultation and the use of social media to disseminate information. Macao has already opened up its geographical, transportation, and tourism data to the industry to enhance public services and to satisfy the needs of the citizens. Continuous efforts are being made in opening up more government information. Macao has also started to employ emerging technologies to provide quality services.

Macao's electronic governance development emphasizes on the optimization and digitization of service procedures and public services and through the development of common platforms and modules, and relevant legislation. It is still in the development stage; however, it is observed that a concerted effort has been made to implement according to the EGOV General Plan to gradually promote electronic governance development of Macao. In addition, a strengthened coordination mechanism plays an important role as well.

Malaysia

1   General Information

Area: 329,847 km^2

Population: 30,513,848

Government   Type: constitutional
monarchy

GDP: $26,600

Internet Users: 78.8

Wired (Fixed Broadband Users): 9

Wireless Broadband Users: 91.7

2   Positioning in a Global Organization and a Region

Among ASEAN countries, Malaysia has high scores on e-participation, cybersecurity and management optimization. These scores surpassed the world and ASEAN's average and close to the Singapore's – the e-Government leader in ASEAN region.

In APEC countries, Malaysia only exceeds the group average on management optimization and e-participation. Other indicators are below the mean of APEC and global.
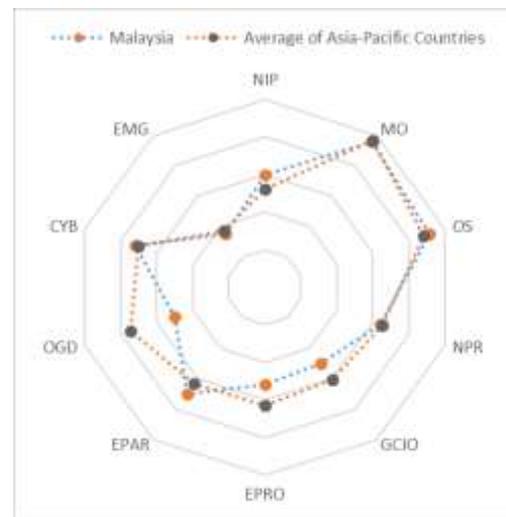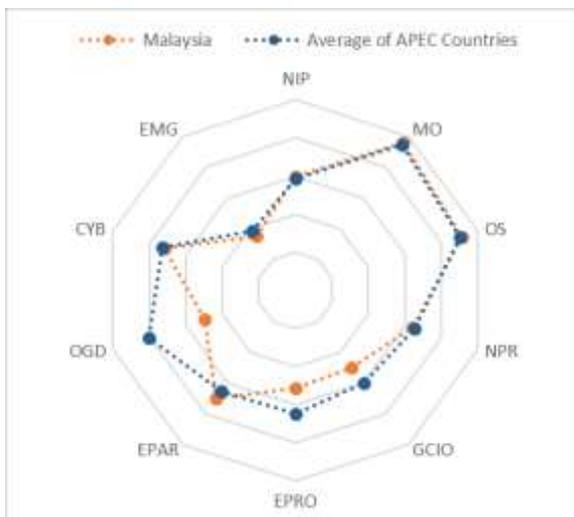
3   Digital Government Development

E-Government has long been an interest of Malaysia government since 1996 with the establishment of the Multimedia Super Corridor (1996). A transformation vision toward 2020 including 12 national key economic areas (NKEA), of which e-Government is one of essential entry point project was announced aiming to "increasing the accessibility, speed, and transparency of government services".

Since e-Government is high on the agenda of Malaysia government, it has received substantial financial, institutional and legal supports. Lots of efforts have been carried out by the Government in order to promote e-Government development.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

Approximately 78.8% of Malaysia's population were Internet users in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). Among them, wired broadband subscribers accounted for around 9% while more than 91.7% of the total population have a wireless broadband connection.

4.2 Management Optimization [MO]

The Malaysian Public Sector ICT Strategic Plan (2011-2015) is the latest national e-Government strategy which draws strategic direction on the implementation of Information and Communications Technology (ICT) in the Malaysian public sectors.

The strategy emphasizes on delivering innovative, efficient and quality citizen and business-centric services by leveraging on the pervasive use of ICT. The ultimate aim is to achieve a Citizen-Centric and Whole of Government public service. 5 programs and 6 policy targets have been identified in the strategy

A secured, dedicated, centrally managed Government consolidated ICT network infrastructure for Government agencies named "1Gov*Net" has been implemented with the target to transform ICT network infrastructure via consolidation to optimize resources and value for money for strengthening the Government service delivery system. To date, 10.600 government premises are linked to 1Gov*Net. Besides, a government cloud called "1GovCloud" has implemented by The Malaysian Administrative Modernisation and Management Planning Unit (Mampu) in order to create a private, secure and dedicated platform for government agencies.

Project Monitoring System creates a collaboration framework for better management and development of e-Government projects across agencies. There is also a Human Resource Management Information System (HRMIS) implemented in the Malaysian Federal Government which provides a single interface to perform human resource effectively. In addition, the Malaysian Government also employed the Generic Office Environment (GOE) with the purpose to enable efficient communication, allowing collaboration across government officers. The government also put in place the use of an enterprise architecture framework called "1GovEA" in order to create an active strategic alignment between backend business and ICT usage in government organizations.

Toward the vison 2020, in May 2015 the Malaysian government introduced the eleventh plan reaffirms the Government's commitment to a vision of growth that is anchored on the prosperity and well-being of its rakyat. This vision identified 6 Strategic Thrusts which are innovative approaches (1) enhancing inclusiveness towards an equitable society, (2) improving wellbeing for all, (3) accelerating human capital development for an advanced nation, (4) pursuing green growth for sustainability and resilience, (5) strengthening infrastructure to support economic expansion, and (6) re-engineering economic growth for greater prosperity. Furthermore, to improve the plan the Malaysian government identified 5 areas to transform Public Sector to be more efficient and productive. (1) Capitalizing on local authorities for quality services at the local level, (2) Enhancing project management for better and faster outcomes, (3) Strengthening talent management for the public service of the future, (4) enhancing service delivery with citizens at the center, and (5) Rationalizing public sector institutions for higher productivity and performance.

4.3 Online Service [OS]

The score for Online Service comprises five sub-dimensions: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience.

In general, most public services in Malaysia are provided digitally. However, not all of them reached the transactional complexity level.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. The National Portal presents a wide range of information resources about government structure, government agencies, legal documents and daily news regarding government's operations. Information is delivered in 16 different languages.

In technical aspect, the result of Google PageSpeed™ Insight showed that the website operates well both from PC and from Mobile Device. The portal also provides several contacting methods via various Social Networks such as Facebook, Twitter, YouTube, Flicker as well as there is a feature allowing the user to receive update mail notification.

4.5 Government CIO [GCIO]

The role of government CIO is defined on MAMPU website. A self-assessment competency for CIOs has been developed in CIO Handbook published by MAMPU, in order to provide an opportunity for CIOs to identify any gaps for self-improvement while performing their role as CIO. CIO-equivalent positions are also found in ministerial agencies via the Public Sector CIO Information Systems. The office of the Malaysian Government CIO has always been at the forefront of equipping and acculturating CIOs in the latest technologies and ICT tools for Public Service delivery through workshops and CIO summits.

The Malaysian government is considering to develop and assign CIO position in the government agencies, departments. They had a survey for ICT perceptions, expectations, and inspirations for finding and knowing the IT skill for government officers.

4.6 E-Government Promotion [EPRO]

The Malaysia Administrative Modernization and Management Planning Unit (MAMPU) is promoting the use of e-Government.

MAMPU also carries out e-Government promotion programs such as conferences, exhibitions, seminars throughout the country. As for assessment mechanisms, the Electronic Government Steering Committee and Government IT and Internet Committee are the two oversight bodies, evaluating the e-Government implementation at national level. The Electronic Government Activities Act of 2007 provides the legal framework for e-Government implementation in Malaysia. Under the law, the Malaysian Public Sector ICT Strategic Plan is still ongoing.

4.7   E-Government Participation [EPAR]

The national portal www.malaysia.gov.my is beginning to evolve from just merely providing e-information to providing e-consultation services as well. It is also the government one-stop-shop for interacting with citizens. The portal provides information on government such as policies, government procedures, the national budget, and legislation. The website has some facility for encouraging citizen feedback and conducts simple online surveys.

As the e-Services can support participation in processes involved in government and e-participation is hence firmly related to e-Government and by providing e-Services such as MY ID, My SMS, MY Health, My procurement, My Ideas, and increasing the benefits of citizen, Malaysian government wants to increase e-participation. In addition, SMS is utilized as an ultimate channel to provide user access to government services. An electronic touchscreen is installed at every service counter in order to receive user feedback for the service provided.

4.8   Open Government Data [OGD]

The official open data portal of Malaysia government is located at data.gov.my which recently involves 32 organizations in 10 sectors as providers with totally 1121 datasets provided to date. The data were published mostly in XLSX and CSV format. Only in 2 states, Freedom of Information is enacted (Selangor and Penang).

4.9   Cyber Security [CYB]

By 2013, a total of 10.636 security incidents was detected by MyCERT, involving all kinds of cyber security threats such as fraud, intrusion, spam, maliciousus code, and so on.

The Malaysian Government has strengthened the role of Cybersecurity Malaysia by Order of the Ministers of Federal Government Vol.53, No.13, dated June 22, 2009, by identifying Cybersecurity Malaysia as a national info security coordination center that provides ICT security specialist services and continuously monitors threats to the national security.

In terms of cyber laws, Malaysia has enacted the Digital Signature Act of 1997; Computer Crimes Act of 1997; Telemedicine Act of 1997, e-Commerce Act of 2006, Electronic Government Activities Act of 2007 and the latest Personal Data Protection Act by 2010.

4.10   The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT).

MY E.G. Services Berhad ("MYEG") is a concessionaire for Malaysian Electronic-Government ("E-Government") MSC Flagship Application. Over the past 5 years MYEG has invested in and is currently deploying our next-generation technologies based on The Internet of Things ("IoT") solutions. We believe that the deployment of IoT coupled with big data analytics will bring significant improvements to our overall quality of life. Our environment will increasingly anticipate our needs as opposed to responding to our actions. MYEG implements cutting-edge IoT solutions that is being deployed on a nationwide scale for the first time anywhere in the world.

A government cloud called "1GovCloud" has implemented by The Malaysian Administrative Modernisation and Management Planning Unit (Mampu) in order to create a private, secure and dedicated platform for government agencies

5 Some Highlights

Management Optimization is always the strong point of Malaysian government with major initiatives have been implemented: the government ICT network "1Gov*Net"; the enterprise architecture framework "1GovEA"; government shared services such as Digital Document Management System, Service Intelligence (SI), Government Risk and Compliance Scorecard (myGRiC); and so on.

Regarding online services, this year, Malaysia government is on its way to restructuring several significant services including customs service. A so-called initiative uCustoms was introduced as "a fully integrated, end-to-end, and customs modernization solution that delivers single window for goods clearance", is expecting to complete no sooner than 2017.

The national portal as well as the one-stop-shop services - malaysia.gov.my - seems to be far outside of Malaysia, which prevented the evaluation process, resulted in a low score for Malaysia in the national portal and online service dimensions.

Malaysia government is also putting great efforts to meet the minimum points required to join by Open Government Partnership. To meet the requirements, several challenges are recommended to focus on the right to information, asset and conflict interest disclosures and citizen engagement.

Mexico

1   General Information

Area: 1,964,375 km^2

Population: 123,166,749

Government Type: Federal Presidential Republic

GDP: $18,900

Internet Users: 59.5

Wired (Fixed Broadband Users): 12.7

Wireless Broadband Users: 58.8
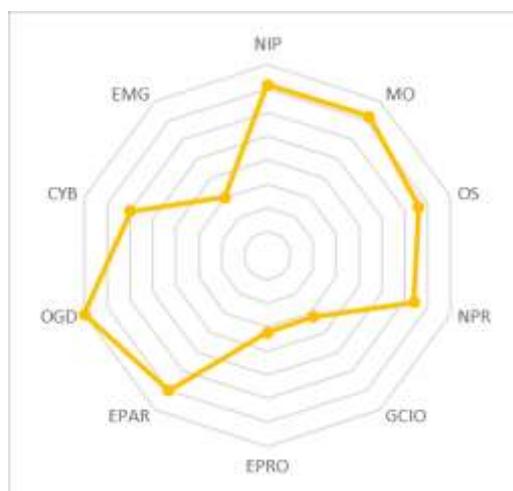
2   Positioning in a Global Organization and a Region

All indicators except the e-Participation (EPAR) and Open Government Data (OGD) indicators are below the average score of OECD and APEC members.
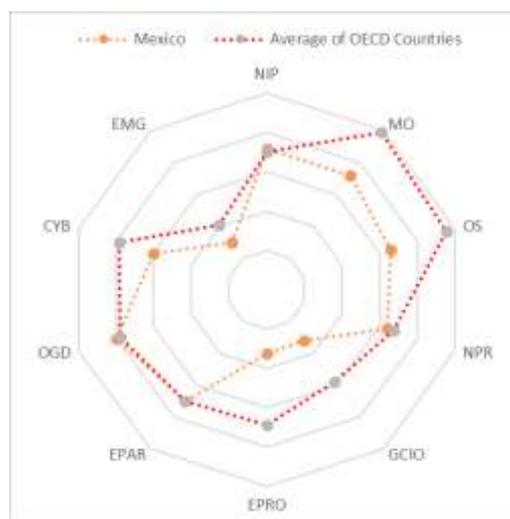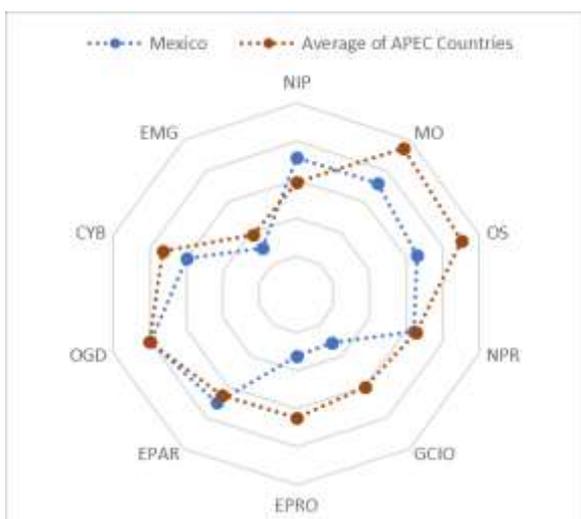
3   Digital Government Development

The Mexican government was already making widespread use of ICT by the end of the 1990s. There was no overarching e-Government strategy for the federal government until 2001. In Mexico, the Institute for Statistics, Geography, and Informatics (INEGI) were in charge of the federal government's IT policy. In 2001, the President's Office for Government Innovation officially introduced e-Government as an initiative to digitalize and modernize government. E-Mexico was a related initiative focusing on connectivity and electronic access. E-Government became one of the six pillars of the Good Government Agenda in late-2002, thus consolidating it as a central strategy of the Mexican Government.

Mexico has a long-standing commitment to using ICT to support public sector reforms and foster good governance by improving transparency, quality, and efficiency

of government. The Mexican government also adopted an initiative called e-Mexico National System that aims to increase the connectivity between all levels of government, the IT industry, and academic institutions until 2025. Through this plan, they would like to provide contents to the citizens, for instance: e-health, e-learning, e-education, and e-Government. In October 2013, Mexico launched its National Digital Strategy to promote the use of Information and Communications Technology. The National Digital Strategy, "Digital Mexico," is the digital action plan the Government will implement over the next few years to encourage the adoption and development of Information and ICT and insert Mexico into the Information and Knowledge Society.

The Strategy sets out the challenges Mexico faces in the digital context and the way it will cope with them through five primary objectives: 1) Government Transformation, 2) Digital Economy, 3) Quality Education, 4) Universal, Effective Health, and 5) Public Safety. The primary goal of the strategy was to achieve a "Digital Mexico" in which technology facilitates economic development and improves the quality of citizens' lives. Based on policies for a digital government, Mexico seeks to build a new relationship between the government and citizens.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Approximately 59.5% of people in Mexico were Internet users in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). About 12.7% have fixed-broadband subscriptions, and wired broadband subscription has reached 58.8%.

4.2 Management Optimization [MO]

The Mexican government also adopted an initiative called e-Mexico National System that aims to increase the connectivity between all levels of government, the IT industry, and academic institutions until 2025. In October 2013, National Digital Strategy, "Digital Mexico", is based on precise definitions, enabling those involved to strive to achieve the objectives set forth therein, which are aligned with the primary goals of the National Development Plan 2013-2018 that guide the government's efforts.

4.3 Online Service [OS]

The score for Online Service is based on five investigating online services, 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 Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Cybersecurity and e-commerce laws were found at national and sub-national level but some of them are pending. Compared with other countries in Central America, Mexico had very good e-Services. e-Tax is the highest score, compare to other online services.

Regarding complexity level, most of Online Service in Mexico has dynamic sites available. It allows downloading of forms and submitting them back to government agencies. In addition to that, only e-Tax has implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services.

For measuring the level of convenience, the third party application result has shown that e-Service portals expect e-Health are above the average considerably regarding speed. These mean they are using only the static information. The third party application for assessing the portal is the application from Google PageSpeed™ Insight.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. The national portal "http://www.gob.mx/" is a part of the Mexican Government Portal and gives citizens a single entry to e-Government services online. The Citizen Portal uses a customer relationship management strategy to better present its content according to users' needs. The portal uses a technological platform that enables interoperability and standardization across different government offices. In technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is above average both from PC and from Mobile Device. However, the portal does not provide the user with some functionality such as other language, and it is still a beta version.

4.5 Government CIO [GCIO]

Regarding the Government CIO in Mexico, the CIO is appointed only nationally. The Director of the e-Government and IT Policy Unite at the Ministry of Public Administration hold the equivalent post of GCIO. There is no information about any CIO association or organization. There is not a CIO training course found in Mexico.

4.6 E-Government Promotion [EPRO]

In Mexico, the law on e-Government was adopted at the national level but not at the sub-national level. The e-Government master plan and policies exist only at the national level. There are no government activities such as organized conferences or citizen training. There are no think-tanks or funds for developing e-Government in Mexico.

4.7 E-Participation [EPAR]

The national portal "http://www.gob.mx/" is a one-stop-shop service for all citizens. Mexican Government has launched the e-Participation portal "http://www.gob.mx/participa", which is a platform for citizen participation that allows, through diverse mechanisms such as forums, surveys, and exercises of co-edition to create better public policy proposals for the development of the country.

4.8 Open Government Data [OGD]

Mexico has recently launched the Open Data portal "http://datos.gob.mx/" that National Open Data Policy creates and implements national policy for the publication and use of open data that is clear, provides legal certainty, uses open and interoperable standards, and is guided by the principle of maximum publicity. According to the site, there are currently over 16,500 datasets and 221 institutions hosted on the site on in late February 2017.

4.9 Cyber Security [CYB]

In 2001, the Steering Committee of the Forum of Incident Response and Security Teams (FIRST) officially granted (DGSCA-UNAM) the approval to operate as a national CERT. The Coordination of Information Security (CSI) / UNAM-CERT of the Directorate General of Computing and Information Technology and Communication, UNAM is a meeting point which can turn the computing community for information, advice and services security; and to exchange experiences and points of view, thereby establishing appropriate security policies, reducing the number and severity of security problems and spreading the culture of computer security.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and Internet of Things (IoT). Mexico has attempted to implement Cloud Computing for Public Sector such as Mexico's Tax Administration System (SAT). However, the evidence shows that it is not officially launched. Other emerging technologies for government agencies are still nullity in Mexico.

5 Some Highlights

Mexico has an impressive point on e-Participation, Open Government Data, and National Portal. Mexico has a high score on e-Participation that is the result of the digital government item in the Good Government Agenda and is also part of the e-Mexico. The citizen participation portal, "http://www.gob.mx/consulta/" is a proposal by the Government of the Republic to promote citizen participation through digital means, as a way to improve public policies, making them more effective and achieve more significant impact on the daily lives of people.

Mexico still has the weakness. The use of emerging technology and Government CIO are the weak points of Mexico. As for the emerging technology, one of Mexico's governmental agencies transitioned to Microsoft's cloud computing services with the aim to improve its services to Mexican taxpayers. No evidence make clear about Government CIO, even if there is a law creating the position of the CIO in the government and a document defining the role and function of the CIO in Mexico. Moreover, Mexico has a low score on Cybercrime Countermeasures, and there also is not any evidence about cybersecurity strategy or action.

Morocco

1 General Information

Area: 446,550 km^2

Population: 33,322,699

Government Type: Parliamentary constitutional monarchy

GDP: $8,300

Internet Users: 58.3

Wired (Fixed Broadband Users): 3.7

Wireless Broadband Users: 46

2 Positioning in a Global Organization and a Region
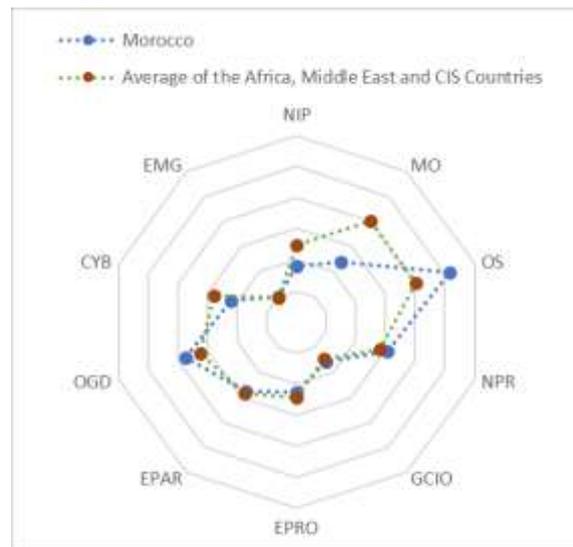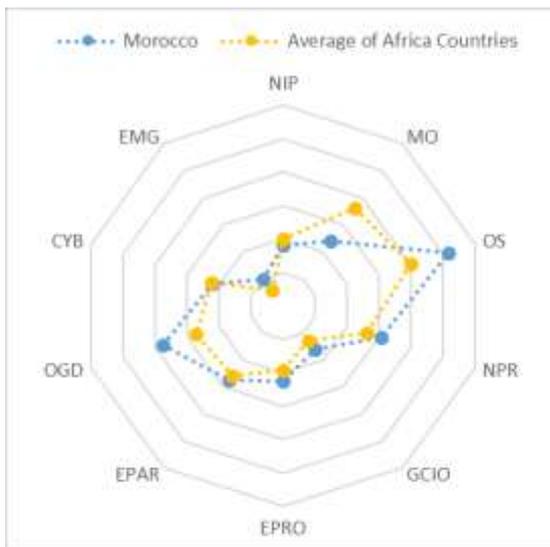
3 Digital Government Development

In 2008, Moroccan government planned to start the program "Digital Morocco 2013" from 2009. Nowadays Morocco completes "Digital Morocco 2013" and moves to the next step, which is setting up a new plan called "Morocco Digital Program 2020" in order to improve the competitiveness of the country. 'This digital program aims to accelerate Morocco's digital transformation, promote Morocco as an attractive destination for outsourcing services, and reinforce the country's status as a regional digital hub.' (The development of Morocco's IT sector). The program focuses on 4 factors: reducing digital gap, improving e-government service, putting Morocco at a digital hub in French-speaking Africa position, and paying attention to a human resource such as training more ICT professionals. Morocco gives itself a goal that positions Morocco in the frontline of e-commerce and digital government in the Africa region.

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4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

So far, 58.3% of the population, less than 20 million people use the network I Morocco, which means the index of networking using remains low. For prepare network infrastructure, Morocco launch Moroccan Agency for Investment and Exportation Development to set up an economic model. This agency can count to a country's service for enterprises since this strategy that the government pushed will attract more investment so giving national industries space and opportunities to develop networking. Moreover, it also has a function that coordinates different actors to ensure network infrastructure elevate smoothly.

4.2 Management Optimization [MO]

Moroccan government creates structures to manage and plan e-participation activities. "The e-Government Steering structures (SPGOV) are governmental departments and public institutions involved in e-government projects" (gov.ma) This department mainly focus on assist defining projects, preparing necessary resource for making plan, monitoring the implantation of the plan, and reporting to the Inter-Ministerial Committee for e-government (CIGOV) the progress of plan. Also, Computer Emergence Response Team (ma-CERT) was established and is responsible for surveillance, detect and respond to cyber-attacks. This department administrates the e-government operation environment. There is no new management policy in Morocco this year.

4.3 Online Service [OS]

https://www.service-public.ma/ and http://www.egov.ma/ are online service website for the general public. For https://www.service-public.ma/, there are 14 different sectors for people to search the service they need. This website seems able to answer most of the people's questions about living in Morocco but the truth is under some titles the information is far from enough. When citizens want to apply for some services and click the corresponding title, there is nothing but a brief introduction that introduces you how to go to the government site to complete your application. The operations of requirements are not implemented online. For http://www.egov.ma/, this website is not a genuinely online service webpage, but it is more like an information website that giving awareness of some e-government activities. However, citizens can search for useful information from this website, for instance, giving directions on how to register car online.

4.4 National Portal [NPR]

http://www.egov.ma/ and http://www.maroc.ma/ are national portals of Morocco. http://www.egov.ma/ mainly includes information about Digital government projects, strategies, the introduction of e-government departments and the path to online service. http://www.maroc.ma/ is the platform that realizes Morocco's national news which states country's actions and political matters. This website links to other websites to apply various services, for example, portal of public services will link to the website https://www.service-public.ma/en, clicking portal of public employment will link to the page of http://www.emploi-public.ma/. However, there is not every service page has an English version. A lot of public websites only serve in Arabic and French.

4.5 Government CIO [GCIO]

There is no policy or strategy can be found about Government CIO in Morocco.

4.6 E-Government Promotion [EPRO]

As 2017, Moroccan e-government ranks at No.37. Comparing to the rank 82 in 2014, Morocco did have massive development on e-government, and also to see Moroccan government push D-government promotion harshly. DPGOV is the steering department of the e-Government program. This structure is in charge of 4 functions: strategic management, steering, assistance, and promotion. Moroccan government gives an individual department to supervise the promotion. Moreover, "Digital Program 2020" plans to improve access to the internet through free Wi-Fi in public spaces and digital literacy programs.

4.7 E-Participation [EPAR]

According to egov.ma website, the definition of e-participation that government gives is "ICT improves citizen participation by allowing them to better interact with the Administration" (http://www.egov.ma/en/e-participation). The reason why the government pays some attention to e-participation is e-participating supplies access for citizens to realize policies, receive public service information, and join in public decision making. By now, Morocco government releases one suggestion box for the improvement of the administration which called Fikra. Moreover, there are three forums: 1. your ideas for new eGov services. 2. Your ideas for simplifying administrative tasks. 3. Your ideas for improving the Administration. Citizens can comment on laws and check the status of suggestions that have been submitted.

4.8 Open Government Data [OGD]

Morocco sets up a visualization engine, Marocviz. The function of this new engine is "Open Data enables governments, businesses, and entrepreneurs around the world to act as a catalyst and tool for social and economic change in diverse sectors." (Morocco open data visualization engine). This visualization platform for Morocco's public data was created by 4 reasons, which means this 4 factors are benefits or convenience that Marocviz can bring. 1. Deliver direct benefits to citizens and communities, and change how citizens perceive open data. 2. Solve two major challenges for journalists (e.x. helping to collect documents) 3. To ease the use of government data as a resource for businesses and entrepreneurs. (e.x. helping companies by facilitating access to valuable government data and simplifying their communication.) 4. Stimulating innovation, scientific discovery and public debate in Morocco. (e.x. Marocviz brings together the public data of the Moroccan government from a variety of agencies and carries out the work of information aggregation and visualization.)

4.9 Cyber Security [CYB]

Morocco still uses the National Cybersecurity Management System. However, in the plan "Morocco Digital Program 2020", "some projects are launched to strengthen the consumer's protection and enforce the market legislation. The General Confederation for Enterprise in Morocco (CGEM) implemented an "e-thiq@" label that aims to categorize trading websites based on a list of criteria" (The Development of Morocco'S IT Sector).

4.10 The use of Emerging ICT [EMG]

The economic model that is included in the plan "Morocco Digital Program 2020" may be an emerging area that uses ICT but there is no resource shows that new ICT technology is applied.

5   Some Highlights

Comparing to last years, Morocco launches a new important program "Morocco Digital Program 2020" this year. In this plan, Morocco government aims to have more human power by training IT professionals, boost public service by reinforcing Digital Government and engage competitively IT economic models by setting up Moroccan Agency for Investment and Exportation Development. Morocco government pushes hard to extend the expertise in the IT area and tends to improve the proficiency of IT to attract more investments.

Netherlands

1   General Information

Area: 41,543 km^2

Population: 17,016,967

Government Type: Parliamentary Constitutional Monarchy

GDP: $ 50,800

Internet Users: 93.2

Wired (Fixed Broadband Users): 42.2

Wireless Broadband Users: 87.8
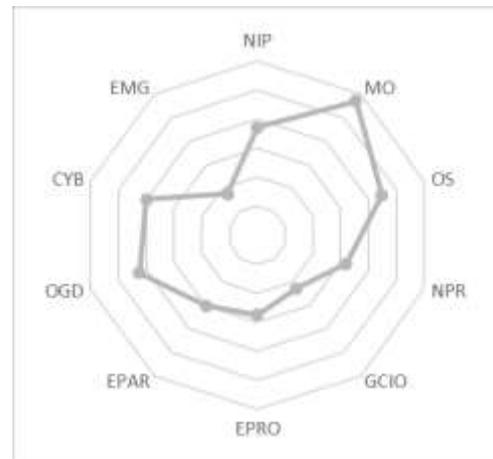
2   Positioning in a Global Organization and a Region
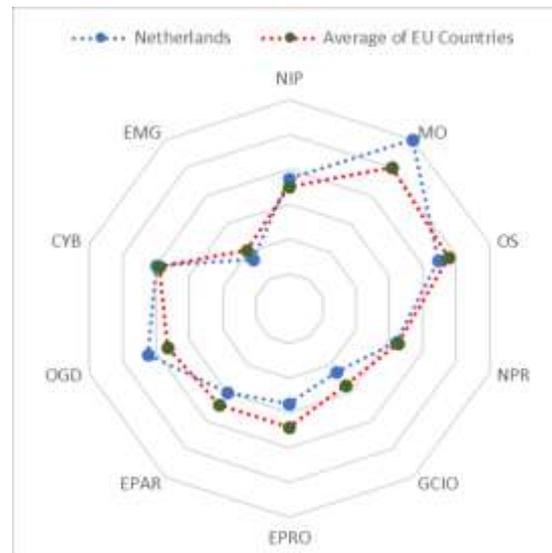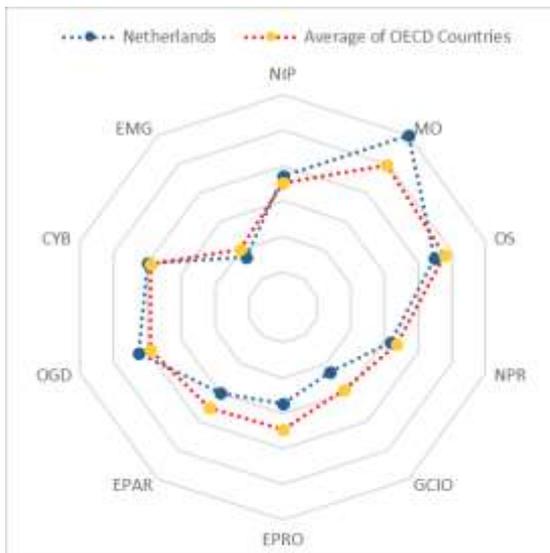
Among OECD Countries, the Netherlands has a better score than the average score of OECD in Management Optimization, Online Service, and National Portal. However, as shown on the above picture, the Netherlands is very low on the e-Government Promotion. A contradictive situation between e-Government Promotion and the Online Service including Management Optimization has indicated that most citizens know how to use e-Government service. As a consequence, Netherland decided to reduce e-Government Promotion program.

These achievements also reflect the position in the European region in which the Netherlands is approaching Singapore, the best country in the region, in the Management Optimization.

3   Digital Government Development

Following on from the previous Digital Agenda (2011 – 2015) which was focused on strengthening the pre-preparation and digitization of the government itself such as services to citizens and businesses, the Dutch government had worked on the new Digital

Agenda containing more comprehensive approach and a broader scope of short-term activities (2016 – 2017) based on the following lines of action:

1. Education, knowledge, and innovation

2. Open and high-speed infrastructure

3. Security and trust

4. More scope for entrepreneurs

5. Digitization of sectors (industry, healthcare, energy, and mobility)

The minister of Health, Welfare and Sport and the minister of Infrastructure and the Environment are responsible for the digitization of these sectors. They adopt the advice from the Advisory Council for Science, Technology, and Innovation (AWTI) to make sure their digitization by the very heart of their policy.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

The Netherlands performs quite well in Network Infrastructure Preparedness. The broadband and fast broadband coverage is very wide and almost reaches 100%. Moreover, 97% of the household can get access to the internet. Fixed, mobile and satellite networks are available all over the country. However, the Netherlands is performing less perfect in the 4G coverage area. However, the Netherlands wants to play a leading role in the European strategic layout plan to provide 5G services. The public authorities and industry have initiated the 5G lab to accelerate innovations around 5G, with which many companies can benefit from the innovative application in the areas such as agriculture, energy, living environment and so on. Moreover, arrangements for 5G multi-band auction are expected to proceed in 2019.

4.2   Management Optimization [MO]

The management optimization of the Netherland government is quite perfect. In July 2016, the Netherland government published a new Digital Agenda to digitize the Netherlands economy for the period 2016/2017 further. Generally, the digital strategy of the Netherlands is a market-based strategy. Importantly, it emphasizes that the local governments' main task is to build the right environment for digital innovation, such as cooperating work, shortening the audit time and reducing the costs of procedures as well as promoting the development. The local and regional government may help and even provide financial assistance when the market fails. The various digital plan and agenda show that the Netherlands is maintaining its relatively good pace of progress over time with sustaining the competitiveness of the digital sector.

4.3   Online Service [OS]

There are 20 basic public Online Services available in the Netherlands which is very comprehensive. Moreover, Netherlands government especially devoted to the development of e-health in recent days. The minister of Health, Welfare and Sport is ambitious to assure 80% of chronically ill patients and 40% of the rest of the population to get direct access to individual medical data within three years. The extra goal is to let 75% of the chronically ill to monitor their health condition independently and to get on-screen communication with a care provider all day available to everyone getting care and support at home.

4.4 National Portal [NPR]

The National Portal of the Netherlands (www.government.nl) offers a door to the citizens of the Netherlands. Almost all information about the Netherlands is available on the national portal. Moreover, "Overheid.nl" act as a central station and provide access to various e-Services.

4.5 Government CIO [GCIO]

The Government office of the Netherlands is affiliated to the Directorate-General for Consular Affairs and Operational Management (DGCB). It is responsible for the Ministry's information systems and operates according to requests from other parts of the Ministry. The Project Management Organization Unit (PMO) in CIO office is responsible for implementing new initiatives which are project-based. The information management advisers in the CIO office are in charge of information policy. The advisers also manage in record-keeping and documentary information systems.

4.6 E-Government Promotion [EPRO]

The Dutch government put lots of efforts in legislation to provide enough room for modernization and innovation of digital economy which will also support the development of e-Services as well as D-Government. The recently concluded EU General Data Protection Regulation is integral to the responsible handling of personal details. This will come into force in 2018. Especially with the digital agenda promoted by the Netherlands, these all emphasize the D-promotion in the Netherlands.

4.7 E-Participation [EPAR]

The Netherlands is carrying forward the modernization of its public administration. The Digital 2017 program started in 2010 and aimed to enforce a people-oriented, and full ICT drove public services. It intends to make all citizens and businesses to be able to do digital business with the government before January 1, 2018. The 2016 progress report showed that of the 550 government-wide services, 88 percent were already available digitally. The Generic Digital Services (GDI) - a necessary digital services infrastructure of the government provided the support for the digitization process so far, and the government uses the impulse e-ID to provide simple and secure access to e-Government services and health care. Furthermore, the government is supporting citizens' initiatives on self-funded broadband networks such as samensnelinternet.nl, the knowledge platform where information can be obtained about various ongoing broadband projects. These show the e-participation of the Netherlands getting better.

4.8 Open Government Data [OGD]

In the Netherlands, since regional portals have been integrated into the national one, the OGD indicator is remarkably improved. 58 % of Internet users present online forms to public authorities. The data from pre-filled forms and online share of life events has increased a lot. The vast increased supply of data and increased usage and political impact of the National Open Data Agenda make the OGD level in Netherlands higher.

4.9 Cyber Security [CYB]

The government has set down the National Cybersecurity Strategy 2 (NCSS2). The strategy has five objectives which all show government is willing of strengthening digital security and resilience. The Dutch government not only get tough with cyber-attacks and crime but also make investment ICT products with safe and privacy-boosting.

4.10 The use of Emerging ICT [EMG]

Between 2015 and 2017, the deployment of cloud solutions in the Netherlands is increasing significantly. In 2016 and 2017, many companies and institutes have set field labs to exploit and test ICT applications. The country has both developed particular policy agendas of drones and smart industry standardization. As of 2018, according to agenda, almost all the affairs of citizens and businesses with the government can be done digitally. Due to these improvements, the score of this indicator shall rise.

5 Some Highlights

Overall, the Netherlands is a country with high performance in digital progress, especially in Management Optimization and Network Infrastructure Preparedness. With the increased number of Digital Government users and the improvement of open data, the score of the Netherlands shall be higher. It's ranking in other international ranking lists also affirms this.

However, although the online services of the Netherlands involve many aspects, the services are not thorough enough. Moreover, there is no indisputable evidence showing the proficiency of the GCIO and the legalization of Digital Government. The Dutch government shall work on these to get higher scores.

In 2018, the 19th Annual International Conference on Digital Government Research will be held in the Netherlands. The theme of this conference is "Governance in the data age". Predictably, it will bring Dutch more improvement in Digital government.

New Zealand

1   General Information

Area: 268,000 km^2

Population: 4,474,549

Government   Type: Parliamentary
Democracy

GDP: $37,100

Internet Users: 88.5

Wired (Fixed Broadband Users): 32.4

Wireless Broadband Users: 101.3
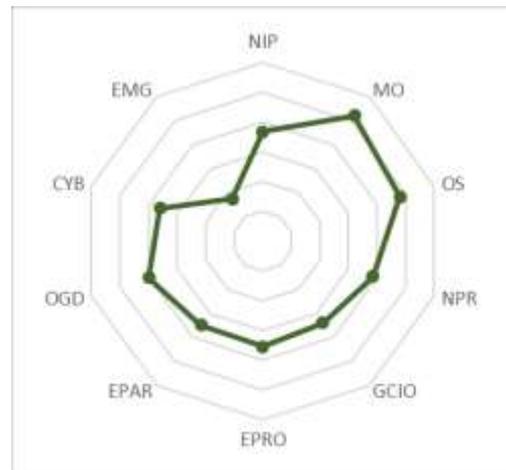
2   Positioning in a Global Organization and a Region
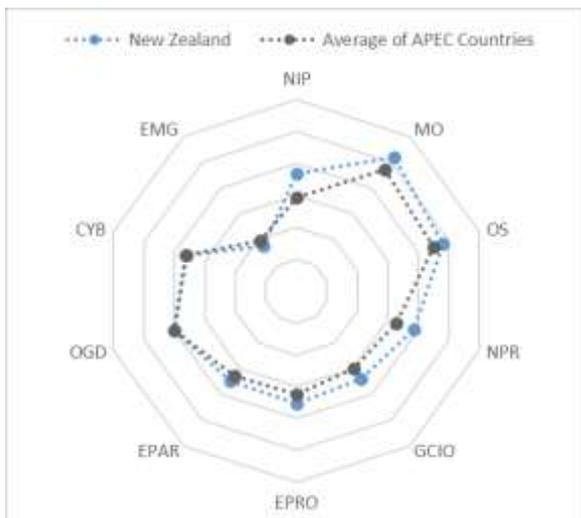
Among APEC Countries, except on the e-Government Promotion, New Zealand is excellent on all indicators. As shown on the above picture, New Zealand is exceptional in the necessary infrastructure, Cybersecurity, Open Government, and GCIO. For Management Optimization, New Zealand is considered more advanced than the United States, the number one country in the current ranking. However, despite the high performance on these indicators, New Zealand has a low score on e-Government Promotion. The situation is even lower than the average of APEC countries and global average.

These achievements also reflect the position in the OECD region in which New Zealand is considerably approaching the United States in the Open Data and the Cybersecurity.

3   Digital Government Development

New Zealand has continued the e-government to the next level in which the public services will be available in digital by default. In 2013, the new e-government strategic plan was launched with the title "Government ICT Strategy and Action Plan to 2017".

The strategy comprises four integrated domains which are covered by a system assurance component. The action plan contains many programme and projects. Since the interoperability among government agencies is critical as the engine for "Services are Digital by Default", the projects are shared across agencies. The agencies work together using "assembly and integrate" norm in which the build the system and preserve for integration with other.

In e-government development, GCIO is the central role. GCIO holds the highest authority to lead the action and the collaboration with the chief in other agency for delivering the optimum result. GCIO in New Zealand comprises several teams that represent specific expertise and functions covering managerial and technical aspects.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Approximately 88.5% of people in New Zealand were Internet users in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). About 32.4% have fixed-broadband subscriptions, and wireless broadband subscription has reached 101.3%.

4.2 Management Optimization [MO]

In June 2013, Cabinet of New Zealand had approved Government ICT Strategy and Action Plan to 2017. It is the revised version of Government ICT Strategy 2015 due to the dynamic ICT environment. The new plan is aimed to achieve the government's aim of an ICT-enabled transformation of public services to New Zealanders.

The new Government ICT Strategy is led by a partnership framework which involved critical stakeholders across government agencies. Current e-Government Strategy New Zealand covers almost all aspects for optimizing back-end process such as the necessity of Governance and Leadership, Assurance Framework, Programs and Initiatives, and ICT System Assurance. In all, New Zealand has fully achieved the maximum score in Management Optimization domain.

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 its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Among these five Online Service, e-One-Stop Service and e-Health have the lowest score, compare to other three online services.

In term of complexity level, most of Online Service in New Zealand has reached a transactional in which user can start the transaction from applying to receiving the service through the portal. In addition to that, the Online Service has implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services.

To measure the level of convenience, the third-party application result has shown that three portals are above the average considerably in term of speed. E-Procurement is the only portal that scored below average in term of page speed. The third-party application for assessing the portal is the application from Google named Google PageSpeed™ Insight on https://developers.google.com/speed/pagespeed/insights. In addition to that, all clickable objects on the portal work as they should do.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. National Portal of New Zealand (https://www.govt.nz/) contains proper information for local citizens and foreigners. Information about New Zealand is available on the portal. The user can find information about culture and heritage, demographic, and government. In technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is above average both from PC and from Mobile Device. However, the portal does not provide the user with some functionalities such as news and social network integration.

4.5 Government CIO [GCIO]

New Zealand government has clearly defined the need for ICT leadership on e-Government. The e-Government Strategy stated the role, the mandate, and the position of CIO in central and local authority. CIO arranged the e-Government Action Plan from across agencies under a partnership framework. GCIO initiates the Partnership Framework. Despite the influential role of CIO in New Zealand, there is no GCIO development program found in New Zealand during the period of this research.

4.6 E-Government Promotion [EPRO]

The Government ICT Action Plan covers all aspects of developing ICT in government. In addition to the technical aspect, managerial and awareness are mentioned on the document. The programs, initiatives, and funding for increasing the awareness on Digital Government have taken place. However, a few of the activities related to e-Government Promotion has been found during this research.

4.7 E-Participation [EPAR]

Culture and society in New Zealand have been created as a high-tech society. These factors have driven New Zealand to the next horizon of e-Government. Citizens and the government can take the benefit of ICT in their daily life. For instance, the parliament member has their website and provide the citizens with the channel to communicate.

Despite all achievements above, the absence of e-participation portal reduces the achievement of New Zealand in this indicator.

4.8 Open Government Data [OGD]

In 1982, New Zealand launched the Official Information Act to participate in the Freedom of Information Act movement around the world. To strengthen the implementation of these act, New Zealand has established Open Data Portal (https://data.govt.nz) to provide public with government information. New Zealand government uses Data one.govt (Open Network Environment) as a platform for data submission.

4.9 Cyber Security [CYB]

New Zealand has ratified several laws and regulation related to cybersecurity. Some of them are as follow:

- Crimes Act 1961, Section 249
- Unsolicited Electronic Messages Act 2007
- Privacy Act 1993
- Electronic Transaction Act 2002

- Trust and Security Guidelines
- Privacy Maturity Assessment Framework
- Cyber Security Strategy

In addition to these laws, New Zealand has established Government Communication Security Bureau (GCSB) for providing information assurance and cybersecurity to the New Zealand Government and critical infrastructure organizations, foreign intelligence to government decision-makers, and cooperation and assistance to other New Zealand government agencies. Besides that, an IT Community New Zealand initiated the foundation of New Zealand Internet Task Force to improve cybersecurity posture of New Zealand.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and Internet of Things (IoT). New Zealand has attempted to implement Cloud Computing for Public Sector. New Zealand Government has released the guidance and requirement for applying cloud computing technology in a government agency. Other emerging technologies such as IoT and Big Data for government agencies are still in an initial stage in New Zealand.

5 Some Highlights

New Zealand has an impressive point on Management Optimization, Open Government Data, and Cyber Security. With the centralized style, New Zealand has reached a high level of e-Government development. The high score in Management Optimization reflects the high degree of connectivity and interoperability of government information system. In this area, New Zealand is attempting to pursue the next step of public service under the theme "Services are digital by default". The effort to achieve the digital by default is equipped with the proper equipment on Open Government Data which ensures all stakeholder can take the benefit of government data. To increase the trust level on e-Government service, New Zealand also has a remarkable Cyber Security infrastructures.

In contrast to those three indicators. New Zealand still has the weakness. The use of emerging technology and e-Government Promotion are the weak points of New Zealand. As for the emerging technology, it is the new indicator for this year survey. New Zealand is commencing the use of Cloud Computing for delivering public services. Many countries are still in the initial stage on the use of emerging ICT.

Furthermore, another weak point of New Zealand is on the e-Government Promotion. It is hard to find any pieces of evidence related to e-government promotion strategy and activities. One argument is that the lack of e-government promotion activities occurred because New Zealand does not need such programs anymore. Their citizen is aware already of e-government service and knows how to use it.

By the increasing use of emerging ICT, New Zealand still has a chance to get a higher score in e-Government Promotion. The promotion activities will follow the progress of developing the Digital Services by default since it needs some introductions to the citizens about this matter.

Nigeria

1   General Information

Area: 923,768 km^2

Population: 181,562,056

Government Type: Federal Presidential Republic

GDP: $6,400

Internet Users: 47.4

Wired (Fixed Broadband Users): 0

Wireless Broadband Users: 21.8
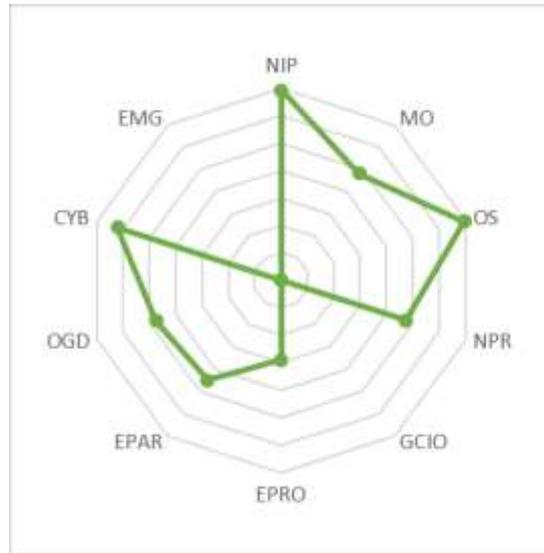
2   Positioning in a Global Organization and a Region
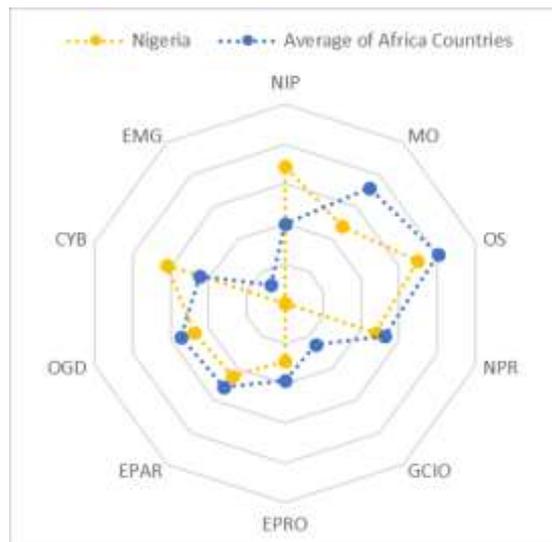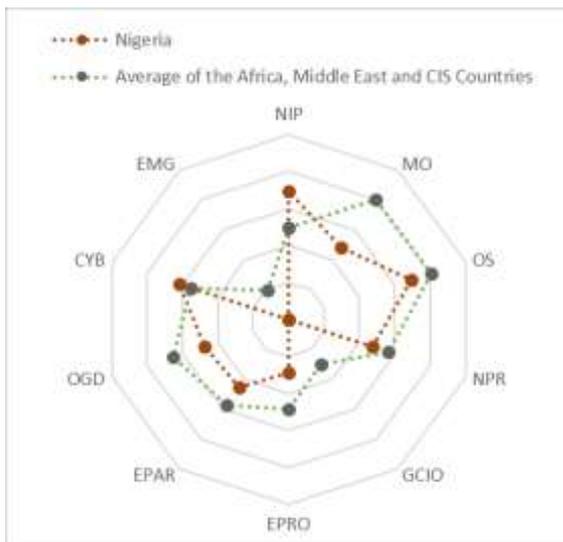
3   Digital Government Development

The national portal, http://www.nigeria.gov.ng is no longer functional as of early 2017, and the official website of the executive branch (www.statehouse.gov.ng) is filled with broken links. Services.gov.ng, the government one-stop-shop for interacting with citizens, runs slowly but is semi-functional. Some Web 2.0 tools are being used to allow more interaction between government and citizen. For instance, a citizen can contact with government officials through feedback forms or email addresses available at some government websites, plus the government has added some social media integration (Twitter and Facebook) to the main portal.

The government established NCC (Nigeria Communication Commission) under the guideline of the ministry of Communication and Technology to help reach out, and protect the consumer and Internet user can access it at http://consumer.ncc.gov.ng/. It is more of a citizen advocacy site compared with the national portal. Here, consumers and businesses

255

are encouraged to send their complaints. They have access to podcasts, opinion polls, and Facebook pages as well.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

The International Telecommunication Union (ITU) estimates that in 2017, 47.4% of Nigerians used the Internet. About 21.8% of the population has access to wireless broadband, but the ITU claims that virtually nobody in the country (0.0%) had wired broadband access in 2017.

4.2   Management Optimization [MO]

As of 2014, Nigeria is ranked 141st in the world according to the United Nations' E-Government Development Index.   The Nigeria government has various initiatives of a government strategy that includes: the National/State Economic Empowerment Strategies (NEEDS/SEEDS), the Vision 2020, the National e-Government Strategy (NeGST) and a well-formulated National IT policy. The National Information Technology Development Agency (NITDA) was charged with the responsibility of coordination the Nigeria project in collaboration with National e-Government Strategies Limited (NeGSt). The Government of President Olusegun Obasanjo approved this policy in March 2001. The Nigerian Federal Ministry of Information and Communications says that its priority is to provide citizens with credible and timely information on government activities and programs and initiatives to create a technological environment for Nigeria's social and economic development, but little has been done regarding management optimization although various initiatives have been rolled out.

4.3   Online Service [OS]

In Nigeria there are legislative initiatives, already, aimed towards providing a favorable environment for the development of e-commerce in Nigeria witnessed principally, for example, by the draft Nigerian Electronic Transactions Bill which is still making its way slowly through the legislative process. On the other hand, the Nigerian Cyber-crimes Act was recently voted into law. The draft Electronic Transactions bill addresses matters such as the formation and validity of electronic contracts as well as the form and validity of electronic signatures while the draft Cyber-crimes Act tackles some types of criminal activity by or through computers and information systems.

4.4   National Portal [NPR]

The Nigerian e-Government portal is http://www.nigeria.gov.ng, but the portal has some limitations. The interface is not user-friendly for all consumers, and the portal provides mostly static information about news, the government, army, and police activities and only link to government departments. There are no e-Services integrated into the portal as well as no information about the social media in the portal to encourage the Nigerian citizens to interact with their government. These limitations are understandable, though, in light of the limited availability of fixed broadband connections in the country.

4.5   Government CIO [GCIO]

There are no specific laws or mandates for CIO positions in Nigeria. The head of the National e-Government Strategies (NeGST) may be the closest position in the Nigerian government. However, the NeGST website does not provide details on its leadership or

organizational structure. There are no CIO associations in Nigeria and not CIO training course is offered by any university or training center.

4.6 E-Government Promotion [EPRO]

The Nigerian Government has many plans and strategies for developing e-Government as well as providing e-Services to the citizen. In 2007, the central government, as part of its public service reforms, announced the intended use of electronic payments for all public sector transactions. This electronic payment system is now in use and continues to improve. These include salaries of employees and payment for procurements and contracts. Also in 2007, the government of Nigeria established a public corporation known as Galaxy Backbone to provide its technological platform for e-Government and is working on comprehensive broadband policy and vision document which will provide a broadband definition, performance indicators, incentives for investment, macroeconomic targets, deployment guidelines, and citizens charter. The Government has articulated a clear vision for e-Government, driven by the Ministers of Information and Communications and Science and technology. However, e-Government is more fragmented and allocated through many different government organizations, so it is not accessible on the same portal like many other countries.

4.7 E-Participation [EPAR]

The national portal, http://www.nigeria.gov.ng is beginning to evolve from just merely providing e-information to providing e-consultation services as well. It is also the government one-stop-shop for interacting with citizens. Some Web 2.0 tools are being used to allow more interaction between government and citizen. For instance, a citizen can contact with government officials through feedback forms or email addresses available at some government websites, plus the government has added some social media integration (Twitter and Facebook) to the main portal.

Furthermore, the government established NCC (Nigeria Communication Commission) under the guideline of the ministry of Communication and Technology to help reach out, and protect the consumer and Internet user can access it at http://consumer.ncc.gov.ng/. It is more of a citizen advocacy site compared with the national portal. Here, consumers and businesses are encouraged to send their complaints. They have access to Podcasts, opinion polls, and Facebook pages as well.

4.8 Open Government Data [OGD]

On September 12, 2013, the first open data portal was launched in Edo State. Edo State is also the first sub-national government body in Nigeria and Africa to launch an Open Data Portal. Currently, the most popular and useful open data portal for Nigeria is operated by the African Development Bank Group, and this only provides limited and narrowly-focused amounts of data. There is much room for improvement in this area.

4.9 Cyber Security [CYB]

In 2014, The Nigerian Government introduced National Cybersecurity Strategy. The strategy seeks to ensure the development of information security assurance and monitoring plan. It includes a new national mechanism on cybersecurity assurance, adoption of fit for purpose standards for Governance, Risk and Control, Core Assurance Capabilities, National Enterprise Architecture Framework. It also endorses the adoption of application security testing as well as the adoption of a Balanced Scorecard Framework for cybersecurity.

The Strategy provides various initiatives for the focused areas and national mechanisms for developing and implementing Legal & Policy Measures, National Incident Management, Critical Information Infrastructure Protection, Cybersecurity Assurance Framework, Manpower Development, Child Online Abuse & Exploitation, National Internet Safety, Public Awareness, Multi Stakeholder Partnership and Global Cooperation on Cybersecurity. The vision of this strategy has set out a clear purpose, direction and outcome of the country's engagement in cybersecurity. The aim of the strategy is to provide a cohesive roadmap, initiatives, and implementation mechanism for achieving the national vision on cybersecurity.

4.10 The use of Emerging ICT [EMG]

There is no doubt that e-crime is an image problem for Nigeria. The recent passage of the new Cyber Crimes bill in the Nigerian Senate may be a step in the right direction. The bill is still awaiting passage in the Nigerian House of Representatives. There continues to be serious controversy over the bill, including whether it contains loopholes that will increase domestic corruption. However, it is clear that a tighter and more effective approach to cyber-crime and cybersecurity is necessary for Nigeria.

5 Some Highlights

While the recent political transition in Nigeria appears to be causing some issues, the recent passage of the new Cyber Crimes bill in the Nigerian Senate may be a step in the right direction. The bill is still awaiting passage in the Nigerian House of Representatives. There continues to be serious controversy over the bill, including whether it contains loopholes that will increase domestic corruption. However, it is clear that a tighter and more effective approach to cyber-crime and cybersecurity is necessary for Nigeria

Nigeria still needs to improve further on its ICT services and telecommunication systems. Mobile Internet holds some promise for increasing access to marginalized sectors of the population, and there has been exponential growth in mobile subscriptions. All Nigerian states now have some form of mobile coverage. However, there are still millions of Nigerians with limited or no access to ICT services due to lack of network infrastructure.

Moreover, there some new tech trends in the ICT field that Nigeria is trying to emulate to improve its telecommunication services. The Ministry of Communications Technology is collaborating with its agencies NCC and NITDA to create and strengthen software and improve broadband infrastructure development.

Also worthy of mention is the continuing trend of mobile banking, where subscribers can send and receive money using their mobile phones. This has been successful due to private sector initiatives to reach out to citizens in rural areas who did not have access to banks.

Norway

1   General Information

Area: 323,802 km^2

Population: 5,265,158

Government Type: Parliamentary Constitutional Monarchy

GDP: $69,300

Internet Users: 97.3

Wired (Fixed Broadband Users): 40.4

Wireless Broadband Users: 101.8
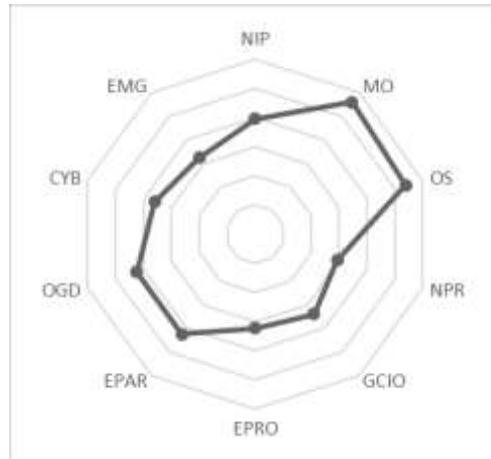
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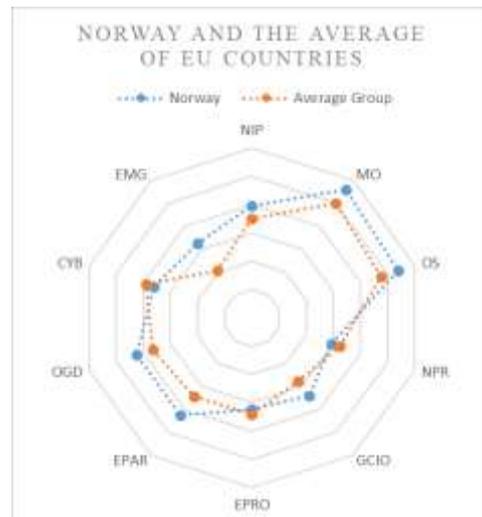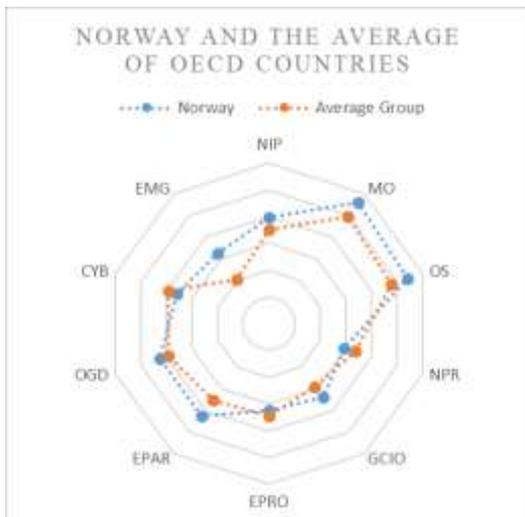
Among OECD countries, Norway shows great performance in e-Government progress, indicated by almost indicators have surpassed the OECD average, except Government CIO (GCIO) and National Portal (NPR). This phenomenon was also witnessed when comparing Norway with European Countries. In comparison with the USA, Norway had similar scores in Management Optimization (MO). However, the e-Participation (EPAR) indicator of Norway is better than those of Denmark, the best country in the Europe region.

3   Digital Government Development

Being one of the countries with advanced ICT infrastructure, digitalization will continue being the top priority in Norwegian Government's agenda for many years to come.

Norway has a massive advantage in online service development when in 2015 Q4, 97 percent of the population aged over 12 had Internet access at home, school or work, or elsewhere. More than 90 percent of citizens use the Internet daily (Eurostat 2014), ranks highest in Euro and the rest of the world. Norwegians also have high expectation

regarding public sectors, and many of them are ready for electronic interaction with the government.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

The total of Internet users in Norway accounts for more than 96% of the population in 2015, according to the Measuring the Information Society Report 2016 from International Telecommunication Union (ITU). Among them, about 93% of people has a wireless broadband connection, while the figure for fixed-broadband subscriptions is only 38.1%.

4.2 Management Optimization [MO]

Norwegian Government has published the latest digital agenda for Norway in 2015, in which prioritized five areas: focusing on user-centric; efficient use of ICT for strengthening innovation and productivity; strengthening digital competence and inclusion; useful digitization of the public sector; and data protection and information security. Difi and Ministry of Local Government & Modernization continue being strengthened as coordinating bodies in the public sector, and the Norwegian Association of Local and Regional Authorities will be in charge for facilitating e-Government development at the local government level. The government also established the Digitization Council in 2016 to help government agencies succeed with their digitization projects.

There is a national enterprise architecture (NEA) developed by Norway International Experience Norwegian Government which consists of technical, conceptual, organizational and procedural standards. The architecture was translated into the domain and organizational architectures at the local level.

4.3 Online Service [OS]

The score for Online Service is based on an investigation of five online services: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience.

Regarding complexity level, most of Online Service in Norway has reached a transactional level in which user can entirely conduct their businesses online. In November 2015, a new authorization initiative called the ID Gateway (ID-porten) for "Mobile BankID" was launched, supporting Norwegian citizens to access over 600 public digital services via "https://www.norge.no/" one-stop-service portal. Doffin "https://www.doffin.no/" is a new national procurement portal launched in 2014, enables public institutions in Norway to publish tender information. However, in before registering as a member, users are required to send all necessary papers and application documents to Doffin for manual approval. Regarding e-Health, "https://helsenorge.no/" is the Health and Care Services' portal guiding the health services and self-service solutions available in the health sector. All online services had security measures such as SSL, Site Authentication, and Password Protection fully implemented.

To measure the level of convenience, the third-party application result has shown that all portal is above the average regarding speed. The third-party application for assessing the portal is the application from Google PageSpeed™ Insight.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information, Technical, and Functionality. National Portal of Norway "http://www.norge.no/" contains proper information for local citizens and foreigners. Information about the country and the latest events are also available by linking to another portal for visitors. In the technical aspect, the result of Google PageSpeed™ Insight showed that the website performance is above average both from PC and Mobile devices. The portal is also equipped with several necessary functionalities search capability, sitemap, and Social Network integration.

4.5 Government CIO [GCIO]

The Norway public administration at national and local levels does not appoint CIOs or equivalent positions within the legal framework. The director, Agency for Public Management and e-Government can be considered the CIO at the national level.

4.6 E-Government Promotion [EPRO]

There are numbers of strategies and documents related to e-Government and ICT development found within national and local government level, for examples, the Norway Digital Agenda (published annually), Difi' strategy 2012-2015, and so on.

Regarding ICT budget, from the data of the Norwegian Government Agency for Financial Management, an estimate of ICT procurements in the public sector in 2014 is put at NOK 16.6 billion. Thanks to the consistent and substantial funding on ICT, the use of digital services in government agencies and municipalities is increasing dramatically: use of public services online increased by 235 percent between 2010 and 2015 (based on a number of logins through the e-ID Gateway). Hundreds of services can be accessed via e-ID login solution, and this number is still growing.

In order to reduce the size and complexity of digitalization projects, the Government has issued the Principles of digitization projects which consists of five fundamental rules: start with needs, think big – start small, choose the right partner, ensure appropriately skilled leader, and iterate outcomes.

4.7 E-Government Participation [EPAR]

Since its launch in 2003, the Altinn portal has played a significant role in the growth of the awareness of citizens about electronic forms and services. Over 200 million digital forms and messages have been transmitted via Altinn so far.

In the efforts to increase the interaction with citizens, the Norwegian Government has put into place the use of Digital Mailbox; an initiative allows government agencies to send messages directly to citizens. Public administration bodies are mandated to implement the digital mailbox by the first quarter of 2016.

Digital "http://digidel.no/" is another initiative launched in 2016 where courses and training programs in computer literacy are provided. Some example courses are Tax Administration's tax return online service course or Difi's "Learn to log in to public utilities with BankID" course.

4.8 Open Government Data [OGD]

Austria has recently launched the Open Data portal "http://data.norge.no/". Moreover, Norway has been ranked as the 3rd most advanced country in Open Government according to the World Justice Project Open Government Index 2015.

4.9 Cyber Security [CYB]

The Norwegian National Security Authority (NSM) is considered as a cross-sectoral professional and supervisory authority within the protective security services in Norway is also responsible for matters of cybersecurity. NorCERT (Norwegian Computer Emergency Response Team), a department operates under NSM, is responsible for detects cyber incidents in Norway. To promote research, training, and education on cybersecurity, Norway established the Center for Cyber and Information Security in 2014, with the primary mission is to increase the national capacity to cope with security challenges in digital space.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). Norway has started to implement Cloud Computing for running One Government Private Cloud (OGPC). OGPC offers Infrastructure-as-a-Service (IaaS) for government agencies. E-Government National Center maintains this Cloud Computing Services. Other emerging technologies are still immature and no evidence to prove that Brunei implemented Big Data and IoT.

5 Some Highlights

Being aware of the high demand of citizen in communicating with public sectors via online way, the Norwegian Government has put many efforts into building a reliable and efficient public sector for better public services delivery. Major initiatives such as Altinn portal, Standard Portal "http://www.standard.difi.no/", Public e-ID solution – MinID, and the latest one - Mobile BankID, launched on November 2015 - help the country securing its position in top 5 of Online Service delivery.

In June 2015, Nordic countries including Demark, Finland, Norway, and Sweden had decided to cooperate on their open government strategy and implementation by sharing their national OGP working and together promote open data. This cooperation and other efforts of the government in promoting for open government help Norway to score 9 out of 10 in Open Government dimension.

Oman

1 General Information

Area: 309,500 km^2

Population: 4,424,762

Government Type: Monarchy

GDP: $71,325

Internet Users: 69.8

Wired (Fixed Broadband Users): 6.2

Wireless Broadband Users: 91.3

2 Positioning in a Global Organization and a Region
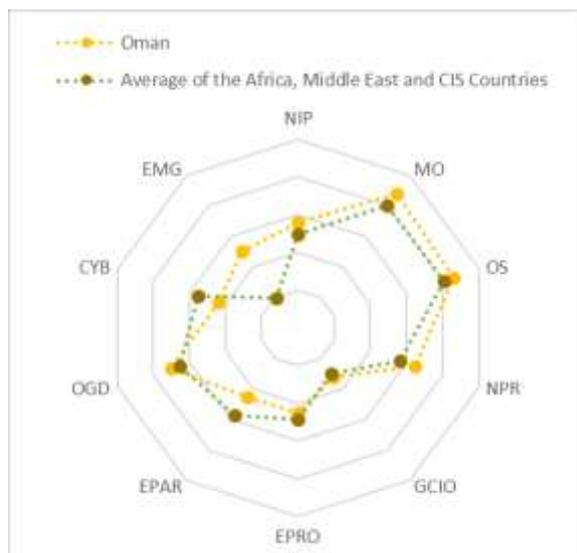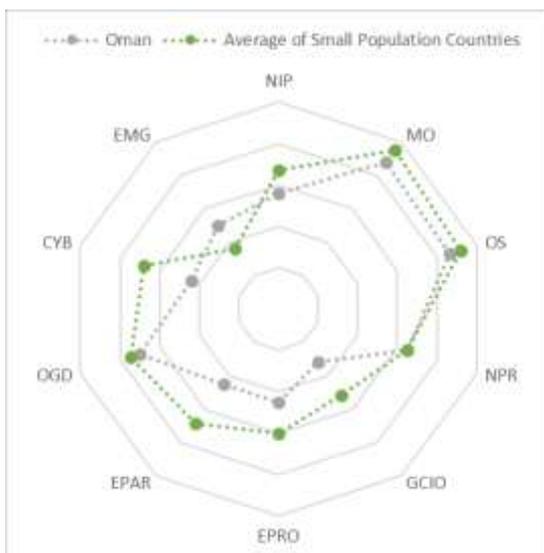
Among GCC Countries, Oman has a better score than the average score of GCC in Open Management Optimization. As shown on the above picture, Oman is considerably low compared to the average of GCC on necessary infrastructure, National Portal and GCIO. However, despite the lack of necessary infrastructure, Oman has been trying to take the benefit of emerging ICT such as Cloud Computing, Big Data, and IoT. Some progress in the area of emerging ICT has led Oman to get a better position than the average of GCC Countries.

These achievements also reflect the position in the Asian region in which Oman is considerably approaching Singapore in the Management Optimization and the use of emerging ICT.

3   Digital Government Development

Oman endorsed its Digital Oman Strategy under His Majesty's grand vision in March 2003 to make contributions on developing the Omani Digital Society and e-government in order to achieve the goals of simplifying processes, adopting technology, etc. As an entire Monarchy country, Oman set up the Information Technology Agency (ITA) in May 2006 and centralizes D-Government development by ITA. ITA is an agency to take responsibilities for IT infrastructure and Digital Government strategies implementation with the practices in ICT.

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

According to ITU Report on Measuring the Information Society Report 2017 Volume 1, Annex 2, 69.8% of people were internet users, 6.2% of people have had fixed-broadband subscriptions, and 91.3% of people have reached wireless broadband subscriptions in 2016.

Compared the data from 2015, the percentage of Internet users slightly decreases. The percentage of fixed-broadband subscriptions slightly increases by 0.7%. The percentage of wireless broadband subscription increased significantly increases by 12.6%, which shows the trend of wireless network development. With the popularity of network infrastructure in Oman, it gives Oman a solid foundation to build its Digital Government system.

4.2   Management Optimization [MO]

By launching Digital Oman Strategies to develop D-Government, the strategy incorporates different focus areas to specify its target at a national level and provides a clear vision and is clearly equipped with initiatives.

Oman also gives a clear framework, Oman e-Government Architecture Framework (OeGAF), for its e-governance to ensure government's IT projects and systems sustain can help to achieve their strategy. OeGAF demonstrates a detailed and transparent structure to show each architecture's responsibilities and connections. Now, official eOman government services include:

a. Sultan Qaboos Award for Excellence in eGovernment: to honor excellent and well-impacted projects
b. G-cloud: a shared platform between ITA and other government entities
c. Oman CERT: risk and security analysis in the cyberspace
d. Innovation and Support Center: think tank of keeping pace with global development and lead the development at a global level
e. Oman Government Network: a telecommunication infrastructure to interconnect government entities
f. National Data Centre: a shared network site to connect government entities
g. The Official eGovernment Services Portal: a service provided a site for business and citizens
h. Information Security Management Framework: to protect information assets from unauthorized access
i. Oman eGovernment Framework
j. eTendering: to automate and implement an electronic tendering system under the corporation between ITA and the Tender Board

k. National ePayment Gateway: secure online payments
l. E-Legislation: substantial legal protection in the use of ICT

4.3 Online Service [OS]

In online service, significant indicators, includes the level of complexity, level of security, and level convenience, are accessed on e-procurement, e-customs, e-tax, one-stop service, e-health.

In term of complexity level, except one-stop services, all of the online services in Oman provide the citizen with the function of transactional payment services and require identification authentication for user login.

In term of security level, except one-stop services, all of the other online services provide SSL, with the limited access to user login, there is no information about password protection and certified authentication.

In term of convenience level, according to a third party application, Google PageSpeedTM, besides one-stop service, all other services have a relatively slow speed to access. One-stop service is an average speed but still does not have a good score for speed. Moreover, all websites did an excellent job on the layout with one-page width, and all clickable objects work very well.

4.4 National Portal [NPR]

There are three significant indicators considered in national portal including information, technical, and functionality.

National Portal of Oman incorporates full information in-country information, government information, demographic information, news, contact, the term of use/privacy, link to government websites either central or local government.

In functionality, the website works well on different browsers. However, the speed of the website on PC and Mobile is above average but still relatively not fast enough.

In functionality, it works well on search capability, sitemap, social network capabilities such as Twitter, Instagram, Facebook, and YouTube, blogs, inquiry form for contacting government, languages in English, link to available online services. Nevertheless, this website does not have SSL, and its Listen function for the page works not very well, which cannot provide effective accessibility for people with special needs.

4.5 Government CIO [GCIO]

Information Technology Authority considered as GCIO office in Oman. As there is only one central office to take the responsibility, it is hard to find sub-central government agencies or provincial/state/prefecture/ city government information. Moreover, formal documents in the GCIO Mandate are not provided on the official website.

In GCIO development program, there is the only information that the government is working on National IT training and awareness. GCIO provides some training projects and certifications for civil service employees, and Community IT training project for citizens.

4.6 E-Government Promotion [EPRO]

Digital Oman Strategy demonstrates 11 initiatives I mentioned above to promote Digital Government. Since Oman is an absolute monarchy country, information on

indicating promotion of Digital Government is not very much. Moreover, Oman has strategies to improve citizens' awareness of IT and D-government, but more efforts on the popularity of e-services among citizen could be considered significant. Therefore, the publicity on promoting those e-services to citizens in order to increase the utilization rate could be a good way for Oman to invest.

4.7   E-Participation [EPAR]

The score for E-participation is relatively low. There is no information related to government officers and parliament members. Moreover, since Oman is a monarchy country, citizens cannot participate in D-development, and it is hard to find the interaction between the government and citizens.

4.8   Open Government Data [OGD]

Oman has a free Open Data portal-sharing portal that everyone can access for over 56 data relating to the Sultanate of Oman, and it has Open Data events keeping updated and a collection of mobile apps developed on Open Data. However, the open data still cannot be considered good enough because some of the datasets are irrelevant, ineffectiveness and in distinction.

4.9   Cyber Security [CYB]

Oman National CERT takes the responsibilities on cybersecurity with laws regulation on cybersecurity, information protection, data security, access control, e-commerce, e-payment, etc. besides National CERT, the center of information security (CIS) develop continuous processes of security monitoring.

4.10   The use of Emerging ICT [EMG]

Cloud computing, Big Data, and the Internet of Things (IoT) are indicators considered in this sector, and Oman does an overall good job on it.

G-Cloud is an Oman government cloud initiative for Omani government entities to provide services relating to sourcing information and communications technology. Additionally, infrastructure-as-a-service (IaaS) and Platform-as-a-Service are provided. Moreover, ITA has organized competition of Open Data Innovation to encourage people to use Open Data to find potential new business from the public.

5   Some Highlights

Compared to last year's report, Oman improved a lot on Online Services and some basic infrastructures to improve their official websites. The best part that Oman did an excellent job on is Management Optimization and Online Service, and Oman has been putting efforts on National Portal and Open Government Data.

In term of Management Optimization, Oman has a comprehensive and clear strategy to ensure their goals, visions, and implementations. Additionally, Oman D-Government Architecture Framework clears shows us the framework of interoperability.

Moreover, official websites for D-Government have improved a lot such as social media interactions, mobile application development for e-services and open data.

However, Oman still has much room for improvements. The popularity of e-services usages could be one crucial factor to improve. Oman has some national and community projects to raise the awareness of D-Government, but it will not be effective if citizens do not have the sense to use ICT in their daily life. With the massive increase in wireless broadband users, it implies that e-services can have a huge potential to invest in and even

for its future development. Furthermore, increasing the interactive involvement between government and citizens could be a good way to gather innovative ideas and encourage citizens to have an awareness of keeping pace with globalization.

Pakistan

1 General Information

Area: 796,095 km^2

Population: 207,774,550

Government Type: Federal Parliamentary Republic

GDP: $4,900

Internet User: 15.5

Wired (Fixed Broadband User): 1.1

Wireless Broadband User: 20.1
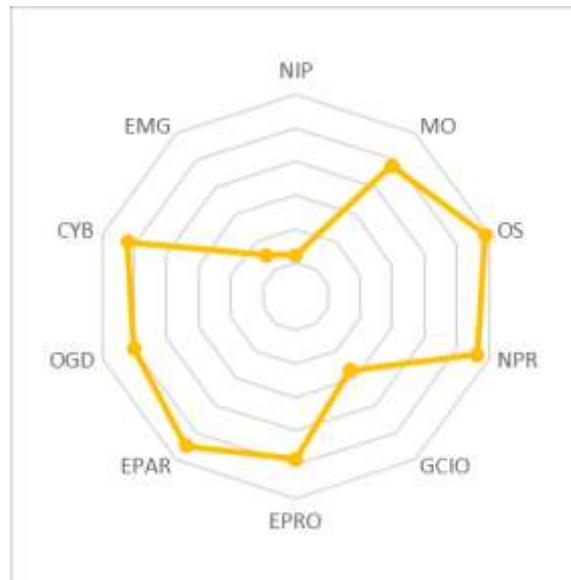
2 Positioning in a Global Organization and a Region
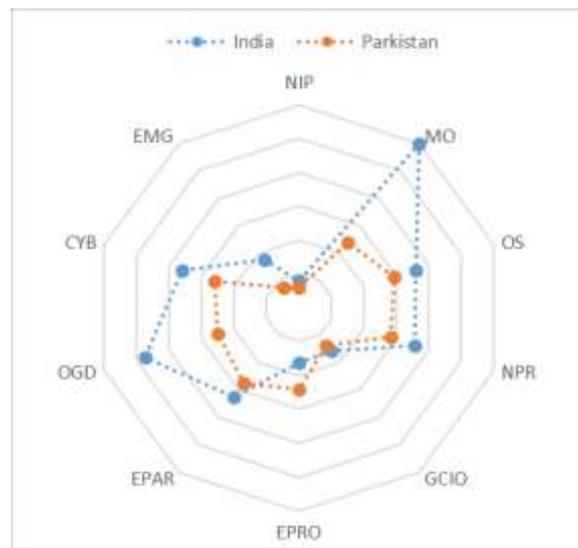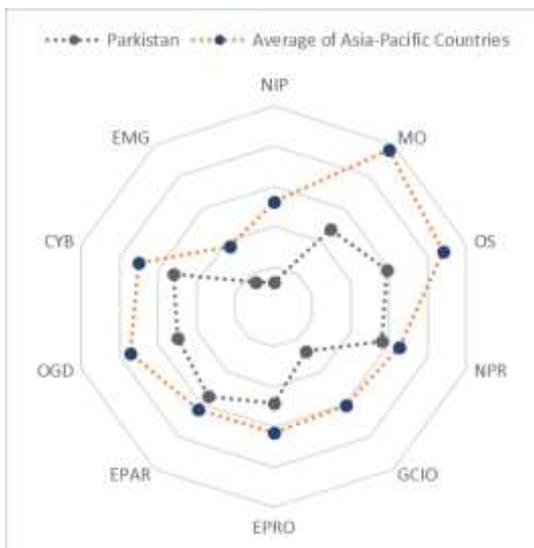
3 Digital Government Development

Referring to the last year record of Digital Government Development. Pakistan has the highest mobile penetration rate in the South Asian region; more than 90 percent of Pakistanis live within areas that have cell phone coverage, and more than half of all Pakistanis have access to a cell phone; fiber systems were being constructed throughout the country to aid in network growth; fixed line availability has risen only marginally over the same period, and there were still difficulties getting fixed-line service to rural areas. To date, there remain the primary challenge for E-Governance in Pakistan that is the low literacy rate of people, and the top management that supports resistance to change to electronic ways, and the unstable governmental policies. As well as the issue of management and deployment of massive ICT in infrastructure, the possible invasion of privacy, and the insecurity of private data from intruders, less collaboration between

different organizations and training for employees are also a challenge. Highly qualified professionals and monetary cost need to be provided for implementation and management of this system, the lack of both also creates an obstacle in the way of achieving the goal.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

As of March 2017, Pakistan's broadband users crossed 2 million. Pakistan has close to 50,590,000 personal computer users. Over the years the percentage of households using personal computers in Pakistan has grown substantially, and around 350,000 new computer users are added every year in Pakistan. There is still a good deal of room for growth, but Pakistan is making steady annual progress.

Amidst the above mentioned though and according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU), in 2016 approximately 15.5% of people in Pakistan were Internet users, about 1.1% have fixed-broadband subscriptions, and wireless broadband subscription has to reach 20.1%.

4.2   Management Optimization [MO]

Pakistan is one of the emerging countries in the world which has been trying to make a difference in his way and implementing D-Government at an enormous rate as well as Pakistani government believe that Information technology is a vital tool in order to accelerate economic growth, efficient governance, and human resource development.

Pakistan Digital Government objectives have been focused on high priority areas for improving the internal operations and management. Most objectives are intended to help Interior better execute administrative and supporting functions that exist across the entities. These functions, while in many cases part of the "back office", play critical roles in accomplishing the missions for which Interior is responsible. They have also been crosscutting and have impacts across the Department and all mission-related activities. The usage of ICT in Pakistan is still improving day by day in internal processes, and the government's computerization efforts and the level of ICT integration are outstanding since the last couple of years. Many reasons can constrain standardization of service procedures and information systems in order to achieve internal effectiveness and efficiency of governmental operations. Currently followings are some objectives of the E-Government in Pakistan: Online Paying Taxes, Utility Bills, Online Shopping, Online Banking, Booking of Tickets, Online Admission for Hajj Applications, Online Business, Online Salary Disbursement for government employees using ATM, Network and Community Creation, Increase the capacity of Government, Information sharing among government institutes and Keeping all records of the country online.

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 are at average speed and efficiency, while the One Stop Service is such considerably in doubt in terms of speed that may cause the access speed considerably slow to access and the e-Procurement cannot be investigated.

The e-Health is still the only online service in Pakistan that cannot be investigated during the period of the 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 an the 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.

4.4   National Portal [NPR]

The National Gateway to the Government of Pakistan (pakistan.gov.pk) is the national portal of the country to improve the communication experience between the government and the public as well as provides a 'single window access' to information and government services which can be accessed by citizens and organizations/ business sector. The national portal of Pakistan has the basic interface for all government website and to contact the government electronically. The Pakistani Government's Web portal presents a wide range of information resources and online services from various government sources, accessible from a single point. Pakistan Government's Web portal is a gateway to improve the communication experience between the government and the public.

Moreover, it provides information that helps the public to understand government structure better. The well-organized portal serves as a platform that assists the public to find desired information. It provides information that helps the public to understand government ministerial structure, parliament and Senate better. The well-organized portal serves as a platform that assists the public to find desired information. To improve users' browsing easy access facility, the portal also allows user link with the sub-government portal (provincial government) such as khyberpakhtunkhwa.gov.pk and punjab.gov.pk that allow each user to visit each portal as they desire. The portal is available in the official language of English. Presently the portal organizes services under the following categories: Apply for Passport, Apply for Visa, Immigration, Family & Child Registration, Pakistan International Airlines, Pakistan Railway, Emergency / Disaster Management, Judicial System, Cause Lists & Judgments of Courts, Business in Pakistan, Electric Supply Companies, Stock Market, Mobile Services / Internet Service Provider / Data Centers, Employment, Banking, Tenders and Public Holidays which are mostly providing related information for the inquirers.

4.5   Government CIO [GCIO]

The D-Government Program in Pakistan is an initiative of the Ministry of Information Technology under the National IT Policy 2000 approved by the Federal Cabinet in August 2000. Extensive research has been undertaken in preparation of this program. This included covering all ministries of the Federal Government about their requirements over a period. Recently office of government CIO issue Information Security Policy under the authority of the Government Chief Information Officer on October 2012.

The Pakistan C National Directorate of Digital Government was established within the Ministry of Information Technology to provide leadership and oversight for IT spending throughout the Federal Government. In addition, each Federal agency has its directorate of D-Government. However CIO networking event has been organized through a so-called event of "Pakistan CIO Summit & Expo" for the CIOs, IT Heads and IT Managers, including from the neighboring South Asian countries, the Middle East and other parts of Asia to gather and set the direction for adoption of new technologies through sharing of knowledge and discussion, and the event has been held since 2013 to date.

4.6 E-Government Promotion [EPRO]

The Government of Pakistan has promulgated the Electronic Transaction Ordinance (ETO) and working towards developing D-Government services. Many organization and website offer services such as D-Government.gov.pk and e-gov.pk. The latter provides links to a variety of lists of services to the public but still a big challenge of how to keep them lively on service.

The digital interactions between Pakistan's government departments, citizens, businesses, employees and other governments improved from a couple of years And this appear from the efforts to develop and promote electronic Government services. The promotion of the use of the Internet and other information technologies to increase opportunities for a citizen to participate with the Pakistan Government and promoting interagency collaboration providing electronic Government services, where these collaborations would improve the service provided to its citizens by integrating related functions and the use of internal electronic Government processes.

4.7 E-Participation [EPAR]

Electronic Democracy is one of the vital areas that Pakistan government has been working to date that the people are waiting to solve inherent civil problems of Pakistan. Among the many projects for improvement of e-participation is the E-Democracy project which aims to offer the citizens an opportunity to get electronic access to relevant information related to administrative decisions concerning the open land in designated districts.

Initiatives of this kind by related government agencies will allow stakeholders to contribute their opinion, either privately or publicly, on specific issues as well as will enable ICT to support individuals in forming up their communities, to share common agendas in progress and to shape up and empower such founded communities. Moreover, the website http://www.ecp.gov.pk/ under the Election Commission of Pakistan (ECP) provides information regarding the general election in Pakistan.

4.8 Open Government Data [OGD]

This dimension measures the extent of the access of the general population to information and knowledge. This includes the presence of policies relating to freedom of information, access to publicly funded research (open content), availability of government data in a reusable format of open data and the ability of citizens to access to information relevant to their needs.

Given the upcoming 2013 elections, soaring foreign and domestic investments in development projects, demands for increased accountability for public expenditure and transparent budgets, the citizens' interest in accessing this sort of open government data has skyrocketed.

However, to date, the http://data.org.pk/ serves as Pakistan Data Portal (PDP) claiming as one of the advanced open data portals of the world having 4-star rating according to Open Data Portal Rating (http://5stardata.info/en/). PDP has rationally linked data features by an advanced Indicator Dictionary. It has one of the most advanced Indicator dictionary in the world with three steps of Indicator metadata for more organized quality control of data attached to the indicator. PDP is one of the biggest data depository for Pakistan's education-related data. It is now accumulating other sectors datasets into the portal, starting with Nutrition. It also has additional features for data visualization and data analysis. In visualization, PDP allows users to create dynamic charts and choropleth

maps, based on user selection for any dataset in the portal. PDP allows the user to dynamically query data from all the datasets from all the years into a single dataset. Users can then perform further analysis on this queried data.

4.9 Cyber Security [CYB]

The first legal framework to address Cybercrimes was introduced in 2002 by the Pakistan government with the name "Electronic Transactions Ordinance 2002 - ETO". The main objective of this framework was to facilitate and identify information, documents, communications, electronic transactions, and records. In 2004, the Ministry of Information Technology prepared Electronic Crime Act. This act included many legislative terms such as Cyber Terrorism, Criminal Access, Electronic Fraud and Data. In 2016, the National Assembly passed the latest cybercrime, under the name "Prevention of Electronic Crimes Bill (PECB)".

In 2018, the Federal Minister for Interior of Pakistan inaugurated the nation's first-ever National Centre for Cyber Security (NCCS) at Air University, Islamabad. The NCCS aims to develop advanced tools and research technologies to protect Pakistan's cyberspace, sensitive data, and local economy from the cyber-attacks.

4.10 The use of Emerging ICT [EMG]

Regarding the use of Emerging ICT, an ICT industry expert indicated that Pakistan's ICT sector is an important business driver and has been ranked one of the most significant contributors to the economy over the last decade. The current technology landscape is rapidly evolving with the emergence of enterprise cloud offerings, which in turn is accelerating the pace of change and growth.

5 Some Highlights

In this modern world where developed countries are still facing challenges in implementing Digital Government. Pakistan is a growing child and hence have more tendency to failure for the new system. The successful implementation of E-Government will be a significant challenge for the Government to cope with the technology issues, Manage Change in the existing system and co-operate with the public expectations.

Regarding Cybersecurity, Pakistan Information Security Association (PISA) has been working for the last many years to highlight this much-needed topic of Multi-Stakeholder coordination for combating Cyber Crimes. PISA will seek to implement an alliance with multi-stakeholders, including government organizations, academia, law enforcement agencies and Internet security specialists from the private and public sector. To leverage their respective expertise and resources for fighting cybercrimes, in responding to the complexity of the cyber-threat landscape where cybercrime investigations are profoundly different in nature to traditional crime, requiring high-level technical expertise and large-scale cross-jurisdictional investigations. It is essential that law enforcement prioritize resources, build cross-jurisdictional and cross-sectorial collaboration in addition to developing the technical expertise, tools, and infrastructure required to combat threats and eventually enhance digital security effectively.

Peru

1 General Information

Area: 1,285,216 km^2

Population: 30,444,999

Government Type: presidential republic

GDP: $12,300

Internet User: 45.5

Wired (Fixed Broadband User): 6.7

Wireless Broadband User: 62

2 Positioning in a Global Organization and a Region
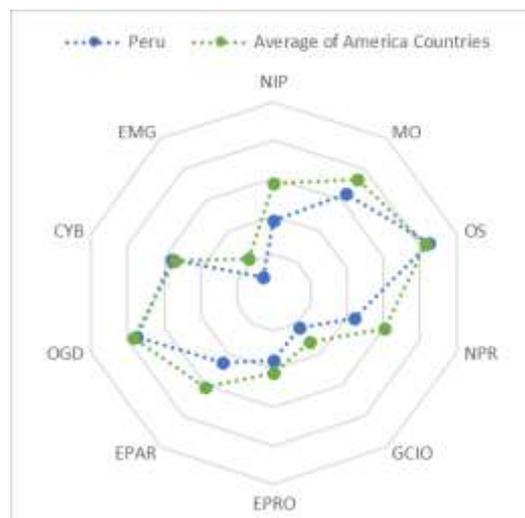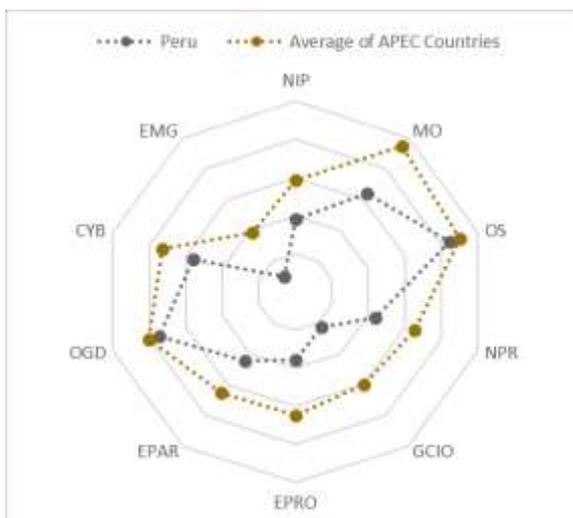
Among American countries, Peru shows slow progress on e-Government performance. Of the ten indicators, only the National Portal has a higher score than the world and regional average point.

A similar thing happens in APEC where Peru surpasses the group average only on the national portal. Other scores are under the group's mean.

3 Digital Government Development

E-government in South America is considered a high priority for improving the internal operations and management. However, levels are still low, and developments are at the initial phase. Most objectives are intended to help the Interior better executing administrative and supporting functions that exist across the government bodies. The e-Government strategy is drafted by the Center for Public Service Innovation (CPSI) in association with the Department of Public Service and Administration and the State Information Technology Agency.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

In Peru, 45.5% of the population uses the Internet, only a minimal increase compared to the previous year, according to the "Measuring the Information Society Report 2016" by the International Telecommunication Union (ITU). The number of fixed-broadband subscriptions is 6.7 per 100 inhabitants, while the number of active mobile broadband subscriptions is 62 per 100 inhabitants, the latter showing a considerable increase over the previous year.

4.2 Management Optimization [MO]

The Peruvian government released its e-government strategy in 2006 in a document entitled "Estrategia Nacional de Gobierno Electrónico" (e-Government National Strategy), through the National Office for e-Government and Informatics (ONGEI). In it, the government defines five strategic objectives and some initiatives for each. With this document, the government aims to promote the utilization of ICT in public administration and the improvement of public services. The Peruvian government also established a special committee, the CODESI, to enable and promote the establishment of the information society in the country.

4.3 Online Service [OS]

The score for online services is comprised of five criteria: e-Procurement, e-Tax, e-Customs, e-Health, and one-stop service website. The Peruvian government maintains websites for all five types of e-services assessed in this survey. The website for e-tax and e-customs (http://www.sunat.gob.pe) offers a high level of complexity and interaction while providing relevant information to citizens. The one-stop service website (http://www.tramites.gob.pe) is clear and straightforward, and shows the most consulted procedures on its main page. The e-procurement website (http://www.perucompras.gob.pe) and the e-health website (http://www.essalud.gob.pe/essalud-en-linea-2) are limited to providing information to the citizens and offer only simple services with low complexity.

4.4 National Portal [NPR]

The Peruvian national portal offers necessary information about the country, as well as government information and links to other government agencies. It also offers limited information on events and news, and dramatically focuses on tourism. The website is simple and lacks many features like social network integration and feedback forms. The legislation is also available on the national portal. The website is only available in Spanish.

4.5 Government CIO [GCIO]

The legal framework related to e-government does not consider the CIO position. However, the ONGEI is responsible for many of the GCIO functions, such as the promotion of ICT utilization in public administration and the implementation of the strategy. Information regarding CIO training programs was found in at least one educational institution. No additional information on CIO regulations was found.

4.6 E-Government Promotion [EPRO]

Through the ONGEI, the Peruvian government is working to promote the use of ICT and the development of e-government. There exists a legal framework for promoting e-government, although the strategy fails to include local governments. There is an annual

fund for IT adoption of Peruvian businesses called Technology Science and Innovation Fund. No information on publications, training programs, or events related to e-government was found.

According to data from Dominio Consultores 2013, the government consumption on IT is still limited, accounting for only 19% of the total market.

4.7 E-Government Participation [EPAR]

The National Digital Agenda states that e-government initiatives aim to increase citizen participation and transparency, although there is still not enough evidence to assess this objective. Users have access to information and contact details of elected officials, legislation, and national budget on government websites. The president also has an official website, which includes a feedback form.

With the growth of mobile Internet connections, the Peruvian Government focused on providing services via mobile applications. A portal for the mobile government was established to serve this purpose (http://www.movil.softwarepublico.gob.pe/). This is the place where various mobile applications are provided to citizens.

4.8 Open Government Data [OGD]

The government is committed to provide open information to its citizens, for which it offers an open data portal (http://www.datosabiertos.gob.pe). This site is still in its beta version; there are currently 142 datasets available from 1,243 institutions, grouped in 10 categories. The government also offers a transparency portal, where it is possible to view information related to different government agencies.

4.9 Cyber Security [CYB]

Peru has specific legislation on cybersecurity, and penalizes cybercrimes through a special section in its penal code. It also has laws on access to information, privacy and data protection, and digital signatures and certificates. There is an official government agency in charge of handling incidents related to cybersecurity, the PeCERT. The ONGEI has published a national strategy for cybersecurity.

4.10 The use of Emerging ICT [EMG]

No evidence of usage or regulations by the government of emerging technologies such as Cloud Computing, the Internet of Things, or Big Data was found.

5 Some Highlights

The Peruvian government started its e-government program many years ago, but it has seen little development in recent years. Although several efforts have been done, it still stays behind in comparison to other Latin American countries. Its strategy also needs to be updated and revised, and more effort needs to be put on the enabling framework. From the range of e-services offered and the state of its agencies websites, it can be said that Peru still lacks a holistic approach to e-Government development.

Philippines

(Prof. Dr. Francisco Magno, De La Salle University, Philippines)

1 General Information

Area: 300,000 km^2

Population: 102,624,209

Government Type: Republic

GDP: $7,700

Internet User: 55.5

Wired (Fixed Broadband User): 5.5

Wireless Broadband User: 46.3
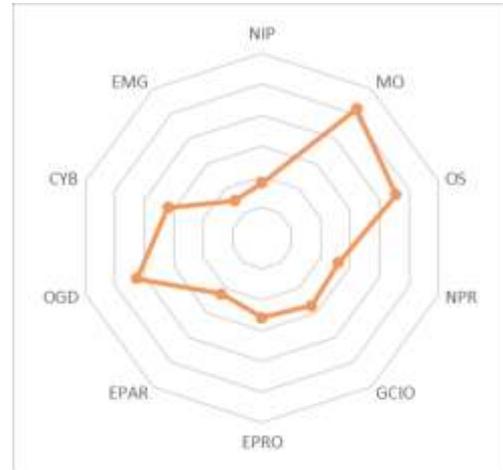
2 Positioning in a Global Organization and a Region
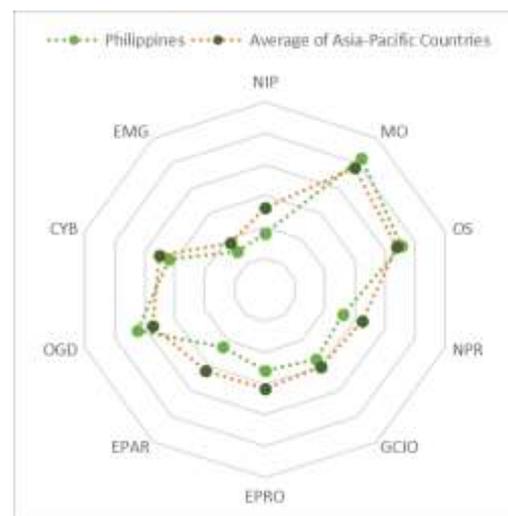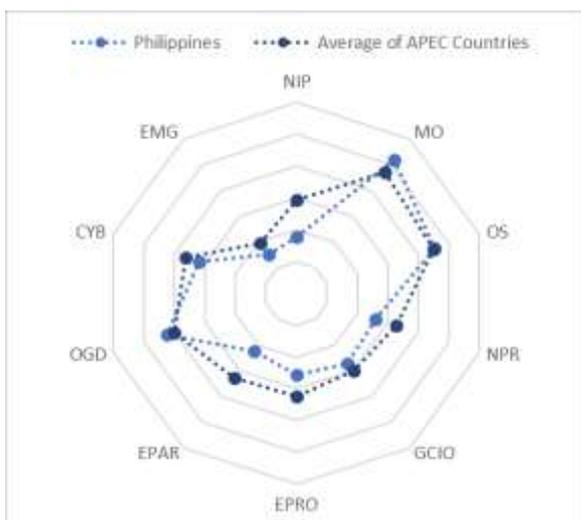
Among APEC Countries, Philippines has a better score than the average score of APEC in Open Government Data and Management Optimization. As shown on the above picture, the Philippines is very low on the basic infrastructure and the use of emerging ICT. However, despite the lack basic infrastructure, Philippines has been trying to take the benefit of modernized government process through Management Optimization and Open Government Data.

These achievements also reflect the position of Philippines in ASEAN region in which the Philippines considerably approached Singapore in the Open Data and the Management Optimization.

3 Digital Government Development

The first step to position the Philippines in the information age was taken in 1997 with the formulation of the National Information Technology (IT) Plan. It envisioned an ICT-enabled future (National IT Council 1997). To further operationalize the vision, the

Government Information Systems Plan (GISP) was unveiled in July 2000. It called for the establishment of an online government that enables every citizen, visitor, and investor to access public information and services online in their homes, in the community or municipal centers, in foreign posts, in public libraries and kiosks, and in government offices. The plan laid down a comprehensive strategy for the computerization of government. It identified the administrative, financing, and infrastructural requirements to wire-up the bureaucracy (Magno and Serafica 2001). The passage of Republic Act No. 8792, or the Electronic Commerce Act of 2000, further strengthened policy support for E-Government. This accords legitimacy for electronic transactions. Under this policy, electronic data messages and documents are considered as having the legal effect, validity or enforceability as any other document or legal writing.

The Philippine Strategic ICT Roadmap 2006-2010 was crafted to update the GISP. The roadmap pointed towards the attainment of an information society that is inclusive, people-centered and development-oriented. In this regard, ICT is considered an essential driver of economic development. The information society is expected to supply relevant digital content and secure a trustworthy online ecology. The roadmap stressed the role of E-Governance, Cyber-Services, Infrastructure Investment, and Human Capital Development (ICTO 2013).

Similar to the GISP and the Philippine ICT Roadmap, the Philippine Digital Strategy 2011-2016 echoed the key role of ICT in fueling development. The strategic plan, drafted by the Commission on Information and Communications Technology (CICT) in 2011, fostered the vision of a connected and networked society empowered by ICT. Similar to the GISP and the Philippine ICT Roadmap, the Philippine Digital Strategy is aligned with the Philippine Development Plan where ICT is expected to promote economic growth and the efficient delivery of public services (CICT 2011).

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

Network preparedness measures the level of Internet use and a subscription to broadband and mobile cellular services. As reported in www.Internetlivestats.com, the Internet penetration rate per 100 people in the Philippines climbed from 37 percent in 2013 to 43.5 percent as of July 2016. This is equivalent to more than 44 million Internet users (DICT 2017a.)

Recent trends indicate that mobile Internet use had expanded. In contrast, the volume of SMS messages had receded. The country is moving away from being the texting capital to becoming the social networking capital of the world. This signifies the migration from one form of the communication medium to another. OpenSignal estimated that 68.63 percent of Internet users could see a 3G or 4G (or better availability) signal. The OpenSignal measurement further showed that 44.14 percent of the time the users were connected to the Wi-Fi rather than the cellular networks (DICT 2017a).

In the 2016 Annual Report of the Broadband Commission for Sustainable Development, the Philippines was ranked at 110 out of 187 member states of the International Telecommunications Union (ITU) member states regarding active fixed broadband subscription. The country has 3.4 fixed broadband subscriptions per 100 people in 2015. This pales in comparison to the 41.58 active mobile broadband subscriptions per 100 people for the same year. The Philippines placed 89 out of 179 ITU member states for active mobile subscription. This indicates that mobile broadband access is more prevalent as a mode for online connectivity (DICT 2017a).

In a study of digital, social media, and mobile usage around the world, it was revealed that 43 percent of Filipinos use laptop or desktop computers to access the Internet. A huge portion has mobile phones which constitute 87 percent of the population, while 55 percent own smartphones. The study also discovered that 47.13 million Filipinos are active Internet users while 35.7 million use mobile devices in accessing the Web. There are 75.4 Million unique mobile users while its mobile connection is approximately 119.2 Million. The number of connection per unique mobile user is 1.58. Those who use prepaid subscription total 95 percent, and 47 percent of the mobile subscriptions are Mobile Connection Broadband (DICT 2017a).

Concerning the frequency of Internet usage, it is estimated that 46 percent of Filipinos use the Internet daily while 30 percent use it once a week. Further, 16 percent use the Internet once a month, and 8 percent use it less than once a month. There are around 48 million active social media users in the country and 41 million of this access social media through mobile devices. The heaviest Internet users come from 20 to 29 years old age group. The infrequent users are those who are 60 years old and above (DICT 2017a).

4.2   Management Optimization [MO]

Management optimization indicates the utilization of ICT for enhancing government business processes. It optimizes the effort to integrate the silo of business processes using ICT. Under the E-Government Master Plan (EGMP), the development of the ICT infrastructure, applications, and shared services across the public sector was conducted through the PHP 470 million Integrated Government Philippines (iGovPhil) Project. The goal is to interconnect government agencies and foster collaboration among them to enhance the speed, efficiency, and transparency of citizen and business transactions (ICTO 2013).

The iGovPhil started in June 2012 as a flagship project of the Department of Science and Technology (DOST) and administered through its attached agencies, namely the Advanced Science and Technology Institute (ASTI) and the Information and Communications Technology Office (ICTO). This is constituted by various components across several offices and will interconnect the current online services of the 98 national government agencies (NGAs) utilizing a network of fiber optic cables that traverse from Metro Manila to Cebu. The NGAs will be linked physically by fiber optic to be laid down along the three metro rail lines (LRT 1 and LRT2, and MRT). Many NGAs are clustered in cities where the train systems run (NCC and NIPA 2012).

As an implementation strategy, the Medium-Term ICT Harmonization Initiative (MITHI) focuses on the interoperability, collaboration, and resource sharing among government offices. This emphasizes the importance of setting up basic national electronic registries to assist interoperability measures. MITHI prioritizes interoperability but does not exclude mission-critical, agency-specific applications to enhance public service provision (ICTO 2013).

In 2016, the Department of Budget and Management (DBM) allocated PHP 4.33 billion to finance 145 new projects identified through the MITHI mechanism. These include 39 projects worth PHP 631.7 million for frontline agencies to put up online services. A critical project costing PHP 1.32 billion aims to provide free Internet connectivity across the nation by building the infrastructure required to provide WI-FI access in town plazas, public schools, and libraries, government hospitals and health centers, and other public spaces (DBM 2016a).

As additional support to optimize the provision of fast and free Wi-Fi access in public places, the amount of PHP 3.6 billion was allocated to the newly-formed DICT in 2017. The agency seeks to provide 19,023 beneficiary sites with WI-FI connectivity during the year. This represents a hike from the 2016 target of 14,684 beneficiary sites. Further, the amount of PHP 463 million is earmarked for the improvement of ICT operations in 359 government agencies to render speedy, efficient, and transparent services to citizens through the National Data Center Infrastructure (DBM 2016b).

In previous years, the inability of the government to use the budget allocated for the ICT sector was evident. The utilization of the E-Government Fund, for example, was characterized by gross underspending. It was estimated that only 30 percent of the fund was used annually. This contributes to the ineffective implementation of the GISP as resources are not effectively harnessed to achieve policy results (NCC and NIPA 2012).

4.3 Online Service [OS]

Online services are provided through the Integration of business processes, policies, procedures, tools, technologies, and human resources to support both assisted and unassisted customer services using ICT networks. One of the key online services developed in the country is E-Procurement. The Philippine Government Electronic Procurement System (PhilGEPS) is an electronic bulletin board and web portal of government procurement bid notices and awards. It contains all procurement processes related to bidding, contract agreements, and payment for supplies and services. The single window system simplifies government procurement through an Internet-based platform. The system is being redesigned to achieve transparency in all stages of the process from procurement planning to project management and contract implementation. The PhilGEPS will be linked with the Government Integrated Financial Management Information System (GIFMIS) to streamline budget and expenditure tracking.

Online services and one-stop shops are applied in efforts to ease the cost of doing business. In 2012, the Department of Interior and Local Government (DILG), DTI, and the ICTO launched the Business Permits and Licensing Services (BPLS) Automation Project. It sought to computerize the BPLS in all cities and municipalities. In coordination with the Local Government Academy, LGUs were trained in streamlining business registration processes using the prescribed standards. In 2016, the DTI, DILG, and DICT released a Joint Memorandum Circular mandating LGUs to submit a unified application form with only two signatories. Under the circular, LGUs are asked to trim down the processing time of business registration to two days and renewals to one day, with a maximum of three steps or less in terms of procedures for both new applicants and renewals (DBM 2017).

An online service platform that is being redeveloped is PhPay. This Internet-based payment facility will enable citizens and businesses to remit payments electronically to government agencies. It renders services through various delivery channels, which include debit instructions (ATM accounts), credit instructions (credit cards) and mobile wallets (SMS). The online payment service will reduce the need for face-to-face transactions thereby limiting opportunities for corruption.

4.4 National Portal [NPR]

The National Portal is the basic interface for stakeholders to access government information. As the official journal of the Republic of the Philippines, the Official Gazette provides a unique platform for publishing government documents, statements, and

announcements. It functions as the National Government Portal (NGP) which is a unified interface in the form of a one-stop source for information and service delivery.

The NGP is seen as a gateway that gathers all web-based government content to maximize efficiency and deliver swift and high-quality service to citizens. The single website platform effectively lessens costs compared to maintaining multiple sites. For citizens, business or government users, this means access to reliable online public information and services. The design of the NGP allows Government-to-Government (G2G), Government-to-Citizen (G2C), and Government-to-Business (G2B) services to occur in one venue. In addition, the NGP helps to unify the Philippine Government under a singular online identity.

4.5   Government CIO [GCIO]

The Government Chief Information Officer (CIO) exercises leadership and governance capacity to supervise the implementation of ICT programs to improve public services. The CIO aligns ICT investment so that the balance between the applied business strategy, organizational change, and government transaction reform is achieved. Implementing E-Government is complex and requires not only a vision and a plan but also strong leadership at the highest level. Since the goal of E-Government is greater efficiency and transparency in the provision of public goods, institutional reforms are needed (Magno 2010).

In 2016, Republic Act No. 10844 was passed creating the DICT with the mandate to serve as the primary planning, coordinating, and administrative entity to implement the national ICT development agenda. The establishment of a permanent Department signals the institution of regularity in the exercise of excellent leadership in the e pursuit of ICT development and E-Government programs. The law provides for the creation of a CIO Council which shall consist of CIOs with the DICT Secretary serving as the Chairman. The CIO Council will assist the Department in the implementation of government ICT initiatives.

The EGMP provides for the formation of a Corps of CIOs. The CIOs are assigned and deployed to national and critical government units. They are tasked to advise agencies on how best to leverage ICTs to optimize the delivery of public services and achieve efficient and cost-effective operations. They are responsible for developing, maintaining and managing the agency's Information Systems Strategic Plan (ISSP). The CIOs will manage and supervise the implementation of ICT-based projects, systems, and processes. They will formulate and implement a Process Transformation and Change Management Plan about the adoption of ICT-based solutions. They are expected to manage operational risks related to ICT in coordination with the agency's management and stakeholders and ensure that the ICT programs and operations are consistent with national policies and standards (ICTO 2013).

The pool of CIOs will be provided institutional support through service groups that will render technical and administrative support for E-Government projects, including the National ICT Governance Service, Systems and Infrastructure Development Service, Systems and Infrastructure Management Service, National ICT Competency Management Service, and Administrative, Financial and Management Service (ICTO 2013).

4.6   E-Government Promotion [EPRO]

E-Government promotion is evaluated by looking at the legal parameters, enabling mechanisms, support systems, and assessment programs. The previous laws that

supported E-Government promotion such as the Electronic Commerce Act of 2000 provided legal recognition to digital signatures, documents and data, and can be used for transaction purposes. Nevertheless, these measures are geared more towards promoting E-Commerce rather than E-Government. The legislation of the DICT Act of 2016 represents a big step in institutionalizing public support for E-Government. Under the law, the DICT has the power to design an integrated framework to optimize all government ICT resources and networks for the identification and prioritization of E-Government systems and applications as provided in the EGMP and the Philippine Development Plan.

The creation of the DICT serves as a robust enabling mechanism for E-Government. In the past, there were issues regarding the continuity of E-Government programs as the governance body for ICT matters changes with the election of a new president. The ITECC, which was an inter-agency council coordinated by the Department of Trade and Industry during the Estrada presidency, was replaced by the CICT. In turn, the CICT which was a commission formed through an executive order issued by President Arroyo was abolished and its functions assumed by the ICTO which was an office of the Department of Science and Technology during the Aquino administration. With a permanent agency now in place, there is greater confidence in the sustainability of E-Government reforms.

The government use planning tools such as roadmaps, assessment reports, and master plan to guide the development of E-Government programs. As a master plan, the current EGMP is a blueprint for the integration of ICT for the whole of government. It builds on past plans and acknowledges that the issue of government interoperability and harmonization is not solely a technical problem, but includes many organizational concerns. As such, the plan describes the systems of governance that need to be strengthened for the effective implementation of E-Government programs and projects (ICTO 2013).

E-Government promotion was also carried out through budget support mechanisms such as the E-Government Fund (EGF). The facility was created to finance mission-critical, high-impact cross-agency projects. The EGF was initially created under the General Appropriations Act (GAA) of 2003. The fund was set up by allocating 2 percent of the capital outlays and maintenance and other operating expenses of each government agency for E-Government projects. This amounted to around PHP 4 billion. In 2004, Executive Order No. 269 mandated the institutionalization and inclusion of the EGF in the annual budget. Since its institutionalization in the national budget, the allocation for the EGF designed has amounted to at least PHP 1 billion annually. For the 2014 budget year, the EGF allocation reached PHP PHP 2.48 billion (Disini Law Office 2015).

The government used assessment and benchmarking techniques for E-Government promotion. In 2012, a joint report called the Electronic Government Development and Strategy: Assessment, Research, Strategy, and Implementation Plan were produced by the National Computer Center and the National IT Industry Promotion Agency of South Korea. It provided an analysis of existing policies and regulations, organizational systems, education levels, ICT infrastructures, front and back office operations, and critical information requirements. Projects for priority implementation were determined based on key criteria such as level of importance and urgency, the degree of innovation, and ease of Implementation (NCC and NIPA 2012).

An assessment of the positive gains from innovation can contribute to E-Government promotion among local governments. In several cases, city governments cited ICT for contributing to the accuracy of records, increases in tax collection and other income, and

improvements in efficiency, accountability, and transparency (Iglesias 2010). The more successful LGUs are those who are open towards engaging in initiatives that are performance-based rather than doing things only for procedural compliance (Magno 2010). Assessment programs can also be linked to performance awards as a means for E-Government promotion. For example, the Excellence in ICT for Good Governance for LGUs (E-Gov Awards) has been going on for the past seven years. This annual search recognizes the local governments with the best practices in applying ICT towards the effective and efficient delivery of public services.

4.7   E-Participation [EPAR]

E-Participation refers to ICT-enable participation in governance processes. It focuses on the demand side of E-Government in terms of how people are using digital platforms. To foster e-Participation, digital inclusion initiatives are needed. Digital inclusion seeks to address the digital divide problem which is considered as a phenomenon where certain groups, based on social, demographic, and geographic factors, are at a disadvantage due to lack of access or facility with ICT (Bannister and Leahy 2014).

There are ongoing initiatives at both the national and sub-national level to strengthen the E-Participation aspect of E-Government in the Philippines. The DICT is developing the E-Participation through the National Government Portal (www.gov.ph) Program as a commitment under the Philippine Open Government Partnership (PH-OGP) National Action Plan 2017-2019. Under the program, a set of online tools will give citizen access to government information, space for consultation, and a platform for collaboration. It has three main components. The first is E-Information which equips citizens with open data and public information. The second is E-Consultation which solicits inputs from citizens on public deliberations on policy issues. The third is E-Decision Making which encourages citizens to co-design and co-produce public goods and services.

The National Government Portal endeavors to heighten citizen participation in public policy and service provision by deploying E-Participation tools. The plan is to launch www.gov.ph with at least five of the following priority services of the government: (1) essential services, (2) Voting Services, (3) taxation services, (4) education and scholarships, (5) civil services, job openings, and trainings, (6) business registration, (7) investing, (8) OFW services, (9) housing, and (10) citizenship and migration. A centralized e-consultation platform on www.gov.ph will be developed with tools for online petition tool, online policy consultation, and citizen feedback.

At the sub-national level, the Open Legislation Platform through Social Media and Website in the provinces of Albay, Bohol and Surigao del Norte is being developed as an E-Participation mechanism. It is also part of the Philippine Open Government Partnership (PH-OGP) National Action Plan 2017-2019. In the existing local legislative process, citizens can only provide feedback on a limited number of ordinances through public hearings. Thus, most people lacked awareness of the ordinances passed in the Sanggunian or local legislative assembly. Participation in public hearings is limited due to lack of interest among the constituents as well as the inaccessibility of the venue. Although civil society organizations are members of the local particular bodies, their participation in local legislation remains weak.

The Open Legislation Platform will supplement local participation in Sanggunian committee hearings and public assemblies. It aims to leverage technology to improve participation. Social media, such as Facebook, is viewed as an accessible medium for citizens. This online mechanism will open up opportunities for citizen engagement with elected officials in local legislation.

In the area of digital inclusion, a key strategy employed by the Philippine government has been the establishment of Community E-Centers (CECs). Investments in this enterprise since 1999 have resulted in the expansion of Internet penetration through the common access points provided by the centers. The creation of CECs as well as cyber cafes that serve outlying provinces and municipalities was driven. Declining investment costs for Internet services led to the expansion of CECs and cyber cafes in the outlying municipalities (Lallana and Soriano 2008).

The setting up of CECs in rural areas was meant to foster the social inclusion of farming communities by enabling them to use the Internet for development gains (Magno 2014). In 2005, the e-Agrikultura Project (Agricultural Growth through Information and Knowledge Networking) was pursued in six provinces. In the CECs, members of the farmers' cooperatives were trained to access the Pinoy Farmers Internet site that allowed them to acquire information on farming technologies, crop diseases, appropriate seeds to plant, and ways to optimize crop yields. Farm income increased and promoted diversity in livelihood opportunities (Barrios, Lansangan and Daquis 2011).

Digital inclusion efforts received further policy support with the passage of Republic Act No. 10929 or the Free Internet Access in Public Places Act on August 2017. The law highlights the need to strive towards the full realization of the right to Internet access as a basic human right. It promotes social inclusion through ICT-enabled citizen participation. The policy aims to provide online government services to Filipinos, especially those living in the countryside who have limited or no access to the Internet.

4.8   Open Government Data [OGD]

Open government data concerns information that can be freely used, reused and redistributed. The released data is available online to allow the public to access it without having to pay fees. In 2013, the Office of the Presidential Spokesperson (OPS), Presidential Communications Development and Strategic Planning Office (PCDSPO), and Department of Budget and Management (DBM) formed the Open Data Policy (ODP) Task Force to begin dialogues and engage partners in the transparency initiative.

The ODP Task Force coordinated with the different government agencies to facilitate the publication of government datasets, harmonize existing portals, formulate data disclosure policies of the government, and deepen engagement with stakeholders, such as the academe, developers, civil society, media and private sector (DBM 2013). The Open Data Portal at www.data.gov.ph was launched in 2014. For the past three years, the government has been able to upload more than 3,300 data files on public expenditures and other information from the various agencies. Formerly housed at the Department of Budget and Management (DBM), the Open Data platform is now lodged at the DICT (Magno 2017).

At the sub-national level, the Full Disclosure Policy (FDP) Portal serves as the open data platform of the Department of the Interior and Local Government (DILG) to promote transparency and accountability among LGUs. The FDP requires local officials of provinces, cities, and municipalities to fully disclose the financial transactions of the LGUs to keep their constituents informed on how the LGU budget is managed and disbursed. The data must be posted in at least three conspicuous places and the FDP Portal. LGUs may also post the information in print media and in their respective websites.

The weakness of the transparency effort lies on the demand side. It was recommended that the government should provide a dedicated feedback channel within the Open Data Portal for key stakeholders such as CSOs, media, and citizens to identify and request

datasets. Transparency is not just about placing documents online, but also responding to citizen demands for information that matters. Otherwise, the data disclosed simply depends on the choice of current officials (Mangahas, 2013).

The active use of open data to monitor public services is crucial in addressing the transparency deficit. It is important to put up feedback loops to engage citizens and other stakeholders in the co-creation and delivery of services, as well as the development of response networks, to maintain a lively ecosystem of open data users. There is a need to encourage sustained third-party creation and submission of data visualizations through building the data literacy of information designers and providing useful links to infographic applications. An engaged academic community can conduct independent reviews of open data initiatives and help strengthen civil society audits of public performance. ICT developers and start-up communities can conceptualize practical mobile applications related to government information sharing and tracking public service provision (Capili 2015).

4.9 Cyber Security [CYB]

Cybersecurity is assessed by looking at how the government is able to protect the security properties of the organization and user assets against relevant security risks. Addressing these risks become urgent given the dark forces in the online world. On February 2016, the SWIFT (Society for Worldwide Interbank Financial Communications) payment system of the Bangladesh Bank was hacked. Fraudulent instructions were sent to the New York Federal Reserve Bank to transfer funds to multiple accounts in the Philippines amounting to USD 101 million. A forensic investigation discovered that malware was installed in the bank's system and was used to gather information on the procedure used by the bank for international fund transfers.

The Department of Justice recorded 614 cybercrime incidents in 2014. Hacking of government websites is common. The government must work closely with the ICT sector in building a robust and trustworthy digital environment (Magno 2016). On March 2016, the server of the Commission on Elections was hacked by Anonymous Philippines in which at least 54 million sensitive data were leaked into the web. The suspect was arrested by the National Bureau of Investigation after the Internet Protocol address used was tracked down. In 2016, at least 68 government websites were subjected to attacks including attempts of hacking, defacement, and Distributed Denial of Service or DDoS (DICT 2017b).

The newly created DICT is mandated to address cybersecurity issues. The Cybercrime Investigation and Coordination Center (CICC), which was formed through the Cybercrime Prevention Act of 2012 (Republic Act No. 10175), and the National Privacy Commission, which was created through the Data Privacy Act of 2012 (Republic Act No. 10172), joined the DICT as attached agencies. The DICT will implement a comprehensive National Cybersecurity Plan and institutionalize the adoption of information security and risk management approaches. It is tasked to ensure the rights of individuals to privacy and confidentiality of personal information, guarantee the security of critical information infrastructures, and safeguard the security of information assets of the government, individuals and business (DICT 2017b).

The DICT will render technical support to government agencies in the development of guidelines in the enforcement and administration of laws, standards, rules, and regulations governing cybersecurity. It is authorized to issue updated security protocols to all government employees in the storage, build public-private partnerships for information sharing involving cyber attacks, threats, and vulnerabilities to cyber threats,

and establish linkages for coordination on domestic, international and transnational efforts related to cybersecurity (DICT 2017b).

After establishing the baseline results for cybersecurity assessment and compliance, government agencies are expected to participate in national cyber drills and exercises. Currently, the country has no single authority that manages a national database and monitors threat reports, including intrusion attempts and other computer incidents. The data remains in a silo with different agencies. A national database for monitoring and reporting will be set up. A program for a national computer emergency response program will be created with guidelines to aid government agencies in the event of a cyber attack. Chief Information Security Officer (CISO) programs will be instituted in government agencies and LGUs. The government will engage with the academy to support the development of cybersecurity specialists through education and training programs. A long-term goal is the establishment of a Threat Intelligence and Analysis Operations Center to house the research and development program on cybersecurity (DICT 2017b).

4.10 The use of Emerging ICT [EMG]

The use of emerging ICT aims to improve E-Government quality in the Philippines. A key innovation is Cloud computing. It is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources, such as networks, servers, storage, applications, and services, that can be rapidly provisioned and released with minimal management effort or service provider interaction. Among its features are on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service. The initial Government Cloud (GovCloud) infrastructure was set up in 2013 by ICTO, which was then under the Department of Science and Technology, as part of the Integrated Government Philippines (iGovPhil) Project which aims to provide cloud infrastructure access to government agencies. GovCloud will provide a platform that Govmail, public key infrastructure (PKI), payment systems, records management, and other hosting and communications services will be operating on (ICTO 2013).

On January 2017, the DICT issued a memorandum circular addressed to both national agencies and local governments prescribing the Philippine government's Cloud First Policy. The policy is aimed at reducing the cost of government ICT, improving employee productivity, and crafting better citizen online services through the utilization of cloud computing technology. Various governments such as the United States, Australia, and the United Kingdom have enacted similar Cloud First Policies. To pursue its Cloud First Policy, the DICT relaunched GovCloud on March 2017. Through GovCloud, agencies will be able to share resources, hardware, and software over the network connected to the data center. It is expected to lead to inter-agency collaboration, operational continuity and business recovery, faster deployment of services, greater budget control and decreased spending on legacy infrastructure (Reyes 2017).

The DICT awarded the PHP 373 million build, operate and transfer (BOT) cloud solution project to the Vibal Group, a cloud and education technology company. GovCloud would execute a hybrid cloud strategy that would use both the private and public cloud. The creation of a private in-country data center would ensure data security, while the off-premise public cloud would make online information and services available to government agencies (Reyes 2017).

5   Some Highlights

The Philippines posted strong and sustained economic growth rates for the past several years but has fared poorly in investing enough for public infrastructure and services. The government is determined to answer the problem of budget underspending and will leverage technology for more efficient public spending (Diokno 2017). This presents a good opportunity to improve the utilization of the E-Government Fund and the effective implementation of ICT projects in the public sector.

Studies indicate that a major barrier towards E-Government is the bureaucratic culture that is averse to risk and resistant to change (Lallana, Pascual and Soriano 2002). Measures can be made to enhance performance incentives, grants, and bonuses that are tied up with accomplishing the results criteria for E-Government.

The continuity of E-Government reforms has been hampered in the past by the absence of a top-level agency that is formally dedicated to govern and oversee ICT policies and programs. The passage of the law creating the DICT in 2016 fills a critical institutional gap. Under the policy, the development of a pool of CIOs will provide the leadership needed for managing E-Government programs at both national and sub-national levels.

Under the new policy architecture, the Philippines can now transition from the non-integrated and agency-specific applications toward an E-Government model where there is sharing of data and interoperability of government offices to provide public services with better value for citizens. The membership of the country in the Open Government Partnership has led to the design of online services that leverages technology to promote participation, transparency, and accountability.

There is a need to develop the demand side of open data and policies. Citizen oversight and monitoring of public services can be strengthened with information intermediaries who can analyze the information made available in online transparency portals. The government can engage universities as knowledge partners in capacity building for CIOs and research programs for tracking E-Government progress.

Poland

1   General Information

Area: 312,685 km^2

Population: 38,562,189

Government Type: Parliamentary Republic

GDP: $26,400

Internet User: 73.3

Wired (Fixed Broadband User): 19.5

Wireless Broadband User: 60.2

2   Positioning in a Global Organization and a Region
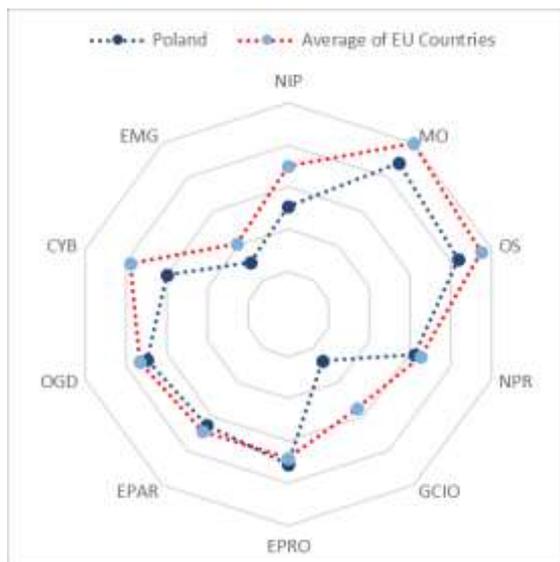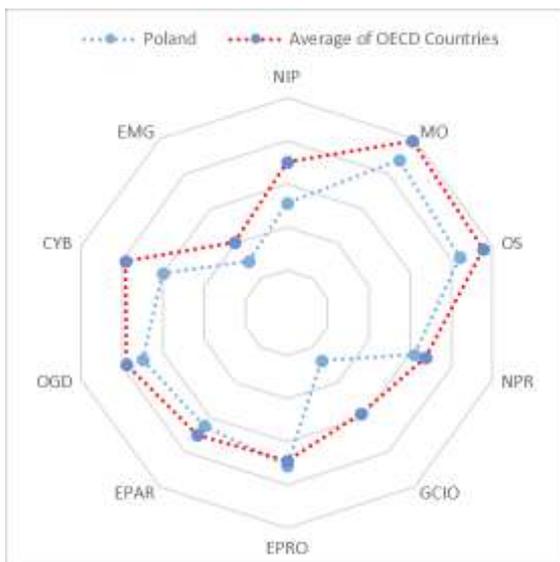
3   Digital Government Development

With Minister of Digital Affair's Department effort, Geo-Information policy was signed and came into effect for Poland's future Geoportal. In February 2017, the Polish government announced a new mid-term government strategy instead of National Development Strategy 2020 responsible for the development included such as major trends, the concept of development and so on. "Government Plenipotentiary for Digital Single Market" was filled by Ministry of Digital Affairs-based deputy minister, it aims to improve access to goods and services; build up a new legal framework for digital networks. A test of mDocuments was successful don by three polish cities included (Ełk, Koszalin, and Łódź) on April 2017, an agreement of this event was signed by three towns' mayor and Ministry of Digital Affairs. The purpose of this test was collecting citizens' evaluation of proposed solutions and figured a solution for ensuring the implementation of mDocuments.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

From the International Telecommunication Union (ITU) 2017 report, there was about 73.3% of the overall population considered as internet users in 2017 compared with 68% last year. 19.2 per 100 inhabitants have fixed-broadband subscriptions. 80.1% of households have one computer, and 80.4% of people have internet access at home.

4.2 Management Optimization [MO]

The Programme for Opening Public was adopted on 20 September 2016 by the Council of Minister, it was the first governmental document especially for the opening of public data. The program increases transparency of public administration and improves quality and quantity of available data. Within the National Integrated Informatisation programme 2020, a state model called optimum 2.0 was facilitated to improve public services among national and local levels government that will be improved by the growth of digital technologies. Computerization among citizens and businesses will be promoted through optimum 2.0.

4.3 Online Service [OS]

The score of online service based on the central government infrastructure components for citizens and companies included such as e-Customs, e-Education, and One-Stop Service. Level of security, level of complexity and level of convenience will be significant indicators to analyze its services.

With government continue the effort, there are dozens of accessible services to companies and citizens provided by the public administration. The primary service fields for citizens are as follows, travel, work, and retirement, vehicles, residence formalities, education and youth, health, family, and consumers. The primary service fields offered to businesses as follows, start and grow, VAT and customs, selling broad, staff, product requirements, finance and funding, public contracts and environment.

In terms of complexity level, Polish government did an excellent job of avoiding one-way interaction among those services fields. The site does not only offer information to users and able to interact with users. All sites had robust security measurements like SSL and password protection. The Table is the list of significant online service and its URL.

4.4 National Portal [NPR]

The score for National Portal is based on three factors Information, Technical, and Functionality. ePUPA portal and Gepportal are two significant portals allowed institutions to offer services to the public. It is a web allow citizens and businesses to take care of official matters without ant costs. The Geoportal with the function of searching, exploring, downloading and converting to users with land-related data and information within Poland.

4.5 Government CIO [GCIO]

The Ministry of Digital Affairs takes responsibility as government CIO, and there isn't any sign of government CIO will found. The Ministry of Digital Affairs is currently in charge of internet security, infrastructure and support the creation of web content.

4.6 E-Government Promotion [EPRO]

For promoting the ICT in Poland, the government introduced much act like an act of 23 March 2017, it allows citizens to handle cases with administration without leaving

home. Associated with other acts and strategy, the Polish government aims to build a great ICT environment for citizens and businesses with substantial protection.

4.7   E-Participation [EPAR]

The program for opening Public Data document was a first official document in Poland especially for the opening of public data. The primary purpose of the document is help improve data's quality and quantity, on the other hand, it increases bureaucracy transparency and E-participation.

4.8   Open Government Data [OGD]

Along with the National Development Strategy 2020, the Efficient State strategy of 2012 committed to open government data. Also in EU context, the Public-Sector Information (PSI) was issued in 2003 demand member states open its data to the public.

4.9   Cyber Security [CYB]

In 2017, the Polish government issued The National Framework of Cybersecurity Policy of the Republic of Poland for 2017-2022. This framework aimed to raise the level of cybersecurity in the Republic of Poland, including the Policy for the Protection of Cyberspace of the Republic of Poland which was introduced in 2013.

The specific objectives of the National Framework of Cybersecurity Policy are (1) Increase capacity for nationally coordinated actions to prevent, detect, combat and minimize the impact of incidents which compromise the security of ICT systems vital to the functioning of the state, (2) Enhance capacity to counteract cyber threats, (3) Increase the national potential and competence in the area of security in cyberspace, and (4) Build a strong international position of the Republic of Poland in the area of cybersecurity[14].

In July 2018, the Polish Parliament passed the Act on the National Cybersecurity System (ANCS). The ANCS introduced a national cybersecurity system, which includes the biggest service providers from various sectors in Poland, as well as governmental and local administration. This act aims to create an efficient and secure system which increases the level of cybersecurity in Poland.

4.10   The use of Emerging ICT [EMG]

Poland Government also issues social security benefits, it includes Unemployment benefits, Child allowances, Medical costs, passport and driver's license, Car registration, Certificates (birth, marriage) but some of them had information only without transactions.

Regarding the e-Health system, The National Health Fund has implemented a public information system of waiting list length and waiting times for health services at healthcare providers – available in all regional branches of the National Health Fund. Some healthcare providers have implemented appointment systems (mostly semi-interactive: the hospital has to call back the person who has filled in the form)

"Computerization of Local Government Bodies using cloud computing" builds for integrated eAdministration services to the public from Electronic Platform for Public Administration Services(ePUAP). The Polish government also encouraged STAP for linking central government with local government.

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[14]   https://www.enisa.europa.eu/topics/national-cyber-security-strategies/ncss-map/strategies/govermental-program-for-protection-of-cyberspace-for-the-years-2011-2016-2013/@@download_version/f28127b284314cc3b1ebec2946761ea9/file_en

5   Some Highlights

The Poland E-government raking jumps from 42 in 2014 to 36 in 2016; the government already noticed the significant contribution coming from ICT to economy and citizens expectation. From early 2000, the government is continuing implement acts and strategy helps ICT development. For example, during February 2017, Minister of Digitisation Anna Streżyńska announced once-only principle (OOP) that will add to the Emp@tia portal. With the new OOP services, government service will available anytime including weekends. Government is applying the OOP to more series that will facilitate modernizing speed. The Digital Affairs Ministry released Draft Cyber-Security Strategy strengthen Poland's cyber-security by 2022. Plenty of projects was financed with sufficient resources by government and ready for improving cyber defense compatibility. With well-deployed infrastructure and long government vision, the Poland E-government will continue overgrowing.

Portugal

1 General Information

Area: 92,090 km^2

Population: 10,825,309

Government Type: Republic; Parliamentary Democracy

GDP: $27,800

Internet User: 74.6

Wired (Fixed Broadband User): 31.5

Wireless Broadband User: 109.2

2 Positioning in a Global Organization and a Region
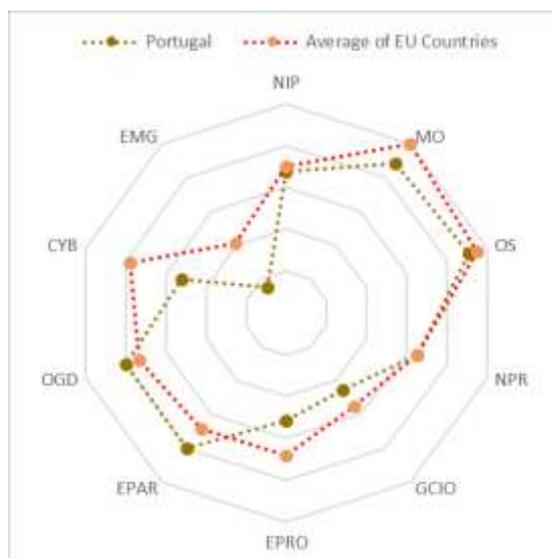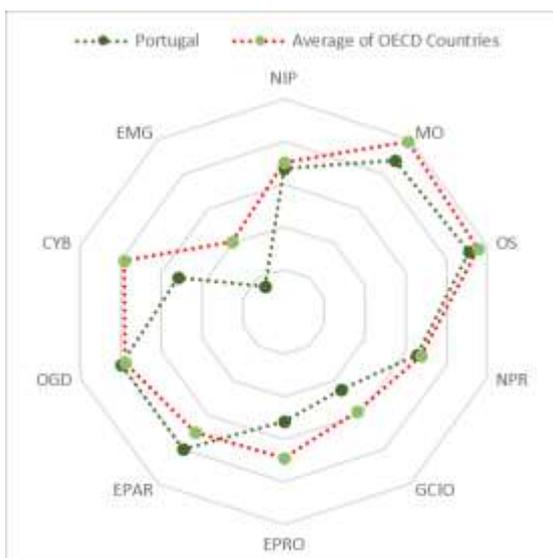
Among OECD Countries, all indicators except National Portal (NPR), GCIO and the use of Emerging Technologies for government (EMG) indicators are above or same with the average score of OECD members. Amongst European countries, Portugal is placed below Denmark. However, as other European countries, the e-Participation (EPAR) indicator of Portugal is the same level as those of Denmark, the best country in Europe region.

3 Digital Government Development

The Portuguese e-Government Development Strategy is coordinated at the level of the Presidency of Council of Ministers, by the Minister of the Presidency and the Administrative Modernization, and undertaken by a series of vital public institutions led by the Agency for the Administrative Modernization (AMA). This strategy will be carried out by the new Simplex Program, under the motto A STRONG, INTELLIGENT and MODERN STATE. In addition, AMA is a public institution that took over the

responsibilities in the areas of modernization and administrative simplification as well as e-Government (formerly under the Agency for Knowledge) in 2007.

The Portugal Digital Agenda, along with the "Strategic Plan of ICT Rationalization and Cost Reduction - PGETIC", approved by the Council of Ministers Resolution No. 12/2012, will make an essential contribution to the achievement of the national objectives in the fields of administrative modernization. Therefore, the Portugal Digital Agenda no longer focused only on Government action and public administration, and also have an active involvement and participation of civil society and the private sector, in particular, of the entities related to the ICT sector.

In March 2014, Portugal launched the National Administrative Modernization Strategy (PGETIC). It is based on the digital by default principle in order to reduce the bureaucratic burden on citizens and economic operators, by introducing transparency and efficiency and reducing the constraints generated by the slowness of different procedural acts. In addition to this effort, as means to improve the efficiency of the public sector and deploy better electronic services that simplify and enhances the competitiveness to the citizens and business, it is being renewed the strategic plan for PGETIC in the public sector started in 2012. The creation of PGETIC meant great achievements in ICT management in the Portuguese Public Administration. It provided the public sector with an extra set of tools to enhance its operation, and represents the beginning of a global plan towards rational use of ICT resources, with a flexible and resilient structure that allows addressing future challenges in a very fruitful way. The ICT rationalization measures, detailed in this plan, were targeted to ensuring, through the provision of services quality ICT, better public services at a lower cost

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

In Portugal, 74.6% of the population uses the Internet, an increase over the previous year, according to the "Measuring the Information Society Report 2016" by the International Telecommunication Union (ITU). The number of fixed-broadband subscriptions is 31.5 per 100 inhabitants, while the number of active mobile broadband subscriptions is 109.2 per 100 inhabitants.

4.2   Management Optimization [MO]

E-Government in Portugal is firmly connected to Administrative Modernization and Public Service Delivery initiatives, focusing on promoting a less bureaucratic Public Administration, cost-effective solutions and innovative public services using different counters, digital services or interoperability solutions. The national e-government strategy is available as a website, in which the framework, objectives, measures, and evaluation, among other aspects, are explicitly mentioned. The implementation and execution of the strategy are under the responsibility of the Administrative Modernization Agency (AMA), whose objective is to promote the modernization of the public administration in the country.

4.3   Online Service [OS]

The score for Online Service is based on an investigation of five online services: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service website. The Portuguese government maintains websites for all five types of e-services assessed in this survey, and all of them obtained relatively high scores. The e-tax website integrates e-customs as well, is clear and easy to use, and offers a high level of interaction with the user. Similar are

the cases of the e-procurement and e-health websites. The one-stop service website presents a search option on its main page and lists the most consulted procedures. It also provides contact information of various government agencies for users seeking support. All websites have a clean design and offer a high level of security. For authentication, it utilizes the Citizen Card service.

4.4   National Portal [NPR]

Portugal's national portal provides news and links to other government agencies on its main page and has a simple design. Necessary information about the country and information about the government and its structure is available on this website. The site also offers integration with SNS, the possibility to subscribe to a newsletter, and an option to send a message to various officials. The site is also available in English.

4.5   Government CIO [GCIO]

The legal framework related to e-government does not consider the CIO position officially. However, the government is aware of the need for a GCIO. The AMA is responsible for many of the GCIO functions, such as the promotion of ICT utilization in public administration and the implementation of the strategy. Information regarding CIO training programs was found in at least one educational institution. No additional information on CIO regulations was found.

4.6   E-Government Promotion [EPRO]

The national e-government strategy shows that the government is making significant efforts to promote e-government and optimize the procedures related to services and public administration, which includes initiatives at the national and local level. The AMA is the leading agency in charge of e-government promotion in the country. Some evidence showing that academic institutions are holding events on e-government was found. No information on publications or training programs was found.

4.7   E-Participation [EPAR]

In general, government websites demonstrate interactive functionality and functional design. These factors have driven Portugal to the next horizon of e-Government. Citizens have access to information related to government agencies and officials, legislation, and the national budget. They can also send messages to officials or the president, who has an official website. The newly redesigned SIMPLEX program seeks to increase citizen participation and improve the relationship between citizens and the government. The government also lets citizens participate in the distribution of budget through the "Portugal Participatory Budget" (OPP) program.

4.8   Open Government Data [OGD]

In April 2011, the Parliament approved legislation establishing the use of open standards in the information systems of Public Administration institutions. It is considered a fundamental step for the sovereignty of and the control over documents that public institutions own. AMA is committed to the development of a comprehensive and open platform containing all kinds of data from public bodies. The government has an open data site (http://www.dados.gov.pt/), in which an extensive range of information from very diverse areas, like demographics and health datasets, is available to citizens. Moreover, it is published and aggregated information produced by the public authorities so that it can be read and reused by any citizen.

4.9 Cyber Security [CYB]

Portugal finds itself in an initial phase of defining a National Information Security Policy. Currently, no framework for cybersecurity has been defined. A strategy for cybersecurity has not yet been approved, but a draft exists and is being discussed. Portugal has specific legislation to penalize cybercrimes through its penal code. It also has laws on data protection, e-commerce, and e-payment. There is an official government agency in charge of handling incidents related to cybersecurity, the CERT-PT, and an information security agency, the National Center for Cyber Security (CNCS).

4.10 The use of Emerging ICT [EMG]

No evidence of usage or regulations by the government of emerging technologies such as Cloud Computing, the Internet of Things, or Big Data was found.

5 Some Highlights

In recent years various efforts have been made by the Portuguese government to promote e-government, simplify public administration procedures, and increase citizen participation. Examples of this are the SIMPLEX project and the OPP program. Also, the government maintains well-designed e-services websites, which are appropriately linked and managed by the AMA, the primary agency in charge of e-government initiatives in the country. Portugal still needs to officially approve a cyber-security strategy and framework to be at the same level as other European countries on this subject. The weak point in Portugal's e-government development is the absence of an official GCIO and the use of emerging ICT. The Portuguese public administration at the national and local levels does not appoint clear CIOs or equally influential positions within its legal framework. And the usage of technologies such as cloud computing, big data, and the Internet of Things by government requires further promotion.

Romania

1 General Information

Area: 238,391 km^2

Population: 21,666,350

Government Type: Semi-presidential republic

GDP: $22,100

Internet User: 59.7

Wired (Fixed Broadband User): 20.7

Wireless Broadband User: 73.7
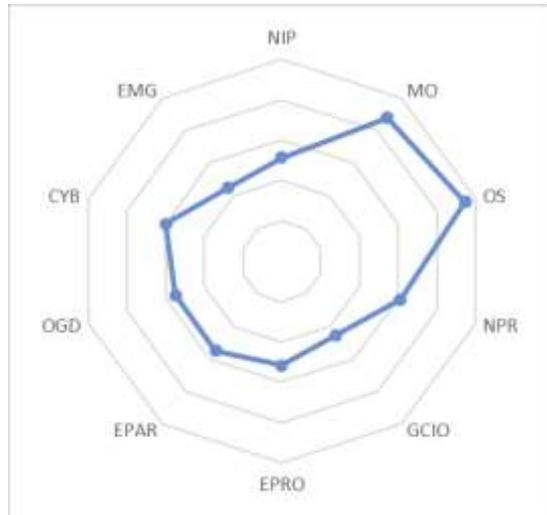
2 Positioning in a Global Organization and a Region
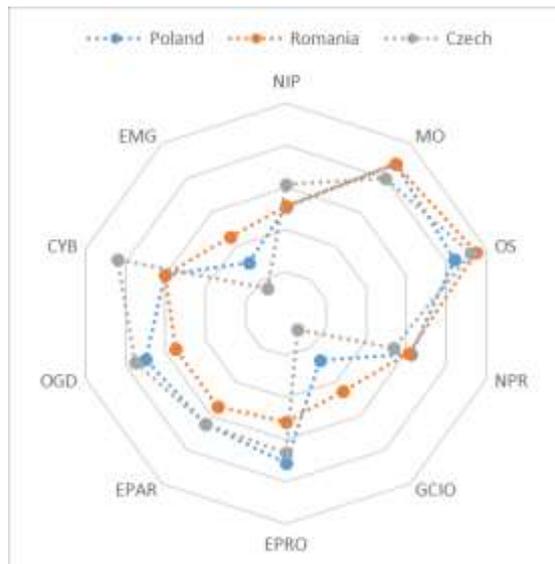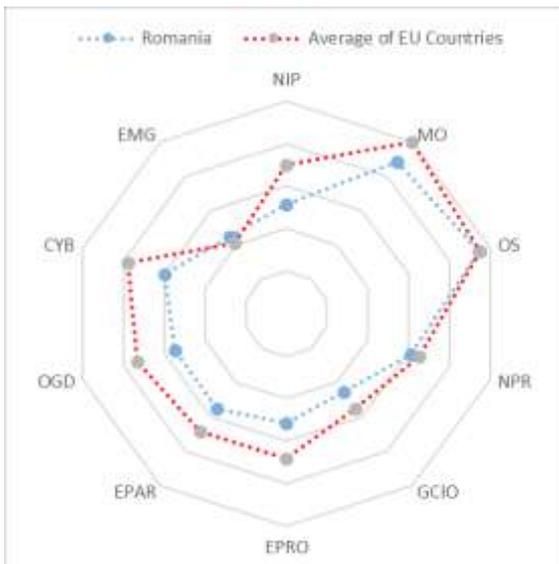
3 Digital Government Development

Romania is one of the 28 states in the European Union, and some of the basic information about Romania is listed below. In 2016, the total population of Romania was 19,759,968 inhabitants (19 million). The total GDP of the country at market prices in 2016 was 169,077.9 million Euros. The GDP per inhabitant in purchasing power standard in EU was 57 in 2015 (which the Standards of EU is 28=100). The overall GDP growth rate in 2017 was 5.5% annually, and the inflation rate in 2017 was 1.1%; the GDP growth increased from 4.8% in 2016 and inflation rate also increased from -1.1% in 2016 to 1.1%. The unemployment rate in 2017 was 4.8%, which decreased compared to 2016 with a 5.9% unemployment rate. The general government gross debt (percentage of GDP) was 38.9% in 2017 and slightly decreased from 39.1% in 2016 (knoema). The total area of the country is 238,392 kilometers squared, and the Capital is Bucharest. The official currency is Romanian leu; an official language is Romanian. Romania is a semi-presidential country that was founded in 1989, and this semi-presidential sometimes can cause

unsteady and political conflicts. The 2017 Overall Ranking from Obi's Lab, Romania ranked 38 and had a score of 55.947. Romania was ranked 20 in overall 21 European Countries that were selected.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

Generic Indicators: From the e-Government in Romania 2017, the report first pointed that the generic indicators: Percentage of enterprises with Internet access in Romania experienced a drop from over 87% in 2015 to around 84% in 2016, and with the same time, the percentage of enterprises with internet access in the European Union is consistently above 93% since 2010.

The report shows that the percentage of individuals using the internet for interacting and obtaining information with public authorities or from public authorities in Romania experienced slight drop compared to 2016, only around 7% of people in Romania use the internet to interact or search for information of the government.

4.2   Management Optimization [MO]

On December 15th, 2016, the Ministry of Communications and Information Society published the National Interoperability Framework (NIF). This NIF will support further implementation of the National Strategy for Romania's Digital Agenda 2020 (which is introduced in the 2017 Country Report from Obi Lab). This project will cooperate with the European Interoperability Framework, and will limit the costs to its minimum, and maximize the efficiency of public services to citizens and businesses.

4.3   Online Service [OS]

There are e-government services for both citizens and businesses in Romania. The groups of services for citizens are 1. Travel; 2. Work and retirement; 3. Vehicles; 4. Residence formalities; 5. Education and youth; 6. Health; 7. Family; 8. Consumers.

The e-government services for businesses are 1. Start and grow; 2. VAT and customs; 3. Selling abroad; 4. Staff; 5. Product requirements; 6. Finance and funding; 7. Public contracts; 8. Environment. In each category, there are specific introductions and related websites.

4.4   National Portal [NPR]

www.e-governance.ro is the "one-stop shop" national website, but it is relatively simple, but it can lead people to several categories of the field that they want to research, and central and local public services and forms online. Also, there is the electronic point of single contact. It allows people to retrieval all information, working procedures, and interactive forms. For the works, Romania has the national network and local communities' electronic networks available.

4.5   Government CIO [GCIO]

An individual does not play the role of CIO but rather is held by the Ministry of Communications and Information Society, through the National Center for Management of Information Society (CNMSI). There is a relatively new, private organization called The CIO Council, whose members are management staff of large national and international companies, operating in Romania.

4.6 E-Government Promotion [EPRO]

Overall, the Minister of Communications and Information Society (MCIS) is taking responsibilities for the whole digital/ e-government development in Romania. Under the leadership of MCSI, there is the Ministry of Internal Affairs (MAI), which is politically responsible for e-government. In addition, the Agency for Digital Agenda of Romania is coordinating all operating systems of e-government. Also, there is the National Institute for Research and Development in Informatics (ICI) in Romania for the technical developments.

4.7 E-Participation [EPAR]

The national portal www.e-governance.ro of Romania has improved over time. The portal is a one-stop service site for citizens. In terms of e-Inclusion, Even though an e-Inclusion dedicated strategy was never in place, it can be found in some strategies and political documents related to Information Society such as e-Romania and the National Government Plan.

4.8 Open Government Data [OGD]

Romania joined the Open Government Partnership in 2011. The government of Romania declared that it would "increase transparency, promote new technologies, and engage citizens." The National Action Plan 2012-2014 of Romania committed that:

1) Increasing public access to open data;

2) Improving the delivery of public services in electronic format;

3) Increasing citizen participation in the decision-making process.

The current commitment completion rate in Romania is 55%, including 78% of e-government, 72% of legislation and regulation, and only 39% of public participation.

4.9 Cyber Security [CYB]

In Romania, CERT-RO is the national contact point for cybersecurity and responsible for elaborating and distributing public politics for prevention and counteracting the incidents that occur within cyber infrastructures. CERT-RO processes two types of cyber-security alerts (1) Alerts collected and sent through automatic systems, and (2) The manually processed alerts.

National Center for IT incidents has been adopted in Romania, and currently, authorities are making efforts to operationalize this unit. The purpose Romania cybersecurity strategy is to define and maintain an environment virtually guaranteed, with a high degree of resilience and confidence, based cyberinfrastructure national, which is an essential support for national security and good government, to maximize the benefits to citizens, businesses and society Romanian. Cyber Security Strategy of Romania presents the objectives, principles and significant Action awareness, prevention and countering threats, vulnerabilities and cybersecurity risks to Romania and to promote the interests, values and national objectives in cyberspace.

4.10 The use of Emerging ICT [EMG]

In Romania, the Local Communities Electronic Networks (LCENs) connect local communities (schools, public offices and libraries) to the Internet. Public Access Points have been set up in each area covered by the networks. The objectives are to reduce the

rural-urban digital divide, stimulate the use of ICTs in schools, and facilitate the interaction between citizens and administration.

Local communities electronic networks covers schools, public offices and libraries to the internet, and 255 rural communities and small towns are covered, including 1.7 million (10% of rural areas) Romanians.

5   Some Highlights

Romania is added for evaluation since 2007 for the first time in Waseda e-Government ranking. Through 12 years of evaluation, we show that the development of e-Government in Romania is not stable in general strategy. The e-Government system is to be the primary tool for building an integrated national system (NES) which would be designed to be the unitary interface that connects all public administration and the citizens as well as the business sector. An individual does not play the role of CIO but rather is held by the Ministry of Communications and Information Society, through the National Center for Management of Information Society. CIO council organized the first National Conference of IT managers in Romania about the future of IT. Cyber and e-commerce legislation have been enacted. Regarding the e-Services, through the Unique Form System, there are six services online available at present, some of them are online with two-way interaction and security.

Romania has not improved much compared to it latest reports. The ranking and score of Romania remained much the same as before. The reason could be the lack of public participation and the public relations from the government.

From the action of open data participation, can conclude that Romania is still in the process of releasing government data to the public since the completion rate is relatively low even in 2018. This open data project has been launched since 2012, but not highlight progress has been made.

Russia

1   General Information

Area: 17,098,242 km^2

Population: 146,877,088

Government Type: Federation

GDP: $26,926

Internet User: 76.4

Wired (Fixed Broadband User): 19.5

Wireless Broadband User: 75
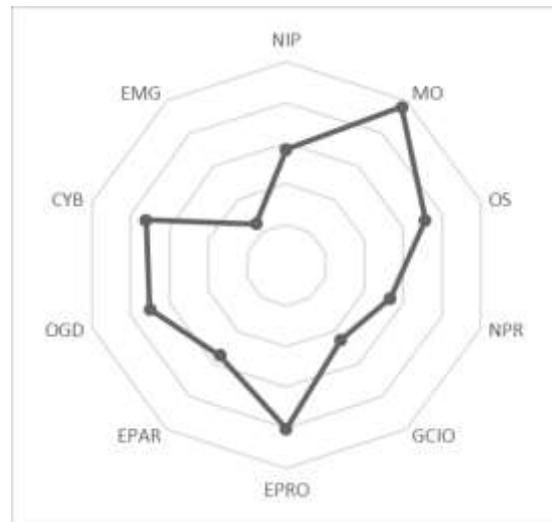
2   Positioning in a Global Organization and a Region

Russia has exceeded on indicators of E-Participation and D-Government Promotion over than not only the average of APEC economies but also than average scores of Europe countries. However, performance on indicator on GCIO was below the average in both groups.
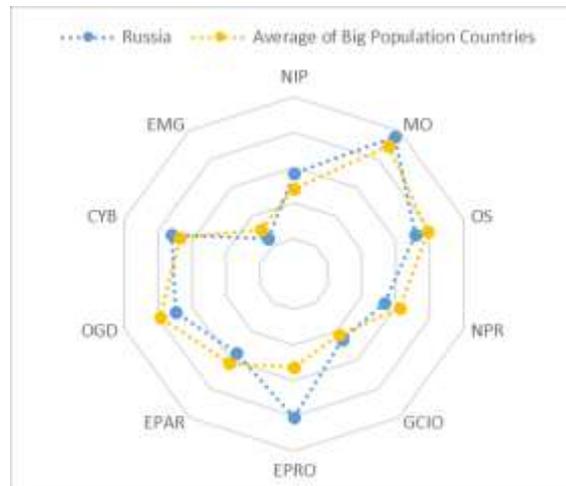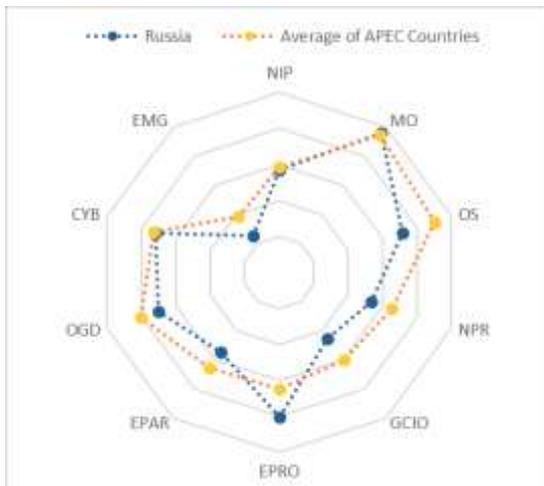
3   Digital Government Development

The latest ICT strategy called "The state programme Information Society 2011-2020" was published by the Ministry of Communications and Mass Media and the Ministry of Economic Development in Russia. E-Government and "effective stage governance" has been mentioned as one of the six objectives, including data management system, local e-Government (e-regions and e-municipalities), and so on. Other related goals contain bridging the digital gap or improving e-Service quality. In addition, the Ministry of Telecom and Mass Communications has developed the systematic approach of e-Government in 2016 to foster more e-participation content, in which user orientation has been established. To lead nation's ICT development, the Ministry of Telecom and Mass Communications has played roles of policy-making and implementation of national

policy and regulations; even there is no official GCIO position at the federal level. Some regional administrations own GCIO office, but it is not a mandatory, and functions of GCIO have not been formally ascertained by the government.

This document was adopted to new realities by "Strategy of the Information Society Development in the Russian Federation for 2017 - 2030" (approved by the Decree of the President of the Russian Federation on 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" (approved by the Resolution of the Government of the Russian Federation of 08.02.2018 No. 127)

During 2018 there was many discussions about Digital Economy, AI, Block Chain, etc. on the level of government officials and Administration of the President tops. The program "Digital Economy of the Russian Federation" was approved by order of the Government of the Russian Federation of July 28, 2017, № 1632-p. The program defines the goals, objectives, directions, and timeframe for the implementation of the primary measures of state policy to create the necessary conditions for the development of the digital economy in Russia, in which data in digital form is a critical factor in production in all spheres of socio-economic activity. For the management of the program, five basic directions for the development of the digital economy in Russia have been identified for the period up to 2024. The basic directions include normative regulation, personnel, and education, the formation of research competencies and technical facilities, information infrastructure and information security.

Resolution of the Government of the Russian Federation of August 28, 2017 №1030 "On the system for managing the implementation of the program "Digital Economy of the Russian Federation"" define the functional structure of the system for managing the implementation of the Program and the rules for developing, monitoring and monitoring the implementation of action plans for implementing the Program have been approved. The functions of the project office for the implementation of the Program are assigned to the independent non-profit organization "Analytical Center under the Government of the Russian Federation".

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

According to ITU, about 76.4% of people in Russia have used the Internet in their daily life, about 19.5% are fixed-broadband users, and the wireless-broadband users are 75.0%.

4.2   Management Optimization [MO]

The latest state programs called "Strategy of the Information Society Development in the Russian Federation for 2017 - 2030" and "Digital Economy of the Russian Federation" to stress the IT development in Russia. In the documents, it contains the plan for e-Government. Also, the Ministry of Telecom and Mass Communication of the Russia Federation has presented a document to guide e-Government path.

At present government efforts are focused on modernization of integrated enterprise network, installation of interagency electronic request system and integration of regional e-Government portals to the Unified System of Identification and Authentication. Currently, 85 out of 85 provinces in Russia are connected to Unified System of Identification and Authentication for accessing regional and municipal public services, more than 50% of Internet users have registered on the portal.

4.3 Online Service [OS]

The e-Services in Russia are currently available through integrated e-Service portal, and accessible via password-protected personal accounts requiring two-stage identity confirmation. A personal account is accessible via e-signature and universal ID card. The maturity of provided services is not uniform among the regions. Payment services such as paying utility fees, civil driver penalties are made available through a personal account on the portal in some regions. E-Tax service is not fully transactional. To use e-tax service a user is required to install special software and fill a tax form using that software. The form is then to be sent to tax authorities through the portal. Upon the confirmation of the receipt, a taxpayer is required to submit a paper-based declaration to the local tax authority.

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]

The Government of the Russian Federation appointed the Ministry of Communications and Mass Media of the Russian Federation service provider of the State Services Integrated Portal of the Russian Federation (https://www.gosuslugi.ru/foreign-citizen?lang=en). The national e-service portal of the Russian Federation has been modified and redesigned. The portal has a private password protected area which allows access to services that need personal identification. Currently, online users can access the portal to find out about the service procedures, and required documents; download forms and online applications, send requests, pay utilities and civil penalties. The portal has feedback features allowing people to inquire about the functionality of the portal and offered services. The portal has a separate version for people with vision difficulties providing a limited number of services. The portal does not allow changing font size of the text and spacing between words, and no text vocalization is provided. There is no policy statement of how the portal caters to disable users. More advanced features such as multimedia shows; sharing tagging, podcasts plus others are not available yet.

The main functionality of the national portal is available only in Russian. Opting for English, German or French languages limit the availability of services to very basic insufficient information on receiving or extending temporary and permanent residents permits. Priorities for further portal development include the increase of its usability and expansion of transactional services.

4.5 Government CIO [GCIO]

Minister of info-communications and mass media is in charge of general management of the department, 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 info-communications and mass media.

No 238-p government decree adopted on February 22, 2012, stipulates that 'Rostelecom', an incumbent telecom company, is the only contactor (executor) of D-Government program, responsible for further development and implementation of info-communication infrastructure and D-Government systems in Russia for the period from 2012 till 2014. In particular, Rostelecom is responsible for the development of e-service portal; ensuring D-Government services are accessible through mobile devices; network integration, employment of e-signature system, implementation of regional D-Government initiatives, etc.

4.6 E-Government Promotion [EPRO]

According to the available estimates, as many as 65% of Russian citizens receive public services by paying a visit to respective governmental bodies, 25% receive services through multi-functional service centers, and only 5% of citizens use e-service portal. To increase the uptake of the services the government plans to expand available services, their functionalities and ease of use, and to ensure their accessibility from mobile devices (see 4.2). Though the importance of creating awareness and providing training for citizens on the use of e-services is shared by various parties involved in D-Government implementation, no concrete measures in this regard have yet been announced by the government.

4.7 E-Participation [EPAR]

Although some improvements have been done a big part of public authorities' information is not available online especially in English yet. The President and the Prime Minister, Governors, and City Administrations have their official websites. Citizens can contact their leaders, ask questions or send suggestions through feedback forms on these websites. http://blog.kremlin.ru is the official weblog of the Russian President, where citizens can discuss, comment about political strategies. Web 2.0 features such as RSS, sharing, mailing list, newsletters and social media networks like Twitter, Facebook, and blog are also available at the portals.

4.8 Open Government Data [OGD]

Up to date, the Russian government has opened more than 19000 datasets, including the government data in economic, education, health, ecology, culture, transport, trade, construction, sport, tourism, entertainment, security, electronic, cartography, and weather. Open Data portal of the Russian Federation http://data.gov.ru/ - is one of the key instruments of state policy in the field of open data, which plays the role of a backbone element, the core of open data ecosystem of the Russian Federation. The most relevant information focused on open government data, links, and published datasets as well as metadata, information created by open data software products and information services. Here are published normative legal acts determining the legal basis for the disclosure of information, methodical and journalistic resources. It also implemented communication interfaces for interaction with public authorities, in their capacity as owners of socially valuable information.

4.9 Cyber Security [CYB]

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" (approved by the Resolution of the Government of the Russian Federation of 08.02.2018 No. 127) These actions are formalize, arrange, and systematize works with Cyber Security risks and Cyber Security itself.

4.10 The use of Emerging ICT [EMG]

As a dynamic country in e-Government area, Russia tries to introduce and apply emerging technologies in public sectors. Several special IT venture funds support several startups within Cloud computing, big data and IOT utilization for public sectors - RosInfoComInvest (http://www.rosinfocominvest.ru/en/ - established by the Ministry of Communications and Mass Media), RVC (https://www.rvc.ru/en/). IT cluster Skolkovo Fund (http://sk.ru/foundation/itc/). Some project supported by the Ministry of Health, Ministry of Education, and local authorities (for example, Moscow government) are ongoing or planned into sophisticated phases.

5 Some Highlights

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 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 Digital 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.

Saudi Arabia

1 General Information

Area: 2,149,690 km^2

Population: 28,571,770

Government Type: Absolute Monarchy

GDP: $55,300

Internet User: 73.8

Wired (Fixed Broadband User): 19.5

Wireless Broadband User: 111.7

2 Positioning in a Global Organization and a Region
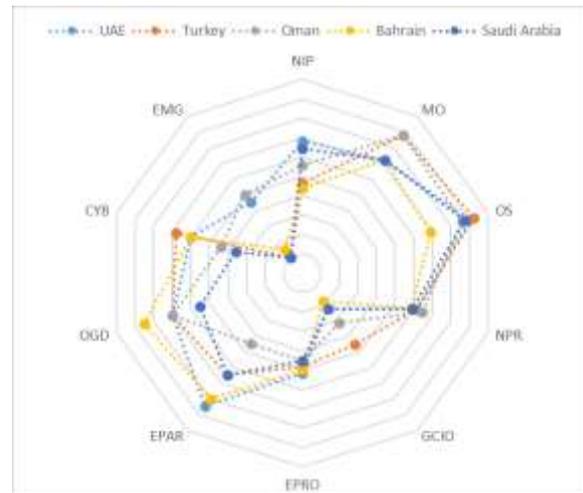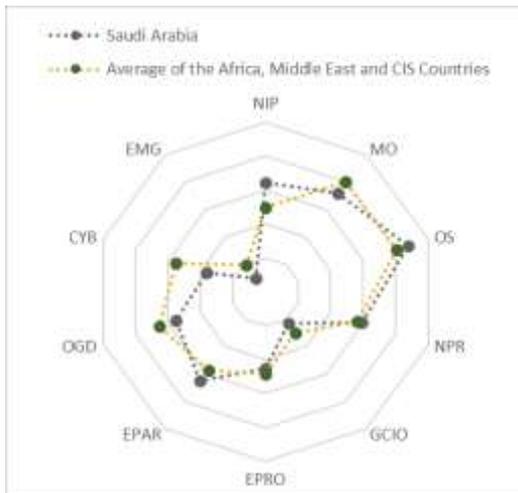
3 Digital Government Development

In 2005, the Ministry of Communications and Information Technology (MCIT), in conjunction with the Ministry of Finance and the Communication and Information Technology Commission (CITC), established YESSER, which drove the rapid development of Saudi Arabia's D-Government. To propel Saudi Arabia's e-government initiative forward, YESSER had a strategic plan divided into two periods. The first plan was from 2006 to 2010 and the second one was from 2012 to 2016. The strategic plan's goals centers around raising the productivity and efficiency of the public sector, providing better service to individuals and businesses, increasing investment returns, as well as finally providing the required information with high accuracy promptly.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

According to the CIA, by July 2017, the total number of individual internet users in Saudi Arabia is 20,768,456, which accounts for 73.8% of the total population, and ranks 35th in the world. Approximately 22.3% of such internet users are has fixed (wired)-broadband subscriptions, while wireless-broadband users have reached 74% of the whole

population (according to the Saudi Arabia Profile report from International Telecommunication Union (ITU) published in 2017).

4.2   Management Optimization [MO]

Following the completion of the first plan in 2010, the second 5 years plan of YESSER has concluded by the year of 2017. Due to the Royal Order No. (1/43801560) and dated 1/11/1438H requires Minister of Communication and Information Technology to cooperate with the Minister of Health, Commerce, Investment, Energy, Industry and Mineral Resources, Education, Finance and others to be responsible for better policy formulation, for devising strategies related to digital transformation in all the public sectors, and for program planning and ensuring coordination between related initiatives in both domestic and foreign domains. Such an initiative would include supervising the National Digital Program, adopting a governance framework for the digital transformation initiatives, and approving the annual work plan and all the operational plans related to the National Digitization Program.

4.3   Online Service [OS]

The official website of Saudi Arabia's government is called the Saudi National Portal, which is divided into three different parts: individual, business, and government. It offers information on training, education, business, health, travel, and others. The scope of such online services has already expanded over the last decade to include employment programs, online job searches, e-learning services, traffic, passports and civil affairs, online payment services, and online issuance of commercial registers. The site also provides free phone, social network, fax and forms of customer support.

4.4   National Portal [NPR]

The e-government of Saudi Arabia at www.saudi.gov.sa provides services both in Arabic and English, providing easy access to their services for its citizen, visitors, businesses and foreign governments.

4.5   Government CIO [GCIO]

Saudi Arabia has held the IDC CIO Summit every year starting from 2011. In 2017, the 7th summit was held in Jeddah with a focus on ICT&NTP: Enabling the Digital foundations for Vision 2030. The goals proposed by the Saudi Vision 2030 highlights the absolute necessity of digital transformation in this modern era. The summit aims to discuss hot ICT topics such as the Implementation of Dynamic Security for the Digital Era and Enable Smarter Governments for a Smarter Future, ultimately to shed light and give exposure on current events and challenges in the information technology sector.

4.6   E-Government Promotion [EPRO]

The launch of YESSER is the first significant step in the D-Government Promotion of Saudi Arabia. With the completion of the two plans inherent in YESSER, Saudi Arabia has expanded its scope of current online services further to include areas such as geographic information, health care, and education. Quality will be improved by streamlining processes and diversifying communication channels. Saudi Arabia will also begin supporting the wider use of online applications in government agencies, such as cloud applications, data sharing platforms, and HR management systems. Sponsorship and advertising by other medium are also to be considered in the realization of D-Government Promotion.

4.7 E-Participation [EPAR]

According to the data from The United Nations, Saudi Arabia was ranked 44th among 193 countries with an index of 0.6822 regarding E-Participation. Comparing with its 51st rank in 2014, the rise in ranking shows a steady positive trend due to the effort of government and the completion of YESSER's second action plan. In the National Transformation Program 2020 from the vision 2030, it shows that the Saudi Arabian government is positively pursuing the achievement of the highest levels regarding transparency and good governance of all sectors by improving the maturity level of government services' transformation into e-service. Moreover, a goal of 85% of internet users of the total population in 2020 has been set to stimulate more participation and utilize of its e-government services by its citizens.

4.8 Open Government Data [OGD]

Saudi Arabia has open government/data in some fields, such as social insurance, trade, education and training, social services, population, and health care. Users can download or share all the data that the government provided in the website.

4.9 Cyber Security (CYB)

On October 2017, the Saudi Arabian government has set up a new authority (NACS) for cyber security which will begin its regulatory and operational tasks by enhancing network protection, IT systems, operating systems, hardware and software components, services and data.

4.10 The use of Emerging ICT [EMG]

The government of Saudi Arabia approved the Anti-Cyber Crime law in 2007 to provide a better online service environment and to better protect customers' privacy. The newest Vision 2030 advocates a long-term goal of developing the nations' digital infrastructure and stimulating the related economy sector through the utilization of the newest technologies.

5 Some Highlights

After the completion of the first and second phase of YESSER's action plan, in the year 2016, Saudi Arabia published "Saudi Arabia's Vision 2030", which is a methodology and roadmap for economic and developmental activities in the Kingdom of Saudi Arabia. One of the primary goal of 'Saudi Arabia's Vision 2030' is to raise Saudi Arabia's ranking on the E-Government Survey Index to the top 5 nations (currently ranked 36th).

The National Transformation Program of 2020 was launched across 24 government bodies operating in the economic and development sectors in its first year.

In the Ministry of Communications and Information Technology, with an objective of achieving the highest levels of transparency and good governance in all sectors and enhancing the interactions between public authorities and citizens. The proposes the rise in its Maturity Level of the government services' transformation to e-services (Current e-government Transformation Measurement (Qyas) with a baseline of 44 and 50 have a goal of 85 and 80 respectively). Moreover, Saudi Arabia's rank in the United Nations index for the development of e-government has a global ranking goal from 18th to 11th. For the furthermost of Vision 2030's objectives, the Saudi Arabin government will commit themselves to enhance the livability of Saudi cities through the development of its IT sector, while also attempting to boost small and medium enterprises in the process.

Singapore

1 General Information

Area: 697 km^2

Population: 5,674,472

Government Type: Parliamentary Republic

GDP: $85,700

Internet User: 82.1

Wired (Fixed Broadband User): 26.5

Wireless Broadband User: 144.6
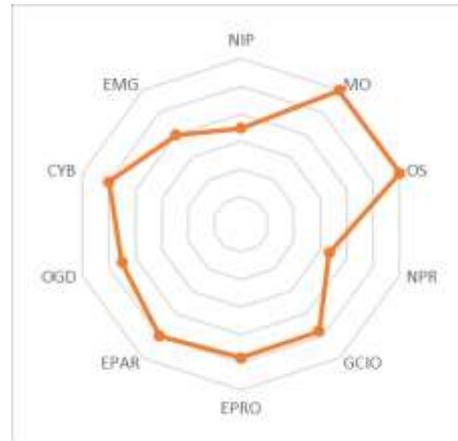
2 Positioning in a Global Organization and a Region
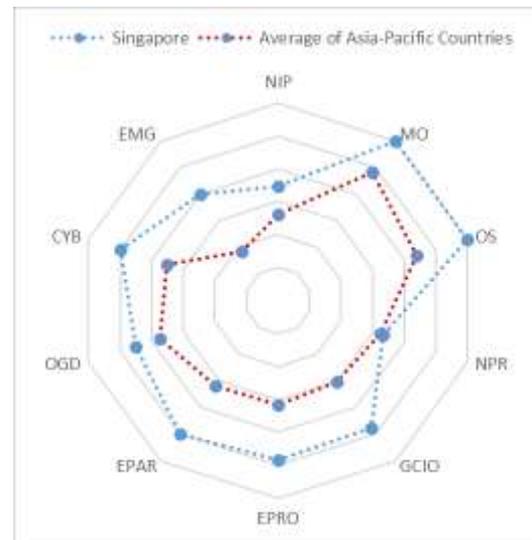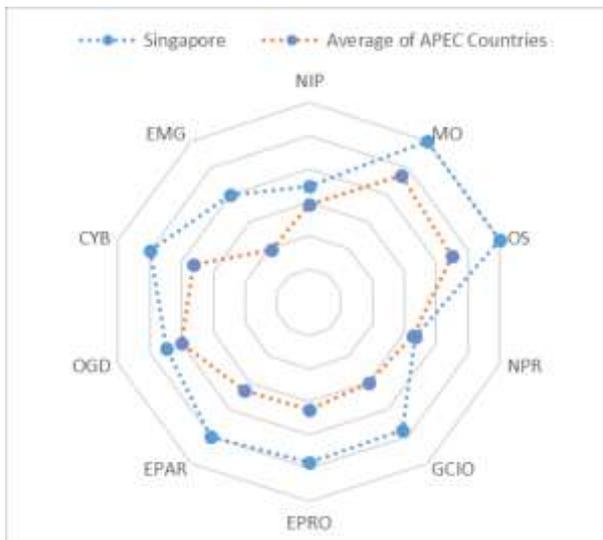
3 Digital Government Development

Since 1980 it had the first CSCP (Civil Service Computerization Programme), e-Government plans have advanced to the 4th version of eGov masterplans called eGov 2015 (2011-2015) in Singapore which aims to be a Collaborative Government which facilitates more significant interaction between Government, people and private sector to co-create greater value for the nation. Government shifts from a "Government-to-You" approach to a "Government-with-You" approach in the delivery of government e-services (initiated by James Kang, the former GCIO).

Smart Nation program was initiated by Prime Minister Lee in November 2014 to "harness the power of networks, data and Infocomm technologies to improve living, create economic opportunity and build a closer community". The Smart Nation is expected to let Singapore being recognized as among the world's best for digital capabilities and achievements. The Smart Nation and Digital Government Group will support agencies by laying out the overall blueprint, building common platforms and systems, exercising technical leadership by setting and enforcing Information and

Communications Technology (ICT) standards, as well as supporting agencies with technical expertise in emerging technology areas.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Approximately 82% of people in Singapore have used the Internet in their daily life. According to ITU's report, about 26.5% are fixed-broadband users, and the wireless-broadband users are 144.6%. Internet penetration in Singapore has reached a high level compared to other countries. Data published by the Singapore government have shown that:

Mobile population penetration rate is 148.2%

Wireless Broadband population penetration rate is 192.8%

Residential Wired broadband household penetration rate is 98.4% (Singaporeans do not use wired connections as much as wireless nowadays).

4.2 Management Optimization [MO]

Singapore is one of the earliest countries who started computerization and telecommunication infrastructure construction. With the development of information society, the government in Singapore has launched continuous strategies in different aspects of e-Government. Also, Singapore has made an effort to integrate the internal government network architecture. For instance, the latest cube program is designed as the new intranet platform for public agencies to communicate, connect and collaborate.

In June 2018 the Government launched of the Digital Government Blueprint which aims to become digital to the core and serve its citizens with heart. The Digital Government Blueprint has six strategies: (1) Integrating services around your needs, (2) Strengthening integration between policy, operations, and technology, (3) Building common digital and data platforms, (4) Operating reliable, resilient and secure systems, (5) Raising our digital capabilities to pursue innovation, (6) Co-creating with citizens and businesses, and facilitating adoption.

There are some strategic national projects which are critical enablers in Smart Nation drive: (1) National Digital Identity - for citizens and businesses to transact digitally in a convenient and secure manner; (2) e-Payments - to allow everyone to make simple, swift, seamless, and safe payments; (3) Smart Nation Sensor Platform - deployment of sensors and other IoT (Internet of Things) devices that will make our city more livable and secure, and (4) Smart Urban Mobility - leveraging data and digital technologies, including artificial intelligence and autonomous vehicles, to enhance public transport.

UPDATED MILESTONES FOR STRATEGIC NATIONAL PROJECTS

Source: https://www.smartnation.sg/about/Smart-Nation
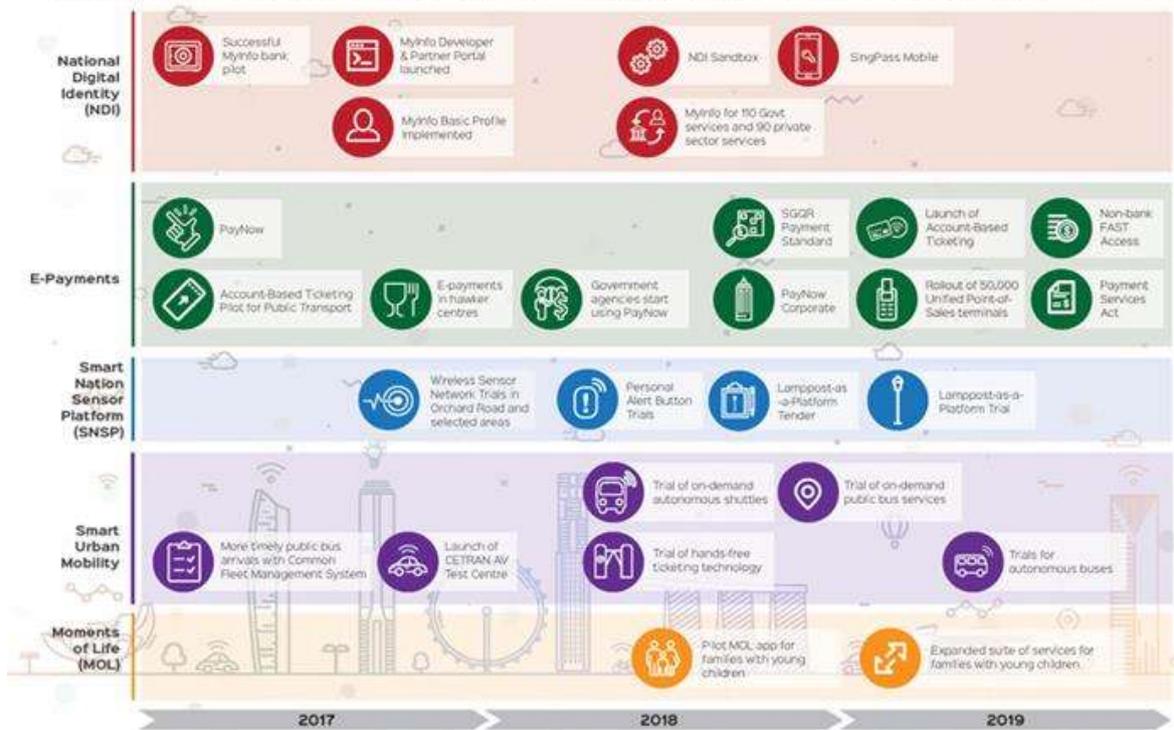
4.3 Online Service [OS]

The score for Online Service of Singapore is also comparatively high, ranked 4th among the evaluated countries. Five online services have been examined and investigated, through the Level of Complexity, Level of Security and Level of Convenience. E-Procurement and One-Stop Service have gained better scores than e-Customs and e-Tax and e-Health. Most of the services in Singapore have come to the transactional stage, allowing citizens are having a two-way transaction with public agencies. However, the third party application result (Google PageSpeed) has been introduced to Waseda e-Government Rankings in 2016 to measure the portals' speed in consideration of convenience. There are still some perfection could be achieved with the online portals in Singapore.

GoveTech has deployed platform computing technology to create API Exchange (APEX) which is a government-wide API platform for data sharing across the government. APIs or application programming interfaces will allow agencies to share their data and infrastructure with other agencies, enabling them to reuse these resources to build new services rapidly. APEX will centrally manage and monitor the security of all the APIs used across agencies.

Another innovation was the creation of a government-wide Platform-as-a-Service (NECTAR) which is an Open Cloud Native Application Infrastructure initiated and managed by GovTech. NECTAR allows government agencies to design, build, deploy and operate a platform-as-a-service (PaaS) for hosting government e-services (from front-end to back-end development, enabling APIs, web, mobile, and data science apps). It enables government agencies to meet stringent government quality and security requirements while maintaining usability, reliability, and agility leveraging on open cloud

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technology. It also enables agencies to develop, host and scale applications at a faster speed.

4.4 National Portal [NPR]

National Portal of Singapore (http://www.gov.sg/) contains timely and useful information for local citizens and foreigners. The portal has also provided the latest national news, useful guidelines in every aspect of Singapore life (classified into topics such as Finance, Education, Immigration, Taxes, Health). Also, the portal has provided useful Singapore economic statistics and digital public services, visions of the nation, linking the country closer to the citizens, business community and visitors with in-depth useful data and information. There are also contact information of government agencies, ministers' speeches, public policies and latest announcements timely. Though online translation, it supports users to obtain government information in Chinese, Malay, and Tamil. Although it appears to be better if the portal equips multiple language versions of all the information, government is encouraging English as a common language to unite the people.

The portal is very well-organized to serve its citizens, without having citizens to know which government agency is responsible for a particular service, policy or program. It has successfully implemented the ONE-Government concept.

4.5 Government CIO [GCIO]

Original information presented in this report is outdated.

The Government Technology Agency of Singapore (GovTech) is a new statutory board established on 1 October 2016 after the restructuring of the Infocomm Development Authority, to empower a nation of possibilities through the harnessing of info-communications technology and related engineering.

Within the establishment of GovTech, the Government Chief Information Office led by a Government Chief Information Officer (GCIO) which plays a central role in driving and overseeing ICT initiatives to maintain Singapore Government's leadership position as an innovative user of Infocomm technologies to delight customers and connect citizens.

Each agency also maintains its own CIO office to serve the ICT needs of the agency. GovTech manages a pool of ICT officers that are seconded to more than 50 government agencies' CIO offices. This enables GCIO to work cohesively with the government agencies to effectively roll out ICT initiatives that would be seamless across the government.

GOVERNMENT TECHNOLOGY AGENCY and DEPUTY CHIEF EXECUTIVE OFFICE oversees Cluster Development and Government Chief Information Office (GCIO) functions. Cluster Development Group oversees the innovative adoption of Infocomm technologies to transform government agencies, business and economic sectors in the respective clusters for greater competitive advantage; and the development of a robust and comprehensive service delivery framework and operating model for CIO services at government agencies. GCIO champions the whole-of-government ICT initiatives to maintain the Singapore Government's leadership position as an innovative user of Infocomm technologies to delight customers and connect citizens.

4.6 E-Government Promotion [EPRO]

High-tech and informational society is one of the vital national strategies in Singapore. Therefore government never has stopped the evolution of e-Government. Not

only the continuous plans but also relevant legal framework has a renewal in the past years. Academic support including seminars and research centers on e-Government and ICT utilization are active in Singapore. It ranked second in this indicator among all evaluated countries.

4.7   E-Participation [EPAR]

Citizens in Singapore have adapted to the culture of connecting government using online service systems and participating in public affairs through different channels which are provided by the government. Reach (www.reach.gov.sg) is a platform built for citizens' voice spread and heard on public policies, public affairs within various forms such as online discussion, events and public consultation. Deliberative democracy has been reflected through ICT utilization in public sectors.

In addition, a portal, eCitizen Ideas! (www.ideas.ecitizen.sg) allows the Government to gather feedback and ideas, and at the same time, Government encourages and promotes citizen engagement.

4.8   Open Government Data [OGD]

Singapore launched Open Data Portal (https://data.gov.sg/) in 2011 as the portal site to provide publicly available datasets from 70 public agencies. Principles are governing the data sharing, such as data shall be made readily accessible; data shall be released promptly. However, Singapore government believes that the existing Singapore laws are sufficient to cover the open government initiatives and its related legal issues in Singapore.

In April 2016, a developers' portal was also introduced to provide developers more comfortable access to real-time data from different government agencies via APIs (Application Programming Interfaces). As of September 2016, the one-stop portal provides access to more than 600 quality datasets from 70 public agencies.

The Singapore Government also opened data for the developers, with aiming to support the efforts of application developers using the data on Data.gov.sg. This includes Real-time APIs, CKAN APIs, and DataStore API. A marketplace that offers APIs which enables applications to embed or optimize tax management capabilities across a range of tax transactions. LTA DataMall is part of a series of information, e-Services, and tools that are available to all land transport users in Singapore. A one-stop integrated geospatial data sharing platform where government agencies share location-based services and information. OneMap APIs allow users to embed an interactive Map on websites.

SingStat Table Builder is access for free over 26,000 historical data series and more than 900 statistical tables from 60 public agencies providing a comprehensive and current statistical view of the critical economic and socio-demographic characteristics of Singapore. Users can build customized data tables, plot graphs and charts, and export these tables and charts in different machine-readable file formats.

4.9   Cyber Security [CYB][15]

Singapore has released different acts and regulations on Cyber Security issues, such as Computer Misuse Bill, The Electronic Transactions Act and Personal Data Protection Act (PDPA), and the later Computer Misuse and Cybersecurity Act (CMCA). A government body called Personal Data Protection Commission has been established to administer and enforce the PDPA. Recently, an organization called Cyber Security Agency of Singapore (CSA) has been found to oversee the national cybersecurity strategy

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[15] https://www.csa.gov.sg/~/media/csa/documents/publications/singaporecybersecuritystrategy.pdf

and outreach. It is expected that new Cyber Security Act will be published in the coming year.

Singapore is transforming to become Smart Nation and has consistently taken cyber threats seriously and developed timely. Singapore issue the first Infocomm Security Masterplan in 2005 to coordinate cybersecurity efforts across the Government. In 2008, the second Masterplan focused primarily on the security of Singapore's CIIs. In 2009, Singapore Infocomm Technology Security Authority was established to safeguard Singapore against cyber-attacks and cyber-espionage.

In 2013, the third Masterplan expanded to cover the more full Infocomm ecosystem, which includes businesses and individuals. In the same year, The National Cybersecurity R&D Programme was established. It aims to improve the trustworthiness of cyberinfrastructure, with an emphasis on security, reliability, resilience, and usability. In 2015, the Cyber Security Agency of Singapore (CSA) was established, CSA is dedicated to the development of cybersecurity, protection of CIIs and essential services, and coordination of national efforts against large-scale cyber incidents. In 2016, the National Cybercrime Action Plan (NCAP) was established. The plan spells out the priorities needed in the fight against cybercrime. These include: (1) the need for public education on staying safe in cyberspace; (2) the development of capabilities to fight cybercrime; (3) strengthening cybercrime laws; and (4) building local and international partnerships.

4.10 The use of Emerging ICT [EMG]

As leading country in e-Government area, Singapore would not pass up the chance to introduce and apply emerging technologies in public sectors. Public projects deploying cloud-computing, big data and IOT are common, ongoing or entering into sophisticated phases.

Organizational preparedness such as National Cloud Computing Advisory Council (NCCAC) is also paying attention to the adoption of technologies, standard industrial construction and fostering collaboration between different sectors. Development and deployment of emerging technologies in e-Government are already advancing in the Singapore Smart Nation initiatives and the related Tech Startup movement under the government leadership of GovTech and Info-communications Media Development Authority of Singapore (IMDA – a split from the former IDA). Its positive impact is already felt in leading industries and various societies.

Internet of Things (IoT)

The Government has been experimenting with many use-cases that involve IoT with the intent of leveraging on emerging technology that could help the government carry out its roles in a more productive manner.

Drones are already deployed in many government agencies to enhance efficiency and boost productivity as well as for workplace safety and health. Singapore has also embarked on trials using uncrewed trucks to transport containers from one port terminal to another. The GovTech Emerging Technology Team had used Blockchain and IoT for electronic procurement.

Machine Learning

The Singapore Land Authority uses drones and machine learning inland inspection with thousands of images of the property being analyzed to detect issues that require attention, ranging from illegal dumping and water ponding to cracks in buildings, under the leadership of

Analytics and Artificial Intelligence Lab

In general, Singapore various government agencies have successfully deployed data analytics in their daily operations and decision makings. Notably, the Land Transport Authority of Singapore has bagged numerous international awards for such innovative deployment.

Further to the actual achievement, Singapore will be setting up a new lab which is as part of the Defence Science and Technology Agency. With an SGD$45 million funding annually, the lab will be used to experiment, build prototypes and develop tools using cross-disciplinary approaches.

5 Some Highlights

As leading nation of e-Government in Asia, Singapore continues to maintain the momentum through transformation. The performance on indicators of Management Optimization, e-Government Development and Promotion, Network Infrastructure Preparedness, the Use of Emerging ICT, and Cyber Security are showing its strong points and advancement this year. Especially on the efforts for cybersecurity, Singapore equips the law and regulatory framework to assure every safety measure and security upgrade can be enforced with a legal basis. In respect to policy, National Cyber Security Masterplan 2018, as the latest strategy, guides government to enhance the nation's security environment and create a robust and trusted society for public, private and individuals. Continuous masterplans in each significant segment are one of the keys to keep Singapore proactive and possessing execution capacity on e-Government development.

Government CIO office is reorganized to focus on emerging technology development and deployment under the Smart Nation initiative (by GovTech) and on nurturing Tech-Startup, high tech workforce development and industry transformation (by IMDA). Both GovTech and IMDA are formally being part of the Infocomm Development Authority of Singapore (IDA).

To future direction, Singapore still has potential on the growth of the use of emerging technologies. This new indicator has been introduced to Waseda e-Government ranking this year. Because many countries are still at the start-up phase, direction for expanding the new technologies into the public service sector needs more endeavor to be clarified. Singapore could seize the opportunity to formulate policies and standards, guide not only domestic innovation but also delight international co-development.

South Africa

1   General Information

Area: 1,219,090 km^2

Population: 57,208,834

Government Type: republic

GDP: $13,400

Internet User: 54

Wired (Fixed Broadband User): 2.8

Wireless Broadband User: 58.6
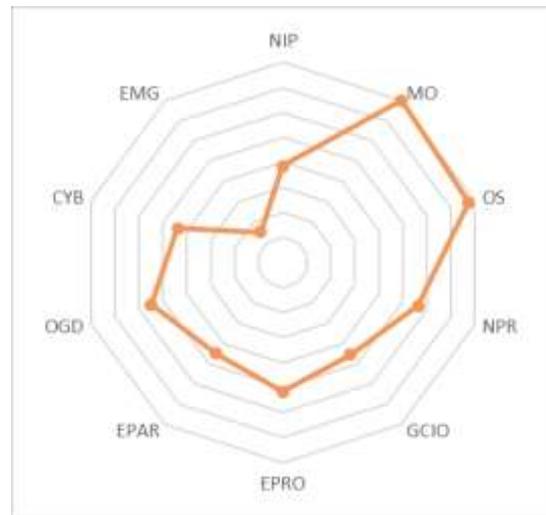
2   Positioning in a Global Organization and a Region

Among Africa countries, South Africa has surpassed the average of the region in most of the indicators, except management optimization and e-merging technology. However, when comparing with the world's average, only e-participation and e-promotion show the better scores.
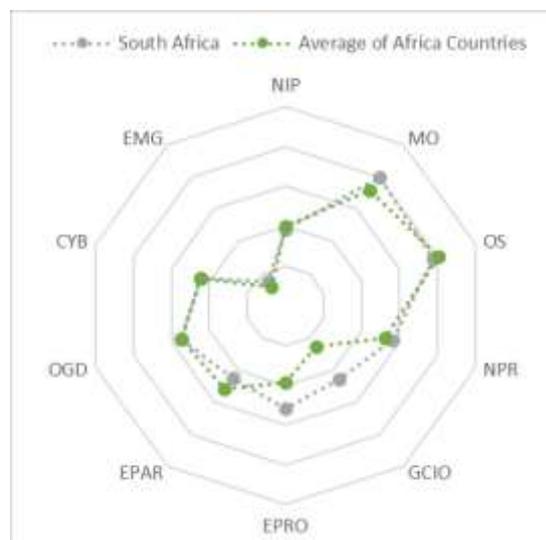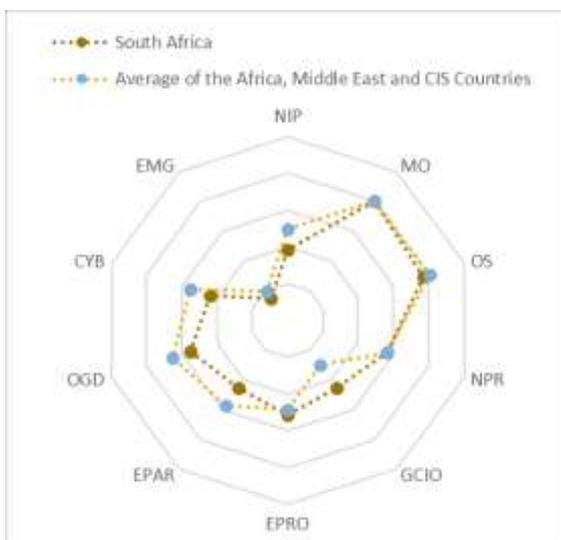
3   Digital Government Development

South African (SA) government's use of ICT to deliver essential services to its citizens shows progress. Realizing the critical role of ICT in enabling modernized government services and benefits for service delivery, to date the government developed its e-Government or D-Government policy framework that proposes the use of ICT to improve government's efficiency and effectiveness and make it convenient for citizens to access government services.

Gauteng provincial government is taking the lead in being one of SA's most modernized provinces and achieving primary e-government objectives. Gauteng has

established the Department of e-Government, which is part of a restructuring process to ensure departments in the province can talk to each other seamlessly. This provincial administration will continue to invest in ICT infrastructure as the province positions itself as a driver of SA's digital economy, a hub of research and innovation in SSA.

4 Indicators

4.1 Network Infrastructure Preparedness [NIP]

Approximately 54 % of people in South Africa were Internet users in 2016, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). About 2.8% have fixed-broadband subscriptions, and wireless broadband subscription has reached 58.6%.

4.2 Management Optimization [MO]

Presently under D-Government policy framework, some distinguished D-Government services the administration has introduced including National Treasury's e-Tender Publication portal, a central supplier database, e-HomeAffairs (to enable you as a South African born citizen to apply for your Smart ID Card and passport online) and the SA Revenue Services' e-Filing system. Local government departments have also introduced specifically catered initiatives such as Gauteng's e-Invoicing service, the City of Ekurhuleni's online system for paying rates, and the City of Cape Town has digitized government information to enable easy access for its citizens.

4.3 Online Service [OS]

The score for Online Service comprises five sub-dimensions: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. 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 is perfect regarding fast speed and efficiency. The e-Procurement, e-Tax and One-Stop Service Portals are such considerably in doubt regarding speed that may cause the access speed considerably slow to access. The e-Health is a bit below the average speed investigated during the period of the survey. For a certain extent, all Online Services have implemented security measures such as SSL, Site Authentication, and Password Protection for obtaining the services. In addition to that, all clickable objects on the listed portals work as they should do best for the e-Customs and e-Procurement and do so a bit above average for the rest.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality gov.za is the government portal of South Africa. It presents a wide range of information resources about country demographic, national programs, government structure, government agencies, legal documents and daily news regarding government's operations. Information is delivered in English only

In technical aspect, the result of Google PageSpeed™ Insight showed that the website operates well in PC and shows some minor layout issues on mobile devices. The analysis also indicated several technical problems which may slow down the portal's loading speed. Social network features are supported.

4.5 Government CIO [GCIO]

For Government CIO [GCIO] in South Africa still has no trace of further development. The role of the CIO in South Africa was endorsed by the Government IT Officer's (GITO) Council in 2002. GITO was created to serve as an IT coordinator, to consolidate the IT activities of government agencies. The council functions as a platform in which both the government and citizens ensure that the government itself is aware of the needs of citizens.

4.6 E-Government Promotion [EPRO]

The Department of Public Service and Administration (DPSA) is responsible for the development and coordination on D-Government strategies. For implementing and monitoring D-Government projects, the South African government established statutory agencies such as the State Information Technology Agency (SITA) and Government Information Technology Officers Council (GITOC).

Public-private partnerships have been promoted in South Africa steadily in order to boost ICT development in the country. Most of the projects are focusing on enhancing a wide range of ICT infrastructure down to services delivery for citizens. Government's expenditure on ICT was estimated to reach $707.6 million in 2019, after reaching a total of $615.9 million in 2014, according to research by Frost & Sullivan56.

The South African Government is aiming to provide broadband access to all citizens at reasonable prices. Given this target, the government has invested resources in enhancing infrastructure capacity, with the initializing the first phase of a 3-year project on the broadband network. The total funding of R740 million was allocated for this purpose. The first phase was said to cover seven provinces, with 5803 facilities including schools, health, and other government entities. Steering committees have been shaped in all eight district municipalities, and they comprise the provincial Departments of Basic Education, Health, Cooperative Governance, and Traditional Affairs, Higher Education, Safety, Security and Liaison as well as the South African Local Government Association.

At the local government level, most evidence were found related to the Gauteng Government D-Government promotion activities. In 2015, the Gauteng provincial government invested over R1 billion in the full penetration of the Gauteng Broadband Network (GBN) for the next four years. This is a part of the Gauteng city region-wide D-Government strategy, targeting at enhancing linkages and integration among city region governments and their department.

4.7 E-Government Participation [EPAR]

Provincial and Local Liaison have provided development communication and extends government's information infrastructure through partnerships with provincial and local government. It coordinates the establishment of Thusong Service Centre (TSC) programme – the one-stop central for government services and information. There were 171 such centers by 2012. This is hoped to bring government services closer to the people.

4.8 Open Government Data [OGD]

The second South African open government partnership action plan was released, reaffirmed South Africa's commitment to good governance and an open society underpinned by values of transparency, accountability, and participatory governance. No trace of successful records is found, made it hard to conclude further development.

4.9 Cyber Security [CYB]

In December 2016 South Africa launched Cybercrimes and Cybersecurity Bill for the primary purposes: (1) To create offenses and impose penalties which have a bearing on cybercrime; (2) To criminalize the distribution of data messages which is harmful and to provide for interim protection orders; to provide for the establishment of a 24/7 Point of Contact; (3) To impose obligations on electronic communications service providers and financial institutions to assist in the investigation of cyber crimes and to report cybercrimes; (4) To provide for the establishment of structures to promote cybersecurity and capacity building; to regulate the identification and declaration of critical information infrastructures and measures to protect critical information infrastructures. No trace of successful implementation of such identified aims is found, made it hard to conclude further development.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). There is still scarce evidence found on the use of emerging technologies in public sectors. No evidence has been found on the utilizing high-end technologies in government's operations as well.

5 Some Highlights

South Africa has achieved average scores on Online Service, D-Government Promotion and e-Participation. Credit is given to the PPP under cooperation with private sectors to enhance national ICT capacity.

However, the country still scored low in all the rest categories since due to inconsistent implementation and view of technology development across municipal governments and departments accordingly to an ICT research analyst at Frost & Sullivan Africa that noted some of the primary factors hindering the efficient rollout of e-government plans in South Africa.

Although GCIO is considered to be one of the critical factors in the success of South African D-Government implementation, this indicator's score was not improved consecutively. Therefore the Government needs to concentrate to develop government CIO in all administration levels further.

Progress has been shown among enabling modernized government services under the current e-government policy framework that proposes the use of ICT to improve government's efficiency and effectiveness and make it convenient for citizens to access government services. Gauteng Province is taking the lead in being one of SA's most modernized provinces and achieving primary e-government objectives. Together with the local municipalities, the Gauteng provincial government plays a crucial role in the deployment and use of ICT to deliver education, healthcare, as well as other government services. The province's goal remains that of being a smart province and will continue to invest significantly in the ICT infrastructure and be a leader in e-government services.

South Korea

1   General Information

Area: 99,720 km^2

Population: 50,924,172

Government Type: Presidential Republic

GDP: $37,900

Internet User: 92.7

Wired (Fixed Broadband User): 41.1

Wireless Broadband User: 111.5

2   Positioning in a Global Organization and a Region

Among OECD countries, the Korean government shows great progress in e-Government development, with all indicators except Online Service (OS) are better than the OECD's average. In the APEC group, the Korean's government performance is even better, with all indicators are surpassed the group's mean.
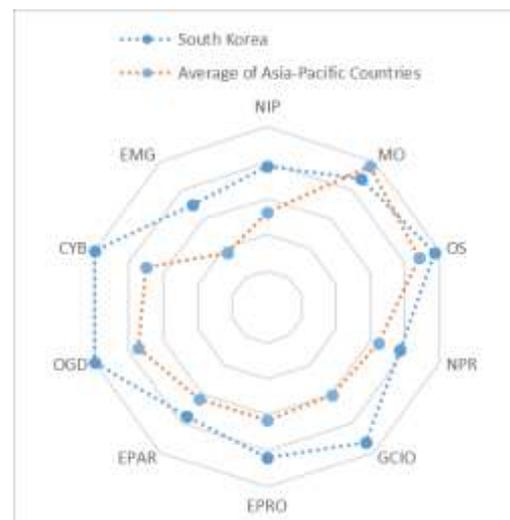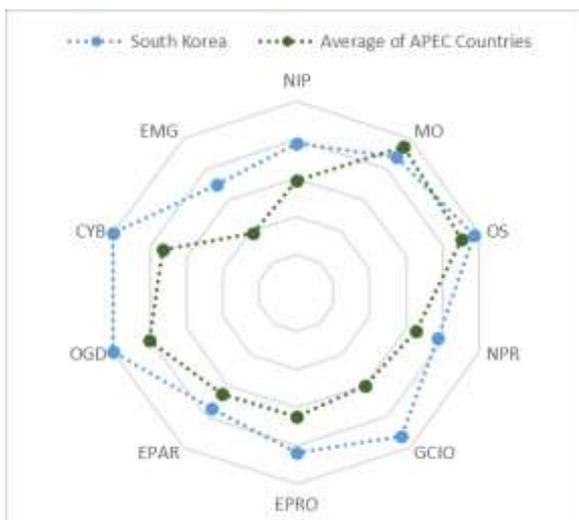
3   Digital Government Development

One of South Korea' success stories on e-government is a harmonization of activities between central and local governments. The unique nation-wide system on e-governments can achieve the tendency. Especially, local governments are well networked based upon the integrated standard of connected systems. This makes very efficient services with all local activities. South Korea hosts some e-government meetings

4   By Indicators
4.1   Network Infrastructure Preparedness [NIP]

The total of Internet users in South Korea accounts for over 92.7 % of the population in 2017, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). Among them, more than 111.5% people

have a wireless broadband connection, while the figure for fixed-broadband subscriptions is only 41.1%.

4.2 Management Optimization [MO]

The Park Geun-Hye's Government embraces Government 3.0 as a new paradigm which pursuits two major targets: delivering customized public services and generating new jobs. In order to turn these targets into realistic, the new paradigm aims to transform the government into a more service-oriented, competent, and transparent government. The On-nara BPS is a new business process management system that has improved the efficiency and transparency of the administration process by handling, recording and managing in a standardized way all the business procedures of the government online. Approximately 362.000 government officers in 154 local and central governments are currently connecting to the system. In addition, all information systems operated by an individual government agency are integrated and managed by the Government Integrated Data Center. Currently, there are 1200 systems of 43 government departments connecting to GIDC. GIDC helps to ensure security mechanisms against cyber-attacks and make all connected systems being prepared for natural disasters.

Information sharing among government organizations is fostering under Government 3.0. Examples can be seen in "My Car Information App" where vehicles' records (insurance, maintenance, and accident) are provided for everyday usage.

4.3 Online Service [OS]

The score for Online Service is based on an investigation of five online services: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience.

Regarding complexity level, most of Online Service in Korea has reached a transactional level in which user can entirely conduct their businesses online. Korea Online E-procurement System, or KONEPS, won the United Nations Public Service Award (PSA), and was selected by OECD as one of the best cases for improving transparency. The entire procurement procedures are processed via KONEPS's subsystems: e-bidding, e-contracting, e-ordering from online shopping mall and e-payment. With the presence of Home Tax initiative, all tax businesses including filing, billing, and payment are processed online, and the information is retrieved anytime by the taxpayer. Taxpayers or their tax agents can request and receive 18 civil affairs certificates. Regarding civil services, Minwon "http://www.minwon.go.kr/" is the one-stop portal where users can find services they need by searching through around 5,300 services available and get detailed information.

To measure the level of convenience, the third-party application result has shown that all portals are above the average in terms of speed. The third-party application for assessing the portal is the application from Google Page Speed™ Insight.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information, Technical, and Functionality. National Portal of South Korea "http://www.korea.go.kr/" contains proper information for local citizens and foreigners. Information about the country, government structure, and the latest government's activities are also available. Regarding technical aspects, the result of Google Page Speed™ Insight showed that the portal performs at average speed and operates well with both PC and Mobile devices. The portal is also equipped with several necessary functionalities search capability, sitemap, and Social Network integration.

4.5 Government CIO [GCIO]

Currently, the country's e-Government lead agency is the Ministry of Security and Public Administration. CIOs are working in each ministry of the government. The Fundamental Law on National Informatization and the Presidential Directive states the appointment of CIO in national and bureau level. According to The Presidential Directive No.157, the position of CIO in each ministry and the governmental agency is mandatory.

The leading roles of CIO are planning ICT projects, allocating ICT budget, and improving regulations related with e-Government project. The eligible person must meet the following qualifications; strong expertise in the corresponding agency's actual performance, full perspective and professional knowledge on ICT, and strong will to initiate innovations in administration through informatization.

4.6 E-Government Promotion [EPRO]

[e-Government Master Plan 2020] as the latest 5 years plan consisting of 5 strategies as follows:

1. Solidifying a position in the global e-government as a major e-government exporter.

2. Building an e-government platform

3. Creating more digital-friendly industries

4. Developing all digital government service

5. Reforming public administration based on intelligent information

Another fundamental factor that has been contributed to the success of e-Government adoption in Korea is the presence of stable IT policy and regulatory framework. The sustained investment for e-Government (around 1% of national budget every year) guarantees Korea Government has sufficient resource for implementing its strategies and action plans. Funds for e-Government come from various sources such as the Informatization Promotion Fund; the Telecommunication Promotion Fund or the Central Fund for e-Government. Moreover, finally, the presence of institutions as coordinating bodies in public sector such as National Computing and Information Agency; National Information Society Agency; and Data Strategy Board; Gov. 3.0 Advisory Group; Gov. 3.0 officers in every ministry ensure the success of the new e-Government paradigm.

4.7 E-Government Participation [EPAR]

Another target of Government 3.0 is about connecting with citizens and encouraging them to engage in public affairs. Government enables this via online voting, online consultant and other large-scale public projects.

'e-People' website for the online participation of citizens was selected as one of the top 10 services for online politics in 2006 World e-Government Forum. The "e-People portal" facilitates citizens' participation in policy-making by processing people s complaints and suggestions via a single window. This is a single window application enables citizen participating in policy-making process by receiving and handling their suggestions and complaints.

The official Facebook "https://www.facebook.com/govkorea" and Twitter "https://twitter.com/govkorea" is also available. Furthermore, elected officials and politicians often have their website or SNS account to notify their activities and communicate with citizens.

4.8 Open Government Data [OGD]

Government 3.0 pursues transparency of government. Open government regarding data and information means the transition from supply-driven transparency (reactive, responsive disclosure of public information) to demand-driven transparency (proactive sharing). According to President Park, Government 3.0 places emphasis on "make information sharing more equitable and transparent between the central government, local governments, government agencies, and the public." Aligning with this vision, Korea has published the National Action Plan on Open Government Partnership. Currently, Citizens can access public information and data at "https://data.go.kr/".

4.9 Cyber Security [CYB]

The National Cyber Security Master Plan was released in 2011, since then, it has been viewed as the foundation to guide the nation's cyber defense strategy. Korea also has a robust legislation framework for cybersecurity such as The Information and Communication Infrastructure, Protection Act.

Both KrCERT/CC and KN-CERT are considered as computer emergency response Protection teams in Korea Government. The Korea Internet and Security Agency is responsible for network and information security. In addition, the National Cyber Security Center (NCSC) is the central point of government for identifying, preventing and responding to cyber-attacks and threats in Korea. The NCSC, in collaboration with the private sector and the military sector, will improve warning systems and response time to security incidents and protect critical national infrastructures in Korea. For raising awareness of cybersecurity, the Korea Information Security Agency is responsible for online training and broadcasting about the responsible use of the Internet among users.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). The government's G-Cloud Project is expanding. A total of 260 e-Government systems have adopted G-Cloud by 2014, and the number is increased to 740, which is equivalent to 60 percent of the entire systems, by 2017.

In 2014, the Ministry The government has adopted the field of "Internet of Things" as a national strategic project, announcing the Internet of Things master plan to achieve a leading country of hyper-connected digital revolution.

5 Some Highlights

By implementing initiatives for optimizing the business process of public sectors such as Government-wide Enterprise Architecture (GEA), On-nara BPS and Government Information Sharing, the South Korean government has reached a high level of efficiency and transparency of administration process. This is awarded by a nearly perfect score on Management Optimization indicator this year.

The strength of South Korea is the comprehensive cybersecurity framework, indicating by the full score in this dimension. With a supportive cyber regulation environment and well-established security agencies, the cybersecurity framework is strengthened, giving the government the capability to identify, prevent and respond to cyber-threats.

Spain

1 General Information

Area: 505,370 km^2

Population: 48,146,134

Government Type: parliamentary constitutional monarchy

GDP: $35,200

Internet User: 80.6

Wired (Fixed Broadband User): 29.5

Wireless Broadband User: 109.2

2 Positioning in a Global Organization and a Region
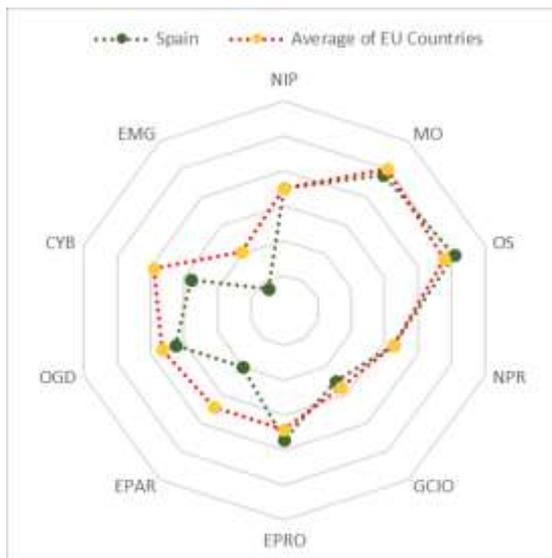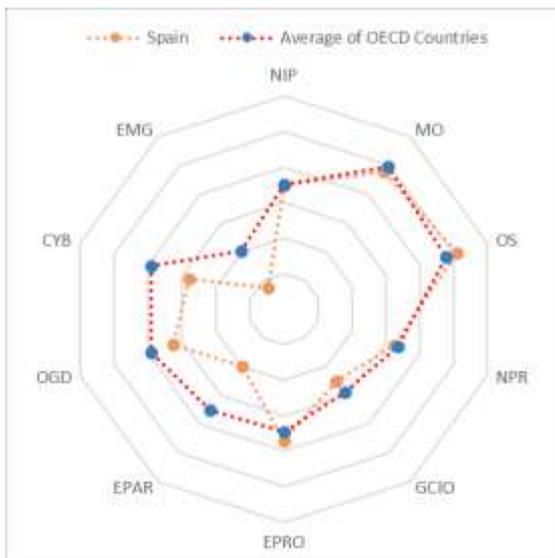
3 Digital Government Development

The development of e-Government in Spain was marked by a series of projects on ICT, especially the projects of Public Administration - The "Conecta" Plan. This strategy aims to promote electronic interactions between Public Administrations and citizens (eCertificates); e-ID card; and a citizen portal to provide access to interactive and transactional services.

The "Moderniza" Plan (2006-2008), a plan of measures aimed at improving, modernizing and simplifying the Administration to better accommodate the needs of citizens. In 2008 the Spanish Council of Ministers approved a 'Plan for the Reduction of Administrative Burden and the Improvement of Regulation' the plan targets a 30 % cut in the burden currently resting on businesses. The 'Avanza' Plan for the development of the Information Society forms part of the broader program 'Ingenio 2010'. The objectives of this plan is to develop user-centric e-Government which furthermore overcomes the

most pressing challenges facing public e-Services. This plan was divided into 2 phases. The first phase is to develop Information Society and for Convergence with Europe, and among Autonomous Communities and Cities. The second is consolidate the milestones achieved during the first phase of the Plan while contributing to foster the demand for ICT and to fortify the ICT industry.

Avanza 2 was introduced in 2010 toward the second strategy 2011-2015. This plan aims to help overcome ten objectives such as Promote innovative ICT processes in regional governments, Spread ICT applications in health and well-being, and Enable the application of ICT to the educational and training system.

In 2012, Spanish government issued MEJORA plan (Strategic Plan for Improving Public Service and Administration) from 2012 to 2015. The MEJORA is divided into three primary strategies: General State Administration (Racionaliz@ Plan), Citizens (Simplific@ Plan), and other public administrations (Compart@ Plan).

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

In Spain, 80.6% of the population uses the Internet, an increase over the previous year, according to the "Measuring the Information Society Report 2017" by the International Telecommunication Union (ITU). The number of fixed-broadband subscriptions is 29.5 per 100 inhabitants, while the number of active mobile broadband subscriptions is 109.2 per 100 inhabitants.

As for the intranet connection, Spain has The 'Red SARA' network, administered by the Ministry of Finance and Public Administrations, is Spain's Government intranet. It interconnects 16 ministries, all Autonomous Communities (17) and Autonomous Cities (2), as well as over 3708 local entities, representing more than 90 % of the population. Red SARA's objective is to increase collaboration and interoperability among the information systems of the various levels of Government.

Furthermore, the Spanish government developed much platforms to promote e-Government services such as Public Certificate Authority (CERES), National e-ID Card (DNIe), @firma – MultiPKI Validation Platform for e-ID and eSignature Services, Cl@ve, and ePassports.

4.2 Management Optimization [MO]

In 2015, the Spanish government adopted its newest strategy, the "Digital Transformation Plan for the General Administration and the Public Agencies belonging to it", also referred to as the "ICT Strategy." It sets out the global strategic framework to make progress in the transformation of the Administration, sets forth the guiding principles, goals, and actions required to complete it, as well as the landmarks in the gradual development of Digital Government. The strategy clearly defines five strategic objectives and nine related areas of work. The document is available to download on the website of the "Electronic Administration Portal" (PAE).

4.3 Online Service [OS]

Like other European countries, e-Services in Spain also are divided into citizens and businesses. The Portuguese government maintains websites for all five types of e-services assessed in this survey: e-procurement, e-tax, e-customs, one-stop service, and e-health; all of them had transactional features and obtained relatively high scores. The e-tax website integrates e-customs as well, is clear and easy to use, and offers a high level of interaction with the user. Similar are the cases of the e-procurement and e-health websites.

The one-stop service website presents a search option on its main page, and lists the most consulted procedures. It also provides government information and different channels users seeking support. Users have access to a personal account by using the "Cl@ve" system, which is the official authentication system for public administration procedures. It is available in five languages.

4.4 National Portal [NPR]

Spain's national portal is also the official website for the Spanish government and the president. It features news, a search function, and links to other sites related to the public administration. Necessary and demographic information about the country and information about the government and its structure is available on this website. The site also offers integration with SNS, the possibility to subscribe to a newsletter, and an option to send messages to the president. The site is available in Spanish and other four languages used in Spain, as well as English.

4.5 Government CIO [GCIO]

Although the title of GCIO is not used as such, an equivalent role is that of the Director of ICT of the State General Administration, whose mission is to coordinate the execution and implementation of the national e-government strategy. Information regarding CIO training programs was found in at least one educational institution. No additional information on CIO regulations was found.

4.6 E-Government Promotion [EPRO]

The ICT Strategy and the Digital Agenda are the main guidelines in the promotion of e-government. While the ICT Strategy focuses on initiatives and goals defined at the national level, the Digital Agenda aims to develop the use of ICT in compliance with the objectives set for the European Union. No information on publications, training programs, or events on e-government was found.

4.7 E-Participation [EPAR]

Citizens have access to information on elected officials, government structure, and legislation on several government websites. The one-stop service website is highly functional and offers information on a wide range of topics. The president has an official website, which is also the national portal, and offers the citizens to send messages to him. No evidence to prove that the government takes the opinions of citizens in the decision-making process was found.

4.8 Open Government Data [OGD]

Spain has performed well in establishing an open government. The government has issued the Open Government Plan, which follows the guidelines of the Open Government Partnership. The third version, for the 2017-2019 period, is expected to be released later this year. The government has enacted a stable legal framework for the promotion of open government. Also, the government has an open data site (http://datos.gob.es) in which an extensive range of information from very diverse areas, like demographics and health datasets, is available to citizens. This site is available in Spanish and English, as well as the other three languages used in Spain. The government also has a portal for transparency (http://transparencia.gob.es), where it provides more information about the public administration and open government initiatives.

4.9 Cyber Security [CYB]

Spain introduced the National Cyber Security Strategy in 2013. It is, the government defines six cybersecurity objectives and eight lines of action. This strategy works in compliance with the National Security Plan and existing security laws. Spain penalized cybercrimes through its penal code. It also has laws for information protection, data security, and e-commerce. There is an official agency for dealing with cybersecurity incidents, the CNN-CERT, and an information security agency, the National Centre for Critical Infrastructure Protection (CNPIC).

4.10 The use of Emerging ICT [EMG]

The growth of IoT in Spain is being incubated by academia in the area of information and computer science such as at the NICS Lab. There is evidence that Cloud Computing services are being developed for the public administration (SARA network), and some regulations have been established. No evidence of official usage or regulations by the government of emerging technologies such as the Internet of Things or Big Data was found.

5 Some Highlights

There will always be a percentage of the population unable or reluctant to use electronic means with Public Administration. Extending the benefits of e-Government to these citizens is, without any doubt, the major challenge for inclusive e-Government policies. The development of multi-channel strategies based on human intermediaries is now possible in Spain.

The Spanish government's efforts to promote e-government have seen results in the areas of open government and cybersecurity, while citizen participation still needs to be improved. The strategy is well structured, and that can be seen in the quality of e-services the public administration offers. In addition, the development of the SARA network will offer a platform for increased integration and efficiency in public administration.

Sweden

1   General Information

Area: 450,295 km^2

Population: 10,161,797

Government Type: constitutional monarchy

GDP: $53,077

Internet User: 91.5

Wired (Fixed Broadband User): 36.3

Wireless Broadband User: 125.2
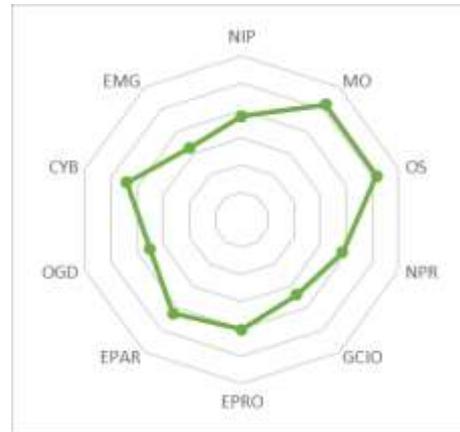
2   Positioning in a Global Organization and a Region

Among OECD countries, Sweden has very high scores on network infrastructure, e-Government promotion, and management optimization. These scores are far above the world and OECD's average and very close to the USA's – who achieved the top position in OECD countries.
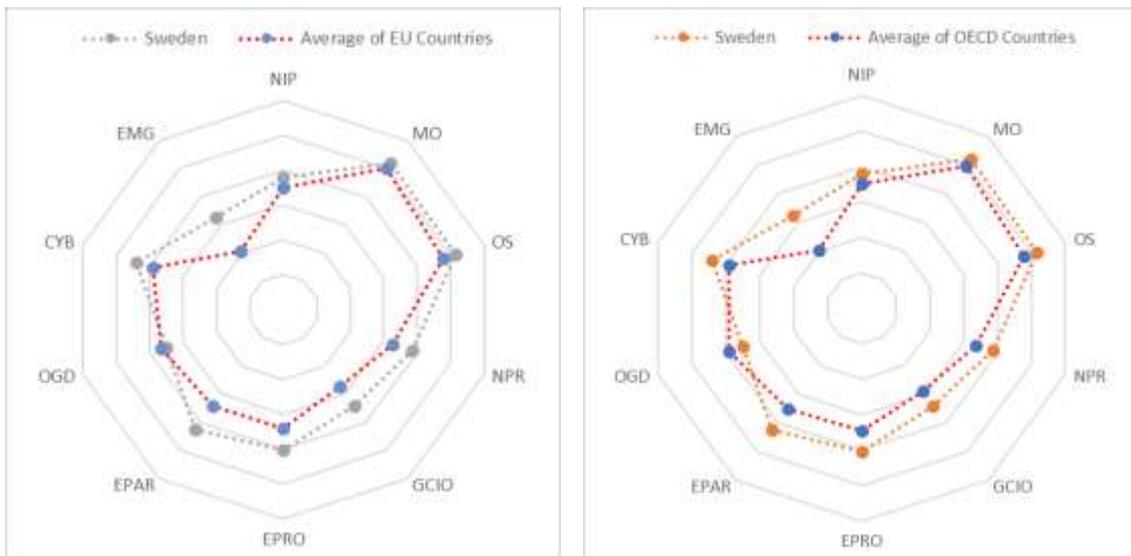
In European countries, Sweden surpasses the regional average on most indicators, except Online Services, Open Government and National Portal. Especially in e-Government promotion, the Swedish government even outweighs Denmark, securing the 1st in the European in this indicator.

3   Digital Government Development

As one of the world's best-connected countries, Sweden has 100% cell phone subscriptions with data, 93% Internet users, 51% of households with personal computers, and 32% broadband subscribers). All of these conditions combine with an early interest from decision-makers on IT, have turned Sweden into a prominent ICT nation with good

infrastructure and advanced services. The Swedish government has formulated strong policies in this progress.

In 2016, Sweden concluded the open government partnership action plan (2014-2016). As the results, the Swedish government focused on the e-Government and enhanced access to information in three main areas: citizen-oriented public sector development, the re-use of public administration documents and aid transparency. The major identified challenge of the action plan is 'More Effectively Managing Public Resources and Increasing Corporate Accountability. They also identified 5 commitments for Sweden, (1) put citizens at the center, (2) re-use of public administration documents, (3) Increased access to Swedish aid information, (4) Improved opportunities for dialogue and transparency, and (5) Increased aid transparency at the global level.

Moreover, according to the- Swedish – innovation in 2018, Sweden has a goal that developed e-government will contribute in making the public sector more open and to work more efficiently and offer services which are natural. The target is a more open and smarter public sector which can support innovation and participation, a more comfortable everyday life for individuals and businesses as well as higher quality and efficiency in public services. In order to realize that, Sweden needs to continue the development of e-government and increase opportunities for private actors to develop new services by providing public data.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

In March 2017, the technical framework of the Swedish e-Identification Board was updated and adapted to eIDAS. Authorities and municipalities will now be able to connect their eServices to the Swedish eIDAS node.

4.2   Management Optimization [MO]

In September 2014, The Swedish minister of ICT presented the Digital Step - a drive to achieve more collaborative e-government. The drive will implement the Swedish strategy on e-government, which was launched in December 2012. The strategy describes how the Swedish Government plans to strengthen further the ability of government agencies to work together in delivering digital services.

4.3   Online Service [OS]

The score for Online Service comprises five sub-dimensions: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience.

In general, most public services in Sweden are provided digitally. However, not all of them reached the transactional complexity level. Regarding e-Procurement, the Swedish Government has not implemented a centralized portal for electronic public procurement, as this is intentionally left up to private operators. The website avropa.se is currently the primary means of communication with procuring entities and suppliers. In order to facilitate the delivery of transactional e-Services to citizens, the Swedish Government has put into place the National e-Identification Board, whose mission is to promote and coordinate electronic identification and signature for the public sector e-Services. Regarding Taxation and Customs, skatteverket.se and tullverket.se are two electronic portals established to provide various transactional services to citizens and businesses. Those services obtained the highest level in complexity score.

To measure the level of convenience, the third party application Google PageSpeed™ Insight has shown that all services have a good access speed.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. Government.se is the government portal of Sweden. It presents a wide range of information resources about government structure, government agencies, legal documents and daily news regarding government's operations. Information is delivered in 14 different languages.

In technical aspect, the result of Google PageSpeed™ Insight showed that the website operates well both from PC and from Mobile Device. The portal also provides several contacting methods via various Social Networks such as Facebook, Twitter, YouTube, Flicker as well as there is a feature allowing the user to receive update mail notification.

4.5 Government CIO [GCIO]

It is clear that the position of CIO does exist in all levels of government, from national, to regional, to local, albeit under different names and with different responsibilities.

4.6 E-Government Promotion [EPRO]

The Minister for Public Administration Ardalan Shekarabi will be is responsible for e-Government. For municipalities digitalization, Swedish Association of Local Authorities and Regions (SKL) continues being in charge. Swedish Association of Municipalities for Joint Development of Public e-Services (SAMBRUK) initiated in 2002 for joint development of e-Services.

Regarding monitoring e-Government progress, the Digitalization Commission has been established in 2012 by the Swedish Government to analyze and monitor progress towards the Swedish ICT-policy goal to become the best in the world at digitalization. Sweden also has research think-tanks on e-Government, such as eGovLab of Stockholm University or Timbro. eGovlab have cooperation with EU.

4.7 E-Government Participation [EPAR]

There are around 60% of Swedish citizens use e-Services. The total of services provided online is around 3800 services. These users conducted over 250 million transactions in various private and public e-Services during 2011, thanks to the availability of world-class broadband. This enables households and businesses to have excellent opportunities to use electronic public services via broadband.

Sweden recently updated its national eHealth vision, which now states that, by 2020, all residents aged 16 or over should have access to all health-related information documented in county-funded health and dental care. Sweden has approximately 10 million inhabitants, 41% (about 4.1 million) of whom had created their account to use personal e-services on the 1177.se portal by June 2017. Through this national patient portal citizens can reach the PAEHR and, in June 2017, the total number of unique users of this e-service had reached 1.3 million.

4.8 Open Government Data [OGD]

Regards of the Open Government, the first Swedish OGP Action Plan was published in 2012 and focused on the challenge of More Effectively Managing Resources. In the second Action Plan published in 2014, the scope was broadened by focusing on More Effectively Managing Public Resources and Increasing Corporate Accountability. Five

commitments were made on D-Government, public sector information and aid transparency. Sweden's third Action Plan builds on three of the commitments in the previous Action Plan and one additional commitment:

- Putting citizens at the center (D-Government)

- Re-using public administration documents and open data

- Improving opportunities for dialogue and transparency in aid management and implementation

- Developing a new format for dialogue with CSOs (new commitment).

As stated in the Independent Reporting Mechanism, more can be done to increase the scope of future commitments by adopting a more integrated approach to open government. An essential step in that direction is the engagement of the Ministry of Culture with a new commitment to the Swedish OGP Action Plan.

4.9 Cyber Security [CYB]

The Government is presenting a national strategy for developing and enhancing cybersecurity in Sweden. The strategy outlines objectives in six priority areas and will help to create long-term conditions for all stakeholders in society to work effectively on cybersecurity, and raise the level of awareness and knowledge throughout society. Six strategic priorities to promote Sweden's security and IT policy objectives, the Government believes there are six primary areas in society's cybersecurity that must be given priority.

1. Securing a systematic and comprehensive approach to cybersecurity efforts

2. Enhancing network, product and system security

3. Enhancing capability to prevent, detect and manage cyber attacks and other IT incidents

4. Increasing the possibility of preventing and combating cybercrime

5. Increasing knowledge and promoting expertise

6. Enhancing international cooperation

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). According to the report from government offices of Sweden, Sweden will start and create a leading international environment for collaboration on AI in 2018. Minister for Digital Development, launched an international leading artificial intelligence collaboration (AI)-Data Factory and Arena. It will strengthen existing, planned and future Swedish initiatives in AI. The goals are to:

1. Create a dynamic, world-class environment where access to large amounts of unique and exciting data will attract academic and industrial researchers, as well as research institutes

2. Provide a hub in applied AI-related projects and in generating data for academia, industry and public services

3. Facilitate cross-fertilization of AI expertise between different areas of application

4. Develop methods and infrastructure for, in a controlled and reliable way, managing large quantities of data and successfully training AI algorithms

5. Maintain a high international profile and collaborate with existing and planned.

5   Some Highlights

There have been lots of efforts carried out by Swedish Government to promote for e-Government. These activities could be found in both central and local government levels. For example, in October 2015, an advisory board for e-Government was established by the Swedish government which consists of high-level decision-makers in the public sector with the task to advise on e-Government policy. In addition, regular meetings and events were held at the municipality level to promote different aspects of e-Government. All of these evidence resulted in a high score for Sweden on e-Government promotion ranking.

More attention need to be paid on providing information on the national portal. It is advised that country information and available services should be included on the national portal as a one-stop gateway for residents and foreigners. In addition, being the country with many popular technology corporations such as Erikson, the government is recommended to utilize emerging technologies into the public sector's operations. This will help to improve the ranking of Sweden in this area.

Moreover, the utilization of emerging technology and establishing some action plans for e-Government, it should be evaluated the contribution to the realization of e-Government.

Switzerland

1   General Information

Area: 41,277 km^2

Population: 8,236,303

Government Type: Federal Republic

GDP: $ 61,400

Internet User: 89.4

Wired (Fixed Broadband User): 46.3

Wireless Broadband User: 103.7
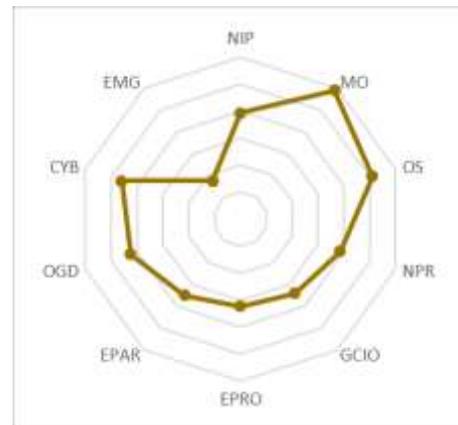
2   Positioning in a Global Organization and a Region
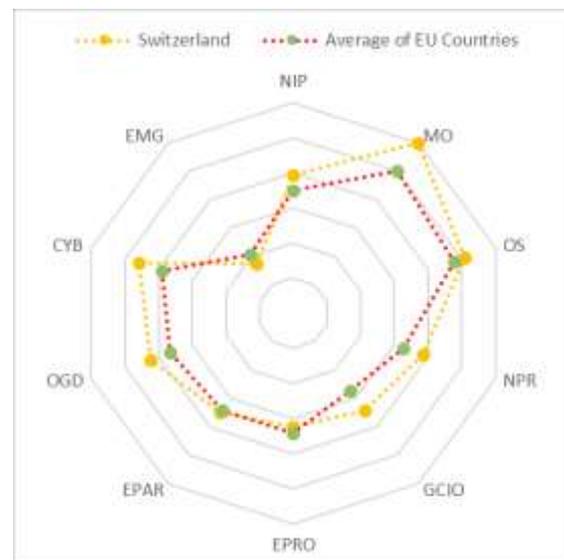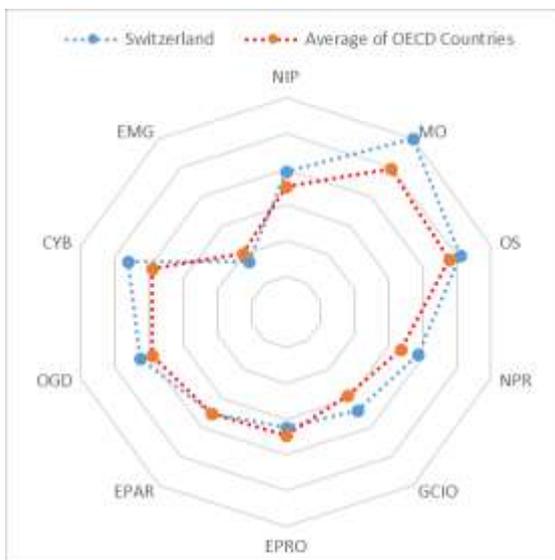
Switzerland has outstanding performance in Management Optimization, which is above the average of OECD countries. However, similar to other developed countries in European, Switzerland has a very low e-Government Promotion initiatives. Its score on e-Government Promotion is lower than the average score of both OECD and European Countries

3   Digital Government Development

Following the adoption of the eGovernment strategy in January 2007 and its subsequent revision in December 2015, Switzerland updated its strategy for 2016-2019 years. The strategy was worked out in a collaboration between cantons and municipalities, facilitated by the Federal IT Steering Unit (FITSU).

The development of Swiss eGovernment platform is carried out in collaboration with numerous private entities, such as leading IT companies, financial institutions, and even the Swiss Post. This allows for highly specialized approach and quality of service.

Swiss Confederation also participates in international projects on eGovernment development, such as a joint programme with India, and shows interest in multilateral

agreements on E-Government (e.g. European declaration on E-Government, Talinn 6th October 2017).

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Switzerland possesses one of the best ICT infrastructures in the region and world with approximately 89.4% of the population having access to the Internet (ITU, 2017). The fixed broadband internet penetration reaches 46.3% while wireless broadband penetration – nearly 103.7%.

4.2 Management Optimization [MO]

Swiss strategy on E-Government provides distinct and feasible objectives for each aspect of E-Government on both national and regional levels that have been developed as a result of collaboration between the central and local governments. Updates on the achievements and further steps are published annually and in free access.

At the core of the system is the Business Process Model Notation (BPMN) that is meant to facilitate interactions between the government, local businesses and potential investors from abroad. The business aspect of Swiss D-Government is one of the most developed, indicating the country's priority in using the E-Government platform for economic needs.

The active side of the system as of now is its interconnectedness between the central government, the local governments, and private stakeholders. The drawback of the system is the lack of uniform metadata standard and centralized financial information system.

4.3 Online Service [OS]

Evaluation of the Online Service is based on an investigation of five online services: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop service, each of which has been evaluated in terms of the level of complexity, level of security, and level of convenience.

Overall, all services showed excellent performance, e-Tax and One-Stop service showing the highest results out of the five.

In terms of complexity, all of the services have achieved a two-way interaction model with users having the opportunity to submit feedback and receive all the needed information with the necessity of visiting the office. The one-stop service ch.ch that is being developed under the framework in effect until 2019 is the only service that reached the transactional level of operability and provides the user with follow-up information depending on previously submitted data.

Convenience-wise, all pages showed good results, e-Tax and One-Stop service being above the rest. The websites were multilingual with only some elements and .pdf documents not being available in English, and the speed and optimization of pages were overall good. Regarding internet speed, the result was good for every service except for e-Procurement that fell within "fair".

The level of security was excellent for every of the services, providing secured certificate and password protection.

4.4 National Portal [NPR]

The evaluation of the National Portal is based on three factors: Content, Technical aspect, and functionality. Swiss National Portal (https://admin.ch) primarily represents a

site of the government of the country, subdivided into pages for each significant public office. The site contains information on the political structure of the country, historical and cultural background as well as various information of different usability for both Swiss citizens and foreigners. The Portal is translated into national languages and English. It is also connected to official social network profiles of the public offices and provides a newsfeed on demand.

Technically-wise, the webpage of the Portal showed poor speed performance, yet fully operation interface.

4.5 Government CIO [GCIO]

Although formally Switzerland does not have a GCIO, de-facto the E-Government framework clearly defines persons with GCIO's responsibilities at all levels. The same applies to education; wherein there are no programmes designated to prepare CIOs but MBA programmes in the field of IT that prepare highly qualified specialist who among other things possess skills of CIO.

4.6 E-Government Promotion [EPRO]

Swiss D-Government programme does not include a separate designated legal document of national or regional level for D-Government promotion. However, the latter is included in documents of some ministries (like SECO). In addition, the promotion of D-Government is mostly carried out by private partners of the D-Government project of Switzerland, such as Swiss Mail.

The promotion activities are in general not viewed as crucial because of high ICT penetration level in the society and computer literacy even among senior generation.

Switzerland is also holding an annual E-Government forum with the help of leading IT companies and is engaged in international projects and agreements on E-Government.

4.7 E-Participation [EPAR]

Being a highly developed post-industrial society, Switzerland can enjoy the full benefits of the digitalization of the administrative field. The services like E-Tax and E-procurement and actively used by society, thus creating stimuli for the government to pursue new horizons in this sphere. The framework for 2020, in particular, provides unification of all D-Government services under one portal (ch.ch), electronic identification system, et cetera. The level of E-Participation remains high, although less than in neighboring European countries, like Germany or France. The weak point in Swiss E-Participation is lack of clear evidence of decisions made by citizenry's feedback.

4.8 Open Government Data [OGD]

Switzerland started the implementation of the Open Government Platform in 2004 under the Federal Act on Freedom of Information in the Administration to participate in the Freedom of Information Act movement around the world. At the moment, Swiss Open Data Portal (https://opendata.swiss/en/) provides various information in different fields and can be considered one of the best Open Data Portals in use.

4.9 Cyber Security [CYB]

Switzerland considers security to be of utmost concern and therefore the cybersecurity of the country is on the highest level. The following laws have been adopted on the issue:

Information Protection Ordnance (2007)

Federal Act on Data Protection (2010)

Military Act: Articles 99-100 – Ordinance on the Armed Forces Intelligence Service (O-AFIS)

Federal Law on Certification Service

De-facto, Swiss cyber-security is maintained by Swiss Cyber Security Advisory and Research Group, FITSU and Swiss-Cert, as well as by private companies taking part in E-Government programme.

4.10   The use of Emerging ICT [EMG]

For this index, the factor includes such technologies as "Big Data", Cloud computing and Internet of Things. As of now, the Swiss government has developed a private cloud platform for public offices and is to complete full-fledged Cloud Computing System under PaaS standard by 2019.

In collecting statistics for Open Government Data platform and for internal use the government actively uses Big Data. Private partners assist the administration in obtaining and analyzing the big data retrieved.

There are no clear indicators of using IoT by the government of Switzerland, although many businesses in the country excel at this type of technologies.

5   Some Highlights

The strongest points of Swiss E-Government are Open Data and Cybersecurity that indicate the importance of transparency and safety as of core priorities for a neutral country. Traditionally having small, yet powerful army Switzerland cannot but excel at preventing all possible risks and hazards employing its outstanding intellectual potential. Importance of transparency highlights the tradition of Direct Democracy in which the voice of every citizen matters and is taken into account while discussing the most important legislation and policy issues. In order for the Direct Democracy to succeed, the constituent is obliged to be well informed of the current state of affairs of the country, and thus a portal for official governmental data is needed. Another strong aspect of Swiss D-Government is an active cooperation between the private and public sector, allowing diversification of labor and high quality of end product.

The weak point in Swiss D-Government is the lack of reliable and uniform D-Government promotion as well as the relative modest use of emerging technologies. Although citizens are already engaged in D-Government services, and new technologies are being gradually implemented, the State could show more active efforts in this direction to maximize the useful output of the D-Government system. With the implementation of new features provided for by the revised D-Government strategy, the Swiss government is likely to amplify its efforts in promoting both new and already existing services.

Taiwan

1   General Information

Area: 35,980 km^2

Population: 23,415,126

Government   Type: multiparty democracy

GDP: $47,500

Internet User: 80

Wired (Fixed Broadband User): 24.2

Wireless Broadband User: 57.1
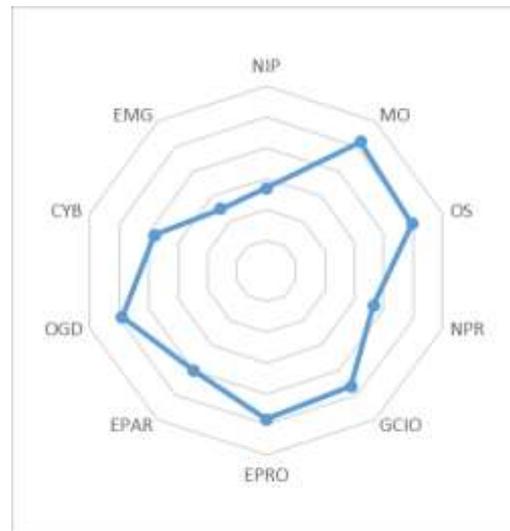
2   Positioning in a Global Organization and a Region
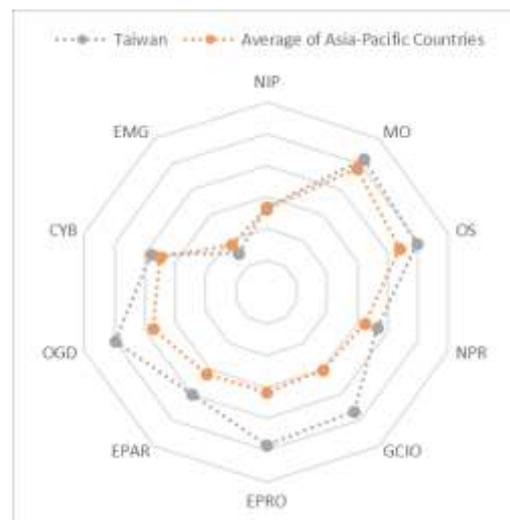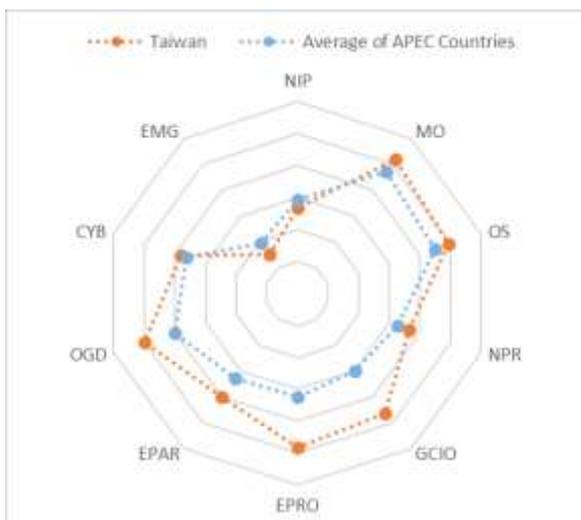
Except for Network Infrastructure Preparedness and National Portal, rest 8 indicators of Taiwan are above the average score of many countries, especially the performance on Open Government Data. Taiwan also has achieved comparatively better scores compared with Asia countries, exceeding or equal to the average except for Network Infrastructure Preparedness and National Portal.

3   Digital Government Development

On November 24, 2016, the Executive Yuan, Taiwan launched the Digital Nation and Innovative Economic Development Plan (2017-2025) (DIGI+ program). The plan's main goals for 2025 are to grow Taiwan's digital economy to US$205.9 billion, increase the digital lifestyle services penetration rate to 80 percent, speed up broadband connections to 2 Gbps, ensure citizens' fundamental rights to have 25 Mbps broadband access, and put Taiwan among the top 10 information technology nations worldwide. Accordingly, the national development council (NDC) of Taiwan promoted the national Digital Government program of Taiwan (2017-2020).

In 2017, as the fifth stage of e-Government development in Taiwan[16]. The newly launched program aims to adopt emerging technologies such as big data, cloud computing, artificial intelligence, etc. to build a comprehensive global leading e-government of which citizens can take full advantage instead of receiving standard public services. Data-driven policy-making, citizen-centric service, and public-private participation are the three main core concepts of the program. Various promotion plans have been implemented, and the results are significantly (see Table 1). For example, Government cloud service and structure have been completed 60% in 2017, and are expected to achieve the goal of 90% by 2020. Until 8th March 2018, Taiwan government has opened more than 35,672 datasets and 172 Application Public Interfaces (APIs). Open Knowledge International has published global open data index 2016, showing that Taiwan topped the index for two consecutive years.

4 By Indicators
4.1 Network Infrastructure Preparedness [NIP]

According to ITU's investigation, Internet users take up 80% of the population in Taiwan. About 24.7% are Fixed-Broadband users, and 57.1% of the wireless broadband users, in which most advanced countries have achieved more proportion close to 100%~110%. According to the nation's research, the network coverage has already reached 100% over the island, and the internet usage rate was about 80% for that age were

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16

https://www.ndc.gov.tw/en/News_Content.aspx?n=8C362E80B990A55C&sms=1DB6C6A8871CA043&s=158C8446035DF66A

above 12 years old. It gives government and enterprises an excellent opportunity to offer information and services to people via the internet.

4.2 Management Optimization [MO]

This indicator "Management Optimization" reflects the utilization of ICT for improving government business processes. Taiwan has propelled the administrative reformation by information system since the 1980s. After consistent electronic/digital Government plans of five stages within particular emphases on government system integrations, Taiwan has optimized the internal office and established a valid operation. The newly launched digital government program includes twenty-four sub-plans involving seventeen central government agencies. In particular, the program identifies clear targets with quantitative measures such as the completion of four nation-wide integrated one-stop services, sixty percentage e-service usage rate, etc. Moreover, NDC has formed an expert committee to evaluate the strategies of its digital government program periodically to ensure that the program remains current and update.

4.3 Online Service [OS]

The score for Online Service is evaluated on five online services, i.e., e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Three levels of sophistication were examined, i.e., Level of Complexity, Level of Security, and Level of Convenience. In Taiwan, most of these online services have reached the required security level and have been estimated as high performances which provide citizens with transactional online service. In particular, considering the trend of incoming aging society with fewer children, Taiwan government makes efforts in integrating the e-Health system to serve citizens in different needs and priorities. Quite a few online systems are connecting hospitals, clinics, drug stores, and citizens in which multiple needs on health can be satisfied even with APPs. For example, the Ministry of Health and Welfare (MOHW) has established "my health bank" to provide citizens with a secure online health service with personal medical data which helps inform and ensure about their health history. In addition, the MOHW has created the ibaby services network which is available to citizens and foreign immigrants in Taiwan in need of the integrated services and assistance in life accommodation, marital registration, issues on pregnancy and nursery with provision of the relevant welfare measures, specifics of subsidies, messages of local public services in counties/cities and health education and knowledge/knowhow. Once a person becomes an i-Baby member, he or she will benefit from a VIP level of personalized service and receive customized information through e-mail or calendar note reminders straight from this website.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. The English version of the National Portal of Taiwan (http://www.taiwan.gov.tw/) offers information about Taiwan including demographic and historical introductions. Other information has been classified for different purposes such as Visas/Immigration, Education/Employment, Tourism, Economy and so on. There are also guides for residents with various aspects of living in Taiwan. Although e-information is the primary function for the English version of National Portal of Taiwan, the Mandarin version of National Portal of Taiwan (https://www.gov.tw/Default.aspx) provides most central and even local government's online services.

4.5   Government CIO [GCIO]

Taiwan has put effort to establish the GCIO system. The year 2012 was an critical time point in which the first GCIO Dr. San-Cheng Chang has been appointed, and the second-degree GCIO system was set up. According to it, the Convener of National Information and Communications Initiative Committee (NICI) fill the post of GCIO in Executive Yuan level, and each Ministry level of central government have their CIOs as well. Regular CIO Meeting has been held among the CIOs and deputy heads of municipal and city governments.

The GCIO organization in Taiwan consists of the Deputy Ministers or Chief Secretaries at cabinet-level government agencies who serve as the ministry level CIOs. Regarding the government ICT strategies, all those ministry level CIOs are under the command of NICI chief commissioner who serves as the Executive Yuan CIO. Currently, the GCIO is Dr. Tsung-Tsong Wu. As the Executive Yuan CIO, his responsibility is to oversee the promotion of upgrade of information and communications and related industries, improvement of administrative efficiency and friendly services of government agencies and the prevalence and applications of Internet usage.

The Responsibility of Ministry-level CIOs is to coordinate the business and ICT resources, promote business process re-engineering and regulatory relaxation, apply ICT to enhance administrative efficiency and develop innovative, friendly services. Similarly, quite a few local city governments have formal appointment and offices for GCIO. The responsibility of local government-level CIOs is to coordinate the business and ICT resources, promoting business re-engineering, apply ICT to enhance administrative efficiency and develop innovative, friendly services at local levels.

4.6   E-Government Promotion [EPRO]

The newest Digital Government program published in 2017 focus on digital government construction within the utilization of emerging technologies including IOT, Cloud Computing, and Big Data. To coordinate with the ide@Taiwan 2020 white paper, the digital government program has proposed three main objectives as "Proving convenient living" "Develop digital economy" and "Fulfill governance transparency". The core concept of the new program is "Data-driven" "public-private collaboration" and "civilian-centric". There are also many promotions covering issues such as government open data and infrastructure at the national level. In addition, the public sector tries to develop a public-private partnership and work with the private sector to implement and govern the development of the smart city. For example, Taipei City government has established the "Taipei Smart City Project Management Office" to build an innovation matchmaking platform to combine industry and government resources to develop a smart solution that satisfies public demands.

4.7   E-Participation [EPAR]

Most of the government agencies in Taiwan have prepared channels for citizens to interact with specific agencies via email, telephone, online message form, and social media such as Facebook. A simple search engine on the one-stop service portal enables citizens to find the departments they want to reach directly and effectively with completed contact lists by names. In response to the rapid development of the internet and the rise of citizen participation awareness, the government has established an E-participation Platform (http://join.gov.tw) to gather the public opinions. People can initiate proposals on this website. Once the proposal gets 5,000 signatures within 60 days, then the authority has to respond formally in 60 days after comprehensive research and analysis. The

government enables to win people's trust and make good use of social innovation power to improve the effectiveness of government governance. In addition, "vTaiwan," an on-line to off-line PPP platform, facilitates stakeholders to come together on consensus issues and leads to original policy formulation.

4.8   Open Government Data [OGD]

Taiwan got comparatively high scores on the indicator of Open Government Data. Open data initiative has remained one of the priorities in Digital Government plans of Taiwan, within legal preparedness such as "The Freedom of Government Information Law (2005)" "Copyright Act (2014)" and "Personal Information Promotion (2015)". The Open Data Portal (http://data.gov.tw/) are not only updating datasets on every aspect in social life and governments but also providing space for citizens to comment and discuss after checking the data. What's more, the details in data standards and guidance for users to read and utilize information are presented on the website. The accomplishment of Open Government Data of Taiwan has also been recognized by other international organization. For example, Taiwan retains top spot for the second year running among 94 surveyed countries in the latest Global Open Data Index published by U.K.-based Open Knowledge International

4.9   Cyber Security [CYB]

To strengthen nation's capacities in Cyber Security, the National Information and Communication Security Taskforces (NISCT) has been formed by The Executive Yuan since 2001, by whom Ministry of Science and Technology was issued as the responsible authority for Cyber Security instead of NISCT, within a new institution called "National Center for Cyber Security Technology (NCCST)" in 2016. Several policies related to Cyber Security and Data Security have been issued in Taiwan, such as Information and Communication Security Policy White Paper (2008/2010), National Information and Communication Security development project (2013-2016), Government Configuration Baseline Initiative (2017-2020), and Mobile Payment Policy promoted by NDC (2017).

4.10   The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). Taiwan government is earnest to implement new technologies into Public Sector. There are all evidence to show their ongoing projects and plans adopting Cloud Computing or Big data, to correspond the data-driven vision for nation's strategy. For example, the Executive Yuan passed "Cloud Computing Industrial Development Program" in 2010 in order to extend the advantage of hardware manufacturing from the existing Information and Communication Industry and to obtain the early opportunity of global cloud computing market. In 2012, the Executive Yuan amended the program to expand the appeal to "Promote the government cloud applications" and "Drive the development of domestic cloud industries." Currently, five strategies "Promote government apps that meet citizens' needs," "Build expertise in app development," "Build system software expertise," "Encourage domestic firms to develop cloud infrastructure," and "Apply green concepts and build cloud computing economies of scale" have been identified and implemented under the Cloud Computing Development Program (2016-2018). Several national Cloud Systems have been developed. For example, to avoid overdoses and adverse drug interactions and help physicians and pharmacists safeguard medication safety, the National Health Insurance Administration set up the patient-centered "NHI PharmaCloud System." As of July 31, 2015, all hospitals in Taiwan have been connected

to the NHI PharmaCloud System since 2015, and a total of 22,708 contracted medical institutions, including hospitals, clinics, pharmacies, and home care institutions, have conducted searches on the system.

However, regulations around emerging technologies are still not been well prepared. The situation may be similar to other countries who try to put the technologies into practice in the first place.

5   Some Highlights

It has excellent performance on the indicator of "Open government", showing government's effort actions to achieve the goals that have been emphasized in aforementioned national plans. Transparency, Accountability or E-democracy have always remained common focus in the society. Along with the development of digital government strategy, Taiwan is indeed expected to gain better achievements on "e-participation" "the usage of emerging technologies" in the future. On the other hand, the national portal should not be forgotten since it is not only the portal to send nation's message to citizens but also an essential window for non-Taiwan citizens to understand and become familiar with the society. In addition, innovation is a vital issue for the digital government as well.

Thailand

1   General Information

Area: 513,120 km^2

Population: 69,183,173

Government   Type: Constitutional
Monarchy

GDP: $16,800

Internet User: 47.5

Wired (Fixed Broadband User): 10.7

Wireless Broadband User: 94.7
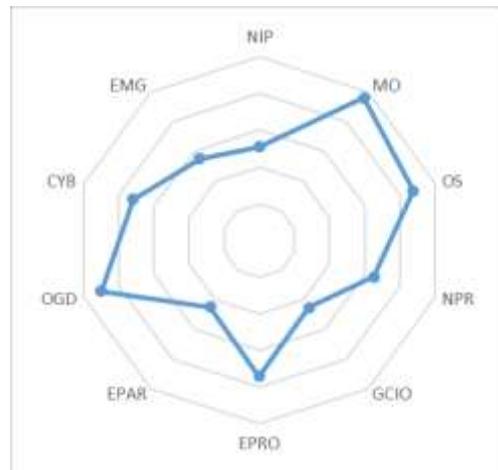
2   Positioning in a Global Organization and a Region
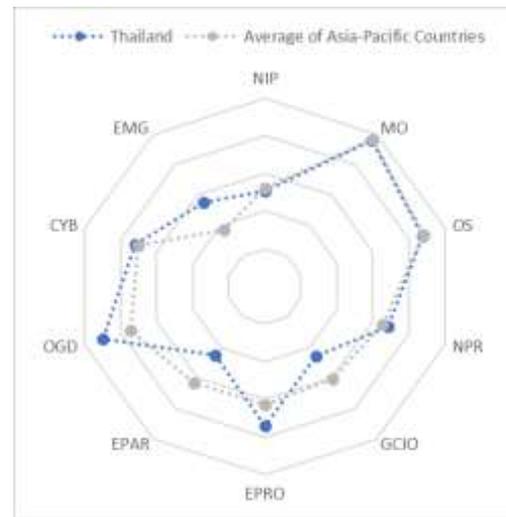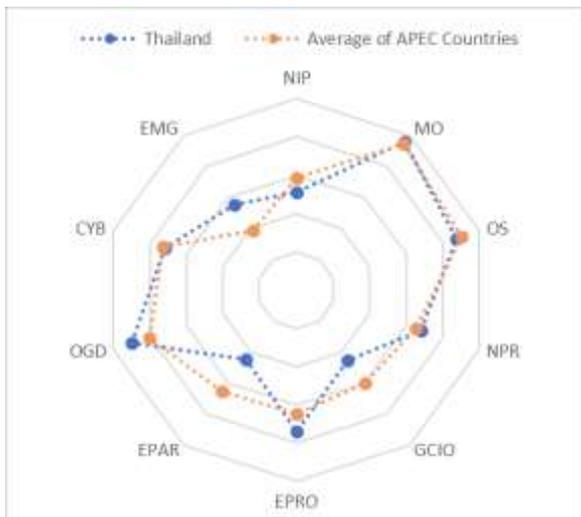
Among APEC Countries, the Management Optimization (MO), Online Service (OS), Government CIO (GCIO), E-Promotion (EPRO), Open Government Data (OGD) and Cyber Security (CYB) indicators are improving and still above the average score of APEC members. The Management Optimization (MO) indicator of Thailand gets the same level of United States, the best country in APEC. Amongst ASEAN countries, Thailand is placed below Singapore. However, the National Portal (NPR) indicator of Thailand is the lowest among these regions.

3   Digital Government Development

The Ministry of Digital Economy and Society (MDES) is the main body responsible the Digital Economy and Society Development (DESD) plan, endorsed by the Cabinet along with D-Government Development (DGD) plan in April 2016 with particular set of strategies including building digital infra, boosting digital economy, creating knowledgeably digital society, developing digital workforce and building trust and confidence in digital era. Both plans are in-line with Thailand Information and Communication Technology (ICT) Policy Framework ICT2020 (2011-2020) which was released on May 2011. While the DESD plan aims to transform the country toward

"Digital Thailand" which is defined as a transformed Thailand that maximizes the use of digital technologies in all socio-economic activities in order to develop infrastructure, innovation, data, human capital, and other digital resources that will ultimately drive the country towards wealth, stability, and sustainability, the DGD plan is to transform the whole government to enhance the country's digital development goal via PPP initiatives. To propel this transformation forward and promote innovation, the government introduced the "Thailand 4.0" economic model, which concentrates on digital improvements that enhance the quality of life and at the same time promotes productivity and efficiency. The Thailand 4.0 concept gives public and private partnerships an critical role. While the private sector takes the lead through its business activities and investments, the government serves as a facilitator and promoter. In this way, more investment in digital-technology-based industries is encouraged by providing sufficient incentives to investors in the targeted industries. (http://www.boi.go.th)

Digital Government development plan which is now turning to 2nd edition (2017-2021) has been undergone by Electronic Government Agency (Public Organization) (EGA) which is soon to transform itself as Digital Government Agency or DGA with an absolute authority profile. The government aims to develop digital capabilities within all key sectors, including agriculture, tourism, education, the medical profession, investment, disaster prevention, and public administration, in order to drive economic and social progress. To achieve this objective, digital technologies need to be incorporated into public services. An integrated information network will be developed cooperatively by government agencies, with a focus on four key development models, namely Government Integration, Smart Operations, Citizen-Centric Services, and Driven Transformation. (https://www.opengovasia.com/articles/7415-thailand-pm-announces-digital-government-plan-2017-2021-to-achieve-integrated-citizen-centric-digital-government-within-5-years)

Figure XII-0-1: Digital Thailand Aims

Figure XII-2: Thailand Digital Economy and Society Development Plan's Strategies

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Approximately 47.5% of people in Thailand were Internet users in 2016, according to the Measuring the Information Society Report 2017 from International Telecommunication Union (ITU). About 10.7% have fixed-broadband subscriptions, and wireless broadband subscription has reached 94.7%. The government has successfully installed fiber-optical-wired broadband internet (the so-called Netpracharat) to cover the village population of some 95% of the country by 2017 and will be 100% coverage in 2018. Free WiFi is provided at each village center area.

4.2 Management Optimization [MO]

Thailand continuingly scores highly regarding optimization awareness; the country adds on the groundwork of EA framework to include digital development structure in all key sectors as a new blueprint of D-Government development. Provisional interoperability for the public sector's digital transformation is directly under the control of EGA turning DGA. The present Thailand Digital Economy and Society Development plan strategies are a key driving mechanism of Digital Thailand for which newly established body called DEPA (Digital Economy Promotion Agency) under MDES is responsible in close cooperation with the current authority of EGA. Currently, the government encourages to deploy e-Payment called "Prompt-pay" for facilitating online payment and fund-transfer by using national ID across all local banks without any fees regarding public administration and online services.

4.3 Online Service [OS]

The score for Online Service is based on an investigation of five online services: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and their URL Address. All of those services were investigated

using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Among these five Online Service, e-Tax, e-Procurement and One-Stop Service are the best performers among five online services.

Regarding complexity level, all online services have reach interaction level where the citizen can obtain the service without necessarily visit the government office. The initial stage of interaction with the government through the portal. In addition to that, all Online Service have implemented security measures such as Site Authentication, and Password Protection for obtaining the services. However, it is still limited to use SSL as a security measure when login to the system.

To measure the level of convenience, the third-party application "Google PageSpeed™ Insight" result has shown that the e-Tax Portal is perfect in terms of fast speed and efficiency, the One-Stop Service is also at fast speed while the e-Procurement and e-Health are at the average term. The e-Customs is such considerably in doubt in terms of speed that may cause the access speed considerably slow to access.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information, Technical, and Functionality. Thailand has several websites collectively which make up online government presence. The digital portal of the Thai government is "https://www.egov.go.th/" that provides daily information and D-Government connectivity for citizens. The portal is available only in the national language Thai. In technical aspect, the result of Google PageSpeed™ Insight showed that the website performance had been improved to a "Fast" speed on both from PC and from Mobile Device.

4.5 Government CIO [GCIO]

The Chief Information Officer (CIO) is a bureaucratic position by cabinet resolution default to be appointed at all levels including provincial level. There are continuingly progressive organizations for the CIO, including CIO Association of Thailand which gathered both CIO and IT persons from both government and private sectors, the International Academy of CIO in Thailand as well as CIO Forum in critical sectors such as healthcare, a public utility as well as banking and insurance. EGA has D-Government Academy that also coordinates with other agencies to organize CIO related activities like seminars, conferences, and workshops. Under the Digital Thailand flagship, CIOs in government sector have been assigned the vital role to lead in a digital transformation in their organizations. To date, provisional ICT training courses for government CEO resolved by the cabinet has been conducted annually for gradually bridging the gap of ICT literacy between CEO and CIO.

4.6 E-Government Promotion [EPRO]

EGA currently in charge of D-Government promotion in Thailand is now transforming to a new DGA (Digital Government Agency) under a new so-called Digital Government bill which is sooner or later endorsed. DEPA (Digital Economy Promotion Agency) under MDES supports funding for DE initiatives which includes some critical D-Government projects. However, ministries, local governments, and state-owned enterprises in telecommunication such as TOT and CAT are also actively involved in promoting D-Government.

4.7　E-Participation [EPAR]

In general, all interest groups have online access to essential administrative information. The presence of e-participation has been improved via the Damrongtham Center which has branches in all provinces nationwide and facilitated by Call Center 1567 (setup under Royal Decree on Criteria and Procedure for Good Governance 2003) and web portal www.damrongdhama.moi.go.th under active support by the present Prime Minister, General Prayut Chan-o-cha, aiming for filing problems and grievances especially against corruption from the general public and make information accessible to them. Currently the government boost more people participation through this channel by opening direct call to the PM via with and direct Government House line 1299 police hotline 191 and Government Contact Center (GAC) 1111 on top of the Call Center 1567. Moreover direct applications - police I lert and GAC-PSC 1111 are already in use as alternatively mobile channels. GAC Web Portal: www.1111.go.th is for years serving as active channel for citizens' requests for public information across all ministries as well as filing general public hardship.

4.8　Open Government Data [OGD]

In Thailand government has appointed EGA to develop Thailand Government Open Data "https://data.go.th" and Open Application "https://apps.go.th" since 2013. These projects are still in an ongoing process. Open Dataset containing links and descriptions has reached amounted to some 1,090 sets increasing from 552 sets while Open Application increased to 288 from 211 applications, both compared to 2016. To keep the information update, EGA authorizes all government agencies to publish their data to the open data portal on behalf of the state, and EGA also has seminar and event to promote Government open data. In addition, for Thailand increasing of Government open data means showing the political will to fight against corruption by publishing as much information as possible in free access for citizens, however it is also creating new economic opportunities and helping better business decisions be made through open data and open application as essential parts of Thailand Open Government.

4.9　Cyber Security [CYB]

Thailand has The Electronic Transaction Act 2001 and Electronic Transaction Decree for Public Sector 2005 as the core of its cyber laws which have been executed by ETDA (Electronic Transaction Development Agency) under MDES. These laws promote e-Commerce and public e-Services as well as deliver the legal framework for the validity of digital signature and electronic transaction. On 18 July 2007, the Computer Crime Act B.E.2550 (2007) came into force. Now, Thailand is in the process of establishing new legislation along with certain government bodies to execute safer cyber and trustworthy digital channel. The government by Ministry of Digital Economy and Society (MDES) is almost passing the eight items of legislation, to support the development of the digital economy, in which three of them are related to cybersecurity including Computer-Related Crime Bill (amendment); Privacy (Personal Data Protection) Bill; and Cybersecurity Bill. The Cybersecurity Bill, one of the legal instruments proposed is under review, and the Bill specifies the establishment of a National Cyber Security Committee (NCSC) which will be chaired by the prime minister to provide national-level cybersecurity policy to protect prevent and combat cyber threats. In addition, Thailand has been appointed as hub and location of ASEAN-Japan ASEAN-Japan Cybersecurity Capacity Building Center (AJCCBC) in April 2018 for new training initiatives to boost cyber-attack defense together with its launch of Cybersecurity Workforce Capacity Building Plan in November 2017; both schemes will enhance cybersecurity readiness of the country.

4.10 The use of Emerging ICT [EMG]

Cloud and Mobile Computing, Big Data, and the Internet of Things (IoT) have been gradually implemented in the government sector through the promotion of EGA. Good example is the government G-Cloud as an IaaS that utilized cloud computing technology for managing resources of government, and it has been certified by ISO / IEC 27001: 2013 that ensure the information security management system. MDES currently promote the start-up companies to exploit Big Data in government sectors for innovation of new business opportunity. In addition, EGA by Research & Development team has set development scheme for some ongoing government pilot projects on IoT.

5 Some Highlights

Thailand can maintain an impressive point on Management Optimization, Government CIO, and Online Service as well as progressive improvement on D-Government promotion, National Portal, Cyber Security, and e-Participation. The use of emerging technology is showing some sign of progress.

Digital Economy and Society Development Plan are now actively implemented in the 3 key agencies, i.e. DEPA, EGA, and ETDA currently under MDES, taking into account of some prominent projects including, toward the ultimate goal of "Digital Thailand" which is in-line with "Thailand 4.0" strategy. The government aims at the end of the digital plan to accomplish digital services and industries through innovation and creativity based type for the betterment of the Thai economy and society. The digital value will be significant to the whole economy while about 95% village population of internet coverage will be aware of the importance of the digital lifestyle era. Every government unit has a CIO, most CIOs together with CEOs still need knowledge, understanding, and skills on digital technologies and best practices for development of the boundary-less environment. There are several organizations for the CIO, such as the CIO Association of Thailand and the International Academy of CIO in Thailand.

The https://www.egov.go.th/ is actively served as a national portal in for Information, Technical, and Functionality while www.damrongdhama.moi.go.th for filing citizen problems and grievances as the main channel of e-Participation to fight against main country's drawbacks, i.e. the un-transparency and corruption. However, the use of Cloud Computing is highly accumulated to reach the total number of 259 Cloud Computing-based system. Big data has been implemented in some high demand for government units like Department of Highway and the government by MDES is encouraging private entities to explore government Big Data for sourcing out new business opportunities. Moreover, in October 2017 the Government published that the National Statistical Office, MDES will lead the development of the big data center as well as the IoT institute will be a part of the Digital Park to be built in Chon Buri province, as a flagship project under the Eastern Economic Corridor. The Park aims to attract investors by offering numerous benefits and provide an environment for domestic and foreign digital professionals to collaborate. It will focus on the development of S-curve industries (Automation and Robotics, Aerospace, Bio-Energy and Biochemicals, Digital and Medical and Healthcare), which can serve as growth engines to accelerate Thailand's future growth. The MDES is planning to spend Bt100 million to draw up the Digital Park master plan and Bt1 billion (USD 30 million) to build the Digital Park building in 2018 on a site of around 280 Acres.

Tunisia

1 General Information

Area: 163,610 km^2

Population: 11,134,588

Government Type: Parliamentary Republic

GDP: $11,700

Internet User: 59

Wired (Fixed Broadband User): 5.6

Wireless Broadband User: 63
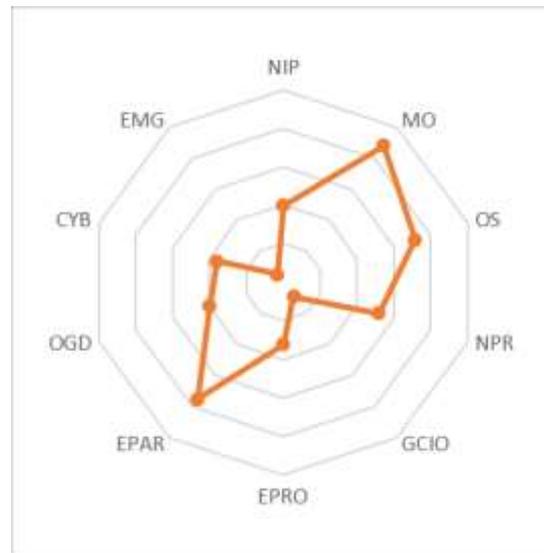
2 Positioning in a Global Organization and a Region
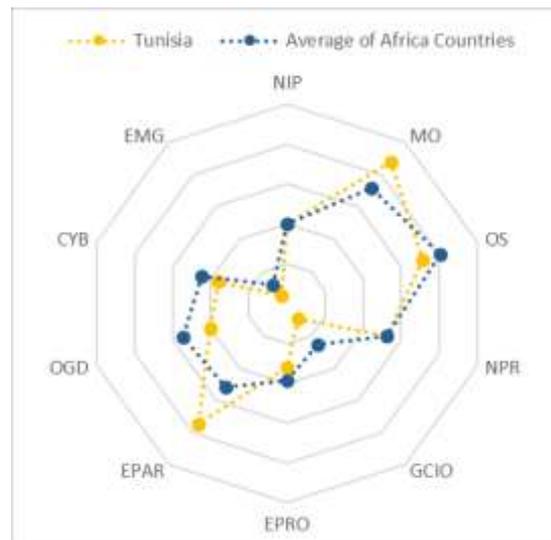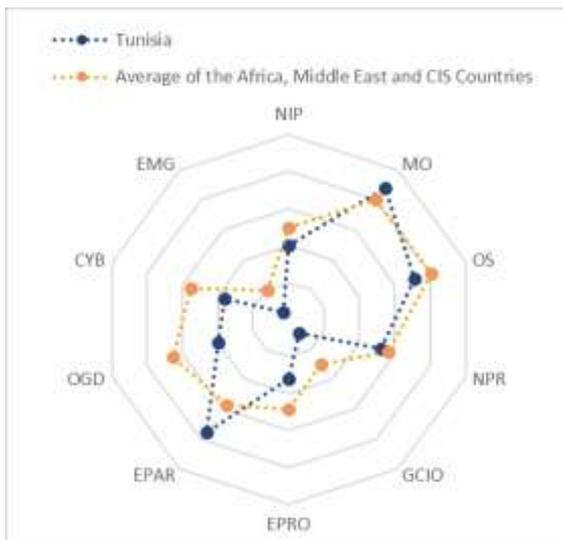
Post-revolution internet policy in Tunisia is critical because the country is an example of a free society in the rest of the region. Since the revolution, the Tunisian Internet Agency (ATI) has transformed. The changes are encouraged. Monopoly agency ended by Moez CHakchouk who took the agency after the revolution. Internet exchange point services, installing essential internet infrastructure locally for two Tunisian telecommunications companies Orange and Tunisian. This effort made costs lower for internet services providers and allowed private companies to take over a share of the market.

3 Digital Government Development

Despite the former tight, controlled dictatorship by President Ben Ali regime, the Government of Tunisia has made significant improvements in promoting a culture of internet freedom in the five years since its revolution as Tunisia lead in Africa and 58th globally in United Nation e-Government Survey 2016. Among African countries, all

indicators expect e-government promotion and the use of the emergency on government indicators are the average scores of the Africa region. Indicators of Tunisia are better those of South Africa and the best in Africa region.

In 2010, the Tunisia government issued the e-strategy 2010-2015. It is a part of the dynamic of the Tunisia government for the development of the knowledge economy and the introduction of the technology of information and communication.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

Approximately 59% of people in Tunisia were Internet users in 2017, according to the Measuring the Information Society Report 2016 from International Telecommunication Union (ITU). About 5.6% have fixed-broadband subscriptions, and wired broadband subscription has reached 63%.

4.2 Management Optimization [MO]

In 2010, the government issued the National Strategy for e-Administration Development for the period 2010-2014. This strategy includes a new generation of public services based on the idea of services integration and interoperability between information systems belonging to administrative structures.

4.3 Online Service [OS]

The score for Online Service is based on five investigating online services, i.e., e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience. Tunisia's approach to promoting information society development and innovative citizen shaping has been positioning information and communication technologies as critical drivers for its economy. Tunisia has well-designed and developed technology parks such as El Ghasala. Furthermore, it has strong research centers and good universities researching modern ICT tools and techniques.

For measuring the level of convenience, the third-party application result has shown that three portals are above the average considerably in terms of speed. The other two portals, i.e., e-Health and One-Stop Service are slightly above the average. The third-party application for assessing the portal is the application from Google PageSpeed™ Insight. In addition to that, all clickable objects on the portal work as they should do.

4.4 National Portal [NPR]

The Tunisian Government portal "http://www.tunisie.gov.tn/" serves as a government portal for public administration, citizens, businesses, visitors and civil society. The portal only hosts online service information and provides links to relevant domains. The portal delivers most of its contents in its official language of Arabic, but also offers information in French.

4.5 Government CIO [GCIO]

The Tunisian public administration at national and local levels does not appoint CIOs or equivalent positions within the legal framework. The director general for e-Government under the prime minister can be considered the CIO at the national level.

4.6   E-Government Promotion [EPRO]

For Tunisia, it can be noted that ICT promotion, which increasingly also includes e-Government promotion, is the main priority of government and the presidential agenda. The law of e-Government exists at the national level but not at the sub-national level.

There also seems to be growing collaboration in the non-government, private and public sectors. This synergy with the presidential leadership at the top level of administration helps to promote ICT penetration and engagement of stakeholders besides changing the nation's online connectivity culture. However, the frameworks, methods, and tools used to measure and evaluate e-Government as well as oversight committees lack adequate levels of integrity.

4.7   E-Participation [EPAR]

Tunisia is one of the most technologically developed nations in the region and has excellent opportunities to implement e-Participation in the country. However, there has been little action taken in this direction recently. In general, government websites provide services in Arabic and French. The national portal and other high-level government sites demonstrate interactive functionality and well thought-out design. Successful national ICT initiatives correlate with increasing awareness of participation. Availability of polls and feedback options shows that the government takes the opinions of citizens into account during decision-making processes. However, there is still a lack of detailed policy declarations, and there are also accountability issues.

4.8   Open Government Data [OGD]

Tunisia joined the Open Government Partnership on 14 January 2014. The Tunisian government has embarked on the preparation of a national action plan (National OGP Action Plan) for the Open Government Partnership. Currently, Tunisia has released the beta version of its open government data website, "http://www.data.gov.tn/", following the wave of open government data portals around the world. However, there is no evidence about the use of open government data, and there is not any dataset hosted on the site.

4.9   Cyber Security [CYB]

The national governance roadmap for cybersecurity in Tunisia is elaborated in the National Agency for Computer Security (ANSI). ANSI is responsible for the benchmarking and measuring cybersecurity development in Tunisia, and also responsible for providing educational and professional training programs for raising awareness with the general public, promoting cybersecurity courses in higher education and promoting certification of professionals in either the public or the private sectors. Moreover, Tunisia has an officially recognized National CIRT (Tunisian Computer Emergency Response Team - TunCERT).

4.10   The use of Emerging ICT [EMG]

Tunisia has attempted to implement Cloud Computing for public sectors, but the evidence shows that it is not officially launched.

5   Some Highlights

Tunisia has the impressive points on e-participation, management Optimization, and National Portal. It also aims to improve e-participation in the public and private sectors. By opening the electronic administration, the government expects to achieve investment

and e-business. Overall, Tunisia has no democratic tradition, but they are in a good process to be a democratic country. The biggest challenge to getting restrictive laws changed is organizing a strong enough public constituency that will push for change. However, Tunisia is the first Arab country to have a successful revolution, post-revolution internet policy has been critical because Tunisia is an example for a free society in the rest of the region and the best in Africa.

Turkey

1   General Information

Area: 783,562 km^2

Population: 79,414,269

Government Type: republican parliamentary democracy

GDP: $20,500

Internet User: 58.3

Wired (Fixed Broadband User): 13.6

Wireless Broadband User: 66.8
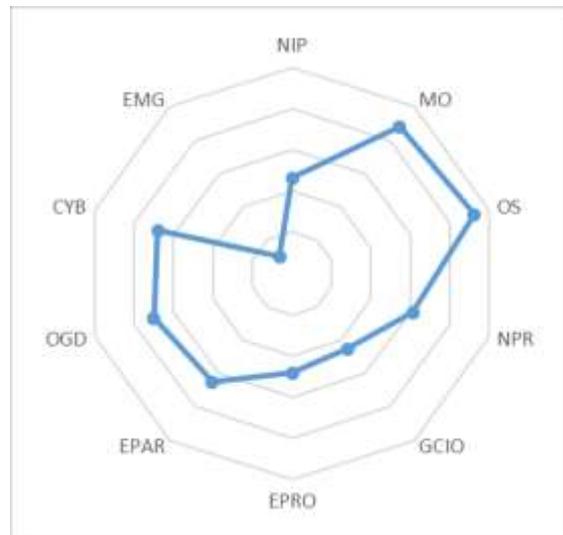
2   Positioning in a Global Organization and a Region
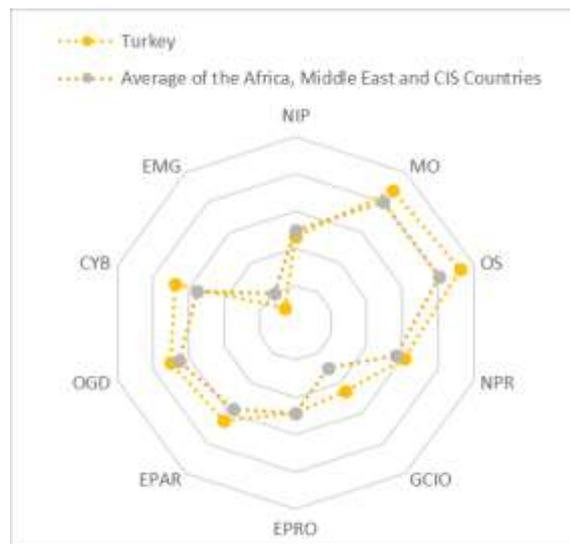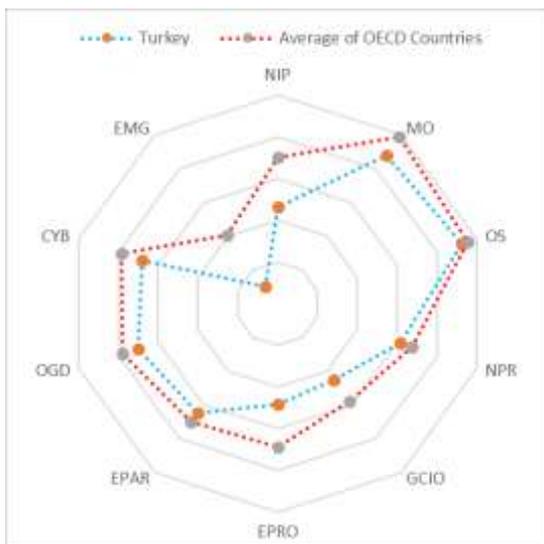
The performances on most of the indicators of Turkey have shown comparatively low level below the average of Europe countries and OECD groups. Among all the ten indicators, Online Service has a good score comparing to other indicators

3   Digital Government Development

Turkey has launched its latest National e-government strategy and action plan for 2015-2019 by the Ministry of Transport, Maritime Affairs and Communication in 2015. For ICT initiative, the Ministry of Development is responsible for the" Information society strategy and action plan". There is no official GCIO position in the government of Turkey, but three main agencies are participating in the e-government strategy/plan making and decision: the Ministry of Development; the Ministry of Transport, Maritime Affairs and Communications and e-Transformation Turkey Executive Committee. Like the last one, the committee contains officers from different government agencies such as the Ministry of Development /Sciences/ Transportation/Education. Also, some members

came from NGOs. According to the introduction, "The Committee is the highest level policy and decision-making, assessment and steering body in the information society Strategy implementation process."

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

According to ITU's report, approximately 58.3% of people in Turkey have used the internet in their daily life. About 13.6% are fixed-broadband users, and the wireless-broadband users are 66.8%. Internet penetration in Turkey is in a comparatively low position compared to most of the evaluated countries.

4.2   Management Optimization [MO]

Turkey's national approach to e-Government can be characterized as centralized. The National e-government strategy and action plan for 2015-2019 have been published by the Ministry of Transport, Maritime Affairs, and Communication, to increasing the pace of structural reforms and strengthens the fundamentals of the Turkish economy with a holistic approach.

4.3   Online Service [OS]

Regarding electronic transactions and identification, the Turkish government enacted several amendments to integrate e-Services into daily public life such as in e-commerce, e-signature and e-procurement legislation, chiefly within the last 5 years. For instance, there is legislation for regulating Internet broadcasts and combating crimes committed through such broadcasts. There are nine cataloged criminal offenses, which can be committed through Internet publications. Nationwide implementation of electronic declarations by the Ministry of Finance is one of the first transactional level "e-Service" type services in Turkey. It was initially part of the Tax Office Automation Project (VEDOP) and is now at the third phase of development and aptly named VEDOP-3. Compared to other top priority services, the current sophistication of daily life citizen services such as car registration, certification still lacks certain quality and integration. However, there is an ongoing pilot project for e-ID card, which is expected to enable more integrated and transactional level daily life services.

Hospitals provide online information through their websites. Furthermore, online appointments are available at individual hospitals. Appointment for all hospitals through a central call center is possible. The Ministry of Health is also working on a one-stop-shop mechanism for online appointments.

4.4   National Portal [NPR]

The Turkish portal, www.turkiye.gov.tr, is integrated as the one-stop service portal for citizens as well. It acts as a gateway for all e-government services and as an administrative resource. As of June 2011, the e-Government Gateway includes more than 260 services of 28 different agencies, as well as information about administrative procedures and links to the services provided directly through websites of each public agency. Although it has well-structured navigation and interface features, the website lacks interactive features such as blogs, SNS, forums or polls. On the other hand, the portal demonstrates secure transactions through mobile electronic signatures (via mobile devices) as well as non-mobile (PC or stationary device based) electronic signatures and password login. As a new functionality, users have access via has a mobile handset with m-signature integration.

4.5   Government CIO [GCIO]

The Turkish public administration at national and local levels does not appoint CIOs or equally influential positions within the legal framework. Heads of IT directorates or IT departments have the primary competencies of a CIO. However, the quality of CIO competency varies from ministry to ministry. One ministry might have strong IT management and leadership while another ministry would have unclear objectives and an insignificant IT department. There is no whole of government perspective for contract management, strategic planning, or ICT implementation among ministries. At the local level, each municipality has an Information Technology Directorate position but with different duties and degree of executive power. Thus, there is no clear intention to change the administrative structure or attach well-defined CIO position to the public management. There is no CIO mandate the law and legislation as well as existence of the law creating the position of CIO in the Turkish Government.

4.6   E-Government Promotion [EPRO]

The national strategy for transitioning into an information society consists of social transformation, public modernization, and a globally competitive IT sector. In light of this projection and taking into account tangible actions, public and private sector collaboration is growing. International and national e-Government related conferences have been organized by initiatives of both the private sector and academic institutions. At the local level, there are small initiatives to promote e-services and to train citizens as compared to the interest in implementation. The central-local government collaboration required to realize an information society is lacking. Due to the high percentage of school-age population, there are significant initiatives and projects driven by ICT to improve the quality of education system and educational content, which helps to promote e-government in different levels with public-private-NGO engagement.

4.7   E-Participation [EPAR]

In general, government websites demonstrate interactive functionality and excellent design, however, in terms of participatory decision-making processes or public discussions, national portal and other government websites at national and local levels offer minimal public engagement. There are online channels besides dedicated phone services for both President and Prime Minister's Office to lodge a request or grievance. However, even with increased public awareness and enhanced web portals; there is not much evidence to show that the government takes the opinions of citizens in decision-making processes. Taking into consideration young people, web 2.0 applications such as blogs or web forums are promising tools, which could encourage more use of e-government services.

4.8   Open Government Data [OGD]

The Turkish Statistical Institute posts government data regularly on its website, (http://www.turkstat.gov.tr/). These statistics come from a variety of government ministries and can be downloaded in Excel format. The site hosts a large amount of data, particularly economic data, but it does not have advanced searching, charting, or organizational features.

4.9   Cyber Security [CYB]

In Turkey, there are several laws that are complement each other's, such as Law No. 5237, "Turkish Penal Code", Law No. 5271, "Code of Criminal Procedure", Law No.

5846, "Intellectual and Artistic Works", Law No. 5809; "Electronic Communication Act", Law No. 5070, "Electronic Signature Act" and Law No. 5651, "Regulation of Publications on the Internet and Combating Crimes Committed by means of such Publication"

4.10 The use of Emerging ICT [EMG]

It is hard to find information about emerging ICT launched in the governmental sector in Turkey, general strategies around new technologies have not yet been organized by the government. There have some private sectors talking about introducing IOT to Turkey such as the company IDC, but no official announcement of large plans about the future visions within emerging ICT.

5 Some Highlights

The Turkey government has continued to complete and add amendments to integrate e-Services into daily public life, the e-service portal (https://www.turkiye.gov.tr/) keeps upgraded various information to citizens, for specific service it can link users to corresponding agencies for e-tax, e-health, e-procedure, etc. The same as some well-prepared nations, Turkey, has shown strength on "Management Optimization" and "Online Service". At the meantime the same with medium developed countries, the lack of systematic GCIO institute, less promotion on e-government implementation and open government initiative are the reasons for lagging. First of all, laying a good foundation as a legal framework and sophisticated initiatives for particular e-government objectives as well as institutional preparedness could benefit the development of e-government in Turkey to a great extent.

United Arab Emirates

1   General Information

Area: 83,600 km^2

Population: 5,779,760

Government Type: Federation of monarchies

GDP: $67,000

Internet User: 90.6

Wired (Fixed Broadband User): 13.3

Wireless Broadband User: 156.7
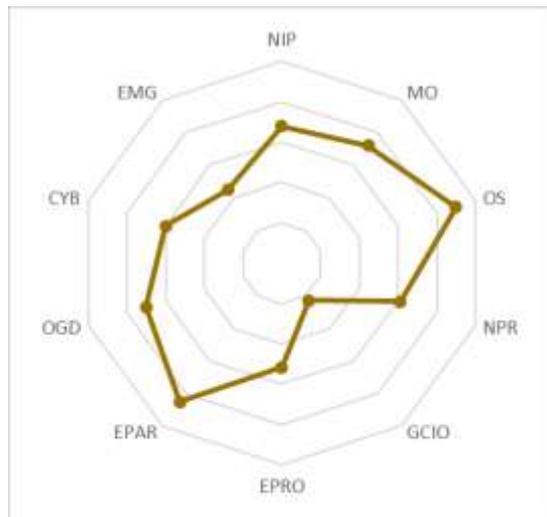
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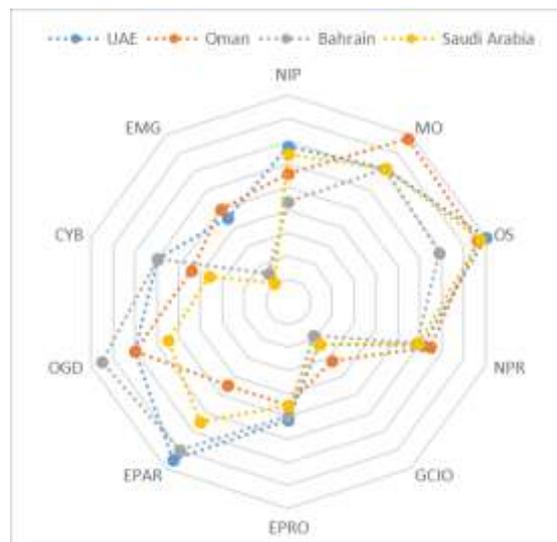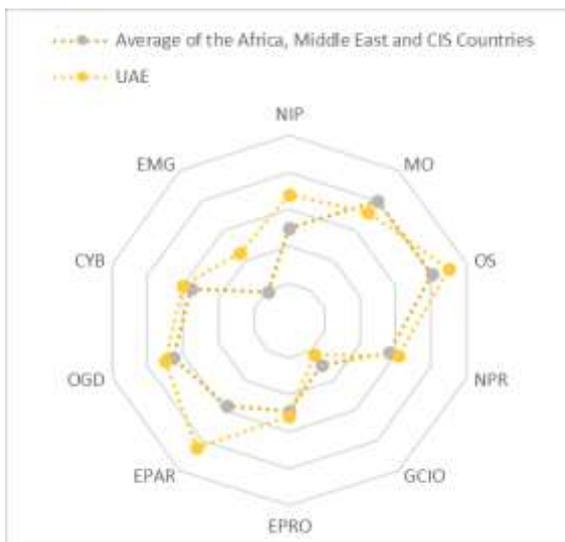
3   Digital Government Development

The UAE is a developed the country in Digital Government, investing heavily in adopting and implementing ICT in its government and private sectors. The UAE plans to transit from a regionally recognized D-Government to a world leading Smart Government (M-Government).

The Telecommunications Regulatory Authority (TRA) was appointed to develop the national plan for achieving the M-Government objectives. TRA has developed the M-Government guidelines and a roadmap that includes milestones for the full implementation of the M-Government initiative, including technical, administrative, regulatory, economic, and informative and awareness aspects. TRA will work during the next phase on connecting the smart services, federally and locally, as well as improving the quality of the provided services, increasing the usage rates and the satisfaction level with M-Government services.

In 2014, The National Plan for UAE Smart Government Goals was initiated in alignment with the national direction embodied in UAE Vision 2021. The vision 2021 focusses on four factors, (1) United in responsibility, (2) United in destiny, (3) United in knowledge, and (4) United in prosperity.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

The UAE is witnessing a major shift in the field of telecommunications and information technology, which enhances its position among the developed nations. The telecommunications infrastructure in UAE is developed, and the broad market is at a world-class level. The UAE government encourages the use of the Internet. Internet users are about 8.5 million in 2018, and the penetration is about 90.6%. The users of wired and wireless broadband are respectively.

Federal Network (FedNet) was launched to transform the UAE into a globally recognized mobile government that provides the best services to the people at any location, round the clock. In addition, FedNet is aligned with Vision 2021 that aims to make the UAE one of the best countries in the world by the year 2021.

4.2   Management Optimization [MO]

The UAE is transforming E-Government to M-Government (Smart Government). The UAE M-Government initiative is in line with Vision 2021 that foresees high quality of life built on world-class public infrastructure, government services, and a rich recreational environment.

A committee has been established to monitor the M-Government initiative in the UAE. The Committee includes members of the Prime Minister's Office from the Ministry of Cabinet Affairs, the TRA, du and Etisalat, and ICT Fund.

Moreover, following on these efforts, the Supreme Committee has delegated the Telecommunications Regulatory Authority (TRA) to develop the national plan for achieving the M-Government objectives, which seeks to enable and support government entities using the latest technologies to achieve the transition on a national level and promote the provision of smart government services.

The United Arab Emirates is a federation of absolute hereditary monarchies. A Federal Supreme Council governs it made up of the seven emirs of Abu Dhabi, Ajman, Fujairah, Sharjah, Dubai, Ras al-Khaimah and Umm al-Qaiwain. All responsibilities not granted to the national government are reserved to the Emirates. A percentage of revenues from each emirate is allocated to the UAE's central budget.

4.3   Online Service [OS]

There are online and offline channel for the UAE Government to deliver online service. The online Services in UAE are categorized for individuals, businesses, visitors, and governments, including transactional e-Payments, e-Health, e-Tax, e-Procurement by two-way interaction.

This portal provides essential information about the UAE relating to its economy, political and government system, strategies, plans, and initiatives. Moreover, there is a one-stop service website featuring a search function, a list of the most consulted information and services.

4.4   National Portal [NPR]

The official portal of the UAE Government is www.government.ae. It is part of the federal E-Government program and a major milestone in the process of E-Transformation in the UAE.

This portal brings all E-Services provided by the UAE federal and local government bodies under one umbrella. It also provides information regarding accessing government services through mobile phones and other similar electronic devices and other means such as ATMs and public payment machines.

The portal aims to provide more and better online services to the people of the UAE and involve them in the government's policies, laws, and public interest initiatives with the ultimate goal of achieving transparency.

4.5   Government CIO [GCIO]

In the UAE, the Government CIO exists at national and local level but there is no information about the CIO laws and regulation, neither the CIO association in UAE.

Education on ICT is stressed, and there are many courses training information technology and CIO in University in UAE.

4.6   E-Government Promotion [EPRO]

Promoting the development of e-Government strategy is also aimed to promote and implement e-Government services are the secure and correct route. However, during one year of evaluation Waseda ranking could not find any new strategy for 2015, 2016. Therefore, it reduces UAE's score on this indicator and also in the overall ranking.

There is no information on government agencies and private entities involved at the local government level. Furthermore, there is no information on a think-tank between government and PPP in UAE.

4.7   E-Participation [EPAR]

One of the significant features of the enhanced portal is the inclusion of E-Participation channels. The federal portal has engaged multiple platforms like forums, blogs, chats, surveys, polls and social media tools like Facebook, Twitter, Flickr and YouTube to reach out to the general public and engage them in active communication with the government about their opinions and experiences on government services, policies.

4.8   Open Government Data [OGD]

http://bayanat.ae/ is an open data portal for UAE. Under Open Data, UAE government data and information is made available to the public. People can now have access to economic data, population statistics. Open Data could benefit students, economists and researchers in particular and the public in general.

4.9   Cyber Security [CYB]

In UAE, the Telecommunications Regulatory Authority (TRA)'s Computer Emergency Readiness Team (AECert) recently underscored the role of cybersecurity in ensuring public safety amid rapid developments in the ICT sector and growing incidents of serious cyber-attacks. AECert also emphasized the need to raise more public awareness and educate society about information security, the attack risks, and prevention methods.

In 2014, The National Electronic Security Authority, NESA, has officially announced the publication of a range of key strategies, policies, and standards to align and direct national cyber-security efforts in UAE. NESA is a federal authority responsible for developing, supervising and monitoring the implementation of U.A.E. cyber-security strategies, policies and standards.

The UAE is extremely conscious about the cybersecurity being offered to its residents as it globally evolves to be among the top smart cities in the world. In UAE, the Telecommunications Regulatory Authority (TRA)'s Computer Emergency Readiness Team is in charge of dealing with cyber-attacks.

4.10 The use of Emerging ICT [EMG]

Even UAE is the developed country in ICT, but the use of emerging ICT is still in a mature stage. There is no information could be found on the evidence that government agency has used Cloud Computing and provide the cloud service from SaaS to IaaS, and also there is no evidence that government agency has used Big Data.

The UAE government has used Cloud Computing, Big Data and Internet of Things for government agencies but there is a lack of regulation on the use.

5 Some Highlights

The UAE government initiatives have played a catalyst role in extending excellence in best innovative practices towards federal and local entities thus improving their performance and building up their capacities through modern ideas such as smart government labs.

The UAE is also a leader in e-Participation. The government offers multiple platforms like forums, blogs, chats, surveys, polls and social media tools to ensure that it is simple and easy for each citizen to participate fully in the democratic process.

The weak point in the UAE is about the use of emerging ICT. As for the emerging technology, and there is no information about the CIO laws and regulation, neither the CIO association in UAE.

In December 2017, TRA has announced the initiation of IMT2020 technology, also known as 5G technology, allowing the use of harmonized spectrum bands and the development of the ICT infrastructure, providing new services that meet the requirements of the digital transformation and smart government.

United Kingdom

1   General Information

Area: 243,610 km^2

Population: 64,088,222

Government Type: constitutional monarchy and Commonwealth realm

GDP: $41,200

Internet User: 94.8

Wired (Fixed Broadband User): 39.2

Wireless Broadband User: 91.4
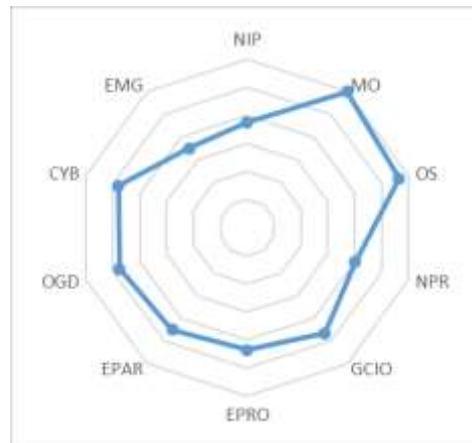
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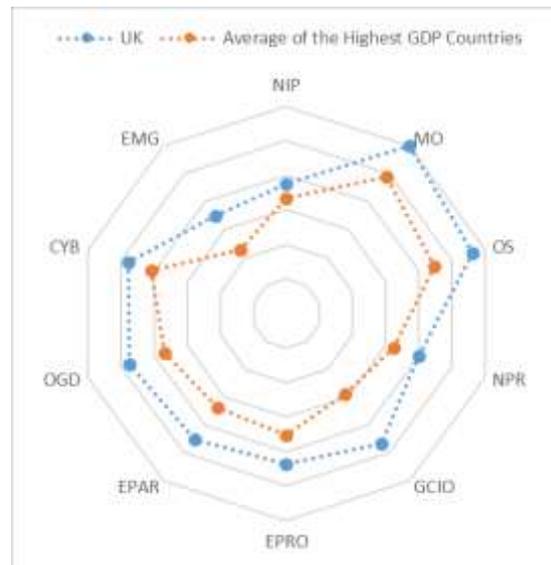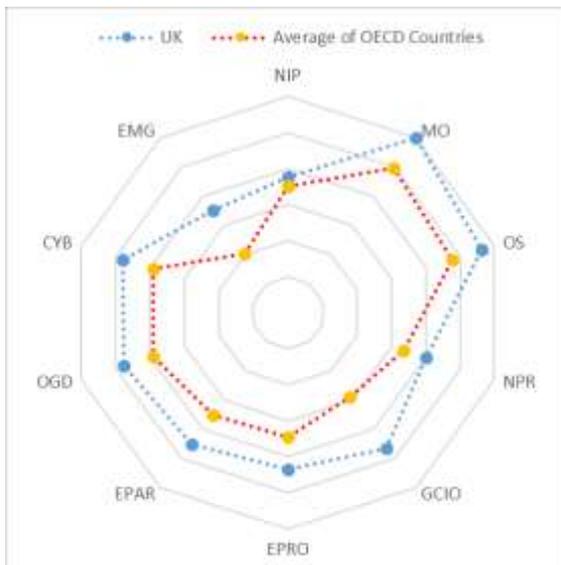
UK is one of the leaders in e-government among OECD and European countries. The UK government has scored more significant results in all indicators than the average of OECD and European. Only National Portal shows a lower score in comparing with OECD and European's average level while Cybersecurity and Management Optimization are considered as UK's most reliable parts.

3   Digital Government Development

The UK has a long history of e-Government development. The Government Digital Strategy released in 2011, updated in 2013 by the Cabinet Office, sets out how the government will become digital by default. April 2014, with the launching of new projects which were funded £1.5 million (about €1.8 million) from the Release of Data fund, the government strived a considerable step to unlock data from public bodies and increase transparency.

The United Kingdom located in Europe, with 64,088,222 populations. The UK political system is a constitutional monarchy with a commonwealth realm. The United Kingdom as the 5th largest economy in the world has GDP of 2649.89 billion dollars

(Statistictimes, 2017). The d-Government development in the UK can be considered successful, and most citizens participate in the process.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

Under the 2017 International Telecommunication Union (ITU) report, the numbers of Internet users and wired board band users increased slightly to 94.8% and 39.2%. On the other hand, the number of wireless board band users decreased from 98.7% to 91.4% in 2017.

4.2   Management Optimization [MO]

UK has launched its Government ICT Strategy since 2011 focusing on several critical targets such as reducing waste and project failure, and stimulating economic growth; creating a common ICT infrastructure; using ICT to enable and deliver change, and strengthening governance. In term of digital government, the Government Digital Strategy was published by the Cabinet in 2012, with the ultimate goal focusing on "how the government will redesign its digital services so well that people prefer to use them".

With the IT Government strategy launched in 2011, which reflect the utilization ICT to improve the government operational processes and to facilitate other goals including reducing project failure, boosting the economy, or strengthening governance by indicating the responsibilities of each related government agencies.

The integration of the processes can be achieved through government network and architecture and interoperability framework.

4.3   Online Service [OS]

The score for Online Service is based on five pillars, which are: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service. These services were assessed based on three primary factors such as Level of Complexity, Level of Security, and Level of Convenience.

The online services included the e-Procurement, e-Tax, e-Customs, One Stop Services, and e-Health. The categories are evaluated based on the level of Complexity, the level of Security, and the level of Convenience. For the e-Procurement, the Contact finder remains Beta version since 2016. The services provided by the government is integrated into One Stop Services at www.gov.uk/ which make the access more efficient and more convenient. The e-Health website is integrated in the way that it provides the list of services citizen can get from NHS. However, e-Custom still needed a great improvement in the level of security and convenience.

4.4   National Portal [NPR]

The portal www.gov.uk make access to government services easier. A citizen can access all of the government agencies through electronic channel. The website offers public information with the search tools to make it simpler. Nevertheless, some information has been a mission from the website such as country information, demographic information, and index function.

4.5   Government CIO [GCIO]

The name of CIO can differ on the country. For the UK, GCIO was established in 2010 and remained in operation until 2013. The new responsible agencies are the

Government Digital Service (GDS). In contrast to the GCIO development, there is a lack of GCIO in the local government level and the GCIO mandate.

4.6 E-Government Promotion [EPRO]

UK Government does not explicitly promote their e-government activities as the citizens are familiar with the system and as it plays a leading role in d-government development. Even though there are some promoting activities, there is no evidence about the assessment aspects of e-Government promotion. There is Government Digital Strategy reports and research, but the latest one was published in 2015.

4.7 E-Government Participation [EPAR]

Since the UK is democratic and open to public opinion, citizen often participates with the government through a various channel including the government website. As seen from category 1, which almost all of the citizen has access to the internet (92%). As the government provides information through the e-Information, the e-consultation and e-decision making become more accessible to achieve.

However, there is no government forum for government forum and no mailing list and text message services. However, with no of those services, the citizens still easily access government news through the official website.

4.8 Open Government Data [OGD]

April 2014, with the launching of new projects which were funded £1.5 million (about €1.8 million) from the Release of Data fund, the UK government strived a considerable step to unlock data from public bodies and increase transparency (European Union, 2014). With the presence of the Open Government Partnership UK National Action Plan 2013 to 2015 setting out a series of commitments, the UK government is making progress to improve transparency, participation, and accountability.

At the local government level, there was a so-called the Local Authority (LA) Incentive Scheme running until March 2015 with the purpose providing monetary encouragements for councils to publish data on specific categories in standard tabular formats. This project was allocated funding (£721,360) from the Cabinet Office's Release of Data Fund, focusing on the priorities of the UK Open Data community.

For the UK, most laws relating to the open data exist except the access to information and administration procedure. Despite the absence of those 2 laws, the UK government launched a project to open information to the public in 2014. The government opened data through the data site https://data.gov.uk/, which citizens can access without having to pay the price.

4.9 Cyber Security [CYB]

The UK has ratified several laws related to cybersecurity. Some of them are as follow Data Protection Act (1998); The Privacy and Electronic Communications (EC Directive) Regulations 2003; Electronic Communications Act (2000) and Electronic Commerce Regulations (2002).

In five years, from 2011 to 2016, the UK Government has financed a National Cyber Security Programme of £860 million to deliver the 2011 National Cyber Security Strategy. Some activities included in the program: the launch of "10 Steps to Cyber Security" in 2015 together with new guidance for businesses: "Common Cyber Attacks: Reducing the Impact"; "Think Cyber – Think Resilience" seminars for around 700 policy makers and practitioners from local authorities; the Foreign Secretary publicly confirmed the Centre

for Cyber Assessment (CCA) to provide assessments of cyber threats and vulnerabilities to policymakers; provide briefing and training to public sector staff in information security roles; and so on.

4.10 The use of Emerging ICT [EMG]

The UK has strong capabilities in high technology manufacturing, telecommunications and digital services which could place the country among the leaders in reaping benefits from using emerging technologies. The UK Government has established the private Government Cloud Computing Infrastructure called G-Cloud which includes Infrastructure-as-a-Service (IaaS), Middleware/Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS). For IoT, the UK government has published a review named "The Internet of Things: making the most of the second digital revolution" by the chief scientific adviser, considering this technology as the way to transform citizens' life and deliver great benefits to the economy.

The evaluation of the use of ICT is based on the use of Cloud Computing, IoT, and the Big Data. Overall, the UK government have a high capability of utilizing those technologies. Nevertheless, the UK government does not have the specific agency acts as a cloud providing, but it is a part of the cabinet. The year 2017, there is evidence that the Government has been utilizing the Big Data as the Chief Executive of the Civil Services said.

5 Some Highlights

In 2017, despite the high ranking of Digital Government, the UK government make some improvement and score higher in some indicators. According to the 2016 report, the UK government scored well in almost indicators and did not need that much effort to develop it Digital Government strategy.

The number of internet users increases. There is some improvement of the national portal, but the sitemap is still missing. There is the presence of GCIO, but the GCIO Mandate is missing from the GCIO category. The score on e-Government promotion scores is low, but it is not because of the lack of promotion but because most people have already been using the e-Government services as indicated in the high rate of participation.

Citizens can access government information without having to pay the cost, and there is the legal framework for the Cybersecurity in case of emergencies. Moreover, overall, the UK d-Government development has been in a high rank, which some functions are missing but it is not a significant problem in operation.

United States of America

1   General Information

Area: 9,826,675 km^2

Population: 321,368,864

Government Type: Federal Presidential Republic

GDP: $56,300

Internet User: 76.2

Wired (Fixed Broadband User): 32.4

Wireless Broadband User: 124.9
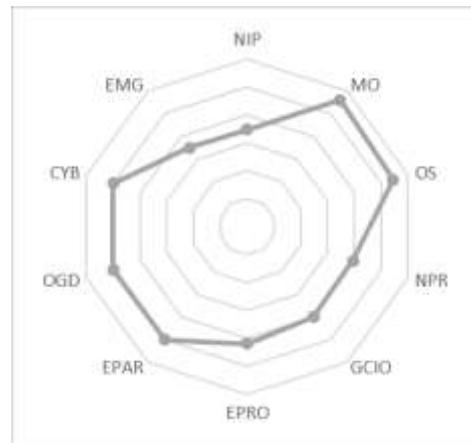
2   Positioning in a Global Organization and Region
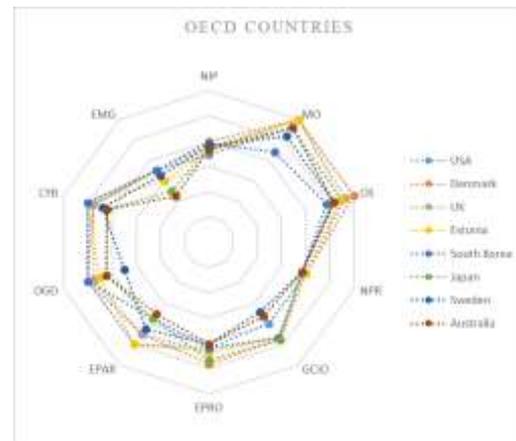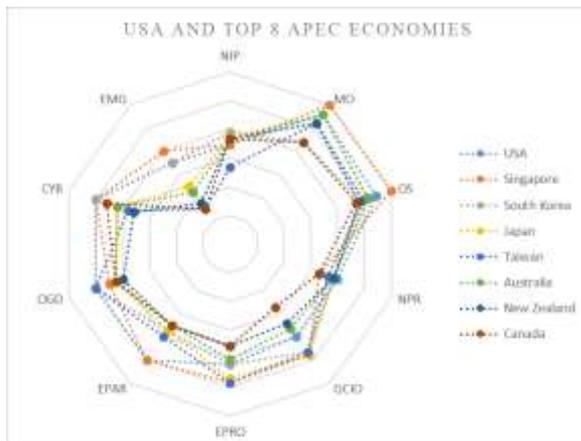
3   Digital Government Development

The U.S. has continued to improve its open-data and online service offerings. Healthcare.gov, for example, which was infamously flawed at launch, operated with very few problems in 2016. Data.gov, analytics.usa.gov, Census.gov, and other open data sites continued to become more user-friendly.

ICT continues to provide new and innovative ways for U.S. citizens to interact, get involved and become empowered. Public participation enhances the government's effectiveness by improving the quality of its decisions through collaboration. Innovative tools can be used to create unprecedented openness in the Federal Government through increased citizen participation to make this type of collaboration a reality.

The Digital Government Strategy is aimed at building a 21st-century government that works better for the American people. The strategy's three primary goals are to: (1) Enable the American people and an increasingly mobile workforce to access high-quality digital government information and services anywhere, anytime, on any device, (2) Ensure that as the government adjusts to this new digital world, we seize the opportunity to procure and manage devices, applications, and data in smart, secure, and affordable

ways, (3) Unlock the power of government data to spur innovation across our nation and improve the quality of services for the American people[17].

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

In the U.S., around 146.7 million people use social networking services at least monthly, representing nearly 76.2% of Internet users. Some changes regarding across-the-board-improvements on key metrics underlying user performance have been identified including three primary improvements in residential broadband service.

4.2   Management Optimization [MO]

A comprehensive Digital Government Strategy aimed at delivering better digital services to the American people, it was introduced in 2012, the strategy builds on several initiatives Streamlining Service Delivery and Improving Customer Service, Delivering an Efficient, Effective, and Accountable Government.

E-Government objectives are focused on high-priority areas for improving the internal operations and management. Most objectives are intended to help Interior better execute administrative and supporting functions that exist across entities. These functions, while in many cases part of the "back office", play critical roles in accomplishing the missions for which Interior is responsible. They are also crosscutting and have impacts across the Department and all mission-related activities.

The usage of ICT in the U.S. is improving day by day in internal processes and the government's computerization efforts and the level of ICT integration has been very good in the last couple of years. Many reasons can constrain standardization of service procedures and information systems in order to achieve internal effectiveness and efficiency of governmental operations.

4.3   Online Service [OS]

In this indicator, we examine the laws of American cybersecurity and e-Transaction as well as e-Services that the U.S. government provides to citizens and enterprises. Available e-Services include an e-Tender system, e-Tax systems, e-Voting, e-Payment system, Social Security services, Civil Registration services, and e-Health systems.

To enhance the security and resiliency of the cyber and communications infrastructure of the United States, a new Cybersecurity Act was issued in 2012, and it focused on protecting ICT critical infrastructure, Information sharing, governmental and private networks. The current statutes for required interfaces will be enhanced and revised. The Electronic Transactions and Information Law which was enacted in the U.S. regulate all matters about information and transactions in all electronic forms. The Law regulates cyber activity in the U.S. It provides a general outline, and requires further elaboration through government regulations.

4.4   National Portal [NPR]

www.usa.gov is the U.S. Government's Web portal for citizens. It presents a wide range of information resources and online services from various government sources, accessible from a single point. It is also known as the National Portal of the USA and is a gateway to improve the communication experience between the government and the public. Moreover, it provides information that helps the public to better understand

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[17] https://www.gsa.gov/technology/government-it-initiatives/digital-strategy

government structure. The well-organized portal serves as a platform that assists the public to find desired information. To improve users' browsing experience, the portal also allows users to create government accounts that allow each user to customize the portal as they desire. The website contains accessibility features, a live chat platform, and the chat hours operation services are conveniently available every weekday except holidays. This provides a one-stop-shop for all government information and services. It comprehensively lists all public services, forms, tools and transactions that the government provides in a user-friendly manner.

In the National Portal citizens can use many online services including e-tax, applying for a driving license, filing a complaint, finding a local doctor, applying for a passport or getting travel advice. The portal's design makes it easy for citizens to find both broad, characteristic information, as well as specific, personalized services. The government has also developed forward-looking Enterprise Roadmaps and modernization profiles to offer a path forward into the next phase of government modernization.

4.5 Government CIO [GCIO]

The U.S. CIO position was established within the White House's Office of Management and Budget (OMB) to provide leadership and oversight for IT spending throughout the Federal Government. In addition, each Federal agency has its CIO, as established by the Clinger-Cohen Act.

The CIO in government is a significant indicator in the world e-Government ranking, not to mention its importance in improving American e-Government platforms. The Federal CIO position is currently held by Suzette Kent.

4.6 E-Government Promotion [EPRO]

The digital interactions between the U.S. government, citizens, businesses, employees and other governments improved from a couple of years ago. This apparently results from the efforts to develop and promote electronic Government services and processes by the establishment of an Administrator Office of Electronic Government within the Office of Management and Budget. The promotion of the use of the Internet and other information technologies to increase opportunities for citizens to participate with the U.S. Government and promoting interagency collaboration providing electronic Government services, where these collaborations would improve the services provided to citizens by integrating related functions and the use of internal electronic Government processes.

To provide effective leadership of the Federal Government, there have been efforts to develop and promote electronic Government services and processes by establishing an Administrator Office of Electronic Government within the Office of Management and Budget. E-Government promotion has reduced the cost and burden for businesses and government entities

4.7 E-Participation [EPAR]

ICT provides innovative ways for American citizens to interact, get involved and become empowered and these relate to more traditional approaches. Public participation enhances the government's effectiveness by improving the quality of its decisions through collaboration. Innovative tools can be used to create unprecedented openness in the Federal Government through increased citizen participation. This program includes Citizen Services Dashboard, Open Government Dialogue Platform, Challenge.gov, and the Citizen Engagement Platform.

The U.S. significantly enhanced its e-Government in this indicator. In the national portal, citizens can use many online services which include paying taxes, submitting tax returns, applying for a driving license, making a complaint, applying for a passport or getting a travel advance. It is a very convenient portal for citizens.

4.8   Open Government Data [OGD]

As a priority Open Government Initiative for President Obama's administration, Data.gov increased the ability of the public to find easily, download, and use datasets that are generated and held by the Federal Government. Data.gov provides descriptions of Federal datasets (metadata), information about how to access the datasets, and tools that leverage government datasets. The data catalogs will continue to grow as datasets are added. Federal, Executive Branch data are included in the first version of Data.gov. The site has undergone continuous improvements since then.

4.9   Cyber Security [CYB]

In September 2018, the White House released its 2018 National Cyber Strategy, outlining the steps the federal government is taking to advance an open, secure, interoperable, and reliable cyberspace. Given the interconnected and global nature of cyberspace, the State Department engages in key diplomatic and programmatic initiatives to support many key objectives reflected in the Strategy. The main objective of this strategy is to manage cybersecurity risks to increase the security and resilience of the Nation's information and information systems.

The responsibility to secure Federal networks - including Federal information systems and national security systems - falls squarely on the Federal Government. Priority Actions of this secure Federation networks are (1) further centralize management and oversight of federal civilian cybersecurity, (2) Align risk management and information technology activities, (3) Improve federal supply chain risk management, (4) Strengthen federal contractor cybersecurity, and (5) ensure the government leads in best and innovative practices.

To preserve cyberspace as an engine of a vibrant digital economy, the United States works with foreign partners and other stakeholder groups, including civil society and the private sector, to promote best practices and policies that enhance innovation, openness, and efficiency. Through cooperation and engagements with foreign partners, allies and other stakeholders, including civil society and the private sector, the Department supports the multi-stakeholder model of Internet governance against attempts to develop state-centric governance models and rejects the use of spurious cybersecurity concerns as a pretext for digital protectionism[18].

4.10   The use of Emerging ICT [EMG]

The United States government believes the security of computer systems is essential to the world for two reasons. The increased role of Information Technology (IT) and the growth of the e-Commerce sector, have made cybersecurity essential to the economy. Also, cybersecurity is vital to the operation of safety-critical systems, such as emergency response, and to the protection of infrastructure systems, such as the national power grid. Based on then-DHS Secretary Janet Napolitano's testimony to the Senate in 2012, in 2011 alone, the DHS U.S. Computer Emergency Readiness Team (US-CERT) received more than 100,000 incident reports and released more than 5,000 actionable cybersecurity

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[18]   https://www.state.gov/r/pa/prs/ps/2018/09/286093.htm

alerts and information products. Twitter, the Wall Street Journal, New York Times, and the Department of Energy and many other prominent companies have reported that their systems had been breached. Furthermore, classified government data has been leaked to the press and the public in several high-profile cases. Current efforts are being made to secure sensitive data to prevent future breaches.

5   Some Highlights

Notable highlights include the U.S. Citizenship and Immigration Services (USCIS) portal, which allows applicants to check their immigration status instantly along with typical wait times, and the Open Government Initiative. The USCIS portal is consistently rated among the most accessed websites in the U.S. government, according to the official Open Analytics counter at www.analytics.gov.

On the local government front, sharing best practices can notably improve the provision of benefits for low-income individuals by state governments. Millions of federal dollars are spent annually on state or local IT that supports these services, and the Advance Planning Document (APD) process allows states to obtain approval for the portion of the costs of acquiring new online systems that the federal government contributes. The current system contains essential mechanisms to hold states accountable for making smart choices about which systems are developed, but it may also encourage siloed systems, which might add greater costs for later integration as well as biasing states against migrating to solutions that could be more cost-effective in the long term. To address this gap, The Office of Management and Budget (OMB) should work with relevant agencies to modernize the APD process to encourage governments to develop enterprise-wide solutions.

Though more than 75% of Internet users have visited a U.S. government website, reports consistently show that public sector websites lag the private sector. Additionally, the government has failed to meaningfully integrate lessons learned from best practices of leading online government services into its operations. Because public sector websites lag the private sector in usability and design, the Federal Web Managers Council should benchmark the design and usability of government websites against leading industry best practices. The Office of Management Budget should continually recommend specific improvements that agencies should make, highlight best practices in its annual E-Government Report to Congress and deploy the E-Government Fund to help replicate best practices across the federal government. The U.S. government has already made some steps in this direction, but more should be done in the coming years.

Uruguay

1 General Information

Area: 176,215 km^2

Population: 3,341,893

Government Type: Presidential Republic

GDP: $ 21,800

Internet User: 66.4

Wired (Fixed Broadband User): 26.8

Wireless Broadband User: 102

2 Positioning in a Global Organization and a Region
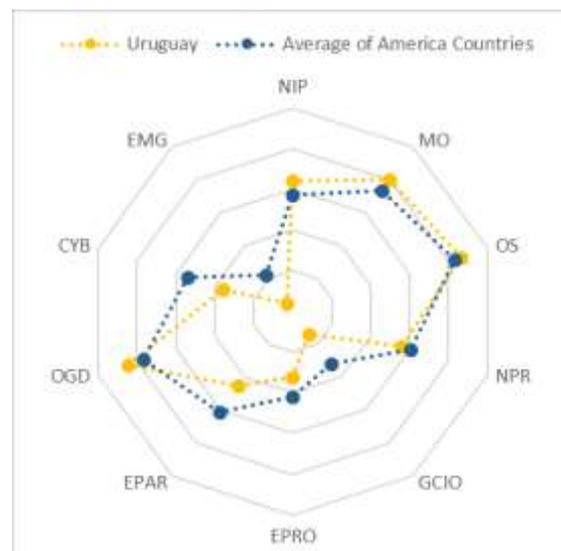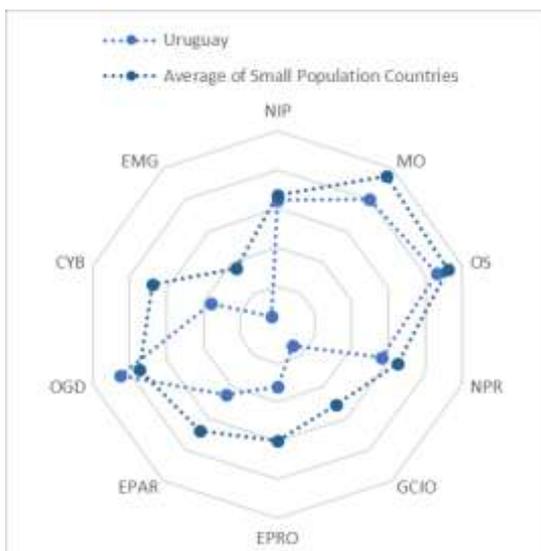
Among American Countries, Uruguay has a better score than the average score of American countries in Open Government Data. As shown on the above picture, Uruguay is very low on the e-Government Promotion, e-Participation, and the use of the Emerging ICT. However, despite the lack of necessary infrastructure, Uruguay has been trying to take the benefit of National Portal for creating demands of a citizen for more advance e-Government services. This also applies to the Online Service, which is on the average of American countries.

3 Digital Government Development

Uruguay has adopted a national strategy for Digital Government, Society of Information and Open Government. The Agency for Electronic Government and Knowledge and Information Society (AGESIC) is in charge of implementing innovative solutions to carry out the goal of IT development and Information Society and Knowledge through proper use of ICT, analyzing technological trends, connecting the relations between national bodies and international organizations and strengthen the public

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participation in e-government. The AGESIC also works closely with other government bodies; for example, it cooperates with the National Institute of Statistics (INE) to survey Access and Use of ICT (EUTIC) to understand the relationship between internet pentation rate and citizen users' file such as education background, income level, etc.

In all, Uruguay has regarded its relatively outstanding advancement in ICT development in Latin America as its advantage in attracting foreign investment and high potential for development.

4   By Indicators

4.1   Network Infrastructure Preparedness [NIP]

In Uruguay, 66.4% of the population uses the internet according to The ITU 2017, a slight decline compared to the previous year. The number of fixed-broadband subscription is 26.8 per 100 inhabitants while the number for mobile cellular subscription is 102 per 100 inhabitants, enjoying quite high broadband penetration rates in Latin America. The State telco Antel is dedicated to improving the data speed and first-class communication service and has accomplished an underwater fiber optics cable construction connecting Uruguay and the United States in 2017

4.2   Management Optimization [MO]

Uruguay has adopted a national strategy for digital government and The Agency for Electronic Government, and Knowledge and Information Society (AGESIC) is in charge of facilitating the implementation of digital government strategies. In order to better advance the quality of digital services of the State, the AGESIC renewed the electronic file in National Institute of Colonization and made the National Institute of Colonization the first agency in management system to accept digital files.

4.3   Online Service [OS]

The Uruguayan Government official website publicizes its information with interactive and amiable features. Besides, it promotes online political participation via the power of social media such as the Presidency Channel on YouTube, Twitter, etc.

4.4   National Portal [NPR]

Uruguay's national portal (http://portal.gub.uy) prominently features a search function, also working as a one-stop service website. In addition, it has an option that allows to directly search for procedures on the official one-stop service website (http://tramites.gub.uy) from its menu. On its main page, it displays news and links to other government agencies. It also links to the official contact website (http://contacto.gub.uy), from where users can send emails to different officials and dependencies. It does not provide necessary or demographic information of the country. The portal is also available in English.

4.5   Government CIO [GCIO]

From 2007, the Agency for Electronic Government and Knowledge and Information Society (AGESIC) was assigned by the parliament the function of promoting the public administration with the digital technologies, consolidating Uruguay's digital policy and thus reach the goal of reaching the Uruguay Digital Agenda of 2010, 2015 and 2020. In 2012, the AGESIC developed one of its division named Society of Information and Knowledge (SIC) to expedite the advancement of Information Society and SIC strategies. The AGESIC took on the job as the position of GCIO in boosting Digital Government, Society of Information and Open Government.

4.6 E-Government Promotion [EPRO]

The digital government is deemed as one of the missions of the AGESIC. The Digital Government Plan 2020 defines the guidelines and objectives in how to reinforce the transformation through the ICT technologies. However, no information on the events related to Digital Government was found. On the other hand, the works that contribute to the open government is valuable. The Digital Uruguay Government Plan 2020 and ten years of Digital Policy can be accessed and downloaded on the AGESIC website.

4.7 E-Participation [EPAR]

Although the e-participation is not a tradition of Uruguay, many measures are taken to activate the citizen participation in order to fulfill the commitments on citizen engagement in the Second National Action Plan such as the Integration Working Group, Public Consultation, and the Open Government Table Dialogue. The citizens have access to information on national budgets, legislation and so on through tools for monitoring action plans such as the Mirador Open Government, the Monitoring Committee, the National Open Data Catalog and the Display Panel Advances, to join the public discussion on projects and plans published on official portals classifies by topics of interest and can be easily reached by the public comments without authentication.

4.8 Open Government Data [OGD]

Uruguay adopts an official open data portal (http://datos.gub.uy) to fulfill its commitment to facilitate public access to the government information announcement. The public can reach the data on this portal from 181 datasets, 36 organizations and 14 groups classified by diverse categories such as infrastructure, culture, transportation, education, etc.

4.9 Cyber Security [CYB]

The AGESIC holds the responsibility of defending cybersecurity and information security in Uruguay. It has developed a guideline to raise the public's awareness and help them to comply with the regulations on protecting personal data.

4.10 The use of Emerging ICT [EMG]

Uruguay has paid many efforts in developing its IT sector and improving the ICT infrastructure which can be reflected by the rather high internet penetration rate in Latin America.

5 Some Highlights

Among the ten indicators in the ranking, the National Portal, Open Government is prominent in keeping Uruguay's national strategy of transparency of government data and easy accessibility for public participation. The missions and commitments may seem promising and crystal, however, the stage monitoring and evaluation do not follow up on time. Uruguay takes pride in its advancement in ICT and is devoted to make it Uruguay's competence in attracting foreign capitals to invest. Marveling at the productive performance that the State telco Antel has made, it is understandable that the focus on economic impetus leads to the relatively neglecting on applying such kind of ICT advancement into public service and public participation. The efforts on how to raise citizen's awareness toward digital government and how to attract the citizen to participate in the mutually beneficially cooperation of ICT development actively should be further polished.

Venezuela

1 General Information

Area: 912,050 km^2

Population: 29,275,460

Government Type: Federal Republic

GDP: $16,100

Internet User: 61.9

Wired (Fixed Broadband User): 8.2

Wireless Broadband User: 43

2 Positioning in a Global Organization and a Region
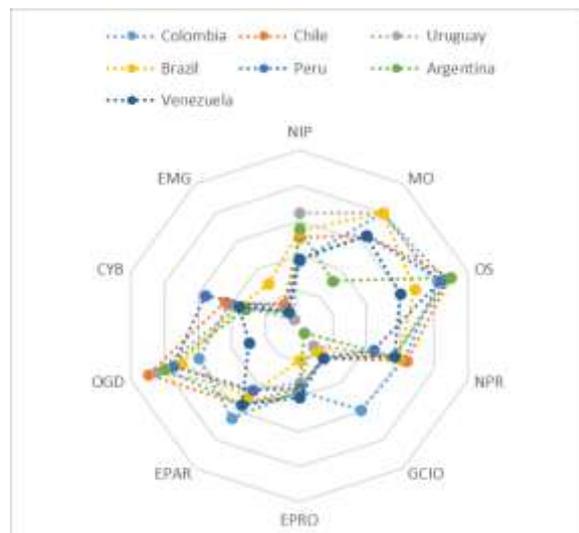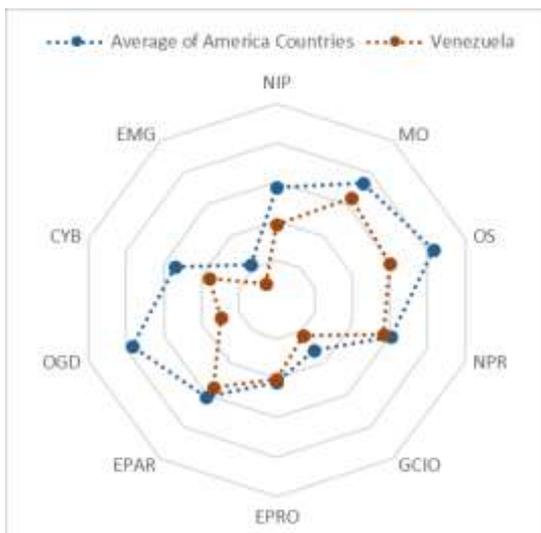
Among America Countries, an only e-Participation (EPAR) indicator is above with the average score of America region. Venezuela is placed below the USA, the best country in America region.

3 Digital Government Development

When talking about the development of the Digital Government in Venezuela in 2017, we need first to explain the political and economic situation in Venezuela. The political turmoil and economic crisis have severely affected the scientific research process. Data released by the private economic advisory on December 31, 2017, shows that the cumulative inflation rate in Venezuela has exceeded 2735% in the past year and surpassed the threshold of 50% of monthly inflation and entered a state of hyperinflation. From the beginning of 2017, the political crisis in Venezuela, which lasted for several months, has been aggravating. With the promotion of the process of establishing the "constitutional

assembly" initiated by Venezuelan President Maduro, anti-government protest marches are staging throughout the country since April and continues to intensify. Violent protests have paralyzed many parts of the country and further destabilized the fragmented economy. Venezuela's government lost its efforts to promote Digital Government in the severe economic crisis and political uncertainty and has no money to invest in the development of ICT.

4 By Indicators

4.1 Network Infrastructure Preparedness [NIP]

In Venezuela, 61.9% of the population uses the Internet, an increase over the previous year, according to the "Measuring the Information Society Report 2016" by the International Telecommunication Union (ITU). The number of fixed-broadband subscriptions is 8.2 per 100 inhabitants, while the number of active mobile broadband subscriptions is 43 per 100 inhabitants, both values being comparatively low among Latin American countries.

4.2 Management Optimization [MO]

In general, the development of Digital Government needs a specific implementation department, that is, the management department that can promote the development of the system of Digital Government, the development of e-commerce and the security of network information. It should play a role in coordinating all levels of authorities, planning the blueprint for the development and encouraging the innovation. After the Information Technology National Plan and Telecommunication Plan was released, there is no more plan released until 2017. The third point is Online Service (OS). Venezuela provides e-services in five areas, e-procurement, e-tax, e-customs, one-stop service, and e-health. However, there is only a simple framework for all the five areas. For example, e-health only provides some health information and does not evolve into a one-stop service website with electronic service. The fourth point is the National Portal (NPR).

4.3 Online Service [OS]

The Venezuelan government maintains websites for four out of five types of e-services assessed in this survey (e-procurement, e-tax, e-customs, one-stop service, and e-health), and all of them obtained low to average scores. The e-procurement website is only accessible after authentication has been accepted, and does not provide any other kind of information. The e-tax and e-customs website offers two-way interaction features, authentication, and information on a wide range of procedures. Its design is straightforward though. The e-health website only provides news and some limited information regarding healthcare. There is no one-stop service website.

4.4 National Portal [NPR]

Venezuela's national portal (http://gobiernoenlinea.gob.ve) shows news and links to other sections that contain information on different subjects. It provides primary and demographic information about the country, as well as government information. Also, it provides a list and information regarding administrative procedures, information for different groups of individuals, access to legislation, and a list of government agencies. It offers integration with social networking services, and links with Twitter for direct communication with the president.

4.5 Government CIO [GCIO]

The legal framework related to e-government does not consider the CIO position. Some GCIO functions are performed by the National Center for Information Technologies (CNTI). No additional information on CIO regulations, office, or training programs were found.

4.6 E-Government Promotion [EPRO]

For e-Government promotion in Venezuela, President Chávez issued decree number 825 dated May 10, 2001, to develop the e-Government process. He also issued the telecommunications, data messages and electronic signatures law as well as a technology and innovation law. Telecommunications Law (OTA) (2000) instrument aims to "establish the legal framework regulating telecommunications in general, to guarantee citizens the human rights of communication and offer the implementation of telecommunications business activities necessary to achieve it." Despite this, e-promotion in Venezuela has been very limited. The CNTI is in charge of managing the e-government efforts in the public administration, but evidence of recent developments is limited.

4.7 E-Participation [EPAR]

This is the only thing that Venezuelan can reach the average level in the world and even above the world level, which is one of the American countries that have the highest degree of EPAR. One of the reasons is that electronic voting has played an important role in Venezuela's elections, which was provided by Smartmatic. This technology helps to provide accurate and transparent results for the Legislative Council in Venezuela. The CEO of Smartmatic, Antonio Mugica, once said: "Smartmatic has been helping the Venezuelan national elections for more than 10 years, demonstrating our commitment to transparency, efficiency, and accountability in a polarized political landscape, our technology helps deliver results that are acceptable to all parties and the winning party is and will always be the will of the people." Such as for the vote on December 6, 2015, Smartmatic provided an end-to-end voting platform, including the service of voter biometric authentication, voting, transmission of results, counting of votes and announcement of results. Smartmatic conducted 12 technical audits before, during and after the election to ensure the integrity of the technology, which includes source code reviews, machine assembly, biometric authentication system operations and maintenance of all software solutions. Technicians representing all the parties participated in each audit and confirmed the correct functioning of the system.

Moreover, according to the statistics of electoral voting organization Datanálisis, among the voters using Smartmatic voting machines, those who think the operating system is "very simple" or "simple" accounts for 93.5%. A more flexible technology can lead to a better user experience, which raises the voter turnout to 74%. Venezuelan President Nicolas Maduro once said: "Venezuela has the most transparent and state-of-the-art voting system in the world, which guarantees the supremacy of voting for all Venezuelan people." High technology is the guarantee for the successful implementation of e-democracy in Venezuela at that time.

4.8 Open Government Data [OGD]

Venezuela has not adopted a Freedom of Information Act. There is no evidence showing that the Venezuelan government is developing an open government plan or open data initiatives. It has a law for simplifying administrative procedures.

4.9 Cyber Security [CYB]

Data maintenance and security are essential. Data maintenance involves the preservation, management, and updating of the data records of government administration and government-related trade, transactions and business activities. On the one hand, it requires the support of software and hardware technologies, and on the other hand, it also needs the establishment of relevant documentary systems. In Venezuela, the departments that are responsible for information security are VenCERT and CNTI. The country has already released some laws of punishing cybercrime legislation, but the law in privacy and data security remains blank.

4.10 The use of Emerging ICT [EMG]

Venezuela has not yet made essential advances in emerging technologies such as cloud computing, the Internet of Things and big data.

5 Some Highlights

In recent years, there is no substantive progress in Digital Government in Venezuela, which is basically at a standstill. The primary task of Venezuela should be to solve the economic crisis and stabilize the domestic political situation. Due to the willingness to participate in e-democracy, the development of Digital Government in Venezuela is worth anticipating.

Vietnam

1 General Information

Area: 331,210 km^2

Population: 94,348,835

Government Type: communist state

GDP: $6,100

Internet User: 55.2

Wired (Fixed Broadband User): 9.9

Wireless Broadband User: 45.79

2 Positioning in a Global Organization and a Region
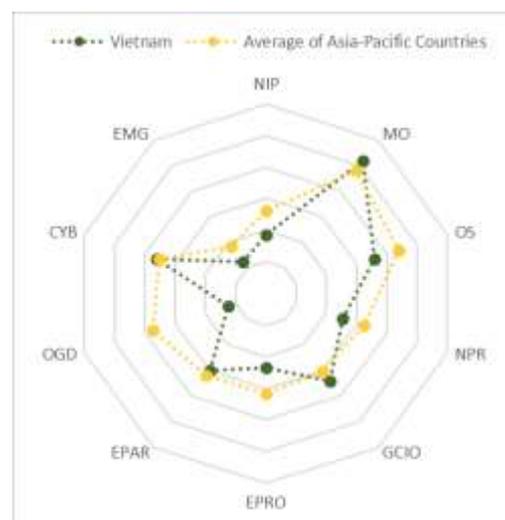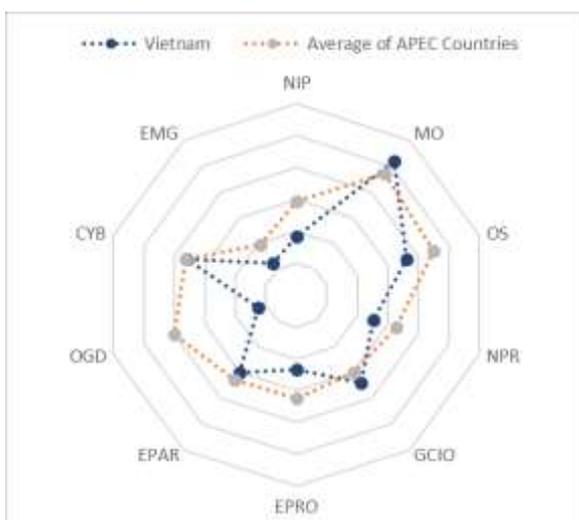
This year Vietnam's overall e-Government score experienced a significant decrease. Among ASEAN Countries, Vietnam shows little progress on e-Government development. The country scores lower than ASEAN's and the world average on most indicators. The similar phenomenon when comparing Vietnam with APEC economies.

3 Digital Government Development

ICT development has been one of the priorities of the Vietnamese government since 2000. On October 2000, the Directive 58-CT / TW on embracing ICT for national industrialization and modernization came into force, making ICT becomes the top priority for the national socio-economic development. In this period, the Vietnamese government emphasized promoting administration reform, developing the national information network, increasing Internet penetration rate and utilizing IT in the state administration operations. The Government approved the most notable ICT project in this period was the Project 112 on computerization of state administration in 2001-2005 with the total funding being around 3.800 billion VND. In September 2001, the Prime Minister approved the state administrative reform program in the 2001-2010 period.

The year of 2015 was considered as an important milestone, marking by the official announcement of the first legal document on e-Government of Vietnamese Government through the Resolution 36a/NQ-CP dated October 2015. The resolution places priorities on ensuring the effective operations of state agencies, better serve people and businesses, and improve the nation's competitiveness.

In 2011, the Vietnamese government introduced a public administration reform master plan for the period 2011-2020. In this plan, they focus on promoting the ICT application for administration in both local and center government in order to promote using e-services and delivering the best government services to citizens, business, and other stakeholders.

4 Indicators

4.1 Network Infrastructure Preparedness [NIP]

The total of Internet users in Vietnam accounts for 50% of the population, according to the Measuring the Information Society Report 2015 from International Telecommunication Union (ITU). Among them, around 31% of people have a wireless broadband connection, while the figure for fixed-broadband subscriptions is only 6.5%.

4.2 Management Optimization [MO]

Until 2015 the Vietnamese Government published the first official legal document on e-Government. It was the Resolution 36a/NQ-CP dated October 2015 signed by the Prime Minister. The resolution lays the foundation for e-Government development in Vietnam, with priorities given to promote the development of online public services, IT infrastructure and human resources during 2015-2017. The critical targets set in the period are pushing administrative reform, utilizing IT in the management and provision of public services. Drawing upon these targets, several measurable actions are prioritized: develop the information system to connect government agencies at all level; establish the national one-stop-service portal; promote IT application in administration reform to enhance the national competitiveness and facilitate a business environment, and improve ICT infrastructure capacity to deliver an Internet connection to remote areas.

Vietnamese government has successfully implemented several information systems in central government agencies, for examples, the Treasury and Budget Management System in Ministry of Finance (project TABMIS sponsored by World Bank), the electronic customs declaration system (project VNACCS/VCIS system partially funded by Japanese government from 2012) in General Department of Customs, and the in General Department of Tax. In addition, until 2015, almost ministerial-level agencies have implemented basic applications such as human resources management system, document management system, one-stop shop application, and so on. All these projects aim to reduce the burden of the application process for citizens and enhance public sectors efficiency.

Under Decree No.17/2017/ ND-CP dated 17 February 2017 by the Government defining the functions, tasks, responsibilities of the Ministry of Information and Communications. Under Decree No. 150/2016 / ND-CP dated 11 November 2016 by the Government defining the functions, tasks, responsibilities and organizational structure of the office of the Government.

- Providing essential public online services level 4, meet actual demand, serving the people and businesses anytime, anywhere, on various devices. IT applications to save the time of citizens and businesses when applying administrative procedures.

- Apply IT effectively in the operation of state agencies to speed up job processing, reduce operational costs.
- Improving technical infrastructure, information systems, national database, an establishment the platforms to develop e-government, to ensure the safety and security of information. Integration, connecting information systems, databases on the national scale, establish an environment to exchange information through the network between state agencies based on the Framework of Vietnam e-Government Architecture.
- Successful implementation of the annual objectives proposed in the Resolution on e-government.
- Decision No. 1819 / QD-TTg dated 26 October 2015 by the Prime Minister approved the national program on IT applications in the operation of state agencies period 2016-2020
- Resolution No. 36a / NQ-CP by the Government on e-Government

4.3 Online Service [OS]

The score for Online Service is based on an investigation of five online services: on an investigation of five online services: e-Procurement, e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry. Table 1 lists the online services and its URL Address. All of those services were investigated using three factors, i.e., Level of Complexity, Level of Security, and Level of Convenience.

Regarding complexity level, only online service in Tax and Customs reached the transactional level in which, user can entirely conduct their businesses online. Organization or enterprise who want to declare their tax online will need to have a bank account belonging to one of the banks that have a cooperation relationship with the General Department of Tax. The General Department of Customs has launched the project named VNACCS/VCIS in 2012 with the support from the Japanese government, in order to provide a useful tool to support customs departments national extensive in cargo clearance services and customs management. In order to declare customs, enterprises need to download and install client software and connect to VNACCS/VCIS system. Payment can be made by bank transfer or directly at customs offices. One stop service gateway is under planning progress.

4.4 National Portal [NPR]

The score for National Portal is based on three factors, i.e., Information (Content), Technical, and Functionality. National Portal of Vietnam (chinhphu.vn) contains proper information for local citizens and foreigners. Information about the country, government structure, and the latest government's activities are also available. Regarding technical aspects, the result of Google PageSpeed™ Insight showed that the portal performs at average speed and operates well with both PC and Mobile devices. The portal is also equipped with several basic functionalities such as search capability and sitemap.

4.5 Government CIO [GCIO]

Currently, the government body responsible for the overall e-Government development at a national scope is the Ministry of Information and Communication. There is a Government CIO Council established in 2011 with the members are the directors of ICT departments in all provinces. To date, the council has demonstrated its roles in several actions such as promulgating instructions in building ICT planning for local governments, applying technical standards for local portals or using state budget for

applying ICT in government agencies. Besides, there are CIO-equivalent positions appointed with the roles to promote ICT development at the local government level.

Consulting for the Minister of Information and Communications and relevant agencies to formulate policies, legal documents, guidelines on information technology, information security, IT applications, and e-Government development.

Pursuant Decision No. 814 / QD-BTTTT dated May 18, 2016, by the Minister of Information and Communications on consolidation of the Chief Information Officer Council of State Agencies in central government.

Consulting for the Minister of Information and Communications and relevant local governments to formulate policies, legal documents, guidelines on information technology, information systems, sharing data resource among state agencies and connecting with the central government in order to promote IT application and develop e-Government.

Pursuant Decision No. 1972 / QD-BTTTT dated November 24, 2011, by the Minister of Information and Communications on establishment the Chief Information Officer Council of State Agencies in local government.

4.6 E-Government Promotion [EPRO]

There is a national strategy on ICT development every year. It is mandated on provinces to endorse similar strategy at local level. There has not been a separate financial mechanism for ICT development. Funding for ICT projects is deducted from the Science Technology fund.

4.7 E-Government Participation [EPAR]

Vietnamese citizens seem not to be aware of government's plans on e-Government although they are supposed to be the center point in any e-Government project. This is due to e-Government projects were used to be designed and developed mostly based on suppliers' perspectives.

Private sectors are the most proactively participated users in e-Government initiatives with 98% of total companies lodging tax via the Internet in 2015. In the same year, the number of firms participating in electronic customs declarations was 35,020, accounting for 98.13% of all businesses. These are the results of the government's aggressive efforts in recent years to promote the tax and customs modernization process.

4.8 Open Government Data [OGD]

Currently, the management, exploitation, and usage of national data are facing with lots of challenges. For instance, there is no existence of a national population data, however practically there has been several separate databases related to the population such as civil, labor, health insurance, driving license, and so on which are managing by different agencies. The statics on socioeconomic are published limitedly without reusing or redistribution. Data from a few sectors such as environmental resource has not been managed well, resulting in fragmentation, inconsistent and duplication. Under the specific circumstance, data can be exchanged among different government agencies.

4.9 Cyber Security [CYB]

With the steady growth of ICT, the Vietnamese government is putting more effort into ensuring the safety and security of the cyber environment. The Law of Information Technology was approved in 2006, establishing the basic principles for this purpose.

Regarding institutional, the Vietnam Computer Emergency Response Team (VNCert) was established in 2005 under the Ministry of Information and Communications with the duties to give warnings on computer network security and advise the Ministers in the safety and security management of state agencies.

There are few national regulations relating to information safety came into force such as: The directive 28-CT/TW, on 16-9-2013 of the Party Central Committee's Secretariat (XI) to enhance the network information security and Decree No. 72/2013/ND-CP, validated 15-7-2013 of the Government in management, provision and use of Internet services and online information.

VNCERT is an organization under the Ministry of Information and Communications, established by Decision 339/2005 / QD-TTg of the Prime Minister, performing coordination activities of computer emergency response in the national scale; warning about safety issues of computer networks; Proposal for standards, technical regulations on the safety of computer networks.

The Authority of Information Security is an organization under the Ministry of Information and Communications to perform the function of advising and assisting the Minister of Information and Communications regarding information security enforcement. The Authority has functions, duties, and powers stipulated in Decision No. 1281 / QD-BTTTT dated September 09 2014 by the Minister of Information and Communications.

4.10 The use of Emerging ICT [EMG]

This indicator uses three current technologies for measuring as the scoring items. These technologies are Cloud Computing, Big Data, and the Internet of Things (IoT). No information was found regarding the utilization of emerging technologies within government agencies.

According to the Decision No. 1819 / QD-TTg dated October 26, 2015, by the Prime Minister approved the national program on IT application in the operation of state agencies period 2016-2020. Vietnam strives to carry out the smart city at least 3 places.

For example, in the cities like Hanoi, Ho Chi Minh, the project is being studied and implemented, such as Intelligent Transport Systems - ITS (Intelligent Transport System); GPS technology applications for bus operator; VOV traffic map mobile application to help citizens find location, plan a route in order to avoid traffic congestion.

5   Some Highlights

Vietnam started to connect to the Internet world in 2000. At the time, only 0.3% of the population were Internet users in Vietnam. This figure has grown to 48.3 million, accounting for more than half of the population in 2015, and ranking 7th in Asia. After two decades, the ICT industry is playing an important role in socio-economic development of Vietnam. Recently, Vietnam stands in the top 10 most attractive outsourcing environments in the Asia-Pacific region; the total IT industry revenue reached 33 billion USD and the total employees working in the IT sector was over 440,000 in 2013.

This year, Vietnam has its highest score on Management Optimization, which reflects the efforts of the government in utilizing ICT in state administration bodies' operations. The Resolution No. 36a / NQ-CP issued by the Government on October 2015 identifies general visions on e-Government such as: promote the development of e-Government; improve the quality and efficiency of the activities of State agencies to serve citizens and

businesses better; improve Vietnam's position on United Nation e-Government ranking; and publicize the activities of state agencies in the network environment. Inheriting achievements accumulated from previous periods, the IT utilization in state agencies have shown positive results.

However, online service delivery is still minimal, despite a high rate of Internet penetration. Most online services are at an interactive level, calling for necessary activities of the government to boost the administrative reform process. Lack of consistent direction in e-Government implementation, especially in local governments, resulted in the high fragmentation in e-Government initiatives and impeded collaboration and data sharing among agencies.

Cybersecurity is another weak point of the country as the lack of necessary security mechanisms and legal framework made online transactions more vulnerable to cyber threats. Alongside the fast growth in ICT, high-tech criminal status in Vietnam tends to be more complicated. This, in turn, will become the barrier preventing citizens and businesses in interacting with governments via online way.

Although there has been some progress from the Vietnamese government on e-Government development, the outcome is still far from meeting expectations. This implies that the government should pay attention not only to technology investments but also to other indispensable determinants such as leadership commitment, legislative framework, inter-cooperation among government agencies and strict supervision from independent bodies.

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