2019

Survey Result

Thailand Digital Government Readiness Survey Project 2019

By Digital Government Development Agency (Public Organization) (DGA)

DGA

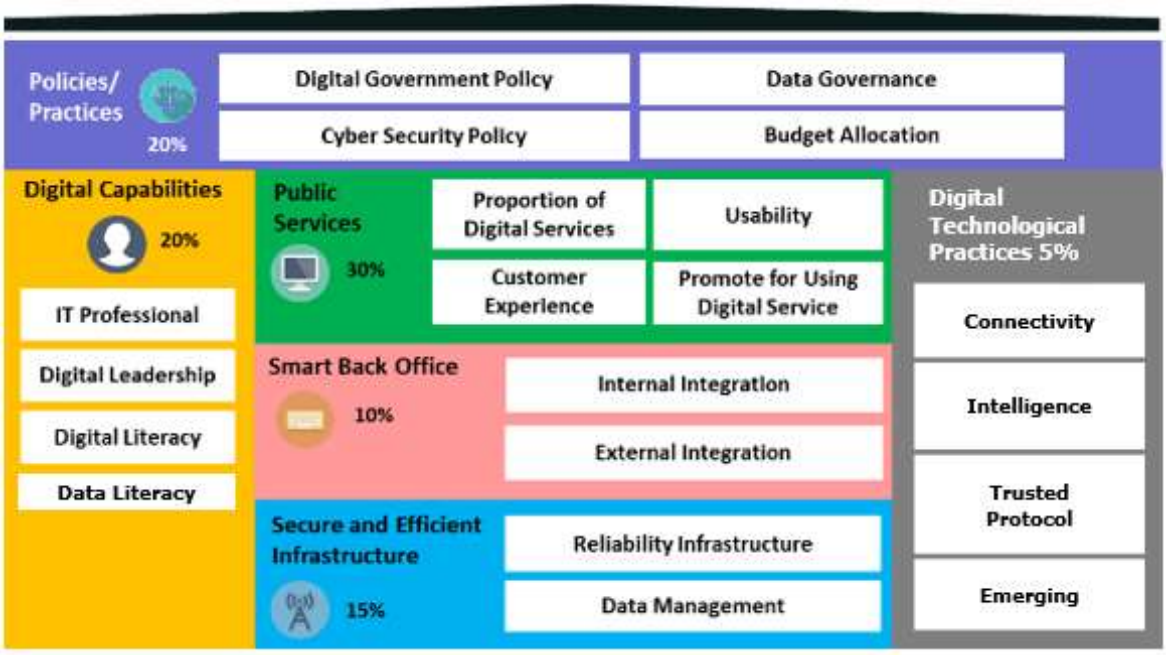
Digital Government Development Agency

Executive Summary

The Digital Government Development Agency (Public Organization) (DGA) as a key organization in driving digital government development sees that, to promote digital government in Thailand, it is necessary to understand operational status and readiness level for digital government development of government agencies, which is useful for strategic planning, policy development and project implementation to benefit the country. In addition, the government agencies should understand and recognize their situation of digital government development, which helps improve and increase their capabilities to foster digital government. As a result, DGA has continuously conducted Digital Government Development Readiness Surveys since 2015 and aims that the survey results will reflect problems, challenges, obstacles and success factors in driving digital government. The survey results can be used in policy development, budget allocation and a reliable source of insight in term of digital government development, and facilitate policy-making units to appropriately prepare such plans and monitor the related policies.

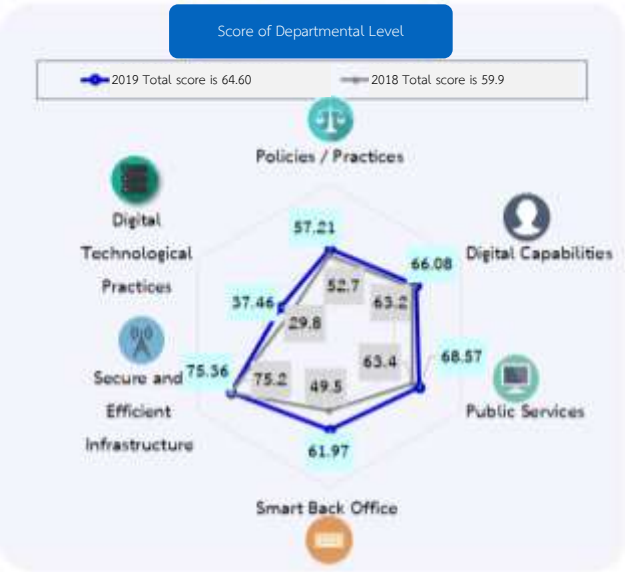
Regarding the 2019 survey project, DGA develops the survey based on related literature review and study, organizing expert meetings to collect opinions on the survey framework and design, and organizing operational workshops with stakeholders to provide a clear understanding and gain opinions on the framework and the survey. These opinions help improve the survey accuracy and be in line with the operational context of the government of Thailand. The framework for Thailand Digital Government Readiness Survey 2019 of the government agencies can be summarized in the chart below.

Thailand digital government readiness survey framework 2019



The 2019 Thailand Digital Government Readiness Survey was sent out to 323 departmental agencies and 301 agencies replied, accounting for 93.2%. Also the survey was sent out to 1,533 provincial agencies and 1,356 agencies responded, accounting for 88.5%. In each province, there were 16 or more agencies who replied, representing 80% of the target agencies of each province. The survey result can be summarized as follows:

2019 digital government readiness survey result: overall score of the department-level agencies



From the digital government readiness survey, the department-level agencies receive an overall score of 64.4 out of 100. Secure and Efficient Infrastructure gains the highest score of 75.36, followed by Public Services which receives a score of 68.57. Meanwhile, the scores for Digital Capabilities, Smart Back Office and Policies / Practices are 66.08, 61.97 and 57.21 respectively. Digital Technological Practices receives the lowest score of 37.46. The details are presented below:

Secure and Efficient Infrastructure

Almost all department-level agencies (98%) are well equipped with reliable digital infrastructure. Most agencies (75.8%) update and maintain their information technology, and have Incident Management Process or Business Continuity Management Process for their information systems. In addition, the agencies regularly verify data backup (99.3%) and have a data backup system management during emergency event (97%), by having onsite data backup (91.1%) and having data backup in remote location (55.5%). Therefore, the agencies should be more encouraged to have off-site data backups in order to increase information system security and data protection.

As for Data Management, almost all department-level agencies (99%) update information in database to be up-to-date and readily available, mostly on a daily-basis or a real-time basis. Moreover, most of the department-level agencies (82.7%) prepare to connect their internal management system with external agencies. However, some agencies (28.9%) have not performed data verification when storing data because they do not appear to have knowledge / expertise in this area (56.3%). Therefore, the related agencies should set guidelines and provide training on the verification of data accuracy and completeness to the government agencies, enabling each agency to get ready for data integration among the government agencies.

Public Services

Most of the department-level agencies (81.8%) provide their core services in digital forms. The most used form of digital service is Self-service, through channels such as websites (83.1%), Mobile Application (23.1%) and Kiosk (4.6%). Therefore, the government agencies should significantly provide their core services through Mobile Application, which is convenient for the public to access anywhere, anytime. Also, their core services should allow the public to perform transactions via Kiosk so that every people group can have equal access to their digital services and reduce inequalities of public access to digital government. Moreover, the department-level agencies should design their digital services to be more convenient and easier for the public to use such as having Advance Search Engine, the most searched Keywords or search predictions, and providing important information in English language.

Although most department-level agencies provide core services in digital forms, some agencies (23.3%) still require copies of smart ID cards and house registrations from service users due to the following reasons. The paperwork is their proof of evidence. The agencies have no system / no connection with Civil Registration Database. They need for individual verification / security and to maintain compliance with laws / rules / regulations accounts. The government should therefore support the adoption of digital technology so that the cancellation of document copies can be achieved. Furthermore, the government should encourage the agencies to consider amending the related laws / regulations in order

to support the cancellation of the request for copies of smart ID cards, house registrations and other documents.

The department-level agencies promote their digital services through digital channel (94%) and through non-digital channel (81.1%) in order to increase the use of their digital services. This reflects the fact that the department-level agencies take an active role in promoting their digital services, make more people aware of and get access to their digital servicers. Besides, the agencies should apply customer satisfaction evaluation results to improve their service quality, as well as study user requirements before starting core service development, enabling them to provide the digital services that meet the needs of the service users, which consequently increase the usage rate.

Digital Capabilities

Most government employees of the department-level agencies (94.4%) are capable of utilizing the information, mostly for Descriptive Analytic. Therefore, the agencies should increase their employee capabilities to utilize the information for Predictive Analytic and for Prescriptive Analytic as well.

The digital skills of the officers (the criteria set out by OCSC) can be categorized into 7 dimensions, and the basic skills and knowledge of government officers (the criteria set out by OCSC) can be classified into 5 dimensions, in order to assess digital literacy level of the officers. The assessment result shows that the government officers have outstanding skills in Strategic and Project Management as well as awareness towards vision, mission, procedures and public services with scores of 3.57 and 4.01 respectively. The digital skills of the officers score an average score of 3.39 – 3.57 while the basic skills and knowledge of the government officers score an average of 3.51 – 4.01 out of a total score of 5.

With regard to Digital Leadership of Chief information officer (CIO) positions of the department-level agencies, not many CIOs participate in training course for CIO position (31.9%) due to the following reasons. They are recently appointed as CIO (27.5%) and they have to perform other administrative duties (15.2%) which reflects that the CIOs of the agencies do not only take on CIO role but also other key responsibilities. Therefore, the agencies should give importance to CIO training program and CIO responsibilities because the CIOs significantly drive the development of digital government towards the desired

direction. Apart from that, the agencies should consider to increase IT officers since most agencies (81.4%) reveal that they do not have enough IT officers to operate and support digital government transformation.

Smart Back Office

Most department-level agencies (99.7%) have their Internal Integrations available on digital platform. Still, some internal management systems are not widely used such as secretary (48.2%) and meeting appointment (67.4%). From the survey, most of the department-level agencies design Internal Integrations themselves, especially buildings and vehicles (99.2%), secretary (98.6%) and meeting appointment (96.6%). Mostly, connections between these systems remain limited. Therefore, a central management system should be developed for all government agencies to use, which will help elevate the government's operations and prevent duplication of system development budget.

In the area of External Integration, some department-level agencies (27.2%) still require to build capacity in information exchange and system connectivity with external parties, which is an important factor for the development of digital government. Meanwhile, most of the agencies who send documents in digital format (86.4%) use e-mail while few agencies (32.6%) use e-Saraban. On the other hand, most agencies (85.1%) still deliver official documents to other government agencies in non-digital format. Most agencies (87.3%) still send / receive official documents in both digital and paper formats because the paperwork is their proof of evidence (95.3%) and is internally used for mandate purpose (62.7%). Therefore, the agencies should be encouraged to use e-Saraban for document delivery and to consider amending related regulations, attitudes of employees and operations in order to facilitate the implementation of digital government.

Policies / Practices

Not many department-level agencies (69.8%) have policies and plans on the development of digital government, some agencies (24.6%) are currently in process of preparing such plans and the rest agencies (5.7%) have no plan. Most current policies emphasize on promoting the use of digital technology to elevate their operations (98.1%),

followed by policies on organizational strategy / operation which underline strategies or digital projects for organizational development (90.5%) and specific digital policies such as master plans related to information technology and digital operational communication (90.5%). Therefore, every government agency should be encouraged to have such plans for developing into another level of digital government.

Relating to Data Governance, it is found that few department-level agencies (6.3%) undertake and announce policies on Data Governance. Not many department-level agencies disclose the governmental data on data.go.th (59.8% of all agencies that disclose the data). Therefore, there should be some supporting measures to urge the government agencies to disclose the data on data.go.th which is considered as government's open data center, including private sector and the public to access open data on data.go.th for further use. Also, the government agencies should promote the sharing of the file formats like CSV, ODS, XML, JSON, KML, SHP, KMZ, RDF (URIs) and RDF (Linked Data) so that they can use government's open data more efficiently.

Aside from setting clear policies, Budget Allocation is a key success factor. The survey indicates the department-level agencies allocate their budget to developing digital services for internal usage or the public / private sector / government sector the most (34.53%). Their budget allocations to developing digital skills of their department officers and to conducting research projects for the best use of such digital technology and findings in their work are 4.64% and 1.41% respectively. This reflects the fact that the agencies give importance to neither developing digital skills of their employees nor conducting research projects for the best use of such digital technology and findings in their work. Moreover, the approved budget of the department-level agencies for developing government's central system is quite small proportion compared to the budget request (41.80%). Therefore, their parent organizations should give importance to the budget for this purpose because this will help elevate the status of the government agencies towards integration.

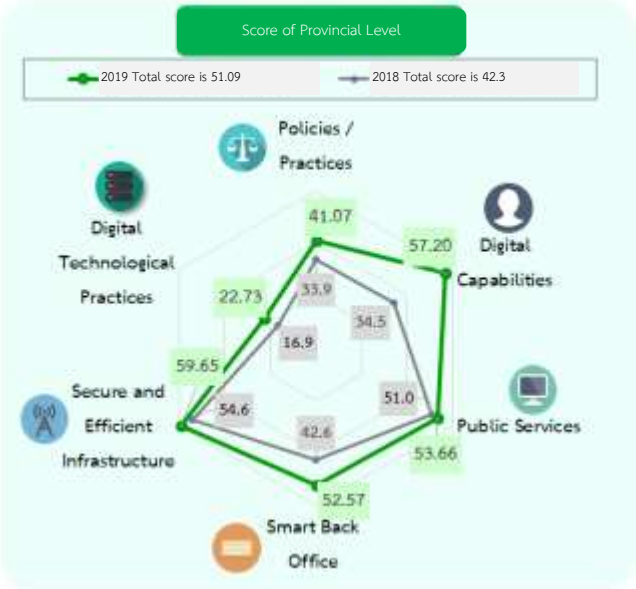
In the interest of Cyber Security Policy, it shows that the department-level agencies significantly require to develop cyber security. Some agencies (62.1%) are aware of and apply Information Security Policy. Nevertheless, few agencies (18.1%) have digital infrastructure security which certifies to ISO/IEC27001 certificate, international standard, while most agencies still use basic method which is virus protection / Malware.

Digital Technological Practices

Most of the department-level agencies (83.7%) use connectivity / communication technology such as Mobile, IoT and QR Code, and apply the connectivity / communication technology to their administration and public services. This is considered as a strength of Thailand since the percentage of the population using mobile phones is quite high, that can be used as a tool for facilitating public services.

However, some department-level agencies (32.2%) implement smart technology (Intelligence) such as AI, Big Data Analytic, Machine Learning, Deep Learning and Robotics as well as some agencies (5.3%) utilize security technology (Trusted Protocol) such as Block Chain. Therefore, central agencies should provide a clear understanding and knowledge to the government agencies including support them to apply new technology to their administration, public services, and appropriately with their organizational mission in order to elevate vertical lift of digital government and introduce new innovations to government's operations.

2019 digital government readiness survey result: overall score of the provincial agencies



The provincial agencies receive an overall score of 51.09 out of 100. Secure and Efficient Infrastructure gains the highest score of 59.65, followed by Digital Capabilities which

receives a score of 57.20. Meanwhile, the scores for Public Services, Smart Back Office and Policies / Practices are 53.66, 52.57 and 41.07 respectively. Digital Technological Practices receives the lowest score of 22.73. The details are presented below:

Secure and Efficient Infrastructure

Most of the provincial agencies are equipped with reliable digital infrastructure. Almost all provincial agencies (97.5%) regularly verify data backup. Most provincial agencies (85.6%) update and maintain their information technology, also (71.6%) prepare a data backup system management if emergency event occurred, mostly backup their data at central agencies (67.5%). Additionally, it is found that few of the provincial agencies prepare Incident Management Process or Business Continuity Management Process for their information systems (21.1%). Therefore, their parent organizations should foster their subordinate organizations to develop such plans to enhance information system security and data protection.

In view of Data Management, most of the provincial agencies (84.8%) update information in database to be up-to-date and readily available, and prepare to connect their internal management system with external agencies (70.7%). But an obstacle is that almost half of the provincial agencies (45.1%) have not performed data verification when the data is stored. Therefore, their parent organizations and the related agencies should set guidelines and provide training on the verification of data accuracy and completeness to the government agencies, enabling each agency to be prepared for data integration among the government agencies.

Digital Capabilities

In support of Digital Leadership, CIOs of the provincial agencies readily drive digital government through the use of digital system in operation between the agencies in their province (97.3%). However, they do not give so much importance to CIO training program. Few CIOs participate in training course for CIO position (25.3%) because they are recently appointed as CIO and line up for next training session. Therefore, essential training course for CIO position should be arranged sufficiently.

The provincial officers are being able to utilize the information (89.5%). The digital skills of the officers (the criteria set out by OCSC) can be categorized into 7 dimensions, and the basic skills and knowledge of government officers (the criteria set out by OCSC) can be classified into 5 dimensions. The assessment result presents the digital skills of the officers at middle level (an average score of 2.54 – 3.06) and the basic skills and knowledge of government officers at high level (an average of 3.18 – 3.78). Their outstanding skills are Digital Literacy (a score of 3.06) and awareness towards vision, mission, procedures and public services (a score of 3.78). One obstacle for the provincial agencies is they do not have enough IT officers so that they require the officers from other fields to support IT tasks (69.6%). Therefore, the parent organizations should consider position allocations which are appropriate to the provincial agencies and may consider increasing IT positions in their subordinate organizations so as to secure adequate staff for digital government development at regional level.

Public Services

The provincial agencies readily promote their digital services by promoting their digital services through digital channel (83.4%) and through non-digital channel (74.3%), and encouraging more use of their digital services (63.9%). Nevertheless, the proportion of their digital services is not high (52%). The most used form of digital service is Self-service, through channels such as websites (74.9%), Mobile Application (23.4%) and Kiosk (4.8%). Accordingly, the provincial agencies should promote the use of Kiosk for public services as Kiosk is easy to use without appearing online.

On top of that, the agencies should be encouraged to apply the customer satisfaction results to their service quality improvement. Especially the department-level agencies with regional branches should take the satisfaction evaluation results of their regional customers to improve service quality and increase the usage rate of the digital services. Furthermore, it is important to study user requirements before starting core service development, which will help provide their digital services that meet the needs of the service users, as well as will consequently increase the usage rate.

Smart Back Office

Almost most of the provincial agencies (96.1%) have their internal management system. Still, some internal management systems are not widely used such as secretary (36.3%) and meeting appointment (46.2%) which are for internal administration. The provincial agencies mostly use internal management system provided by their parent organizations, especially human resource management (78.5%), archives (75.50%) and budget allocation (65.80%). Central system should be developed to enable all government agencies to get access, which help elevate the government's operations and prevent duplication of system development budget.

The agencies still require to build capacity in information exchange and system connectivity with external parties since some provincial agencies (51%) have not had digital data link system with external parties. Most agencies (82.2%) still deliver official documents to other government agencies in non-digital format. Meanwhile, most of the agencies who send documents in digital format (87.5%) use e-mail, and e-Saraban accounting for only 63.6%. Most agencies (80.6%) still send / receive official documents in both digital and paper formats because the paperwork is their proof of evidence (97.6%) and is internally used for mandate purpose (58.6%). Therefore, the agencies should be encouraged to use e-Saraban for document delivery, including to consider amending related regulations, attitudes of employees and operations which do not facilitate the implementation of digital government.

Policies / Practices

Not many provincial agencies disclose the governmental data on data.go.th (42.7% of all agencies that disclose the data). Therefore, there should be some supporting measures to urge the government agencies to disclose the data on data.go.th which is considered as government's open data center, including private sector and the public to get access on data.go.th for further use.

The provincial agencies significantly require to develop Cyber Security Policy because only few agencies have digital infrastructure security which certifies to ISO/IEC27001 certificate, international standard (17.9%).

The fiscal budget on digital technology is a significant factor in increasing readiness to undertake digital government policy. The survey finds that only few provincial agencies (24%) allocate their fiscal budget to digital technology. Most of them reveal that this budget is normally handled by central agencies so that they have not made budget preparation for digital government development in the fiscal year 2019 (50%). Therefore, their parent organizations should consider budget allocation which is appropriate to the provincial agencies or encourage the provincial agencies to undertake such policies.

Digital Technological Practices

The survey suggests that most provincial agencies (75.8%) use connectivity / communication technology such as Mobile, IoT and QR Code. It is obvious that the government agencies apply connectivity / communication technology to benefit their administration and public services. This is considered as a good development for public services by taking the advantages of mobile phones. Still, there are some limitations. Almost none of the provincial agencies implement smart technology (Intelligence) (0.4%), and none of them utilize Trusted Protocol. Therefore, the parent organizations should support their subordinate organizations to apply new digital technology to their administration, public services, and appropriately with their organizational mission in order to elevate vertical lift of digital government and introduce new innovations to government's operations.

The policy recommendations for Thailand digital government development

Policies / Practices

1. Every government agency should prepare or develop its plans and practices in accordance with Digital Government Development Plan under Parliament Administration Act and Digital Service Act 2019. The key focuses are Data Governance, Digitization, Integration, One Stop Service, Open Government Data, including the consideration of budget allocation on the related plans and executions.

2. The government should consider the allocation of sufficient budget on digital government development, especially integrated budget on main systems / internal

management systems that are used among the government agencies in order to achieve the development goals.

3. Without delay, the government should announce and undertake Data Governance to all government agencies as a principle and guideline for moving in the same direction.

Digital Capabilities

1. The government should adjust the organizational structure and enhance capabilities of the government officers to have positive attitudes toward new technology and successfully adopt new technology in their work as stated below:

(1) Adjust the organizational structure and manpower in support of digital government development plan.

(2) Promote CIOs to perform duties full-time and extend their term in office, enabling CIOs to deliver tangible results.

(3) Assess the digital skills of all government officers according to the criteria set out by the Office of the Civil Service Commission (OCSC).

(4) Create employee development plan for the government officers.

(5) Develop skills of the government officers both horizontally and vertically, not only technical skills.

2. The government should provide a clear understanding on digital government development concept to the local and regional agencies and promote the agencies to apply it to their administration and public services appropriately.

Public Services

1. The government should develop system or platform to provide public services as One Stop Service to be more convenient for public users, meet user requirements, receive user feedback and enlarge public participation.

2. Every government agency should provide its core services through Kiosk so that every people group can have equal access to digital services and reduce inequalities of public access to digital services.

3. The agencies should create and improve their websites according Government Website Standard.

4. The government / central agencies should find a balance between providing / developing central information system, and allowing the regional agencies to provide / develop their local systems themselves.

5. Every government agency should accommodate the principle of Citizen Centric by studying user requirements before developing service system, enlarging user Participation and receiving user Feedback.

Smart Back Office

1. The government should establish standard, criteria and method for their digital system, including necessary digital infrastructure, to comply with international standard.

2. The government should deploy Smart Back Office Solution to support digital demonstrations such as official document delivery, meeting room and vehicle booking, and others.

3. Every government agencies should have its administration and operation through digital channels.

Secure and Efficient Infrastructure

1. The government should have security system / measure for digital services of the government agencies.

2. Every government agency should establish secure and efficient infrastructure and cyber security measure to enhance user privacy and security.

3. Every government agency should have Incident Management Process and Business Continuity Management Process (BCP) with BCP testing scenarios.

Open Government Data and Integration

1. Every government agency should prepare and store its information based on their organizational mission in digital format.

2. The government should establish an information center for exchanging digital information and registers (integration) between the government agencies.

3. The government should develop open data center (data.go.th) and encourage the government agencies to disclose their information through this channel.

Digitization

1. The government should provide a clear understanding on new technology such as Big Data, IoT, AI, and Block Chain. Therefore, the government agencies can properly make use of new technology in their demonstration and public services, also appropriate to their organizational context.

Government Laws and Regulations

1. Every government agency should amend laws, rules and regulations in order to support digital government development, especially integrated data across the agencies, including laws / regulations relating power of attorney and the cancellation of the request for copies of smart ID cards, house registrations and other documents.

2. The government should consider to increase flexibilities in their procurement process, relevant documents, Term of Reference (TOR) and timeline, corresponding to digital government development and staying relevant in the fast moving technology.

Table of Content

1. Introduction

1.1 Background

Since the government's policies aim to build Thailand's digital economy and society by maximizing the use of digital technology as a significant tool in driving digital economy and society of the country to achieve stability, prosperity and sustainability, in recent years the government has undertaken the policies and the cabinet resolutions seriously and consistently. One of the government's crucial policies is digital government transformation. A decision taken by the cabinet of ministers on 5 April 2016 approved in National Digital Economy and Society Development Plan and Three-Year Digital Government Development Plan (2016-2018) as key driving factors to make the best use of digital technology for national sustainable development.

Digital Government Development Agency (Public Organization) (DGA) holds the duty to provide services and supports to all government agencies with regard to digital government transformation, under the supervision of the Prime Minister, the Office of Prime Minister. The Prime Minister has assigned Deputy Prime Minister Somkid Jatusripitak to supervise the DGA on his behalf. DGA perceives that, to foster digital government development in Thailand, it is essential to understand status, problems and obstacles during the execution, as well as readiness level for digital government development of each agency. Therefore, DGA has periodically conducted Digital Government Readiness Survey Project since 2015, on a yearly basis. The survey results would reflect problems, challenges, obstacles and success factors in driving digital government, which is very useful for policy making, budget allocation and a reliable source of insight in term of digital government, also facilitate policy-making units to prepare their plans and monitor their policies appropriately.

Their executions over the past years are to set framework, indicators and criteria for Thailand digital government readiness assessment, which is comparable to international assessments related to digital government; to survey the readiness of the departmental agencies and provincial agencies; to analyze survey results and prepare survey reports; and to organize seminars to share the survey outcomes.

To maintain consistency, DGA has conducted Thailand Digital Government Readiness Survey Project 2019 by targeting to assess digital government readiness of the government agencies in Thailand. In particular, the survey project has been improved from the previous year, which would draw a clearer picture of digital government readiness of the government agencies.

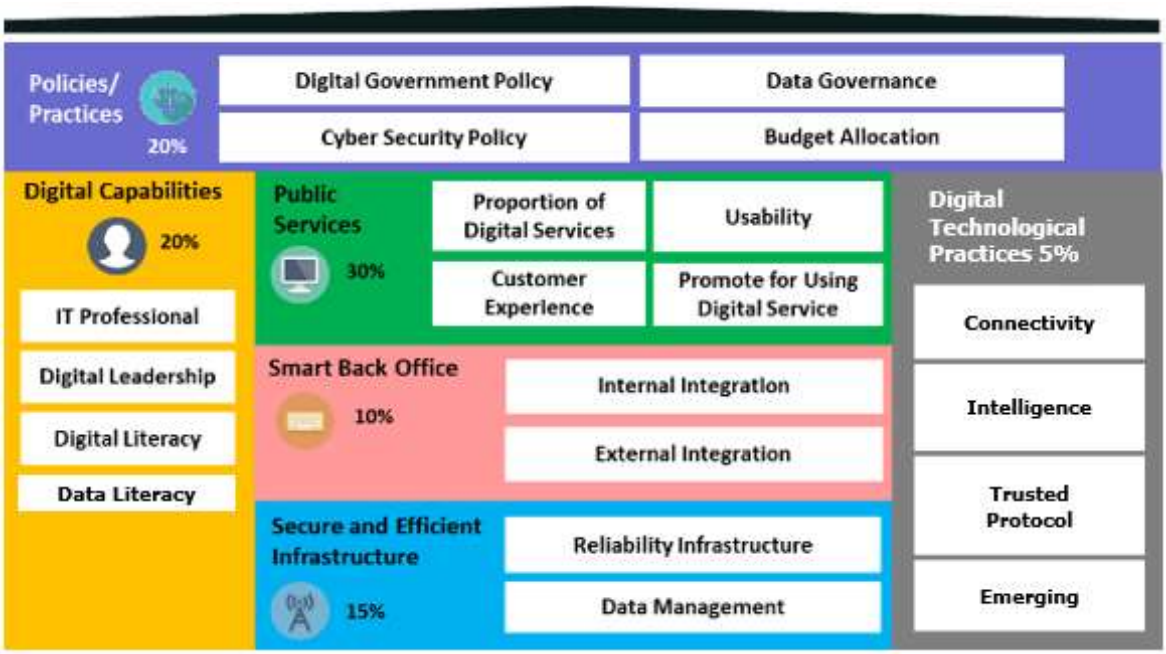
1.2 Objectives

1. To develop and improve the survey in accordance with the context of Thailand and global concepts related to the assessment of digital government in order to assess digital government readiness of the government agencies in Thailand. Therefore, that reflects actual digital government readiness level of the government agencies.

2. To conduct digital government development readiness survey of the government agencies at the departmental level and the provincial level in order to gain reliable and right insight that reflects problems, challenges, obstacles and success factors in driving digital government, which facilitate appropriate policies, government's measures and budget allocation on digital government development.

3. To share the survey result with the government agencies and related organizations, both domestic and foreign, being used as a reliable source of digital government development insight.

2. Framework for Thailand Digital Government Readiness Survey 2019



The 2019 survey framework for the departmental agencies and the provincial agencies consists of 6 pillars as follows:

Pillar 1: Policies / Practices – a 20% weighting by assessing the following sub-pillars: Digital Government Policy, Data Governance, Cyber Security Policy, and Budget Allocation on digital technology to support the policies and projects related to digital government.

Pillar 2: Digital Capabilities – a 20% weighting by assessing the following sub-pillars: the adequacy of IT officers (IT Professional sub-pillar), CIO training, the application of digital technology to the organizational administration and CIO's duties (Digital Leadership sub-pillar), the digital skills and training of the officers (Digital Literacy sub-pillar), and capabilities of the officers to utilize information (Data Literacy sub-pillar).

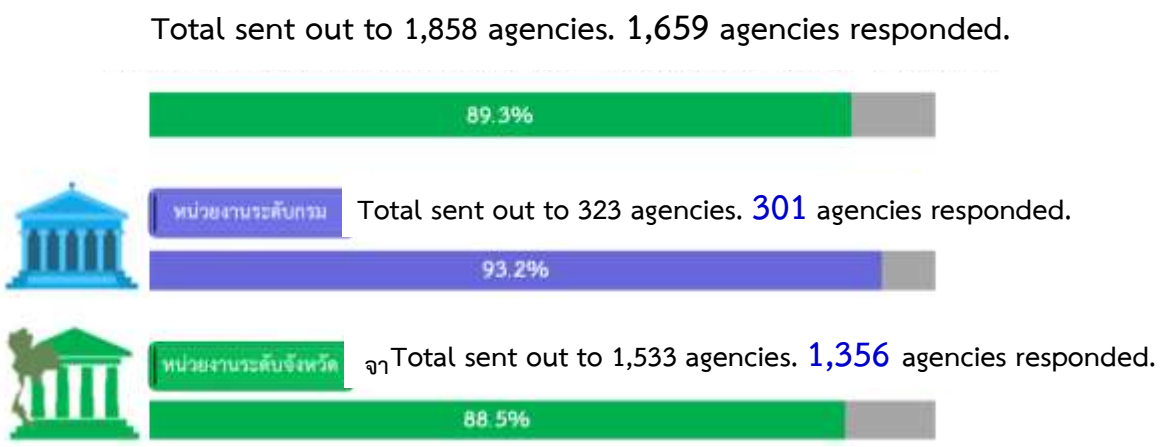
Pillar 3: Public Services – a 30% weighting by assessing the following sub-pillars: digital services and service channels according to the United Nations (UN) standards (Proportion Digital Services sub-pillar), ease of digital services and convenience in the website (Usability sub-pillar), study of user requirements before developing services and customer satisfaction evaluation on digital services for service quality improvement (Customer Experience sub-pillar), and (Promote for Using Digital sub-pillar).

Pillar 4: Smart Back Office – a 10% weighting by assessing the following sub-pillars: the use and connection of internal management systems (Internal Integration sub-pillar), and information exchange and system connectivity with external parties and official document delivery in digital format (External Integration sub-pillar).

Pillar 5: Secure and Efficient Infrastructure – a 15% weighting by assessing the following sub-pillars: digital infrastructure, Incident Management Process or Business Continuity Management Process for the information systems and data backup (Reliability Infrastructure sub-pillar), and internal database management and connection with external agencies, Data Warehouse and / or Data Lake (Data Management sub-pillar).

Pillar 6: Digital Technological Practices – a 5% weighting by assessing the following sub-pillars: the use of connectivity / communication technology such as Mobile, IoT and QR Code (Connectivity sub-pillar), smart technology such as AI, Big Data Analytic, Machine Learning, Deep Learning and Robotics (Intelligence sub-pillar), and security technology such as Block Chain (Trusted Protocol sub-pillar).

3. Survey Result: Thailand Digital Government Readiness Survey 2019



Remark: Also 2 Local Administrative Organizations (LAOs) responded.

The 2019 Thailand Digital Government Readiness Survey was sent to 1,858 agencies, 1,659 of which replied (accounting for 89.3% of the target agencies). There were 301 departmental agencies who replied, which account for 93.2% of the target departmental agencies, and 1,356 provincial agencies who replied, which account for 88.5% of the target provincial agencies.

3.1 Readiness Survey Result of the Departmental Agencies

Overall readiness score and the score by pillar of the department-level agencies

The readiness score by pillar and sub-pillar of the department-level agencies

The department-level agencies receive an overall score of 64.4 out of 100. Secure and Efficient Infrastructure gains the highest score of 75.36, followed by Public Services which receives a score of 68.57. Meanwhile, the scores for Digital Capabilities, Smart Back Office and Policies / Practices are 66.08, 61.97 and 57.21 respectively. Digital Technological Practices receives the lowest score of 37.46. The details are presented below:

1. Secure and Efficient Infrastructure represents the highest score of 75.36 and consists of 2 sub-pillars. Reliability Infrastructure is the sub-pillar which gains the highest score of 76.58. This reflects the fact that the department-level agencies are well equipped with reliable digital infrastructure. 98% of all department-level agencies update and maintain their information technology. 75.8% of the department-level agencies have Incident Management Process or Business Continuity Management Process for their information systems. Almost all department-level agencies regularly verify data backup and have a data backup system management during emergency event (99.32% and 97.01% respectively). Nevertheless, only half of the department-level agencies (55.48%) have data backup in the remote location. Therefore, the agencies should be more encouraged to have off-site data backups.

As for another sub-pillar, Data Management has a score of 72.92, which reflects a good readiness of government agencies in data management. Almost all department-level agencies (99%) update information in database to be up-to-date and readily available, mostly on a daily-basis or a real-time basis. Moreover, 82.7% of the department-level agencies prepare to connect their internal management system with external agencies. However, 28.9% of the department-level agencies have not performed data verification when storing data as some agencies (56.3%) do not appear to have knowledge / expertise in this area. Therefore, the related agencies should set guidelines and provide training on the verification of data accuracy and completeness to the government agencies, enabling each agency to get ready for data integration among the government agencies.

2. Public Services gains the second-highest score of 68.57 and consists 4 sub-pillars. Promote for Using Digital is the sub-pillar which represents the highest score of 79.90. This reflects the fact that the department-level agencies readily promote their digital services, including increase the use of their digital services. 94% of the department-level

agencies promote their digital services through digital channel and 81.1% through non-digital channel, with 79.7% encouraging more use of their digital services.

Secondly, Customer Experience has a score of 70 which is considered as having quite high score for department-level agencies. 68.8% of the department-level agencies evaluate consumer satisfaction towards the use of their digital services. Nevertheless, only 56.8% of the department-level agencies apply the customer satisfaction results to improve their service quality. The government should therefore encourage the agencies to bring the results into use for the public's convenience and to increase usage rate of the digital services. In addition, some digital services (74%) have not conducted study of user requirements before starting core service development. Studying user requirements before the process of development will enable them to provide the digital services that correspond to the needs of the users, as well as will consequently increase the usage rate.

Next, Proportion of Digital Services has a score of 68.67. The proportion shows that the department-level agencies provide access to digital government services via multiple channels. Meanwhile, the department-level agencies provide digital services which accounts for 81.8% of their core services. The most used form of digital service is Self-service, through channels such as websites (83.1%), Mobile Application (23.1%) and Kiosk (4.6%). Government agencies should therefore significantly improve their digital services through Mobile Application. Currently more people use mobile phones due to lower prices of mobile devices. Government agencies should take this opportunity to enlarge their digital services through Mobile Application. Furthermore, the government still pushes the government agencies to avoid copies of smart ID cards and house registrations. However, 23.3% of the department-level agencies still require copies of smart ID cards and house registrations due to the following reasons. The paperwork is their proof of evidence, accounting for 16%. The agencies have no system / no connection with Civil Registration Database, representing 13%. The agencies must use for individual verification / security at 11%, and to maintain compliance with laws / rules / regulations accounts for 10%. The government should therefore support the adoption of digital technology so that the cancellation of document copies can be achieved such as establish connection with Civil Registration Database from Central Database of Department of Provincial Administration. In addition, the government should encourage the agencies to consider amending the related laws / regulations, which leads to the cancellation of the request for document copy.

Usability is the sub-pillar which receives the lowest score of 58.92. This reflects the fact that government services are difficult to use. For instance, only 69.8% of the agencies provide services in English language, while only 29.6% of the agencies have Advance Search Engine, the most searched Keywords, search predictions, etc. The agencies should therefore improve their official websites to be more convenient to the public and easier to use.

3. Digital Capabilities receives the third-highest score of 66.08 and consists of 4 sub-pillars. Data Literacy is the sub-pillar which gains the highest score of 80.90. Most agencies (94.4%) reveal their employees are capable of utilizing the information, mostly for Descriptive Analytic. Therefore, the agencies should enhance their employee capabilities to utilize the information for Predictive Analytic and for Prescriptive Analytic.

Secondly, Digital Literacy has a score of 72.04. The digital skills of departmental officers (the criteria set out by OCSC) can be categorized into 7 dimensions, and the basic skills and knowledge of government officers (the criteria set out by OCSC) can be classified into 5 dimensions, in order to assess the digital literacy level of the officers. The assessment result shows that the readiness level of digital literacy of the government officers is considered satisfactory with an average score of 3.39 – 3.57. Meanwhile, the basic skills and knowledge of the government officers score an average of 3.51 – 4.01 out of a total score of 5. There are outstanding skills in Strategic and Project Management as well as awareness towards vision, mission, procedures and public services with scores of 3.57 and 4.01 respectively. Nevertheless, the least digital skill is Internal Integration and Service Design (3.39 out of 5) while the least basic skills and knowledge of the government officers are Data Literacy (3.51 out of 5) and awareness towards good governance, standard, values, behaviors, digital law and other related laws (3.56 out of 5). These skills are considered importance factors for digital government development. Therefore, the agencies and training institutes should place their focus on the development of digital capabilities by emphasizing on the related training programs.

Next, Digital Leadership is sub-pillar which has a score of 64.15. It is found that 31.9% of all CIOs have experience in being trained for CIO position, which reflects that the CIOs focus on their other administrative duties rather than attending training. The CIOs receive high-level training organized for the governmental IT management (CIO Training Couse) the most at 24%. However, most department-level agencies' CIOs do not participate

in training for CIO position (67.8%) due to the following reasons. They are recently appointed as CIO (27.5%), which reflects that the agencies should therefore have a succession plan for this role and new CIOs should receive proper training before promoting them. (This depends on their organizational context, especially for those agencies that can plan for new CIO appointments.) Also, they have to perform other administrative duties (15.2%), which reflects that the CIOs of the agencies do not only take on CIO role but also other responsibilities. The agencies should give importance to CIO training program and CIO responsibilities because the CIOs significantly drive the development of digital government towards the desired direction.

IT Professional is the sub-pillar which gains the lowest score of 54.16 compared to the other sub-pillars. The department-level agencies on average have 47 IT officers per agency, and the officers who directly operate IT account for 81.6% of all IT officers. Many department-level agencies (81.4%) reveal that they do not have enough IT officers to support. The agencies should consider to increase IT employees.

4. Smart Back Office receives the next highest score of 61.97 and consists of 2 sub-pillars. Internal Integration is a sub-pillar with a score of 65.83, which is in the middle level. Most department-level agencies have their internal management system. For instance, 91.4% of all agencies have human resource management system. Still, some internal management systems are not widely used such as secretary (48.2%) and meeting appointment (67.4%). From the survey, most of the department-level agencies design and use internal management system themselves, especially buildings and vehicles (99.2%), secretary (98.6%) and meeting appointment (96.6%). Most department-level agencies reveal that they cannot link to internal management system because the system connection between agencies remains limited. Central agencies should develop standards or central system so that all government agencies can access and operate from a single database, which will help elevate the government's operations and prevent duplication of system development budget.

External Integration is another sub-pillar with a score of 58.11. This reflects that the agencies still require to build capacity in information exchange and system connectivity with external parties, which is an important factor for the development of digital government. Some department-level agencies (27.2%) have not had digital data link system with external parties. Most of the department-level agencies (85.1%) still deliver official

documents to other government agencies in non-digital format such as post service / facsimile / messenger. Meanwhile, most of the agencies who send documents in digital format (86.4%) use e-mail while e-Saraban accounts for only 32.6%. In order to establish efficient digital correspondence between government agencies and reduce paperwork, the agencies should be encouraged to use e-Saraban for document delivery. Most agencies (87.3%) still send / receive official documents in both digital and paper formats because the paperwork is their proof of evidence (95.3%) and is internally used for mandate purpose (62.7%). Therefore, the government also should consider amending related regulations, attitudes of employees and operations that do not facilitate the implementation of digital government.

5. Policies / Practices receives the next highest score of 57.21 and consists of 4 sub-pillars. Digital Government Policy is a sub-pillar with a score of 58.72. Half of the department-level agencies (69.8%) have policies and plans on the development of digital government, some agencies (24.6%) are currently in process of preparing such plans and the rest agencies (5.7%) have no action plan. Therefore, the government agencies should be encouraged to have such plans and the capacity for developing into another level of digital government. The current policies emphasize on promoting the use of digital technology to elevate their operations (98.1%), followed by policies on organizational strategy / operation which underline strategies or digital projects for organizational development (90.5%) and specific digital policies such as master plans related to information technology and digital operational communication (90.5%). Therefore, the government agencies should be encouraged more to create policies / practices which underline strategies or digital projects for organizational development including specific digital policies. Regarding digital government development plan, some department-level agencies have not focused on digital connectivity of public services for one stop service (70.5%), facilitating consideration of governmental approvals (73.2%), utilization of Data Governance framework in government's data management (79.5%) and Open Government Data (85.8%). The agencies should be encouraged to have policies and plans on the development of digital government and underline these aspects.

Data Governance is next sub-pillar with a score of 58.21. Very few department-level agencies (6.3%) undertake and announce policies on Data Governance. Not many department-level agencies disclose the governmental data on data.go.th (59.8% of all

agencies that disclose the data). Therefore, there should be some supporting measures to urge the government agencies to disclose the data on data.go.th which is considered as government's open data center, including private sector and the public to access open data on data.go.th for further use. The file formats mostly shared by department-level agencies are still PDF, DOC, TXT, TIFF and JPEG (1 star). The government agencies should encourage the sharing of the file formats like CSV, ODS, XML, JSON, KML, SHP, KMZ, RDF (URIs) and RDF (Linked Data) (from 3 stars up) so that they can use government's open data more efficiently.

Budget Allocation is next sub-pillar with a score of 57.03. Most of the department-level agencies allocate their budget to maintaining devices and systems, and to purchasing computers related goods for internal usage (91% and 88%), which aim to develop Hardware. Few agencies request and spend budget on research projects and internally apply such digital technology and findings in their agencies (31%). Government agencies should raise the awareness towards the importance of the research findings and utilization of such digital technology in their agencies and internally elevate digital performance. With respect to budget allocation of the department-level agencies, the largest proportion of their total budget is spend on developing digital services for internal usage or the public / private sector / government sector (34.53%). Their budget allocations to developing digital skills of their department officers and to conducting research projects for the best use of such digital technology and findings in their work are 4.64% and 1.41% respectively. This reflects the fact that the agencies do not give importance to developing digital skills of their employees and conducting research projects for the best use of such digital technology and findings in their work. Moreover, the approved budget of the department-level agencies for developing government's central system is quite small proportion compared to the budget request (41.80%). Their parent organizations should give importance to the budget for this purpose because this will help elevate the status of the government agencies towards integration.

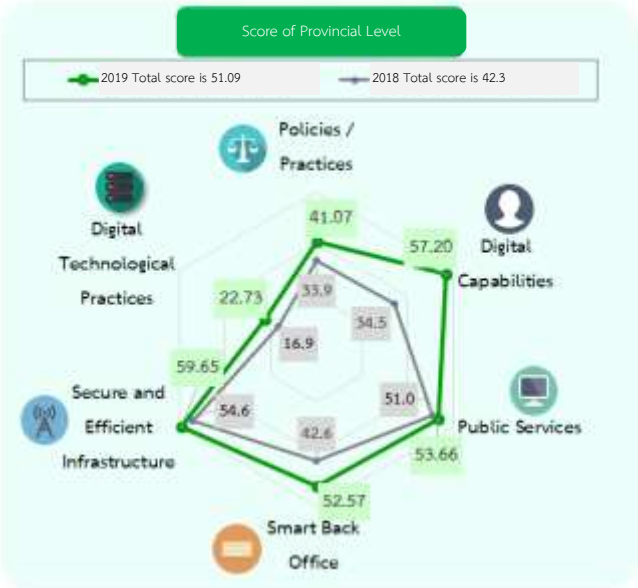
Cyber Security Policy is the sub-pillar which receives the smallest score of 53.07. It reflects that the agencies significantly require to develop cyber security. Few agencies (18.1%) have digital infrastructure security which certifies to ISO/IEC27001 certificate, international standard, while most agencies still use basic method which is virus protection / Malware. More than half of the agencies (62.1%) are aware of and have applied Information Security Policy.

6. Digital Technological Practices receives the lowest score of 37.46 and consists of 3 sub-pillars. Connectivity is the sub-pillar with the highest score of 82.56. Relatively 83.7% of all department-level agencies use connectivity / communication technology such as Mobile, IoT and QR Code. It shows that government agencies apply connectivity / communication technology to benefit their administration and public services. This is considered as a good development for public services by taking the advantages of mobile phones.

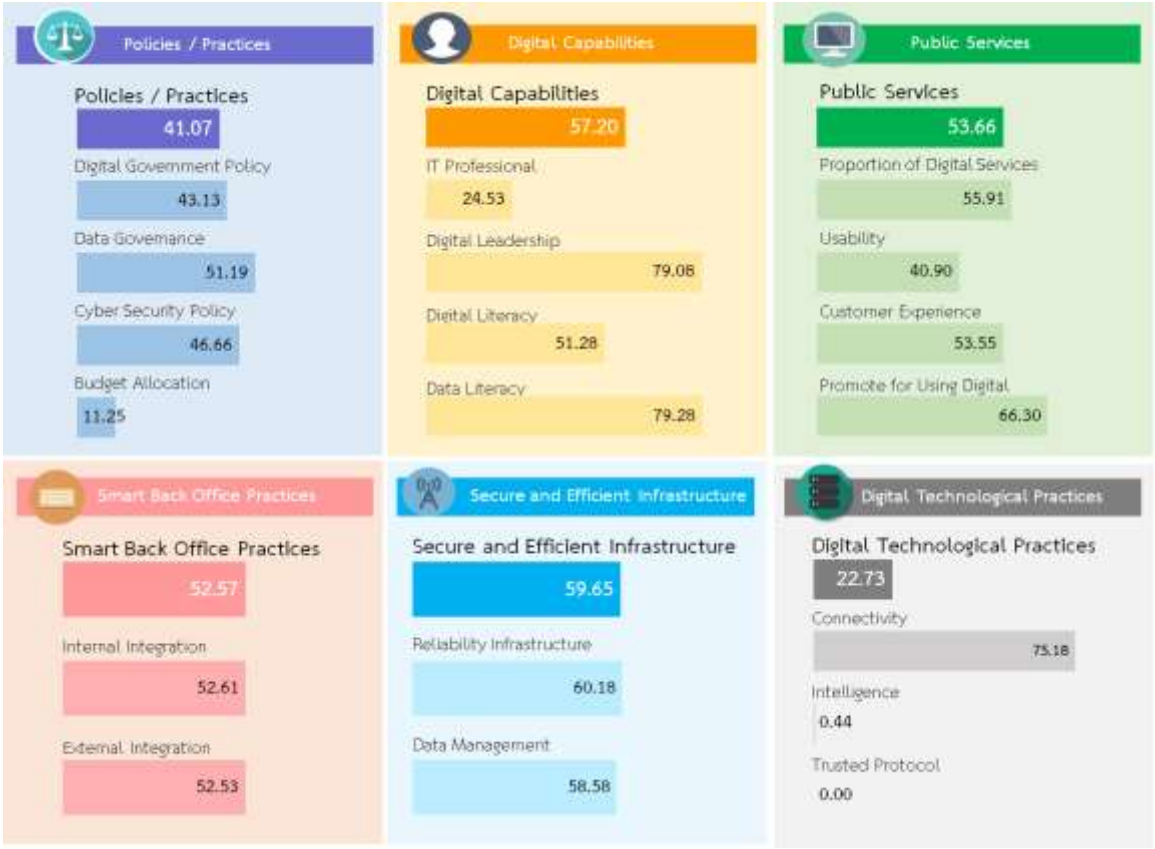
Intelligence is next sub-pillar with a score of 27.74. The survey finds that 32.2% of the department-level agencies implement smart technology such as AI, Big Data Analytic, Machine Learning, Deep Learning and Robotics. It shows that smart technology such as AI and Big Data Analytic are not widely used in the department-level agencies. Next, Trusted Protocol is a sub-pillar with a score of 5.32. Only 5.3% of the department-level agencies utilize technology to increase security such as Block Chain. Very few department-level agencies use Block Chain. Therefore, the department-level agencies should be supported to apply new technology to their administration, public services, and appropriately with their organizational mission in order to elevate vertical lift of digital government and introduce new innovations to government's operations.

3.2 Readiness Survey Result of the Provincial Agencies

Overall readiness score and the score by pillar of the provincial agencies



The readiness score by pillar and sub-pillar of the provincial agencies



The provincial agencies receive an overall score of 51.09 out of 100. Secure and Efficient Infrastructure gains the highest score of 59.65, followed by Digital Capabilities which receives a score of 57.20. Meanwhile, the scores for Public Services, Smart Back Office and Policies / Practices are 53.66, 52.57 and 41.07 respectively. Digital Technological Practices receives the lowest score of 22.73. The details are presented below:

1. Secure and Efficient Infrastructure is the highest score of 59.65 and consists of 2 sub-pillars. Reliability Infrastructure is the sub-pillar which gains the highest score of 60.18. This reflects that the provincial agencies are equipped with reliable digital infrastructure, which is considered satisfactory. Most of the provincial agencies (85.6%) update and maintain their information technology and almost all provincial agencies (97.5%) regularly verify data backup. 71.6% of all provincial agencies prepare a data backup system management if emergency event occurred, mostly backup their data at central agencies. Few provincial agencies (21.1%) prepare Incident Management Process or Business Continuity Management Process for their information systems. Most of them have not developed such plans themselves but central agencies do. Therefore, their parent organizations should foster their subordinate organizations to develop such plans themselves.

Another sub-pillar is Data Management which has a score of 58.58. Most of the provincial agencies (84.8%) update information in database, mostly on a daily-basis or a real-time basis. Meanwhile, many provincial agencies (70.7%) prepare to connect their internal management system with external agencies, which demonstrate a strong readiness of government agencies in data management. 28.9% of the provincial agencies have not performed data verification when the data is stored as some agencies (80.7%) do not appear to have knowledge / expertise in this area. Therefore, their parent organizations and the related agencies should set guidelines and provide training on the verification of data accuracy and completeness to the government agencies, enabling each agency to get ready for data integration among the government agencies.

2. Digital Capabilities has the second-highest score of 57.20 and consists 4 sub-pillars. Data Literacy is the sub-pillar which gains the highest score of 79.28. Most agencies (89.5%) reveal their employees are being able to utilize the information. Still, the provincial

agencies should enhance their personnel capabilities to utilize the information for Descriptive Analytic, Predictive Analytic and for Prescriptive Analytic gradually.

The second sub-pillar is Digital Leadership with a score of 79.08. It is found that 25.3% of all CIOs have experience in being trained for CIO position, which reflects that the CIOs focus on their other administrative duties rather than attending training. Most agencies (97.3%) work through digital channels in their province which indicates the readiness of Deputy Governor as CIO of the province in driving digital government.

Digital Literacy is next sub-pillar with a score of 51.28. The digital skills of the provincial officers (the criteria set out by OCSC) can be categorized into 7 dimensions, and the basic skills and knowledge of government officers (the criteria set out by OCSC) can be classified into 5 dimensions, in order to assess the digital literacy level of the officers. The assessment result shows that the readiness level of digital literacy of government officers is considered satisfactory with an average score of 2.54 – 3.06. In addition, the basic skills and knowledge of government officers score an average of 3.18 – 3.78 out of a total score of 5. Their outstanding skills are Digital Literacy and awareness towards vision, mission, procedures and public services with scores of 3.06 and 3.78 respectively. Nevertheless, the least digital skill is Internal Integration and Service Design (2.54 out of 5). Moreover, the least basic skills and knowledge of government officers are Data Literacy (3.18 out of 5) and awareness towards good governance, standard, values, behaviors, digital law and other related laws (3.23 out of 5). The agencies should therefore develop these skills and capabilities of their officers.

IT Professional is the sub-pillar which has the lowest score of 24.53 compared to the other sub-pillars. The provincial agencies on average have 1 IT officer per agency. The officers who directly operate IT account for only 30.4% of all IT officers while the officers from other fields who have been assigned to operate in IT field represent 69.6%. It can briefly be said that the provincial agencies do not have enough IT officers so that they require the officers from other fields to support. In addition, most provincial agencies (85.6%) respond that they do not have enough IT specialists. Their parent organizations should therefore classify and allocate IT positions of the provincial agencies based on their organizational mission or allocate central officers to support and / or provide advice to the provincial agencies sufficiently. However, few provincial agencies (19.2%) request to have more IT specialists because the positions in the provincial agencies are quite limited and

supervised by their parent organizations. Only 6.3% of the provincial agencies can get more officers. Therefore, the parent organizations should consider position allocations which are appropriate to the provincial agencies and may consider increasing IT positions in their subordinate organizations so as to secure adequate staff for digital government development at regional level.

3. Public Services has the third-highest score of 53.66 and consists of 4 sub-pillars. Promote for Using Digital is the sub-pillar which gains the highest score of 66.30. It indicates that the provincial agencies readily promote their digital services, including increase the use of their digital services. 83.4% of the provincial agencies promote their digital services through digital channel and 74.3% through non-digital channel, with 63.9% encouraging more use of their digital services.

Next, Proportion of Digital Services is the sub-pillar with the second-highest score of 55.91. The provincial agencies provide digital services which account for 52% of their core services. It demonstrates that some provincial agencies, which are subordinate, can not apply digital policies from their parent organizations to their local operations. Consequently, the proportion of digital services of the provincial agencies is lower than that of the department-level agencies. The parent organizations should therefore design digital services based on regional service requirements and enhance their subordinate organizations to provide digital services to the public. The most used form of digital service is Self-service, through channels such as websites (74.9%), Mobile Application (23.4%) and Kiosk (4.8%). The provincial agencies should accordingly promote to use Kiosk for public services. Also they should guide the public on how to use Kiosk because the local people may have a lower access rate of online service. Without internet connection, Kiosk is more convenient and easy for the local people to use.

Customer Experience is next sub-pillar which has a score of 53.55. Not many provincial agencies (44.9%) evaluate consumer satisfaction towards their digital services. Not many provincial agencies (39.2%) apply the customer satisfaction results to improve their service quality. Therefore the agencies should be encouraged to utilize the satisfaction evaluation results for service quality improvement. Especially the department-level agencies with regional branches should take the satisfaction evaluation results of their regional customers to improve service quality, increase the public's convenience and usage rate of the digital services. Furthermore, some digital services (49.1%) have not included

study of user requirements before starting core service development. The study of user requirements before the process of development will enable them to provide the digital services that meet the needs of the service users, as well as will consequently increase the usage rate.

Usability is the sub-pillar which receives the lowest score of 40.90. This suggests the fact that government services are difficult to use. For instance, only 15.6% of the agencies provide contents in English language and only 58% of the agencies have Search Engine filter for Key Word input when searching large amounts of data.

4. Smart Back Office receives the next highest score of 52.57 and consists of 2 sub-pillars. Internal Integration is a sub-pillar with a score of 52.61, which is in the middle level. Most provincial agencies have their internal management system. For instance, 89.2% of all agencies have human resource management system. Still, some internal management systems are not widely used such as secretary (36.3%) and meeting appointment (46.2%) which are for internal administration. From the survey, the provincial agencies mostly use internal management system provided by their parent organizations, especially human resource management (78.5%), archives (75.50%) and budget allocation (65.80%). Central agencies should develop central system and enable all government agencies to get access, which help elevate the government's operations and prevent duplication of system development budget.

Another sub-pillar is External Integration with a score of 52.53. This reflects that the agencies still require to build capacity in information exchange and system connectivity with external parties, which is an important factor for digital government development. 51% of all provincial agencies have not had digital data link system with external parties. Most of the provincial agencies (82.2%) still deliver official documents to other government agencies in non-digital format such as post service / facsimile / messenger. Meanwhile, most of the agencies who send documents in digital format (87.5%) use e-mail, e-Saraban accounting for only 63.6%. Most agencies (80.6%) still send / receive official documents in both digital and paper formats because the paperwork is their proof of evidence (97.6%) and is internally used for mandate purpose (58.6%). Therefore, the agencies should be encouraged to use e-Saraban for document delivery, including to consider amending related regulations, attitudes of employees and operations that do not facilitate the implementation of digital government.

5. Policies / Practices receives the next highest score of 41.07 and consists of 4 sub-pillars. Data Governance is the sub-pillar with the highest score of 51.19. Not many provincial agencies disclose the governmental data on data.go.th (42.7% of all agencies that disclose the data). Therefore, there should be some supporting measures to urge the government agencies to disclose the data on data.go.th which is considered as government's open data center, including private sector and the public to get access on data.go.th for further use.

Cyber Security Policy is next sub-pillar which receives a score of 46.66. It exhibits that the agencies significantly require to develop cyber security. Only 17.9% of the agencies have digital infrastructure security which certifies to ISO/IEC27001 certificate, international standard, while most agencies still use basic method like virus protection / Malware.

Digital Government Policy is next sub-pillar with a score of 43.13. The score of the provincial agencies refers from the score of their parent organizations.

Budget Allocation is the sub-pillar which receives the lowest score of 11.23. Only few agencies (24%) allocate their fiscal budget to digital technology since most of them reveal that this budget is normally handled by central agencies. Besides, 50% of the agencies have not made budget preparation for digital government development in the fiscal year 2019.

6. Digital Technological Practices has the lowest score of 22.73 and consists of 3 sub-pillars. Connectivity is the sub-pillar with the highest score of 75.18. The survey suggests that 75.8% of all provincial agencies use connectivity / communication technology such as Mobile, IoT and QR Code. It is obvious that the government agencies apply connectivity / communication technology to benefit their administration and public services. This is considered as a good development for public services by taking the advantages of mobile phones.

The other 2 sub-pillars are Intelligence with a score of only 0.44 and Trusted Protocol with no score (score of 0.00). This could be said that almost none of the provincial agencies implement smart technology such as AI, Big Data Analytic, Machine Learning, Deep Learning and Robotics, and none of them utilize technology to increase security such as Block Chain. Therefore, the parent organizations should consider setting guidelines for developing tools and / or encouraging their subordinate organizations to apply new digital technology to their administration, public services, and appropriately with their

organizational mission in order to elevate vertical lift of digital government and introduce new innovations to government's operations.

4. Cluster Analysis Grouped by Departmental Agency from Survey Result

From the survey result, the agencies can be grouped into clusters according to the following model in order to exhibit readiness level of digital government development by considering growth from 2018 survey result and value for money of digital government spending for the fiscal year 2019.

Applying BCG Model (Boston Consulting Group Model) to analyze readiness level of each agency as well as its position: The agencies can be classified into 4 groups by considering 2019 Performance score and Growth or difference in readiness score between year 2019 and year 2018, and average score. Each group has its definition and recommendation as stated below:

Developed – This group is outstanding in term of showing high readiness level of digital government and able to exhibit high growth from previous year. Therefore, this group should maintain its high standard and keep developing.

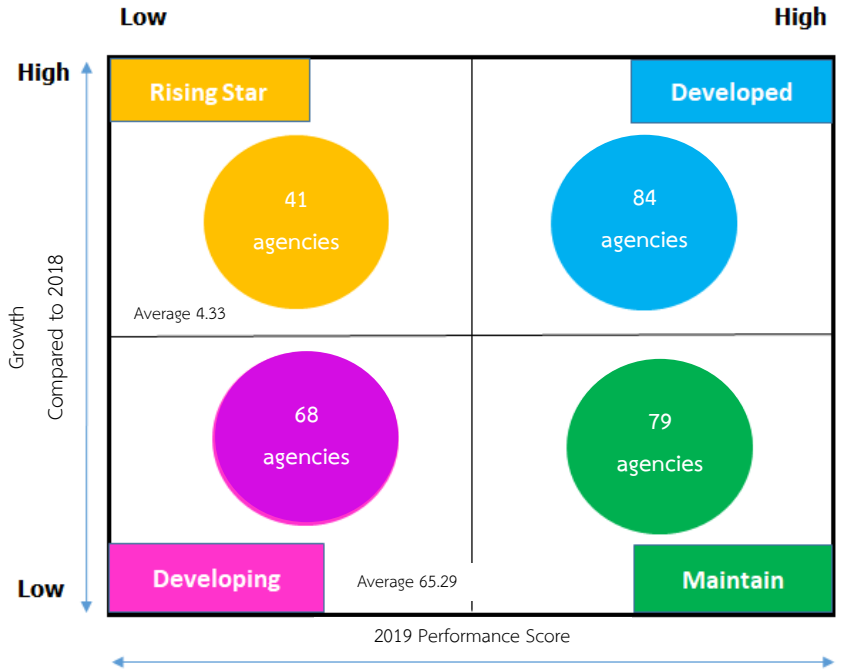
Maintain - This group is outstanding in term of showing high readiness level of digital government but exhibits drop or growth at low to middle level. Therefore, this group should improve its readiness level where necessary.

Rising Star – This group is outstanding in term of showing readiness level of digital government at low to middle level but exhibits high growth from previous year. Therefore, this group should immediately improve its readiness level.

Developing – This group is outstanding in term of showing readiness level of digital government at low to middle level and exhibits low growth. This group is initially developing its readiness level of digital government.

1. Grouped by department-level agency: Readiness level survey result of 272 department-level agencies are grouped, representing 90.37% of all 301 agencies who replied the surveys, because these agencies responded to the surveys in 2019 and 2018.

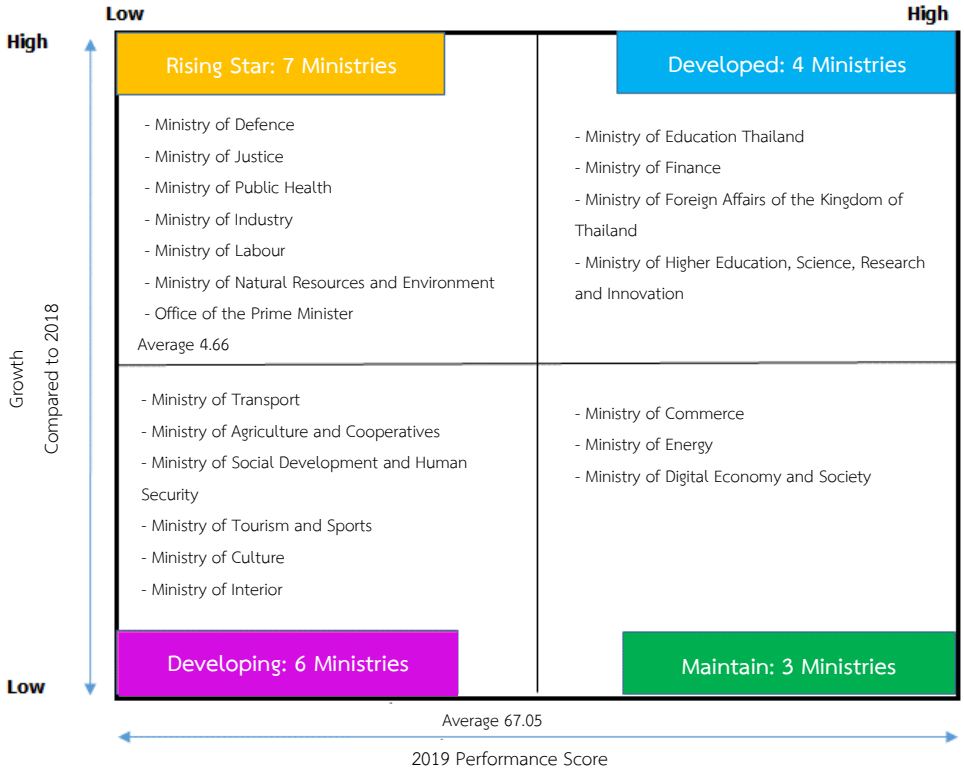
Department-level agencies are classified into 4 groups by applying BCG Model



Grouped by department-level agency by applying BCG Model (Boston Consulting Group Model), the survey demonstrates that 84 department agencies are in Developed group, 79 agencies in Maintain group, 41 agencies in Rising Star group, and 68 agencies in Developing group.

2. Grouped by ministerial-level agency: Considering readiness level survey result of ministries and other office, totally 20 ministries are grouped as follows:

Ministries are classified into 4 groups by applying BCG Model



Grouped by ministerial-level agency by applying BCG Model (Boston Consulting Group Model), the survey presents that every group has similar density and distribution pattern. 4 ministries fall under Developed group, 3 ministries under Maintain group, 7 ministries under Rising Star group, and 6 ministries under Developing group.

5. Policy Recommendation for Thailand Digital Government Development

Policies / Practices

1. Every government agency should prepare or develop its plans and practices to provide its services and administration through digital system in accordance with Digital Government Development Plan under Parliament Administration Act and Digital Service Act 2019. The main objectives are described below:

(1) Data Governance

(2) Digitization

(3) Integration

(4) One Stop Service

(5) Open Government Data

2. Every government agency should consider its budget request to support its plans and practices according to the 5 objectives in policy recommendation no. 1

3. Central agencies should consider the allocation of sufficient budget on digital government development, especially integrated budget on main systems / internal management systems that are used among the government agencies in order to achieve the development goals.

4. The government should consider budget adjustment and / or studying new concepts of funding to support long-term development of digital government project in order to secure adequate finding and not to speed up the government's spending at the end of the fiscal year.

5. The government should announce and undertake Data Governance to all government agencies as a principle and guideline for moving in the same direction as follows:

(1) Declare the rights, duties and responsibilities on data management of the government agencies as well as the rights and duties of data owners or controllers at every step.

(2) Build data protection management system which involves data preparation, storage, classification, processing or utilization, concealing or disclosure, monitor and destroying data.

(3) Have data quality improvement and control measures to secure data accuracy, completeness and availability for data exchange and integration, as well as to have information management assessment, enabling the government agencies to safeguard data quality and data innovation.

(4) Outline policies or clear criteria for data access and secure infrastructure including data protection measure, data security guarantee and personal data protection.

(5) Prepare data description for government's digital data sets which describes data structure, content, data format, data source and data access rights.

Digital Capabilities

1. The government should adjust the organizational structure and enhance capabilities of the government officers to have positive attitudes toward new technology, successfully adopt new technology in their work, and increase employee capabilities when downsizing the government agencies. The details are presented below:

(1) Adjust the organizational structure and manpower in support of digital government development plan. For a short-term plan, the government should consider to increase Technologists, especially for the provincial agencies. For a long-term plan, the government agencies should be encouraged to apply digital technology to their operation, have career development plan similar to private sector, revise their roles and missions according to the government's organizational structure transformation and ensure adequacy of manpower.

(2) Promote CIOs to perform duties full-time and extend their term in office, enabling CIOs to deliver tangible results, in order to develop and apply information technology and communication technology to their administration and successfully achieve their vision and goal.

(3) Assess the digital skills of all government officers according to the criteria set out by the Office of the Civil Service Commission (OCSC). The assessment results can be used for employee development plan of the government officers during digital government transformation.

(4) Create employee development plan for the government officers such as the digital skills of the government officers at different levels, regularly provide training on the importance of digital government development and new technology to the government officers, and apply it to their operation such as digital data preparation, data governance, digital service design, data selection and analysis, and smart technology. Moreover, the government should organize tests and provide Certificates to the government officers who usually pass the tests. All above aims to make the government officers ready for change.

(5) Develop skills of the government officers both horizontally and vertically, not only technical skills, such as strategic thinking, cooperation, teamwork, communication and management skills, because digital government involves all government agencies and requires information exchange and system connectivity among the agencies, also their cooperation.

2. The government should provide a clear understanding on digital government development concept to the local and regional agencies and promote the agencies to apply it to their administration and public services appropriately.

Public Services

1. The government should develop system or platform to provide public services as One Stop Service to be more convenient for public users, meet user requirements, receive user feedback and enlarge public participation.

2. Every government agency should provide its core services through Kiosk so that every people group can have equal access to digital services and reduce inequalities of public access to digital services.

3. The agencies should create and improve their websites according Government Website Standard so that the government agencies have the same standard for Open Government Data and undertake Civic Participation policy.

4. The government / central agencies should find a balance between providing / developing central information system, and allowing the regional agencies to provide / develop their local systems themselves. Therefore, the system / service can truly meet the user requirements.

5. Every government agency should accommodate the principle of Citizen Centric by studying user requirements before developing service system, enlarging user Participation and receiving user Feedback, in order to improve digital services of the government, fulfill the user needs and increase the usage rate.

Smart Back Office

1. The government should establish standard, criteria and method for their digital system including necessary digital infrastructure which comply with international standard, to establish integration, information exchange and system connectivity among the government agencies, as well as security and reliability. Integration and unity enhance efficiency in public service and demonstration, also convince for the service users.

2. The government should deploy Smart Back Office Solution to support digital demonstration. To save time and reduce paperwork, processes, errors, overlapping operations and inequality among the agencies, the following digital systems should be implemented:

(1) Systems for government orders, letters and documents by using e-Saraban and Electronic Correspondence Management Services (e-CMS) to facilitate digital delivery of official letters, documents, mail merge, and government orders at every step.

(2) Systems for meeting room and vehicle bookings to facilitate every agency to manage these bookings digitally, to replace the bookings on paperwork.

(3) Other administrative systems such as integrated finance management, human resource management, mission management, archives and calendar planner.

3. Every government agencies should have its administration and operation, and provide public services through digital channels. Following the standard, regulations and criteria, the data integration and connectivity among the agencies would exist, also increase user convenience.

Secure and Efficient Infrastructure

1. The government should have security system / measure for digital services of the government agencies to monitor and secure system readiness and reliability, at least having cyber threat or cyber risk protection according to the Cyber Security Act.

2. Every government agency should establish secure and efficient infrastructure and cyber security measure to enhance user privacy and security.

3. Every government agency should have Incident Management Process and Business Continuity Management Process (BCP) with BCP testing scenarios.

Open Government Data and Integration

1. Every government agency should prepare and store its information based on their organizational mission in digital format. The information must be up-to-date, accurate, reliable, effectively used and exchanged across the government agencies, also possible for further processing.

2. The government should establish an information center for exchanging digital information and registers (integration) between the government agencies to support the operation of the government agencies when providing digital services to the users as follows:

(1) Set policies and measures on digital data exchange and connectivity

(2) Coordinate with and facilitate the government agencies in digital data exchange, monitor and govern such operation in order to achieve the same direction and standard, following the criteria, method, and conditions of the EGA's executive committee.

(3) Prepare data description for government's digital data sets which describes data exchange and connectivity with proof of evidence.

(4) Set standard and criteria for data disclosure, which include type, format and standard of open data, based on international concept. The government agencies should be encouraged to prepare open data, in accordance with Open Government Data Act enabling citizens to have free access to public data without

any restrictions, which can further be used and publicized or for service improvement and innovation.

(5) Accelerate to share open data or public news and information of the government agencies through digital formats and channels. Promoting the sharing of the file formats like CSV, ODS, XML, JSON, KML, SHP, KMZ, RDF (URIs) and RDF (Linked Data), citizens can use government's open data more efficiently. (Data.go.th recommends the file formats from 3 stars up like CSV, ODS, XML, JSON, KML, SHP, KMZ, RDF (URIs) and RDF (Linked Data)). The data must comply with Open License, Machine-Readable and Non-Proprietary and be convenient for citizens to access and monitor the government performance. Besides, this makes service improvement and innovation possible, also benefits the country in other aspects.

3. The government should develop open data center (data.go.th) and coordinate with the government agencies to deliver or link open data in accordance with Open Government Data Act in order to facilitate citizens and government's operation, and encourage the government agencies to disclose their data through this channel as well.

Digitization

1. The government should provide a clear understanding on new technology such as Big Data, IoT, AI, and Block Chain. Therefore, the government agencies can properly make use of new technology in their demonstration and public services, also align with their organizational context and significantly uplift the government operation and innovation.

Government Laws and Regulations

1. Every government agency should amend laws, rules and regulations in order to support digital government development, especially in the following aspects:

(1) Integrating data and operation to support integration across the agencies which truly construct digital government.

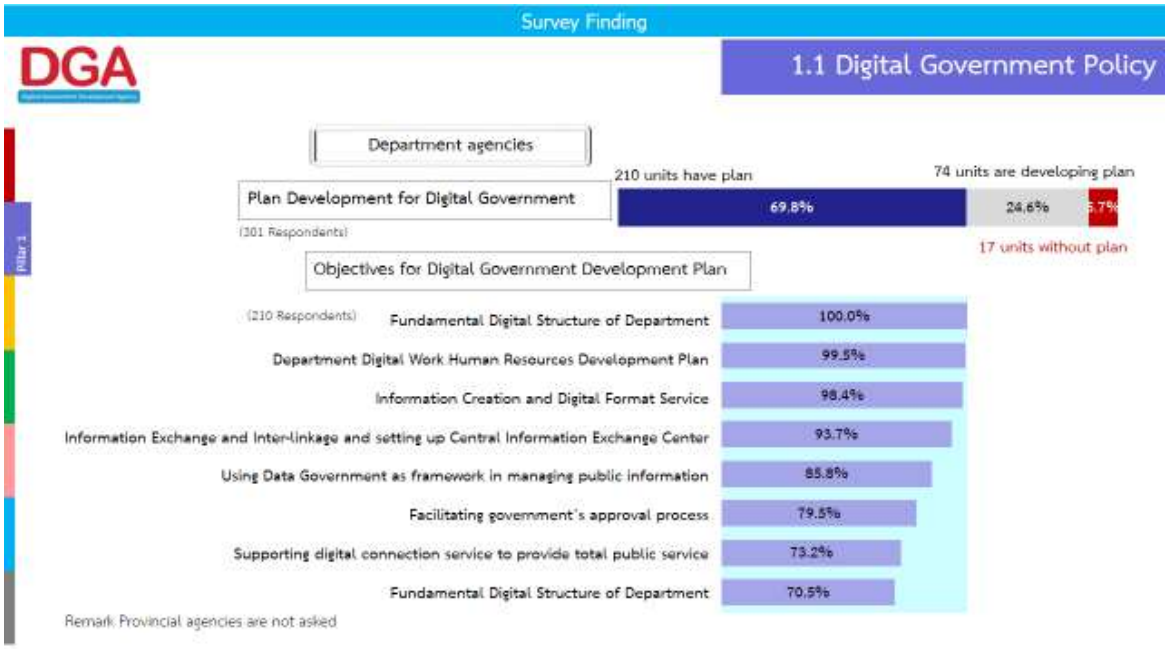
(2) Amending laws / regulations relating power of attorney to simplify government transactions, not require copies of smart ID cards from the users.

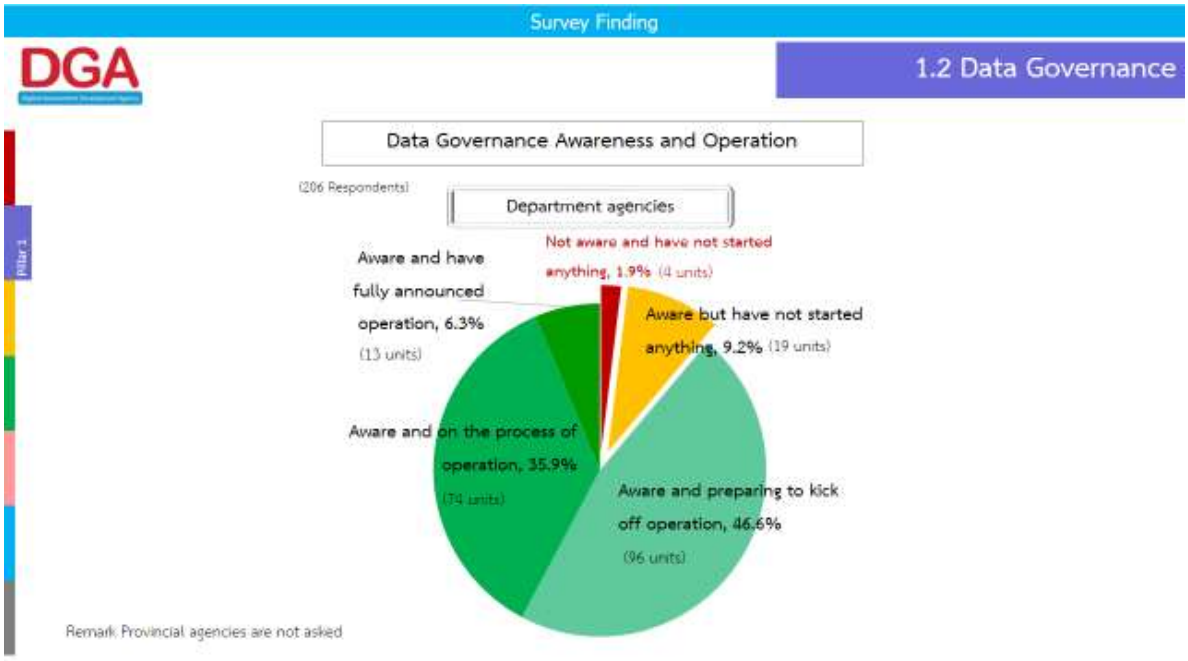
(3) Amending relevant laws / regulations to accelerate the cancellation of the request for copies of smart ID cards, house registrations and other documents.

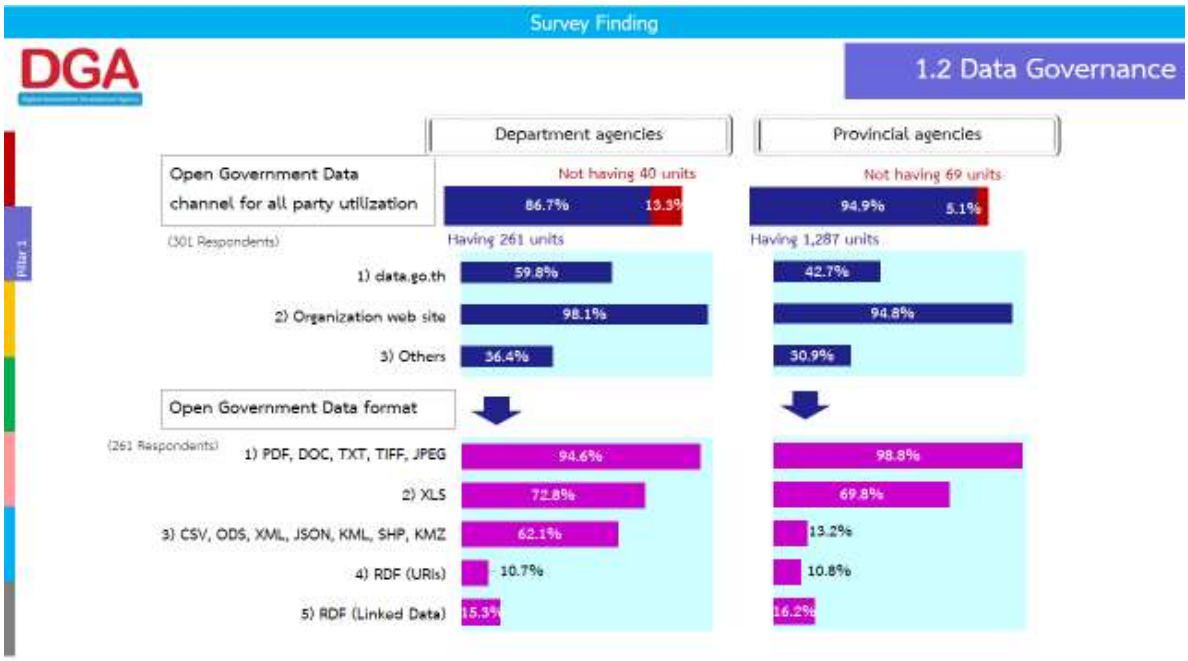
2. The government should consider to increase flexibilities in their procurement process, relevant documents, Term of Reference (TOR) and timeline, which motivates digital government development and keeps staying relevant in the fast moving technology.

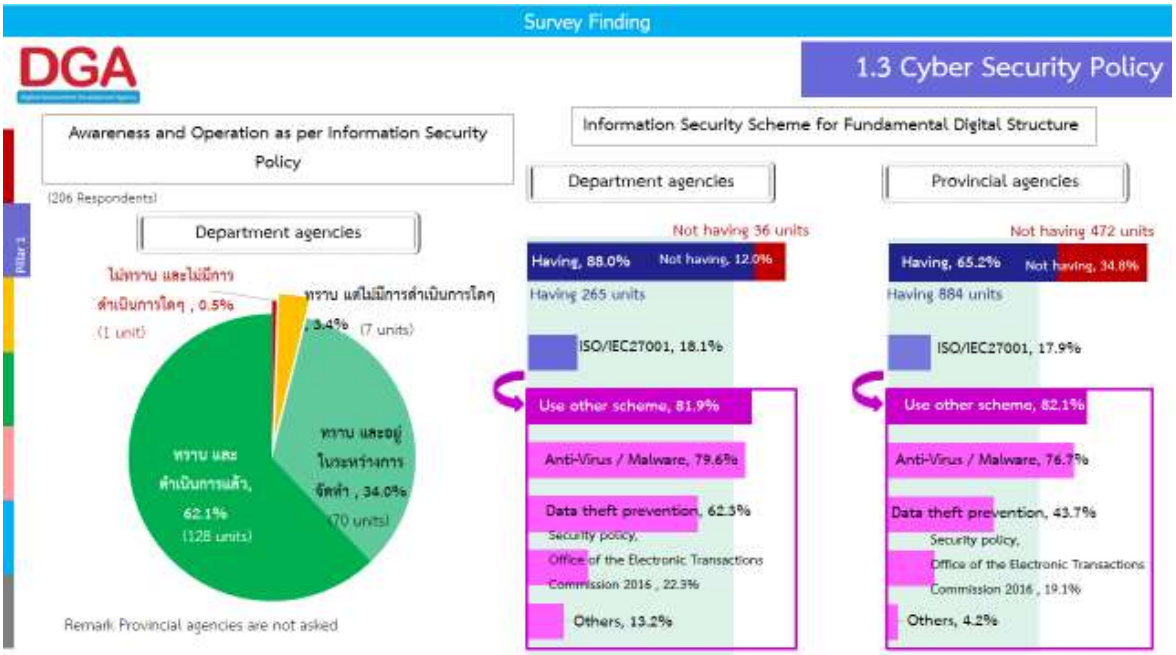
Appendix – Fact Finding from Survey Result

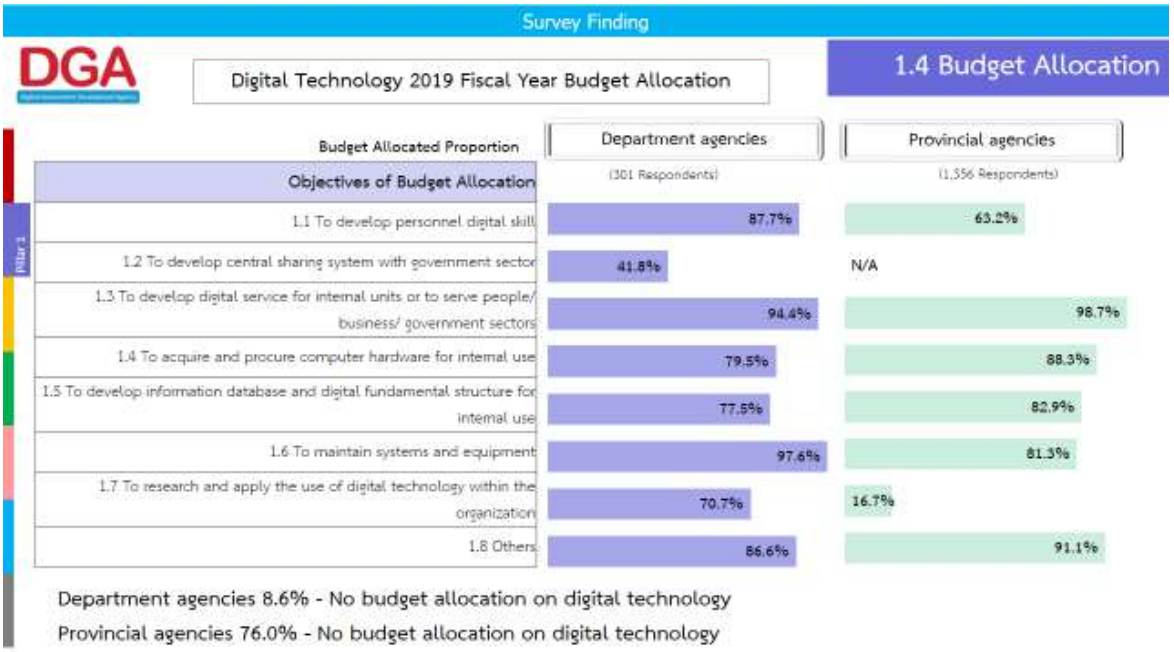

DGA
Pillar 1: Policies / Practices


Survey Finding
DGA
1.1 Digital Government Policy
Department agencies
Plan Development for Digital Government
(301 Respondents)
210 units have plan
69.8%
74 units are developing plan
24.6%
5.7%
17 units without plan
Objectives for Digital Government Development Plan
(210 Respondents)
Fundamental Digital Structure of Department
100.0%
Department Digital Work Human Resources Development Plan
99.5%
Information Creation and Digital Format Service
98.4%
Information Exchange and Inter-linkage and setting up Central Information Exchange Center
93.7%
Using Data Government as framework in managing public information
85.8%
Facilitating government's approval process
79.5%
Supporting digital connection service to provide total public service
73.2%
Fundamental Digital Structure of Department
70.5%
Remark Provincial agencies are not asked

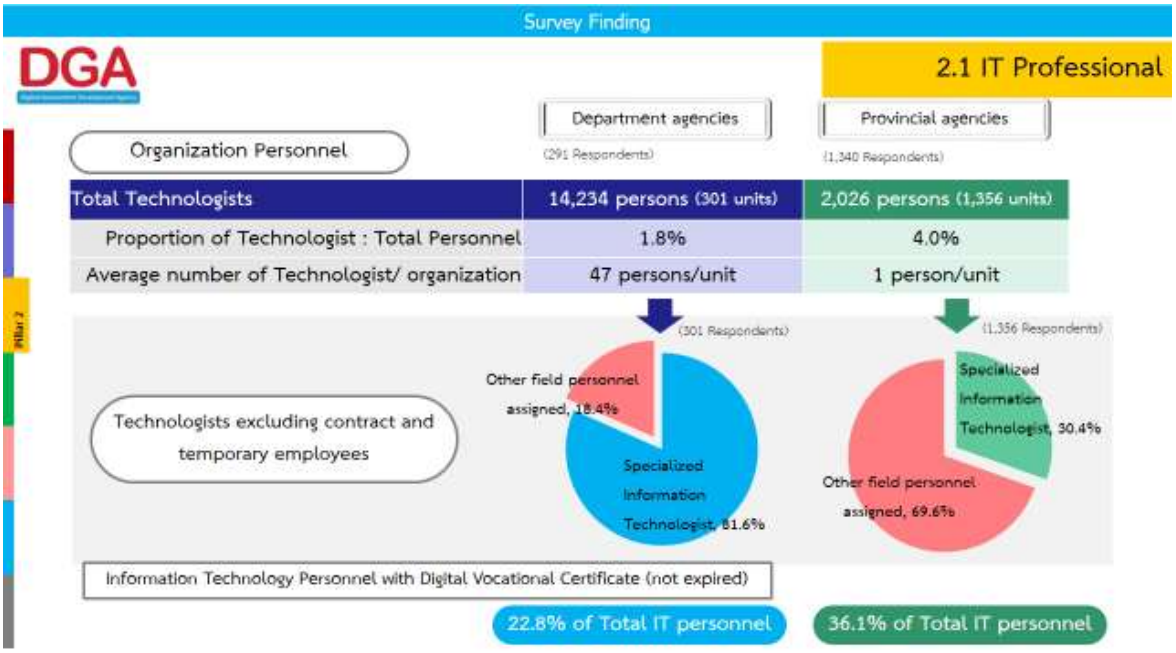

Survey Finding
DGA
1.2 Data Governance
Data Governance Awareness and Operation
(206 Respondents)
Department agencies
Not aware and have not started anything, 1.9% (4 units)
Aware and have fully announced operation, 6.3% (13 units)
Aware but have not started anything, 9.2% (19 units)
Aware and on the process of operation, 35.9% (74 units)
Aware and preparing to kick off operation, 46.6% (96 units)
Remark Provincial agencies are not asked

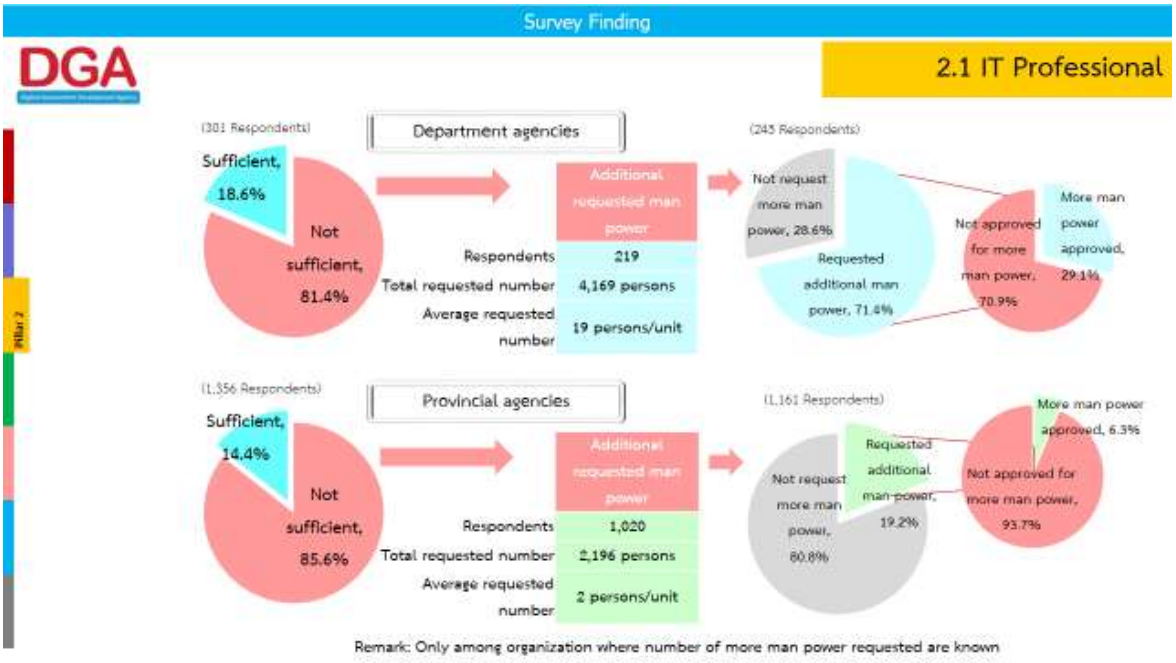

Survey Finding
DGA
1.2 Data Governance
Department agencies
Provincial agencies
Open Government Data channel for all party utilization
(301 Respondents)
Not having 40 units
86.7%
13.3%
Having 261 units
Not having 69 units
94.9%
5.1%
Having 1,287 units
1) data.go.th
59.8%
42.7%
2) Organization web site
98.1%
94.8%
3) Others
36.4%
30.9%
Open Government Data format
(261 Respondents)
1) PDF, DOC, TXT, TIFF, JPEG
94.6%
98.8%
2) XLS
72.8%
69.8%
3) CSV, ODS, XML, JSON, KML, SHP, KMZ
62.1%
13.2%
4) RDF (URIs)
10.7%
10.8%
5) RDF (Linked Data)
15.3%
16.2%

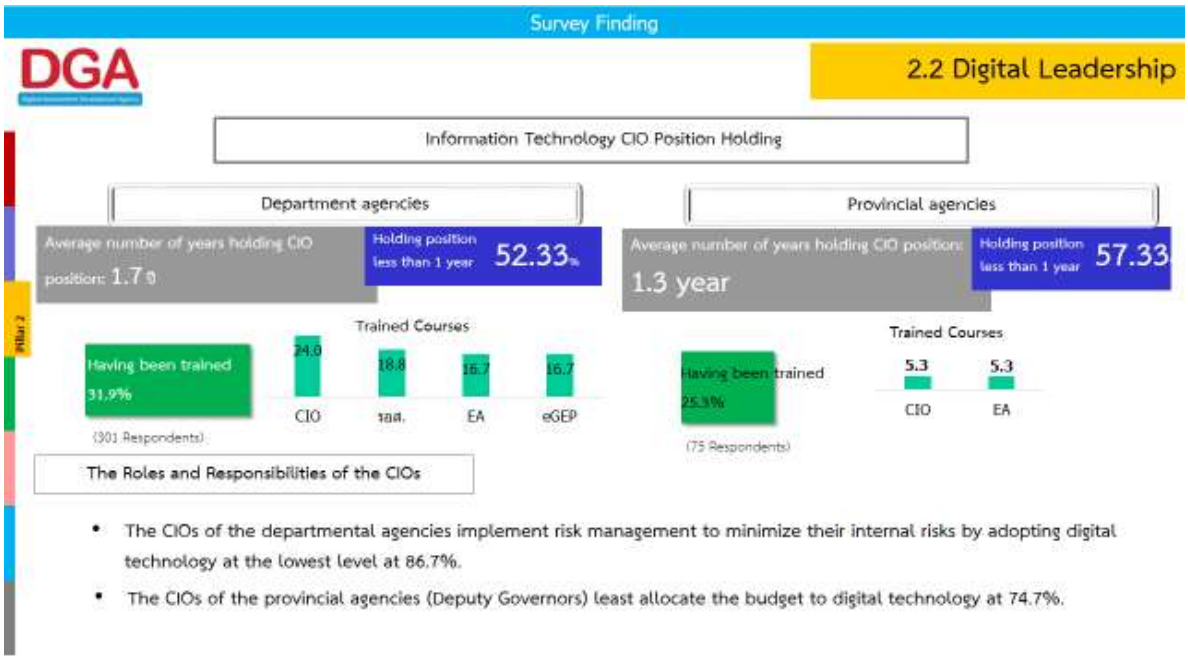

Survey Finding
DGA
1.3 Cyber Security Policy
Awareness and Operation as per Information Security Policy
(206 Respondents)
Department agencies
ไม่ทราบ และไม่มีการดำเนินการใดๆ , 0.5%
(1 unit)
ทราบ แต่ไม่มีการดำเนินการใดๆ , 3.4% (7 units)
ทราบ และดำเนินการแล้ว, 62.1% (128 units)
ทราบ และอยู่ในระหว่างการจัดทำ , 34.0% (70 units)
Remark Provincial agencies are not asked
Information Security Scheme for Fundamental Digital Structure
Department agencies
Not having 36 units
Having, 88.0%
Not having, 12.0%
Having 265 units
ISO/IEC27001, 18.1%
Use other scheme, 81.9%
Anti-Virus / Malware, 79.6%
Data theft prevention, 62.3%
Security policy,
Office of the Electronic Transactions Commission 2016 , 22.3%
Others, 13.2%
Provincial agencies
Not having 472 units
Having, 65.2%
Not having, 34.8%
Having 884 units
ISO/IEC27001, 17.9%
Use other scheme, 82.1%
Anti-Virus / Malware, 76.7%
Data theft prevention, 43.7%
Security policy,
Office of the Electronic Transactions Commission 2016 , 19.1%
Others, 4.2%

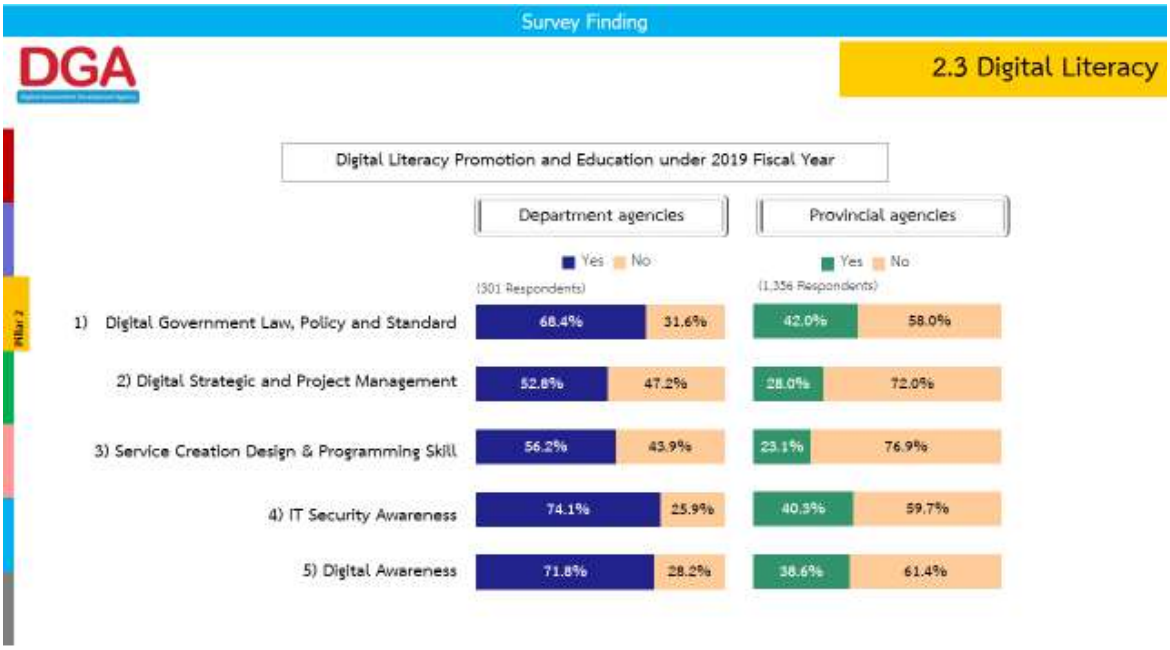

Survey Finding
DGA
1.4 Budget Allocation
Digital Technology 2019 Fiscal Year Budget Allocation
Budget Allocated Proportion
Objectives of Budget Allocation
1.1 To develop personnel digital skill
1.2 To develop central sharing system with government sector
1.3 To develop digital service for internal units or to serve people/ business/ government sectors
1.4 To acquire and procure computer hardware for internal use
1.5 To develop information database and digital fundamental structure for internal use
1.6 To maintain systems and equipment
1.7 To research and apply the use of digital technology within the organization
1.8 Others
Department agencies
(301 Respondents)
87.7%
41.8%
94.4%
79.5%
77.5%
97.6%
70.7%
86.6%
Provincial agencies
(1,356 Respondents)
63.2%
N/A
98.7%
88.3%
82.9%
81.3%
16.7%
91.1%
Department agencies 8.6% - No budget allocation on digital technology
Provincial agencies 76.0% - No budget allocation on digital technology

Pillar 2: Digital Capabilities

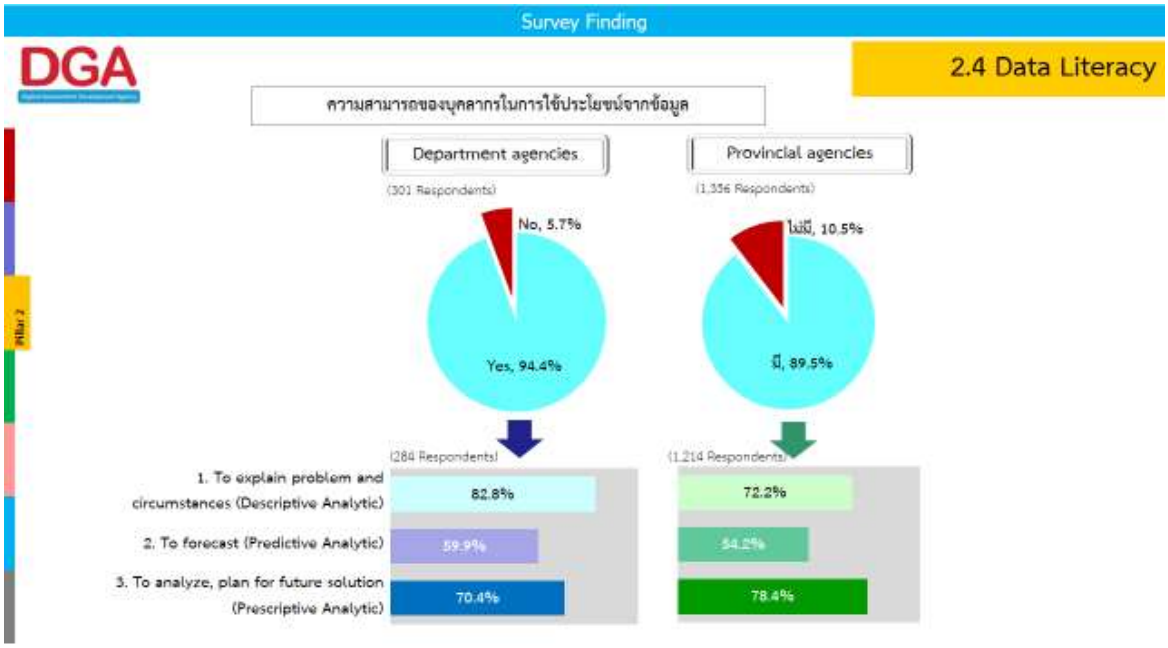



Survey Finding
DGA
2.1 IT Professional
(301 Respondents)
Department agencies
Sufficient, 18.6%
Not sufficient, 81.4%
Additional requested man power
Respondents 219
Total requested number 4,169 persons
Average requested number 19 persons/unit
(245 Respondents)
Not request more man power, 28.6%
Requested additional man power, 71.4%
Not approved for more man power, 70.9%
More man power approved, 29.1%
(1,356 Respondents)
Provincial agencies
Sufficient, 14.4%
Not sufficient, 85.6%
Additional requested man power
Respondents 1,020
Total requested number 2,196 persons
Average requested number 2 persons/unit
(1,161 Respondents)
Not request more man power, 80.8%
Requested additional man-power, 19.2%
Not approved for more man power, 93.7%
More man power approved, 6.3%
Remark: Only among organization where number of more man power requested are known

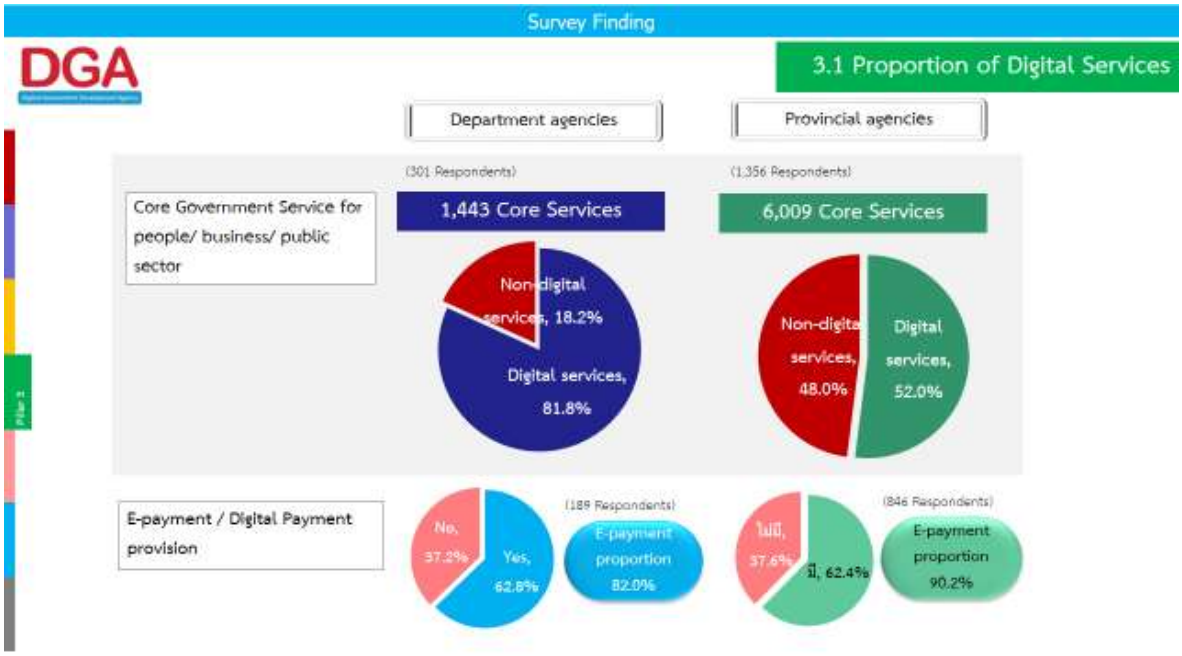

Survey Finding
DGA
2.2 Digital Leadership
Information Technology CIO Position Holding
Department agencies
Average number of years holding CIO position: 1.7
Holding position less than 1 year 52.33%
Trained Courses
Having been trained 31.9%
24.0
18.8
16.7
16.7
CIO
สสส.
EA
eGEP
(301 Respondents)
Provincial agencies
Average number of years holding CIO position: 1.3 year
Holding position less than 1 year 57.33
Trained Courses
Having been trained 25.3%
5.3
5.3
CIO
EA
(75 Respondents)
The Roles and Responsibilities of the CIOs
• The CIOs of the departmental agencies implement risk management to minimize their internal risks by adopting digital technology at the lowest level at 86.7%.
• The CIOs of the provincial agencies (Deputy Governors) least allocate the budget to digital technology at 74.7%.

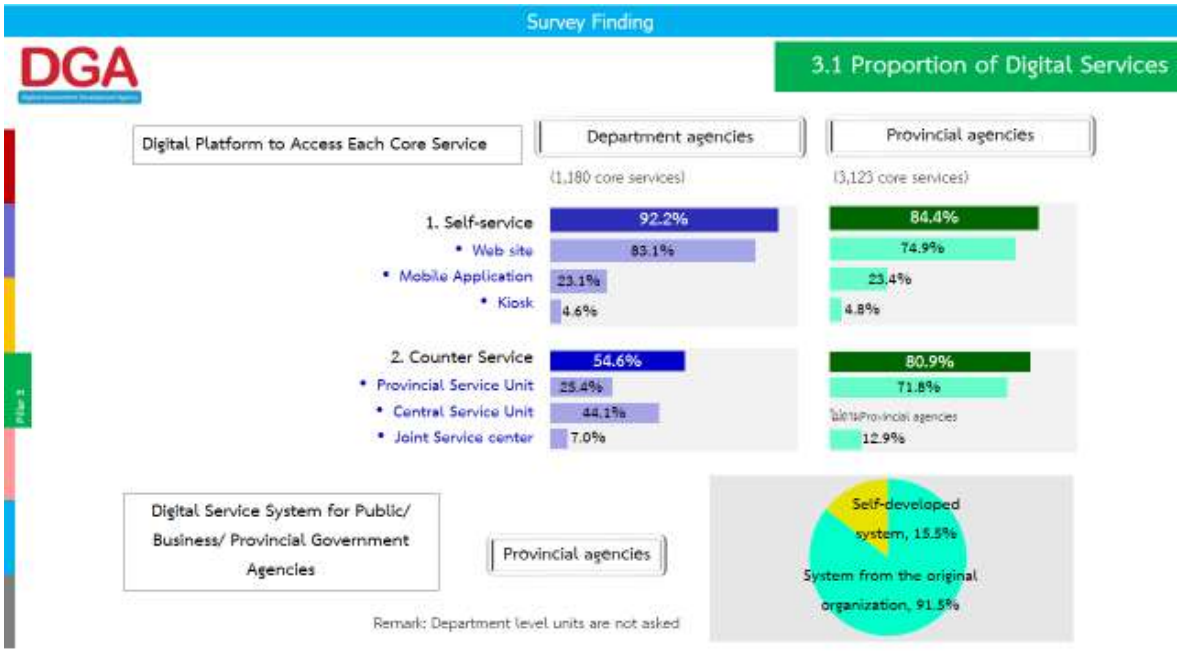

Survey Finding
DGA
2.3 Digital Literacy
Digital Literacy Promotion and Education under 2019 Fiscal Year
Department agencies
Provincial agencies
Yes
No
(301 Respondents)
(1,356 Respondents)
1) Digital Government Law, Policy and Standard
68.4%
31.6%
42.0%
58.0%
2) Digital Strategic and Project Management
52.8%
47.2%
28.0%
72.0%
3) Service Creation Design & Programming Skill
56.2%
43.9%
23.1%
76.9%
4) IT Security Awareness
74.1%
25.9%
40.3%
59.7%
5) Digital Awareness
71.8%
28.2%
38.6%
61.4%

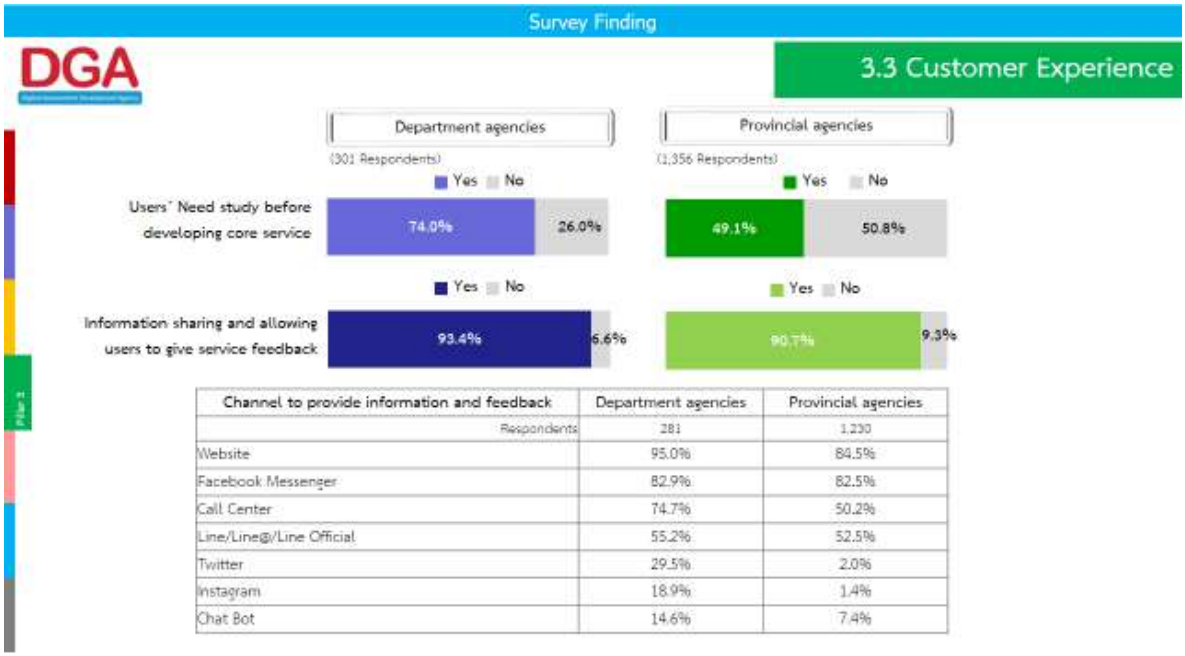

Survey Finding
DGA
2.3 Digital Literacy
Full average score: 5
Department agencies
Provincial agencies
(301 Respondents)
(1,356 Respondents)
Digital Skill Level (OCSC's standard)
1. Digital Literacy
3.56
3.06
2. Digital Governance, Standard, and Compliance
3.55
2.87
3. Digital Technology Efficiency to increase organization potentiality
3.52
2.87
4. Internal Integration and Service Design with Digital Technology
3.39
2.54
5. Strategic and Project Management
3.57
2.85
6. Digital Leadership
3.48
2.66
7. Digital Transformation
3.51
2.76
Fundamental Capability and Knowledge of Government Officers (OCSC's standard)
8. Technology employment tactics to support work function and compatibility
3.98
3.64
9. Knowledge about safe technology utilization on social aspects, privacy and morality
3.71
3.44
10. Knowledge about Core Data Literacy, Utilization and Comprehension
3.51
3.18
11. Knowledge about Good Governance, Standard, Good Guideline, Digital and other related laws
3.56
3.23
12. Knowledge about organization target, mission, work process and service
4.01
3.78


Survey Finding
DGA
2.4 Data Literacy
ความสามารถของบุคลากรในการใช้ประโยชน์จากข้อมูล
Department agencies
(301 Respondents)
Provincial agencies
(1,336 Respondents)
No, 5.7%
Yes, 94.4%
ไม่มี, 10.5%
มี, 89.5%
(284 Respondents)
(1,214 Respondents)
1. To explain problem and circumstances (Descriptive Analytic)
2. To forecast (Predictive Analytic)
3. To analyze, plan for future solution (Prescriptive Analytic)
82.8%
59.9%
70.4%
72.2%
54.2%
78.4%

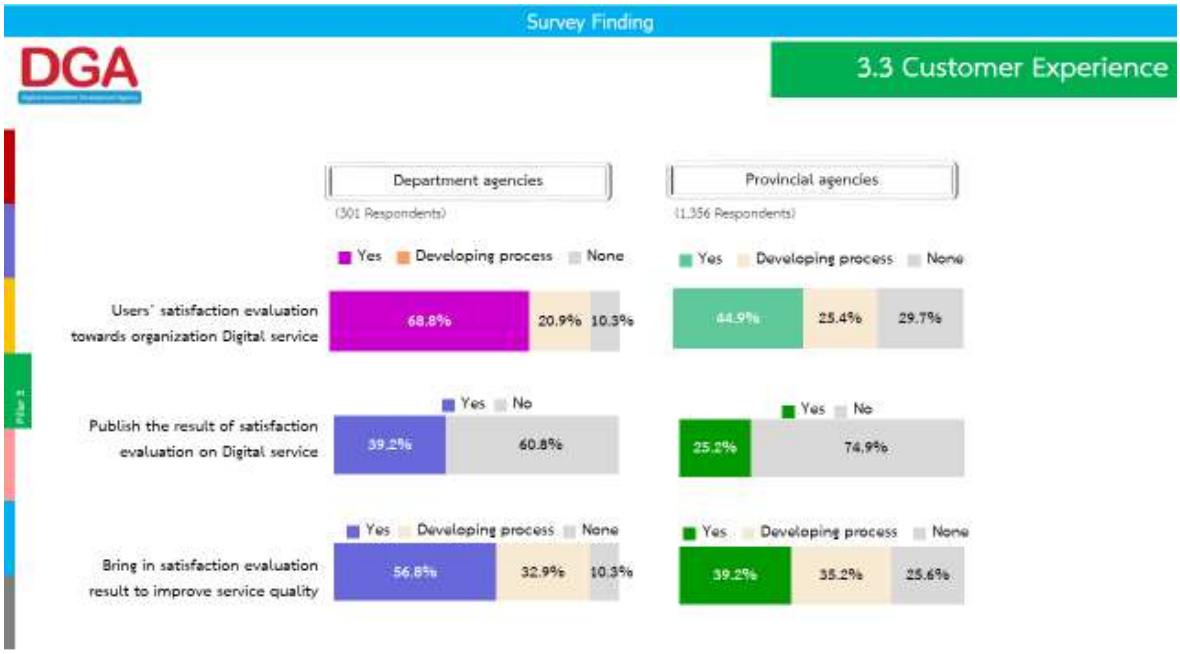

DGA
Pillar 3: Public Services

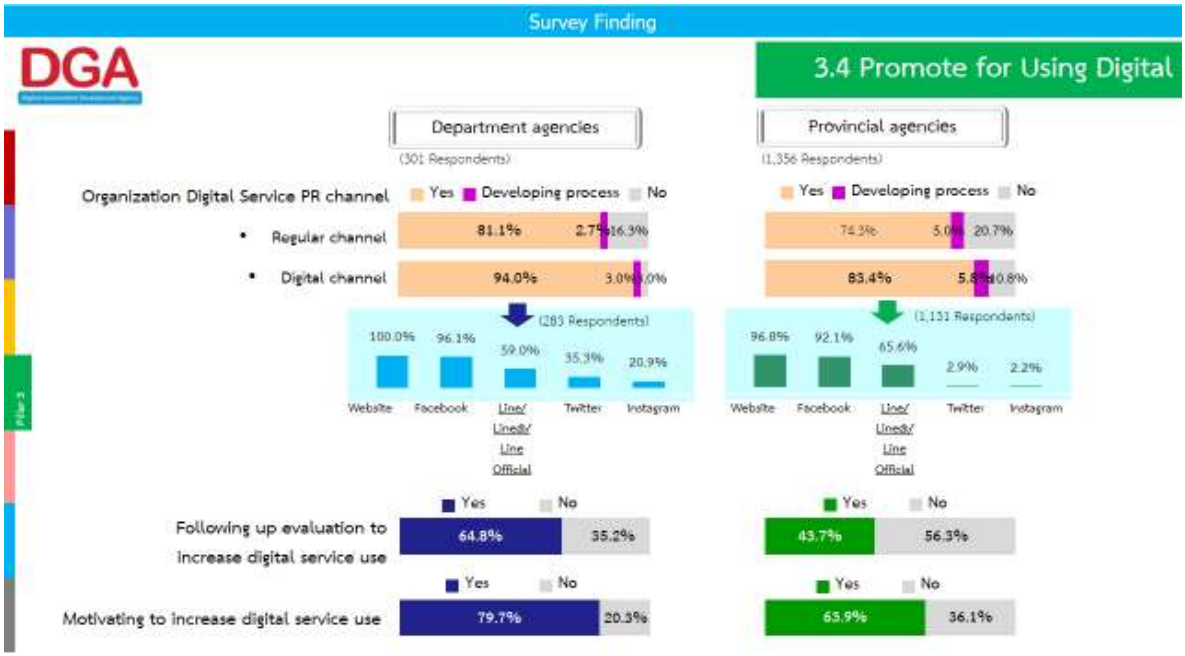

Survey Finding
DGA
3.1 Proportion of Digital Services
Department agencies
Provincial agencies
(301 Respondents)
(1,356 Respondents)
Core Government Service for people/ business/ public sector
1,443 Core Services
6,009 Core Services
Non-digital services, 18.2%
Digital services, 81.8%
Non-digital services, 48.0%
Digital services, 52.0%
E-payment / Digital Payment provision
(189 Respondents)
(846 Respondents)
No, 37.2%
Yes, 62.8%
E-payment proportion 82.0%
ไม่มี, 37.6%
มี, 62.4%
E-payment proportion 90.2%


Survey Finding
DGA
3.1 Proportion of Digital Services
Digital Platform to Access Each Core Service
Department agencies
Provincial agencies
(1,180 core services)
(3,123 core services)
1. Self-service
92.2%
84.4%
• Web site
83.1%
74.9%
• Mobile Application
23.1%
23.4%
• Kiosk
4.6%
4.8%
2. Counter Service
54.6%
80.9%
• Provincial Service Unit
25.4%
71.8%
• Central Service Unit
44.1%
• Joint Service center
7.0%
12.9%
Digital Service System for Public/ Business/ Provincial Government Agencies
Provincial agencies
Self-developed system, 15.5%
System from the original organization, 91.5%
Remark: Department level units are not asked

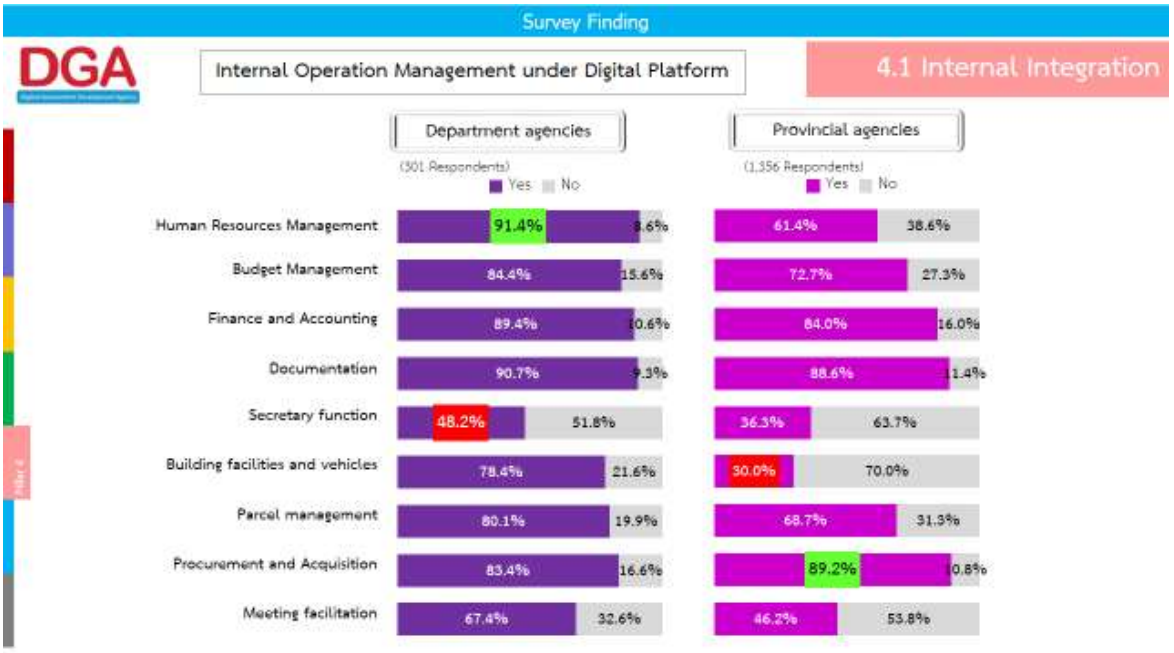


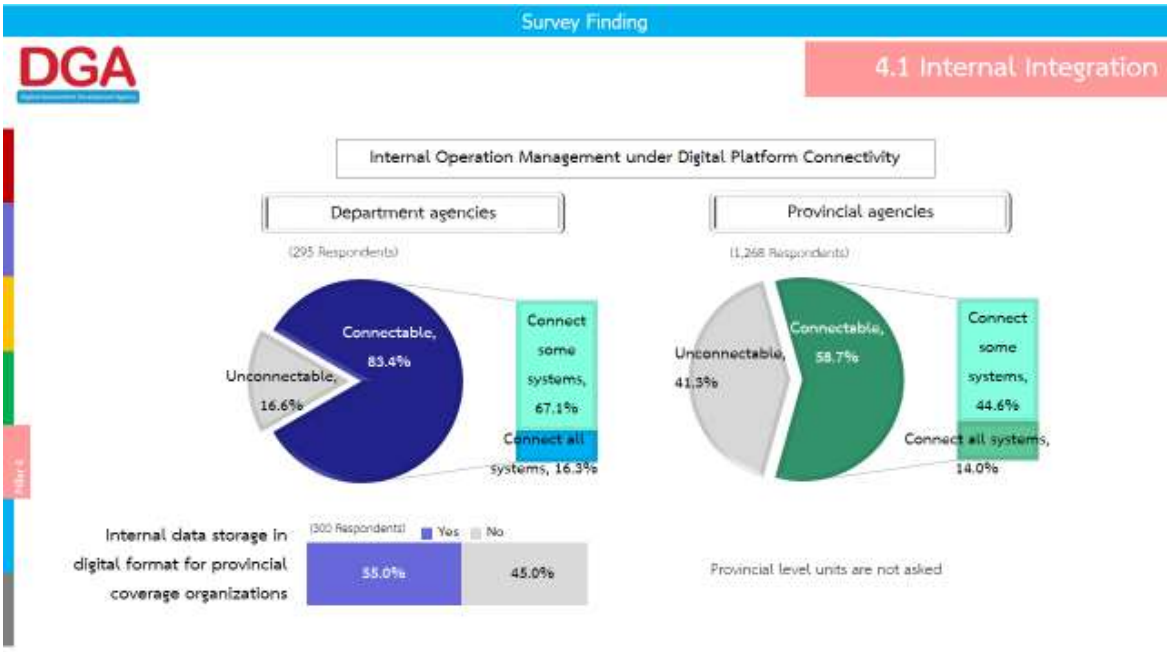
Channel to provide information and feedback	Department agencies	Provincial agencies
Respondents	281	1,230
Website	95.0%	84.5%
Facebook Messenger	82.9%	82.5%
Call Center	74.7%	50.2%
Line/Line@/Line Official	55.2%	52.5%
Twitter	29.5%	2.0%
Instagram	18.9%	1.4%
Chat Bot	14.6%	7.4%

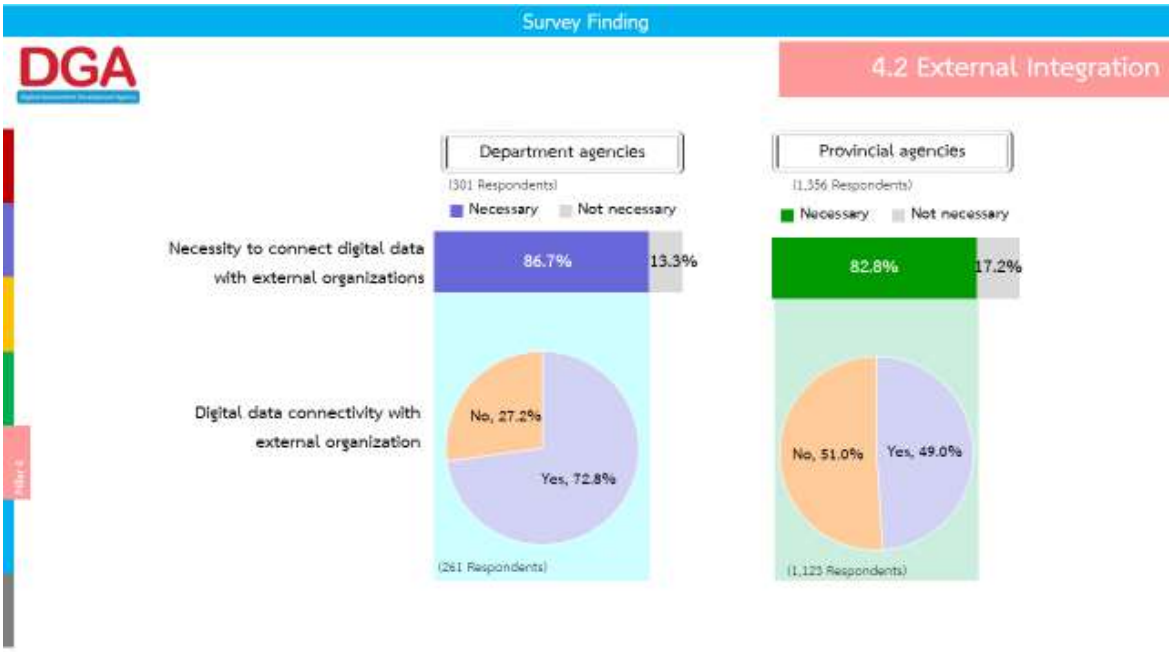

Survey Finding
DGA
3.3 Customer Experience
Department agencies
(301 Respondents)
Provincial agencies
(1,356 Respondents)
Yes
Developing process
None
Users' satisfaction evaluation towards organization Digital service
68.8%
20.9%
10.3%
44.9%
25.4%
29.7%
Yes
No
Publish the result of satisfaction evaluation on Digital service
39.2%
60.8%
25.2%
74.9%
Yes
Developing process
None
Bring in satisfaction evaluation result to improve service quality
56.8%
32.9%
10.3%
39.2%
35.2%
25.6%

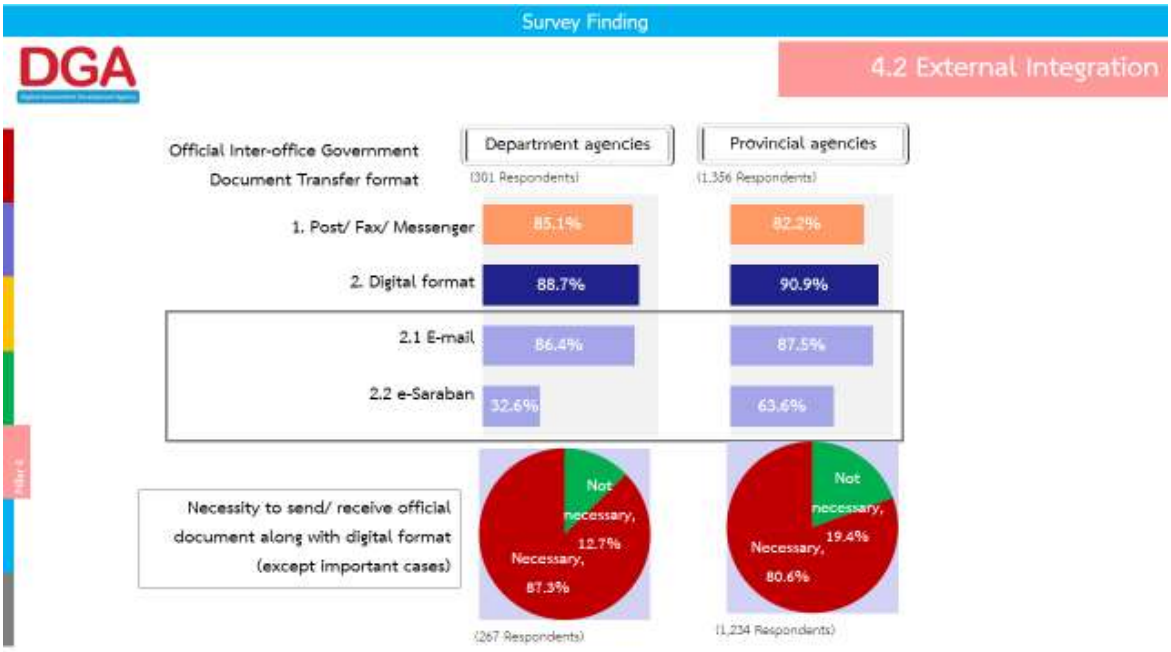

Survey Finding
DGA
3.4 Promote for Using Digital
Department agencies
(301 Respondents)
Provincial agencies
(1,356 Respondents)
Organization Digital Service PR channel
Yes
Developing process
No
Regular channel
81.1%
2.7%
16.3%
74.3%
5.0%
20.7%
Digital channel
94.0%
3.0%
3.0%
83.4%
5.8%
10.8%
(283 Respondents)
100.0%
96.1%
59.0%
35.3%
20.9%
Website
Facebook
Line/ LineBk/ Line Official
Twitter
Instagram
(1,131 Respondents)
96.8%
92.1%
65.6%
2.9%
2.2%
Website
Facebook
Line/ LineBk/ Line Official
Twitter
Instagram
Following up evaluation to increase digital service use
Yes
No
64.8%
35.2%
43.7%
56.3%
Motivating to increase digital service use
Yes
No
79.7%
20.3%
65.9%
36.1%

Pillar 4: Smart Back Office Practices

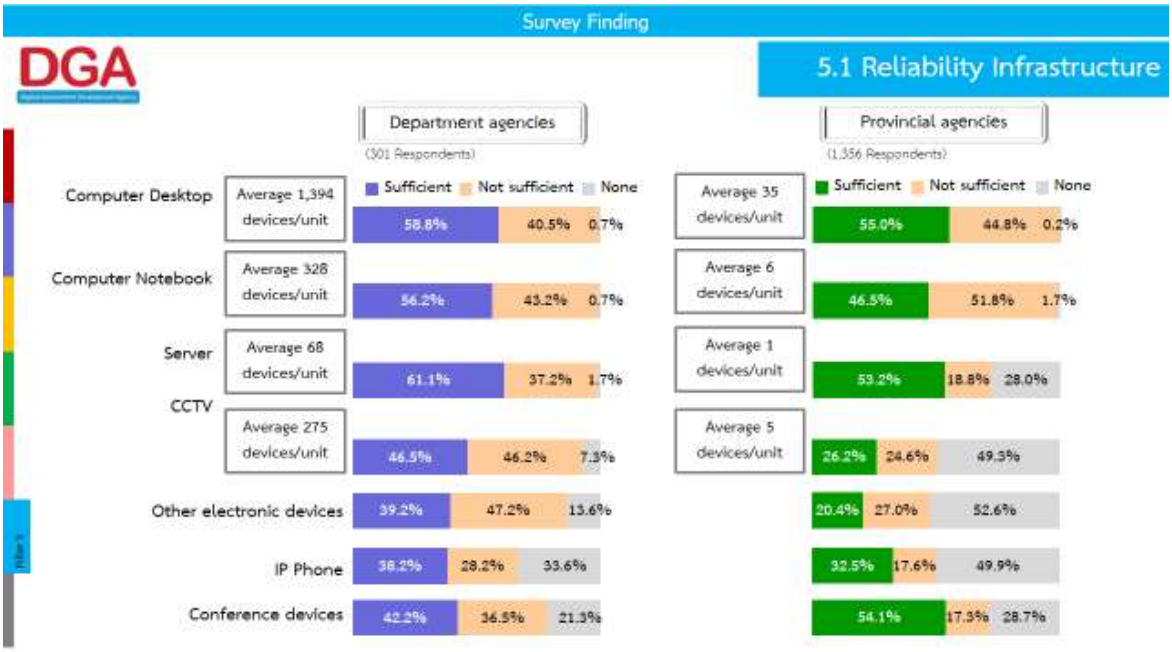


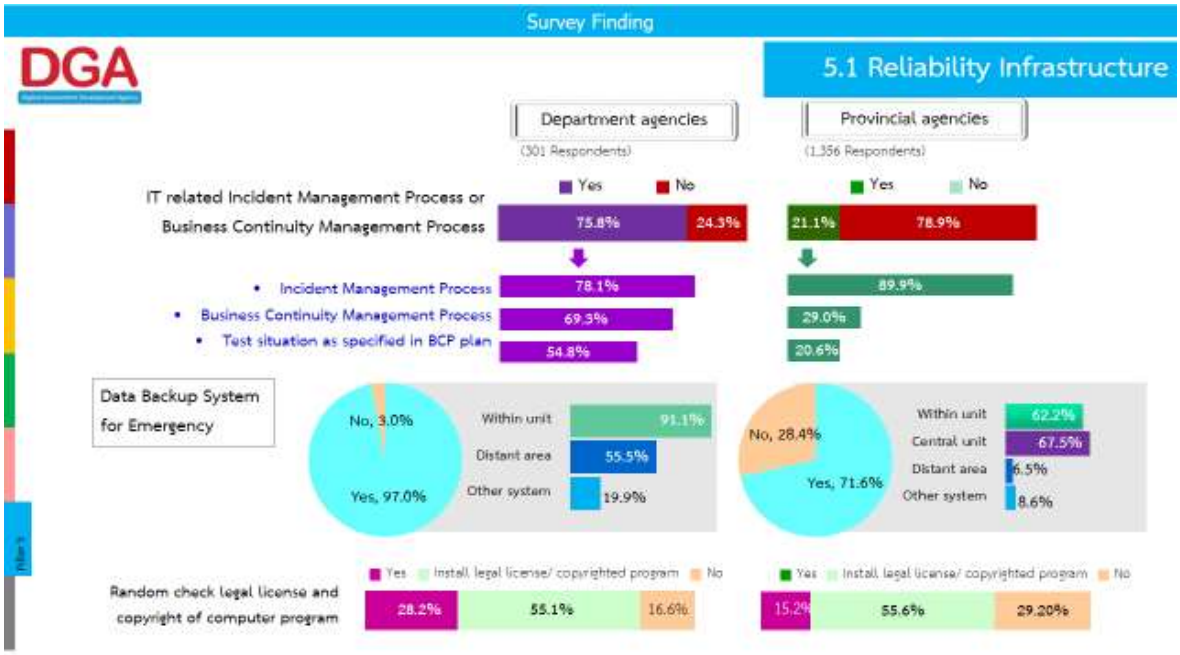

Survey Finding
DGA
4.1 Internal Integration
Internal Operation Management under Digital Platform Connectivity
Department agencies
(295 Respondents)
Connectable, 83.4%
Unconnectable, 16.6%
Connect some systems, 67.1%
Connect all systems, 16.3%
Provincial agencies
(1,268 Respondents)
Unconnectable, 41.3%
Connectable, 58.7%
Connect some systems, 44.6%
Connect all systems, 14.0%
Internal data storage in digital format for provincial coverage organizations
(300 Respondents)
Yes
No
55.0%
45.0%
Provincial level units are not asked

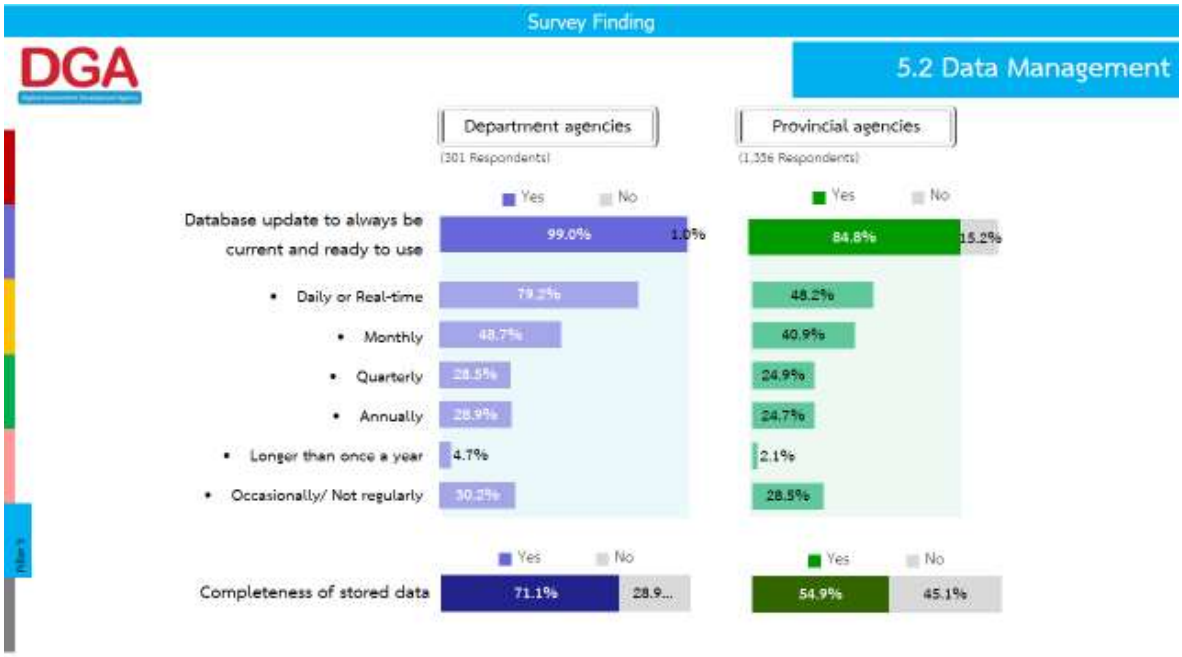

Survey Finding
DGA
4.2 External Integration
Department agencies
(301 Respondents)
Necessary
Not necessary
Necessity to connect digital data with external organizations
86.7%
13.3%
Digital data connectivity with external organization
No, 27.2%
Yes, 72.8%
(261 Respondents)
Provincial agencies
(1,356 Respondents)
Necessary
Not necessary
82.8%
17.2%
No, 51.0%
Yes, 49.0%
(1,123 Respondents)

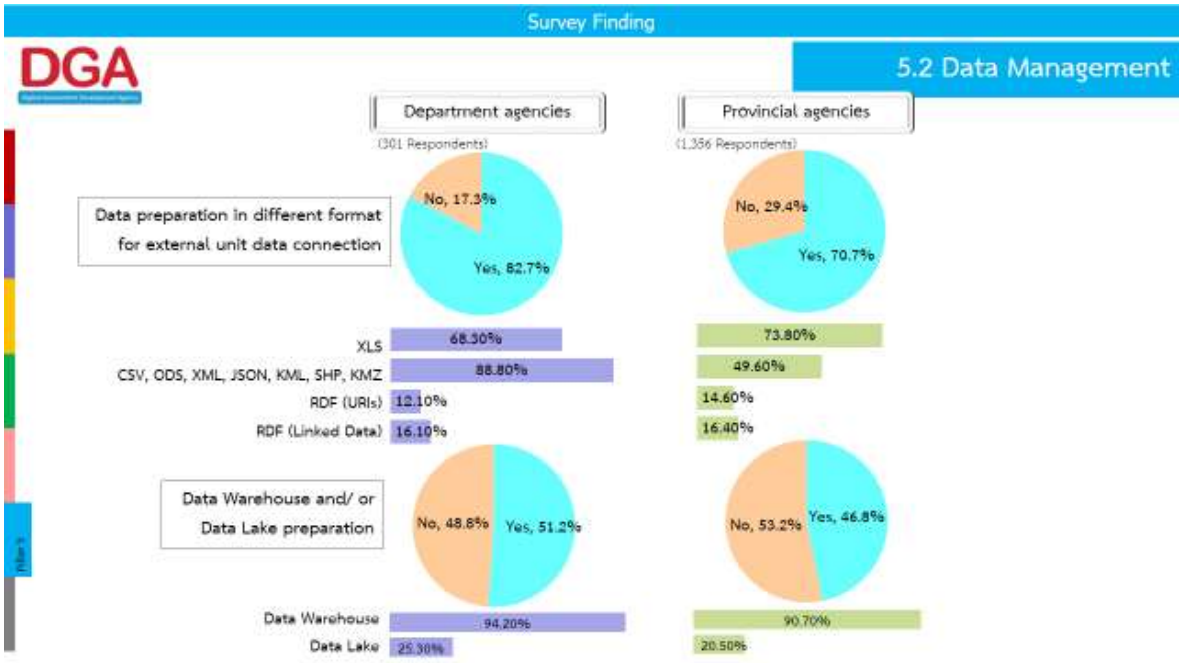

Survey Finding
DGA
4.2 External Integration
Official Inter-office Government Document Transfer format
Department agencies
(301 Respondents)
Provincial agencies
(1,356 Respondents)
1. Post/ Fax/ Messenger
85.1%
82.2%
2. Digital format
88.7%
90.9%
2.1 E-mail
86.4%
87.5%
2.2 e-Saraban
32.6%
63.6%
Necessity to send/ receive official document along with digital format (except important cases)
Not necessary, 12.7%
Necessary, 87.3%
(267 Respondents)
Not necessary, 19.4%
Necessary, 80.6%
(1,234 Respondents)


DGA
Pillar 5: Secure and Efficient Infrastructure


Survey Finding
DGA
5.1 Reliability Infrastructure
Department agencies
(301 Respondents)
Provincial agencies
(1,356 Respondents)
Computer Desktop
Average 1,394 devices/unit
Sufficient 58.8% Not sufficient 40.5% None 0.7%
Average 35 devices/unit
Sufficient 55.0% Not sufficient 44.8% None 0.2%
Computer Notebook
Average 328 devices/unit
56.2% 43.2% 0.7%
Average 6 devices/unit
46.5% 51.8% 1.7%
Server
Average 68 devices/unit
61.1% 37.2% 1.7%
Average 1 devices/unit
53.2% 18.8% 28.0%
CCTV
Average 275 devices/unit
46.5% 46.2% 7.3%
Average 5 devices/unit
26.2% 24.6% 49.3%
Other electronic devices
39.2% 47.2% 13.6%
20.4% 27.0% 52.6%
IP Phone
38.2% 28.2% 33.6%
32.5% 17.6% 49.9%
Conference devices
42.2% 36.5% 21.3%
54.1% 17.3% 28.7%


Survey Finding
DGA
5.1 Reliability Infrastructure
Department agencies
(301 Respondents)
Provincial agencies
(1,356 Respondents)
IT related Incident Management Process or Business Continuity Management Process
Yes 75.8% No 24.3%
Yes 21.1% No 78.9%
Incident Management Process
78.1%
89.9%
Business Continuity Management Process
69.3%
29.0%
Test situation as specified in BCP plan
54.8%
20.6%
Data Backup System for Emergency
No, 3.0%
Yes, 97.0%
Within unit 91.1%
Distant area 55.5%
Other system 19.9%
No, 28.4%
Yes, 71.6%
Within unit 62.2%
Central unit 67.5%
Distant area 6.5%
Other system 8.6%
Random check legal license and copyright of computer program
Yes 28.2% Install legal license/ copyrighted program 55.1% No 16.6%
Yes 15.2% Install legal license/ copyrighted program 55.6% No 29.20%


Survey Finding
DGA
5.2 Data Management
Department agencies
(301 Respondents)
Provincial agencies
(1,356 Respondents)
Yes
No
Database update to always be current and ready to use
99.0%
1.0%
84.8%
15.2%
• Daily or Real-time
79.2%
48.2%
• Monthly
48.7%
40.9%
• Quarterly
28.5%
24.9%
• Annually
28.9%
24.7%
• Longer than once a year
4.7%
2.1%
• Occasionally/ Not regularly
30.2%
28.5%
Completeness of stored data
71.1%
28.9...
54.9%
45.1%


Survey Finding
DGA
5.2 Data Management
Department agencies
(301 Respondents)
Provincial agencies
(1,356 Respondents)
Data preparation in different format for external unit data connection
No, 17.3%
Yes, 82.7%
No, 29.4%
Yes, 70.7%
XLS
68.30%
73.80%
CSV, ODS, XML, JSON, KML, SHP, KMZ
88.80%
49.60%
RDF (URIs)
12.10%
14.60%
RDF (Linked Data)
16.10%
16.40%
Data Warehouse and/ or Data Lake preparation
No, 48.8%
Yes, 51.2%
No, 53.2%
Yes, 46.8%
Data Warehouse
94.20%
90.70%
Data Lake
25.30%
20.50%

Pillar 6 เทคโนโลยีดิจิทัลและการนำไปใช้
(Digital Technological Practices)