Thailand's Digital Government Readiness Survey 2020

by Digital Government Development Agency
(Public Organization)(DGA)
together with Bluebik Group Co. Ltd.

Table of Content

Thailand's Digital Government Readiness Survey Methodology and Development 3

Overview Survey Result of Thailand Digital Government Readiness Survey 2020 12

Fact Finding from Thailand Digital Government Readiness Survey 2020 21

- Pillar 1: Policies and Practices 22
- Pillar 2: Digital Capabilities 35
- Pillar 3: Public Services 43
- Pillar 4: Smart Back Office 53
- Pillar 5: Secure and Efficient Infrastructure 67
- Pillar 6: Digital Technological Practices 78

Recommendations for Thailand Digital Government Development 83

- Recommendation from Thailand Digital Government Readiness Survey 2020 84
- Policy Recommendation for Thailand Digital Government Development 100
- Extended recommendations based on digital government readiness survey 101

Thailand Digital Government Readiness Survey Methodology and Development

Survey procedures consist of 3 main parts

Define a target group

Target group consisted of 1,926 government agencies which can be classified into 3 levels as follows:

1. 315 Departmental agencies or equivalent
2. 2 Local Administrative Organizations (LAOs): Bangkok and Pattaya
3. 1,609 Provincial level under the Department level

Design survey methodology

- The survey was primarily conducted online, however, the survey will be prepared in a paper form for agencies that were not ready or had a problem in responding to online survey.
- There was a verification by using website's verification methodology and **there were more intensive data and document verification, compared with 2019.**

Develop survey

- Developing and Improving **framework for Thailand Digital Government Readiness Survey 2020**
- **Developing and Improving survey by designing questions more thoroughly** to be consistent with the new assessment framework
- **Developing a digital government development readiness model** as a tool to compare the potential among agencies
- Modifying weight for scoring calculation
- Determining points of survey along with the methodology of collecting evidence

A target group can be classified into 3 levels

Define a target group

Target group consisted of 1,926 government agencies which can be classified into 3 levels as follows:

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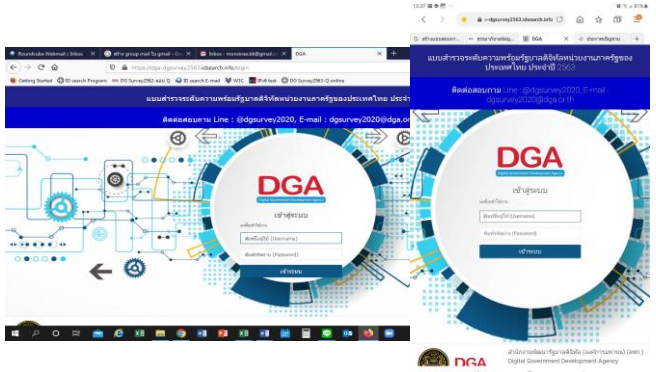
Set a target group for survey		
Target group	No. of agencies	Amount of responded agencies
Departmental level • Government agencies / State enterprises / Public organizations / Independent organizations • Covering all ministries / equivalent	315 agencies	At least 284 agencies (90%)
Local Administrative Organizations (LAOs) Bangkok and Pattaya	2 agencies	100%
Provincial level (under the Department level)	1,609 agencies • 76 agencies additional from 2019	At least 1,287 agencies (80%) Surveyed at least 80% of each province

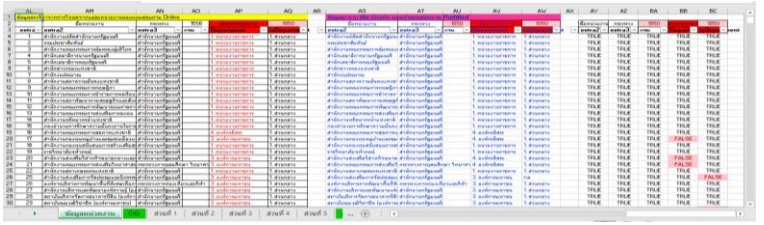
Surveys were mainly done through online channels which were validated before analyzing the final results.



1) The survey displayed were designed for the difference of screen size of the respondents' device.
2) Respondents were able to complete the survey via Login with Username and Password of each agency.

Design survey methodology

- The survey was primarily conducted online, however, the survey will be prepared in a paper form for agencies that were not ready or had a problem in responding to online survey.
- In addition to website verification, **data and evidence from respondents were more intensively verified, compared with 2019.**



1) Check the accuracy, completeness and clarity of the data provided by the agency
2) Check the rationality of the data provided by the agency
3) Contact the coordinator of the responding agency to inquire and correct information

Survey procedures consist of 3 main parts

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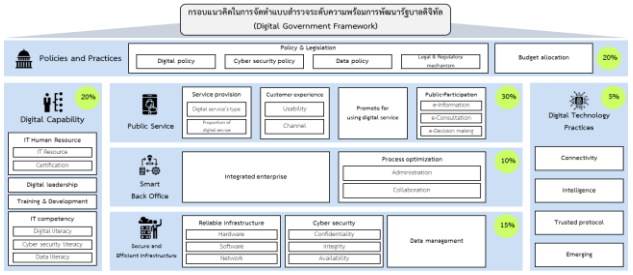
Survey 2020 was designed to in accordance with the survey framework and maturity model.

1 Thailand Digital Government Readiness Survey Framework



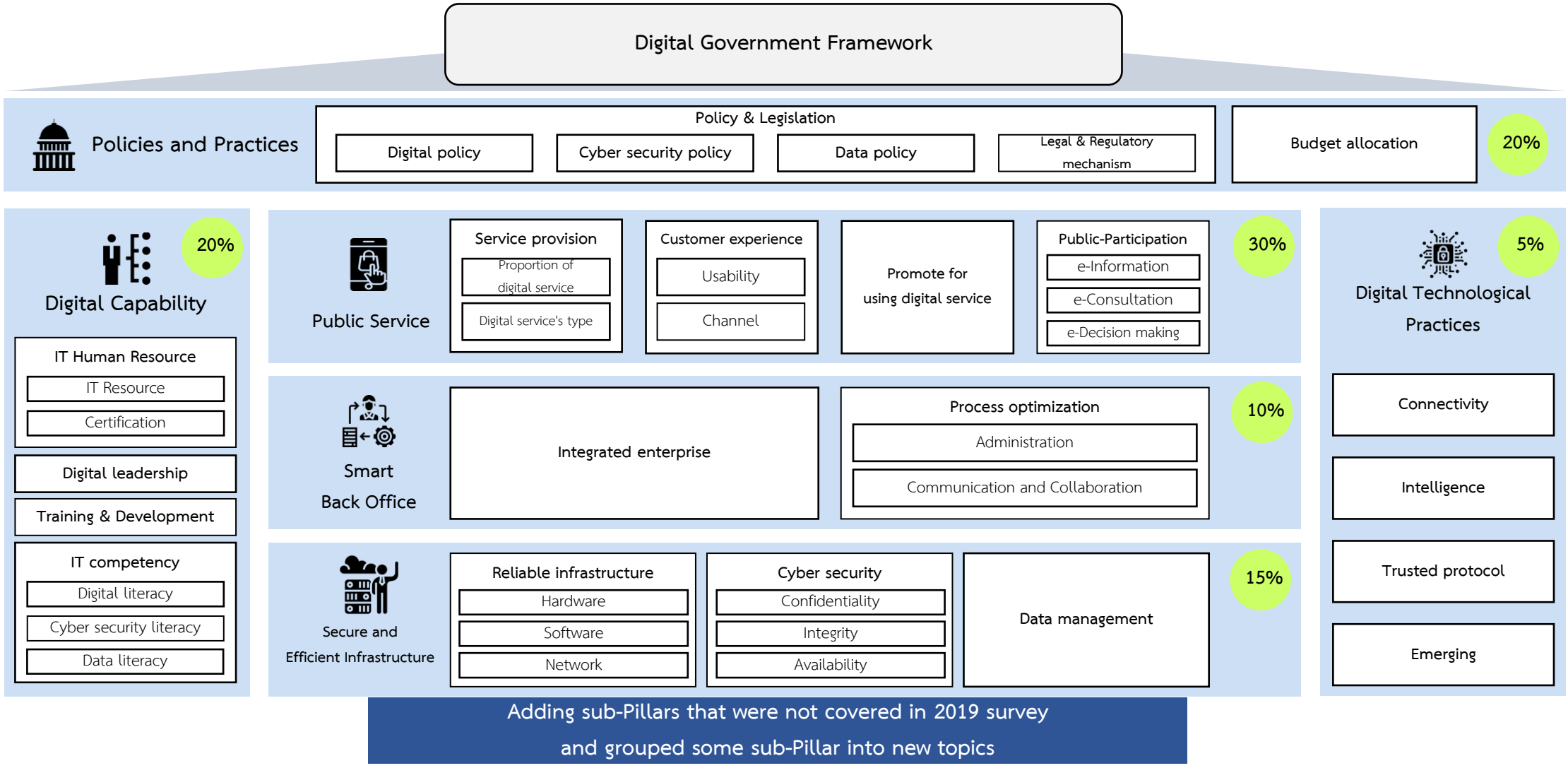
- Determined the Pillars according to a survey framework as in 2019
- Designed according to context of Thai government agencies and digital government development framework
- Defined and grouped survey topics based on global research
- Adjusted the details of each Pillar to clarify the survey topics

2 Maturity model

Factors / Levels	Initial (E-Government)	Developing (Open)	Defined (Data-centric)	Integrated (Fully Digital)	Optimizing (Smart)
Policies and Practices	Compliance	Transparency	Constituent value	Insight-driven transformation	Sustainability
Digital Capability	Inefficient	Elementary	Intermediate	Effective	Digital savvy
Public Service	Reactive	Intermediated	Proactive	Embedded	Predictive
Smart Back Office	Basic	Co-ordinated	Digital	Strategic	Transformational
Secure & Efficient Infrastructure	Obsolete	Fundamental	Cross-channel	Integrated	Digitized
Digital Technology Practices	Outdated	Standard	Disruptive-tech	Leading-tech	Future-tech

- Developed a measurement guideline based on the concept of Gartner's Digital government maturity model
- Designed based on Pillars from the Digital Government Readiness Survey framework to achieve consistency in measurement and recommendation development

Framework for Thailand Digital Government Readiness Survey 2020



Maturity model

In the 2020 Readiness Survey, a Maturity Model is developed to measure Thailand Digital Government Readiness. The Maturity Model will be another complementary tools to assist government agencies of Thailand to understand their digital readiness, providing guidance on how to transform in order to align with Thailand national development plan and to meet a world class standard.

The Maturity Model is designed to adopt Pillars and sub-Pillars to measure the level of digital readiness which is aligned with the digital government development plan and focus on the essence of digital government aspect. Each Pillar are scored by 5 levels as following:

Pillars	Sub-Pillars
Policies and Practices	Digital policy / Data policy
Digital Capability	Digital leadership / Training & Development / IT Competency
Public Services	Service Provision / Customer experience / Public-participation
Smart Back Office	Integrated enterprise / Process optimization
Secure and Efficient Infrastructure	Reliable infrastructure / Cyber security / Data Management
Digital Technological Practices	Connectivity / Intelligence / Trusted Protocol

Maturity model will be measured from 6 Pillars according to the survey framework which can be divided into 5 levels.

Factors	Level 1 **Initial** (E-Government)	Level 2 **Developing** (Open)	Level 3 **Defined** (Data-centric)	Level 4 **Integrated** (Fully Digital)	Level 5 **Optimizing** (Smart)
Policies and Practices	Compliance	Transparency	Constituent value	Insight-driven transformation	Sustainability
Digital Capability	Inefficient	Elementary	Intermediate	Effective	Digital savvy
Public Service	Reactive	Intermediated	Proactive	Embedded	Predictive
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Secure & Efficient Infrastructure	Obsolete	Fundamental	Cross-channel	Integrated	Digitized
Digital Technological Practices	Outdated	Standard	Disruptive-tech	Leading-tech	Future-tech

Overview of Thailand Digital Government Readiness Survey Result

Survey 2020 consists of respondents more than 96% of total government agencies in Thailand

From total sent out of 1,926 agencies, 1,850 agencies responded.

96.1%

Departmental agencies or equal

From total sent out of 315 agencies, 292 agencies responded.

92.7%

Local Administrative Organizations

From total sent out of 2 agencies, 2 agencies responded.

100.0%

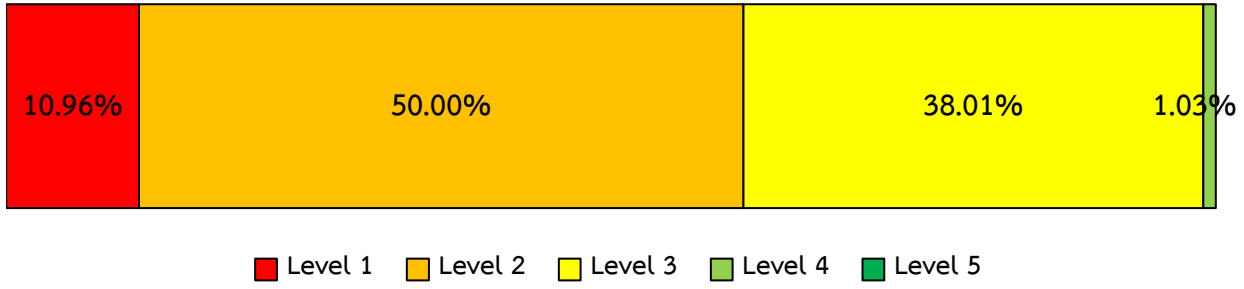
Provincial agencies

From total sent out of 1,609 agencies, 1,556 agencies responded.

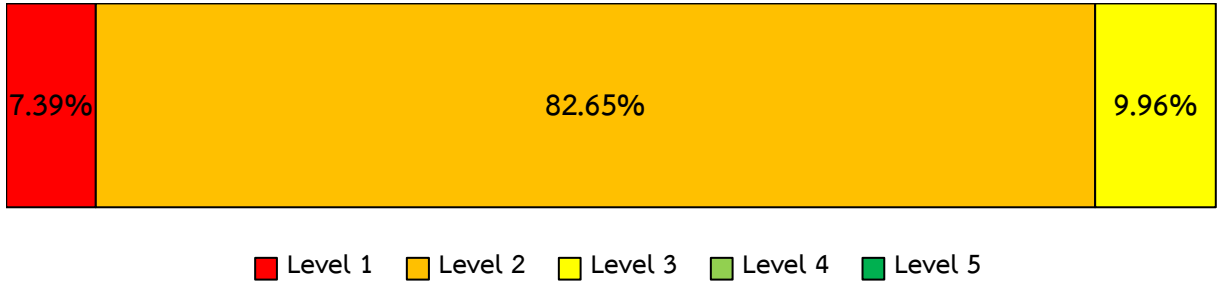
96.7%

Overview result from maturity model

292 Departmental agencies



1,556 Provincial agencies



- Overall, Departmental agencies are more readily than Provincial agencies.
  - Departmental agencies have an average of maturity at level 3 which is greater than Provincial agency almost 4 times.
  - Some of departmental agencies have a maturity at level 4.

Result from maturity model by Pillars

Agencies were classified into four groups according to survey score

Agency classification aims to classify agencies into a group based on their survey scores by min-max normalization. Each agency can relatively compare their normalized scores *(Z-score)* across periods. The normalized scores can be calculated as below formula.

$$z_i = \frac{x_i - \min(x)}{\max(x) - \min(x)}$$

z_i = คะแนนปกติของหน่วยงาน

x_i = คะแนนของหน่วยงาน

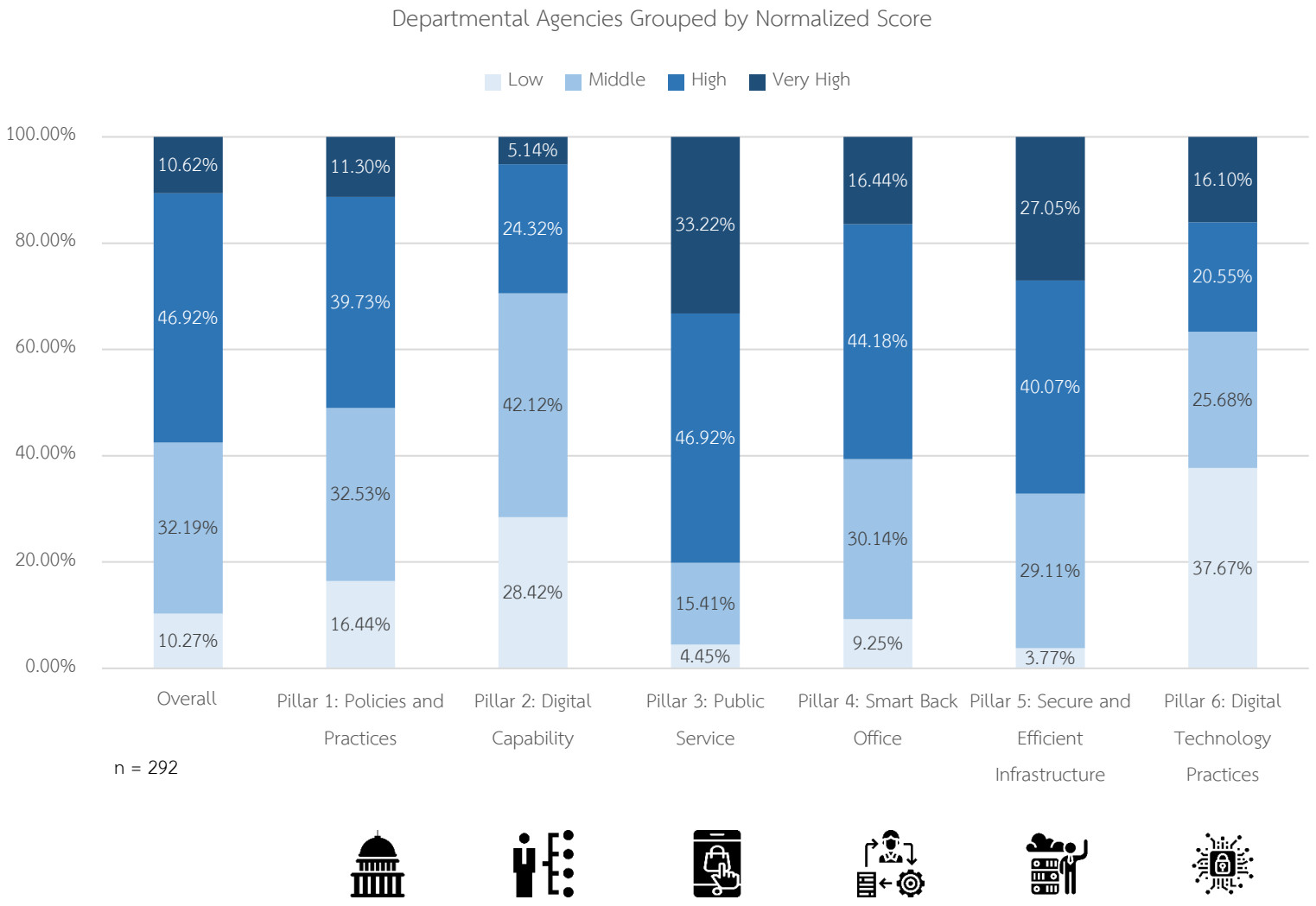
$\min(x)$ = คะแนนต่ำสุดภายในกลุ่มตัวอย่างทั้งหมด

$\max(x)$ = คะแนนสูงสุดภายในกลุ่มตัวอย่างทั้งหมด

Agencies were grouped by a ranged of normalized scores as UN's country classification as following:

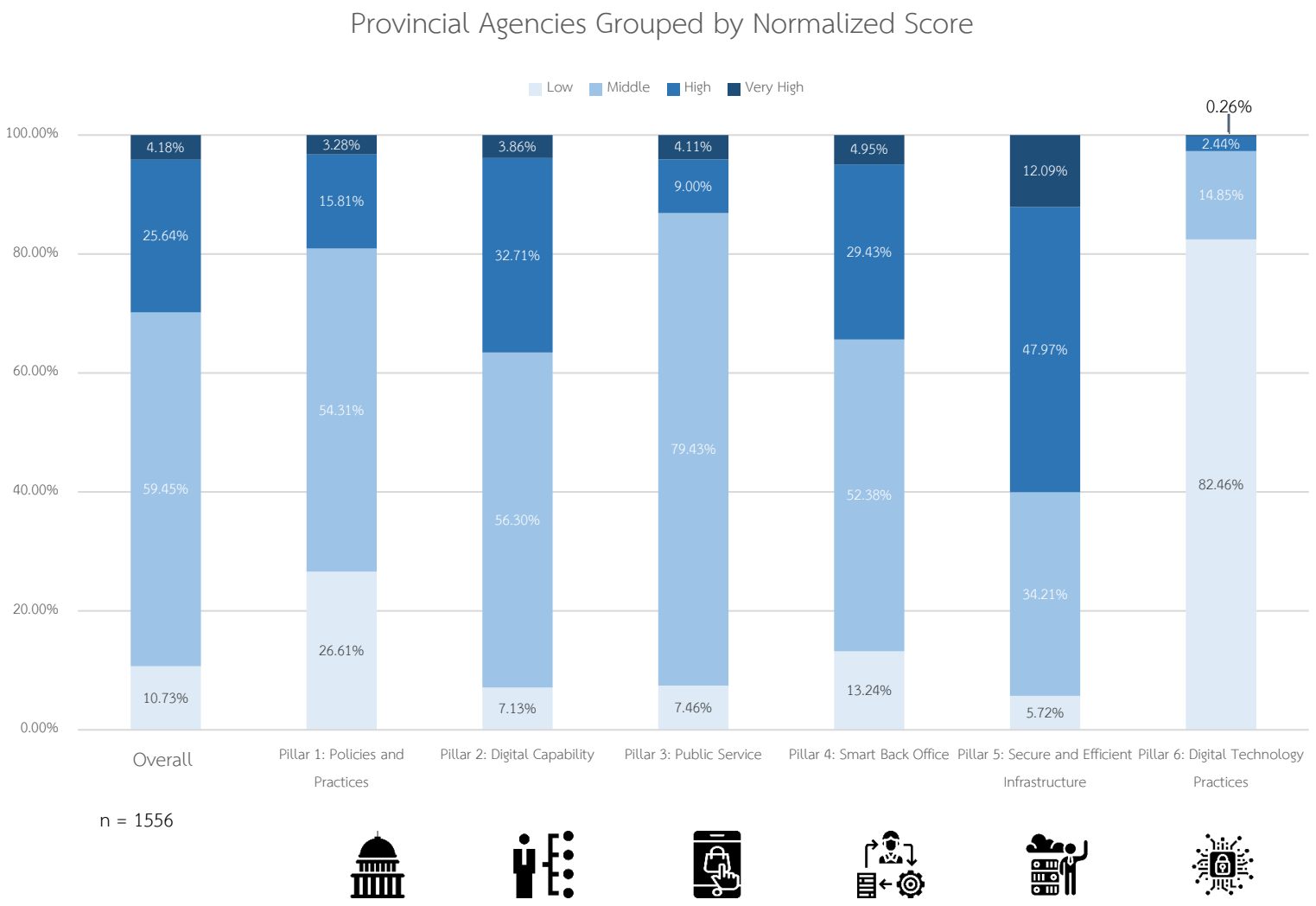
1. Low (Z-score < 0.25)
2. Middle (0.25 < Z-score < 0.50)
3. High (0.50 < Z-score < 0.75)
4. Very High (Z-score > 0.75)

Overall agency classification for Departmental level



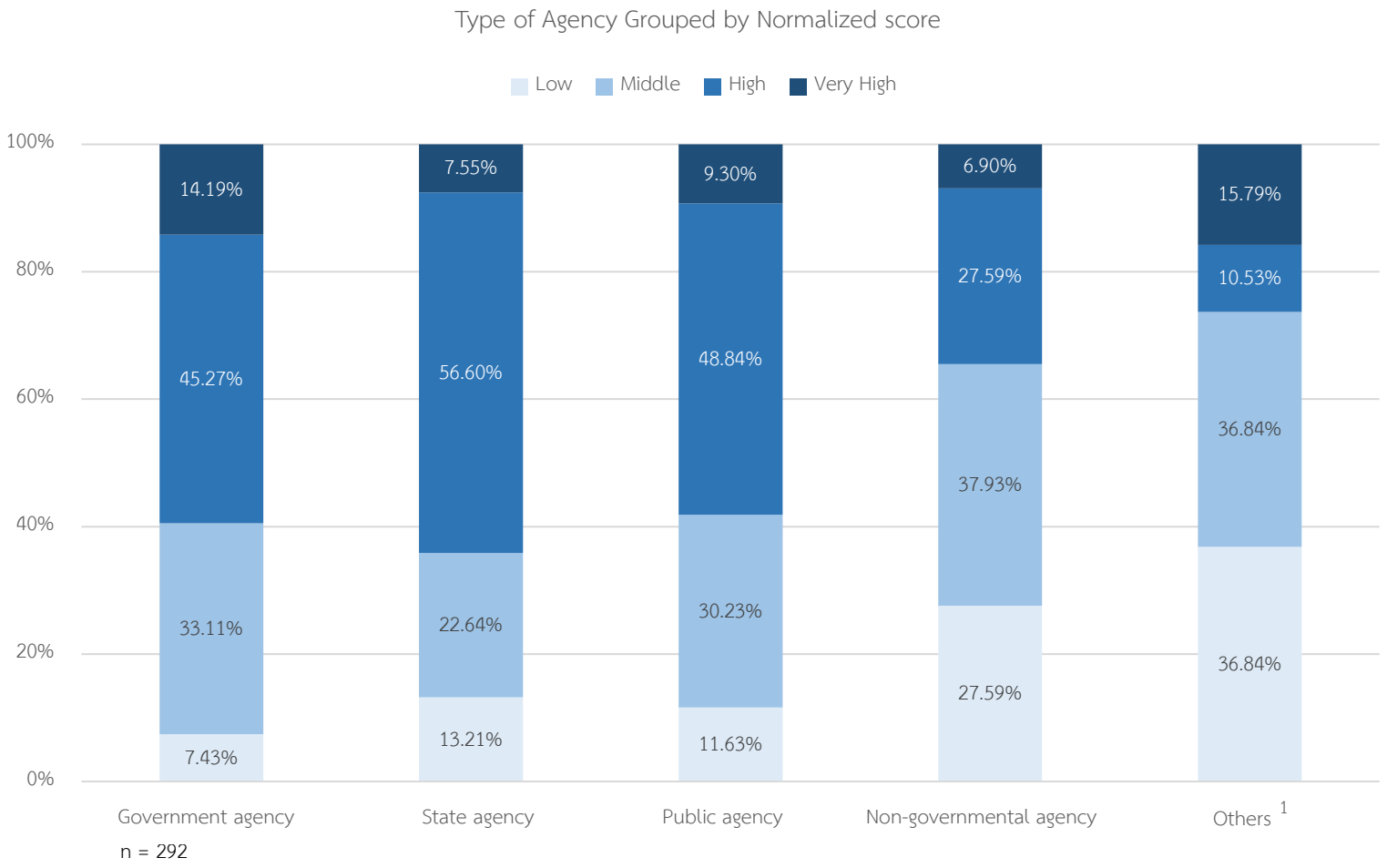
- Departmental agencies have high score in **Public Services** and **Secure and Efficient Infrastructure** in which these 2 pillars are the key elements to provide digital public services.
- Another high-score pillar is **Smart Back Office** which is to support digital public services.
- **Digital Capability** and **Digital Technologies Practices** are the Pillar with the two lowest score. Improvement in Digital Capabilities as one of the key enablers would help departmental agencies accomplish digitalization.
- Overall, departmental agencies have developed plan and action items alignment with the Digital Development Framework

Overall agency classification for Provincial level



- Provincial agencies were outstanding in **Secure and Efficient Infrastructure** since they were reinforced by infrastructure from Departmental agencies.
- **Digital Capability** was the second most outstanding comparing with other pillars since this pillar was scored in limited area in which Digital leadership and Training Evaluation area were excluded.
- **Public Service** was mostly in middle range since they rely on service from Departmental agencies
- **Digital Technology Practice** was the least outstanding pillar since there were only few digitalization areas.
- Provincial agencies aligned their operation with Departmental agencies resulting in similar outstanding pillars

Overall agency classification by type of agency

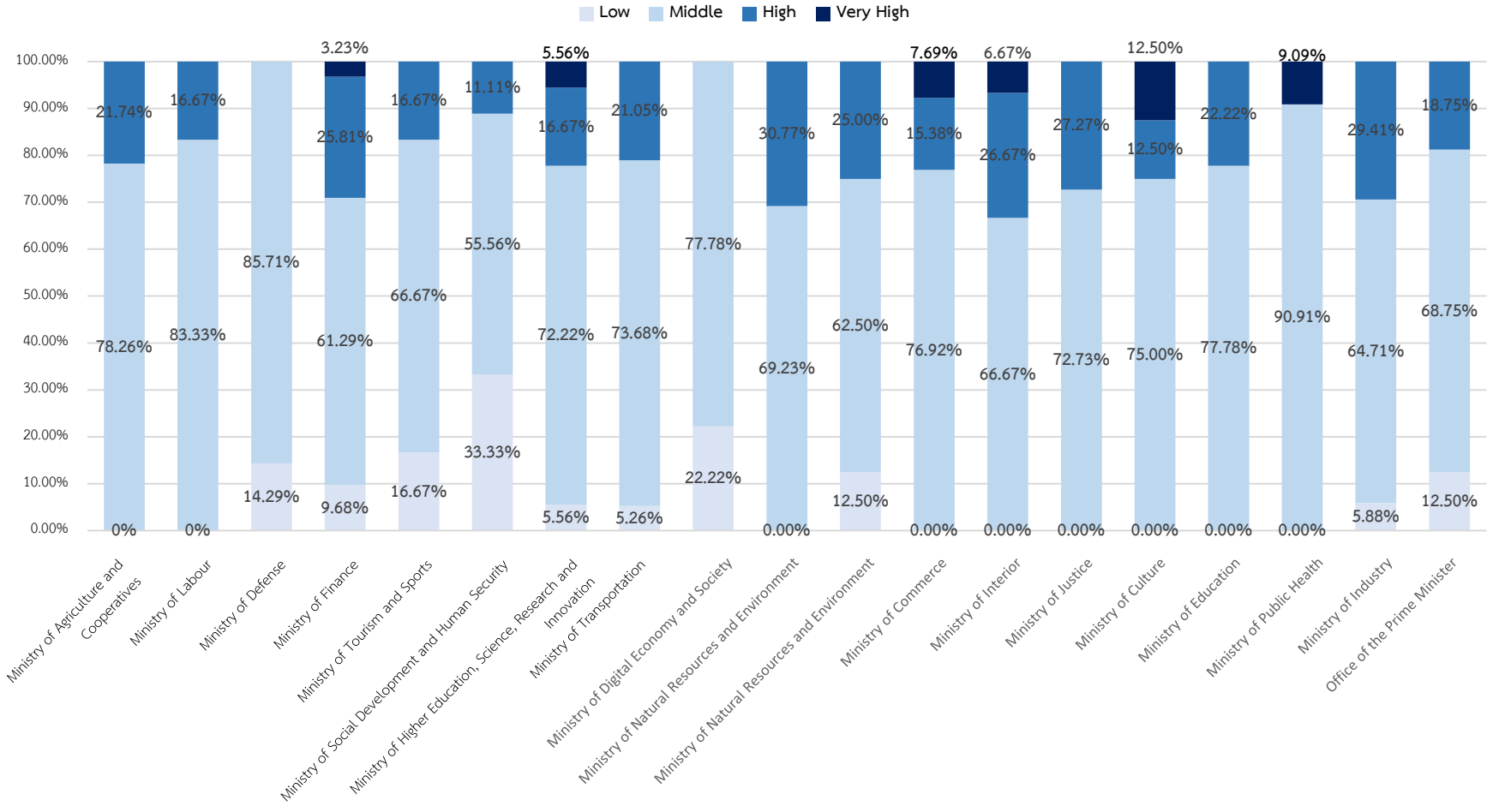


n = 292

- Government agency, State agency and Public agency have similar score distribution by comparison
- Non-governmental agency has the least outstanding normalized score, comparing to other types of agency

1. For example, Student Loans, Health System Research Institute, Red Cross

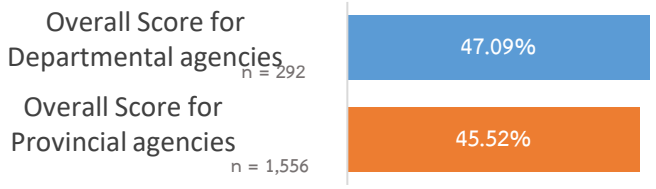
Overall agency classification for Ministry level

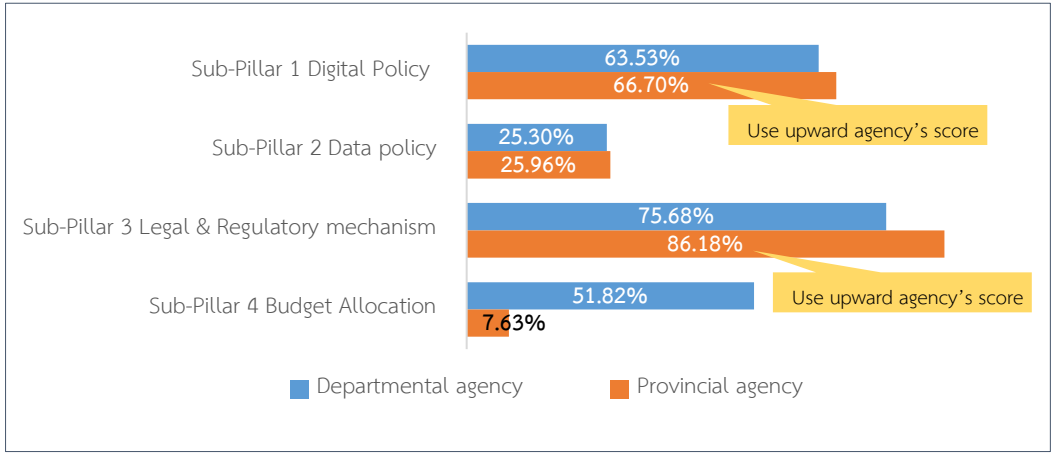


- Ministry of Interior, Ministry of Commerce and Ministry of Culture were the top three
- Ministry of Culture has the highest score in the High Group compared to other ministries. This reflected that the departments under the ministry had relatively good digital self-improvement, resulting in a high overall rating
- Meanwhile, Ministry of Defense and Ministry of Digital Economy and Society were still behind compared to others.

Fact Finding from Thailand Digital Government Readiness Survey

Pillar 1: Policies and Practices





Overall score

	Highest Pillar	Lowest Pillar
Departmental level	Legal & Regulatory mechanism	Data policy
Provincial level	Legal & Regulatory mechanism	Budget allocation

Summary of Fact finding

Digital policy

- Most of the Departmental Agencies had good knowledge and understanding of the digital government development plan required by their own agencies and have a plan that was consistent with the digital government development plan.

Data policy

- Most Departmental Agencies had preliminary actions both data governance and open government data but there was still a lack of action to continuously improve or maintain their standards.
- Most agencies with disclosure Information was disclosed in basic file formats such as PDF, DOC, CSV, but there was a lack of disclosure in a format that can be used for in-depth analysis such as RDF files.

Legal & regulatory mechanism

- Most Departmental Agencies had no obstacle in term of Regulations that affect operations, However, the agencies with barriers were largely unresolved of Rules or regulations that hinder their operations.

Budget allocation

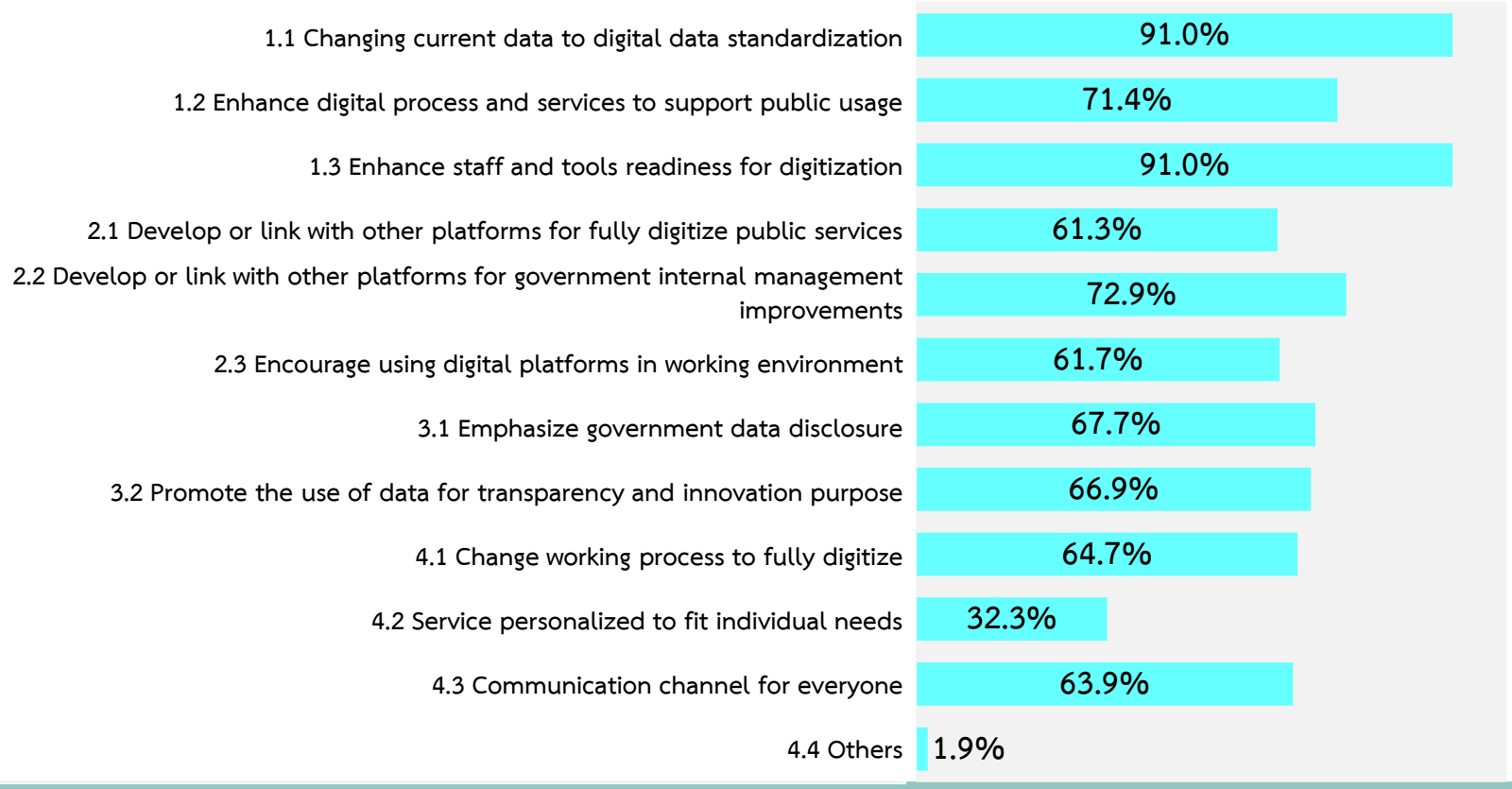
- Most agencies focused on budget allocation to maintain on equipment and systems, thus lacking budgets for system development or adopting new technology in the organization. This was one of the obstacles that may prevent the agency to drive the project.
- Most provincial agencies did not allocate funds for technology and digital operation. It showed the provincial agencies are not concerned with technology and digital as expected.

Pillar 1: Policies and Practices

1.1 Digital Policy

	Departmental agencies (292 agencies)	Provincial agencies (1,556 agencies)
Plan Development for Digital Government	158 units have plan: 54.1%; 108 units are developing plan: 37.0%; 8.9%	280 units have plan: 18.0%; 835 units are developing plan: 53.7%; 28.3%
	26 units without plan	441 units without plan

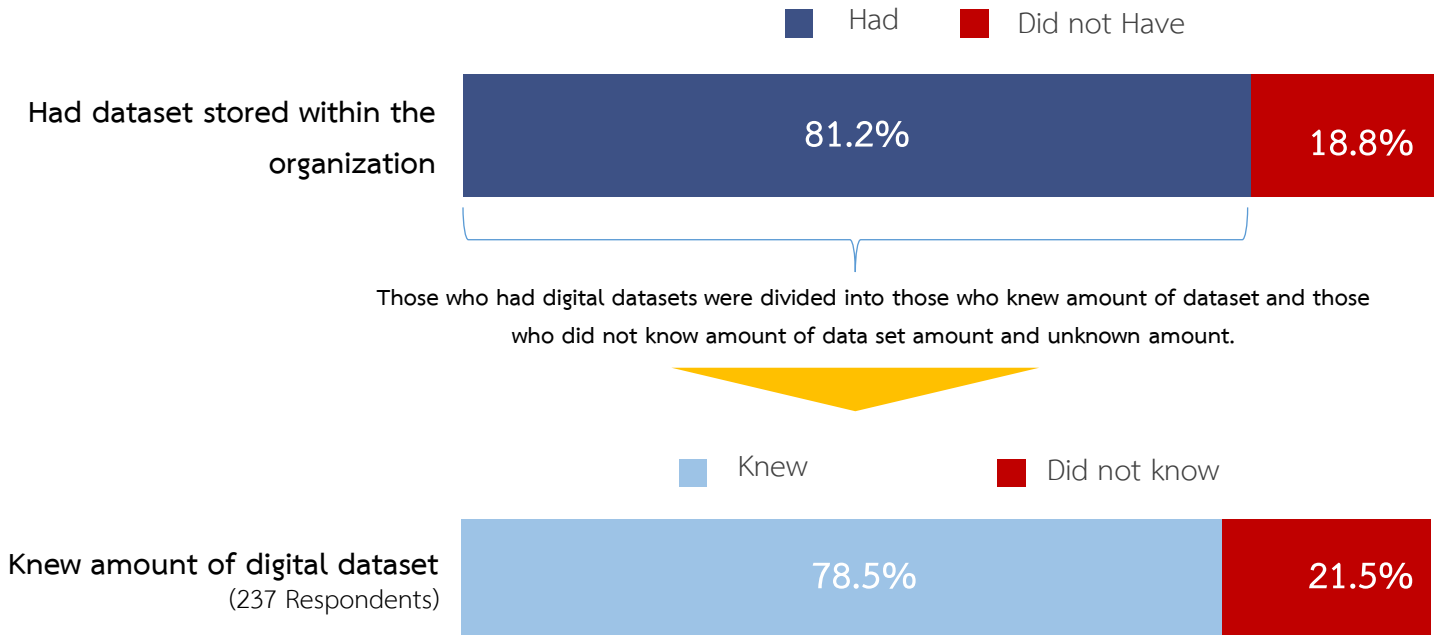
Striving towards Digital Government (266 Respondents)



Provincial agencies are not asked

Pillar 1: Policies and Practices

1.2 Data Policy



Total dataset
404,490

Total digital dataset
402,683

Pillar 1: Policies and Practices

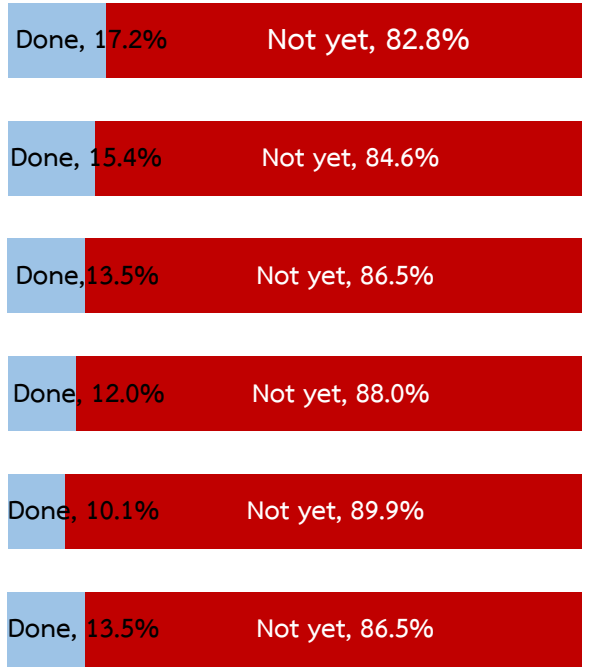
1.2 Data Policy

Implementation of Data Governance

Departmental agencies

(267 Respondents)

1. To define data Governance structure, duties and responsibilities in each segment, and to centralize data Governance



Note : Provincial agencies are not asked

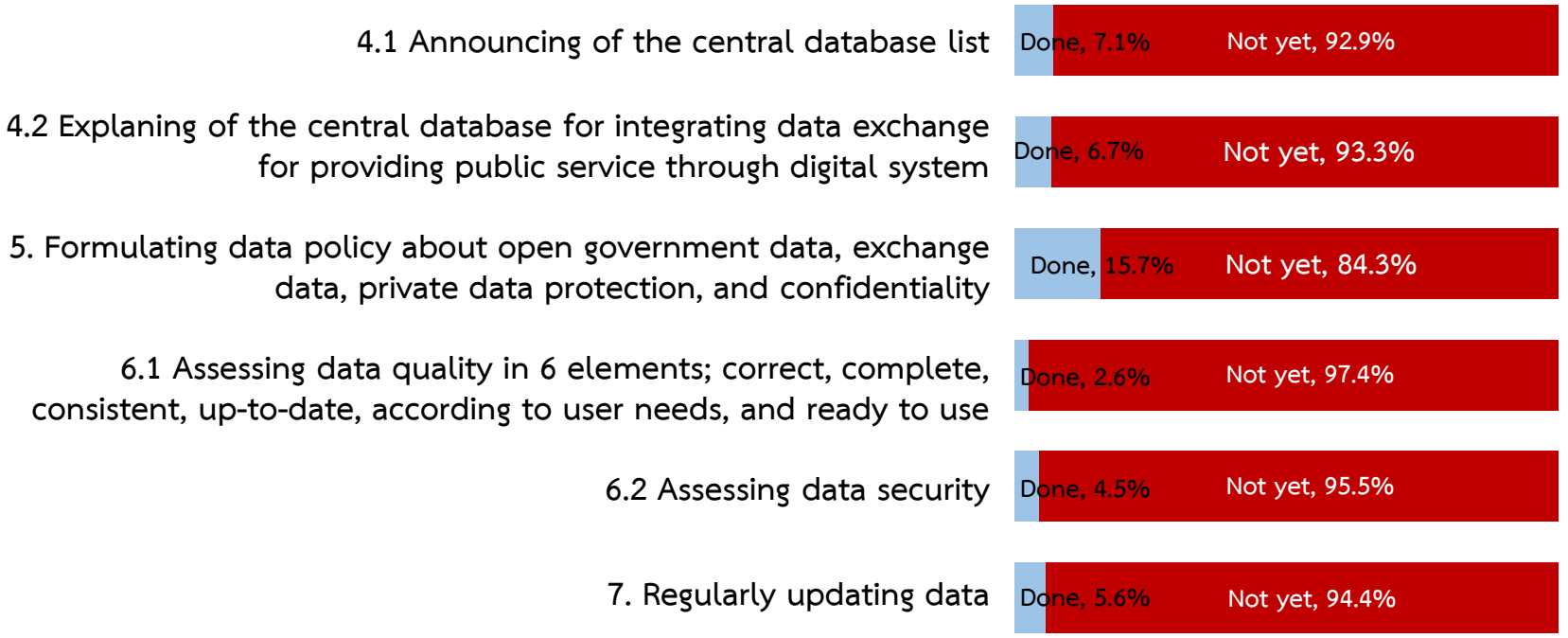
Pillar 1: Policies and Practices

1.2 Data Policy

Implementation of Data Governance

Departmental agencies

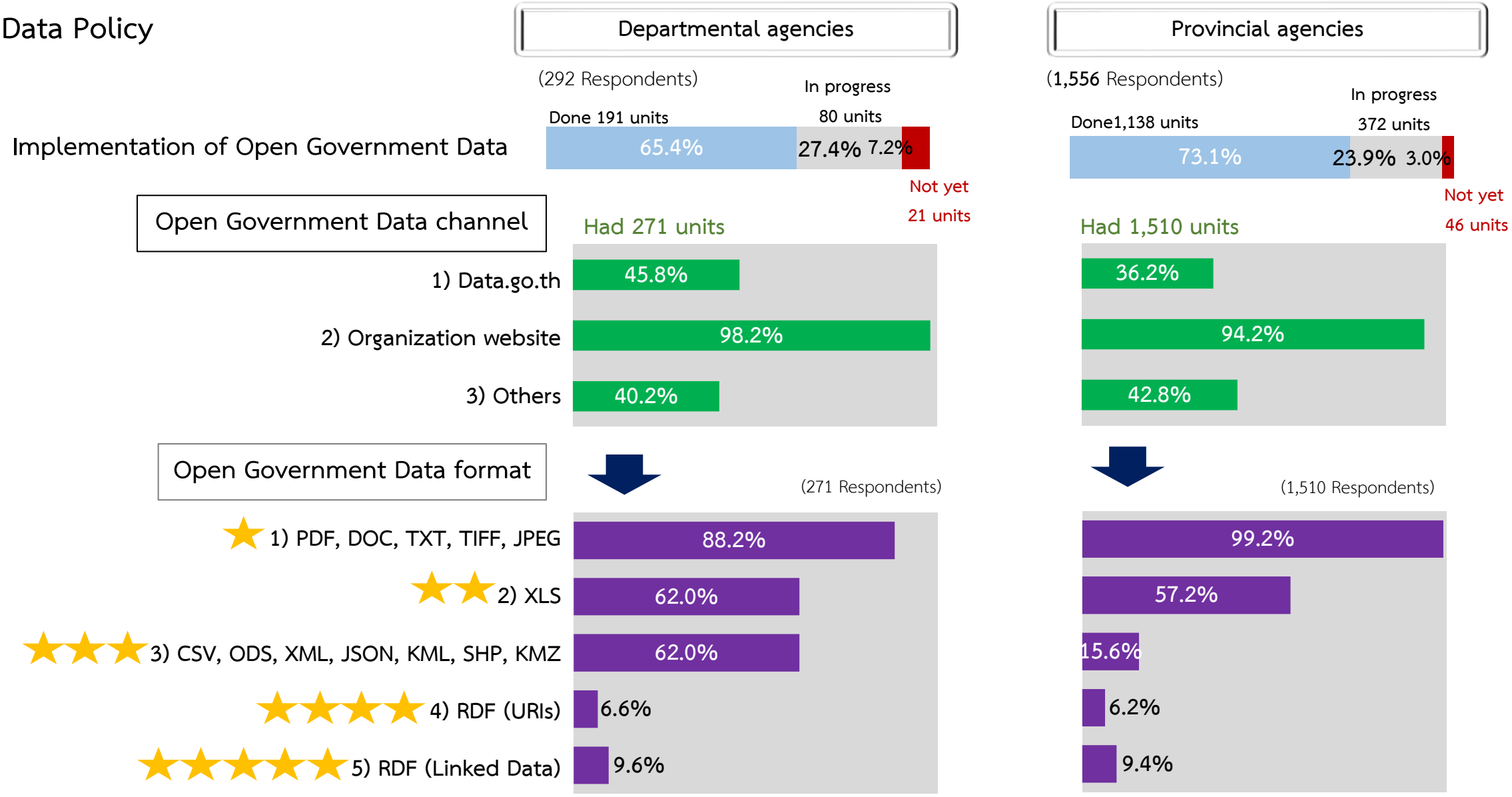
(267 Respondents)



Note : Provincial agencies are not asked

Pillar 1: Policies and Practices

1.2 Data Policy



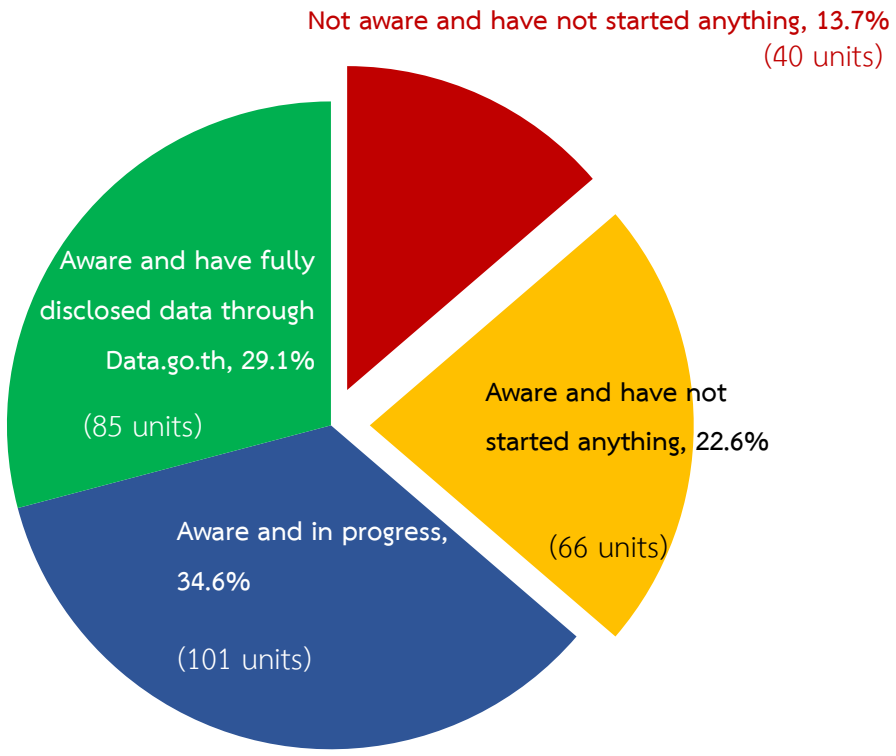
Pillar 1: Policies and Practices

1.2 Data Policy

Open Government Data Awareness and Operation through Data.go.th

Departmental agencies

(292 Respondents)



Note : Provincial agencies are not asked

Pillar 1: Policies and Practices

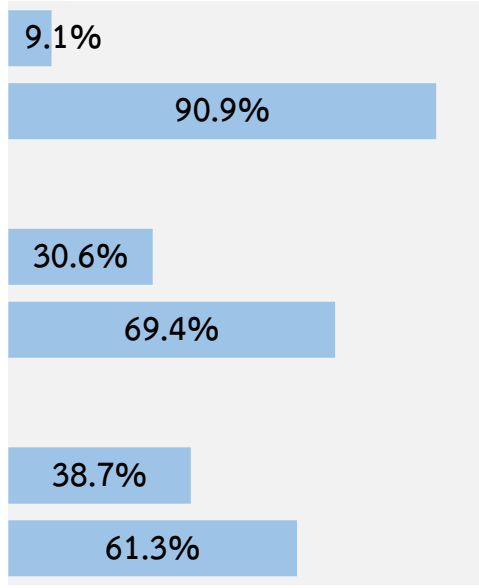
1.2 Data Policy

Disclosure Process via Open Government Data (data.go.th)

1. Preparation

Departmental agencies

(186 Respondents)



Note : Provincial agencies are not asked

Pillar 1: Policies and Practices

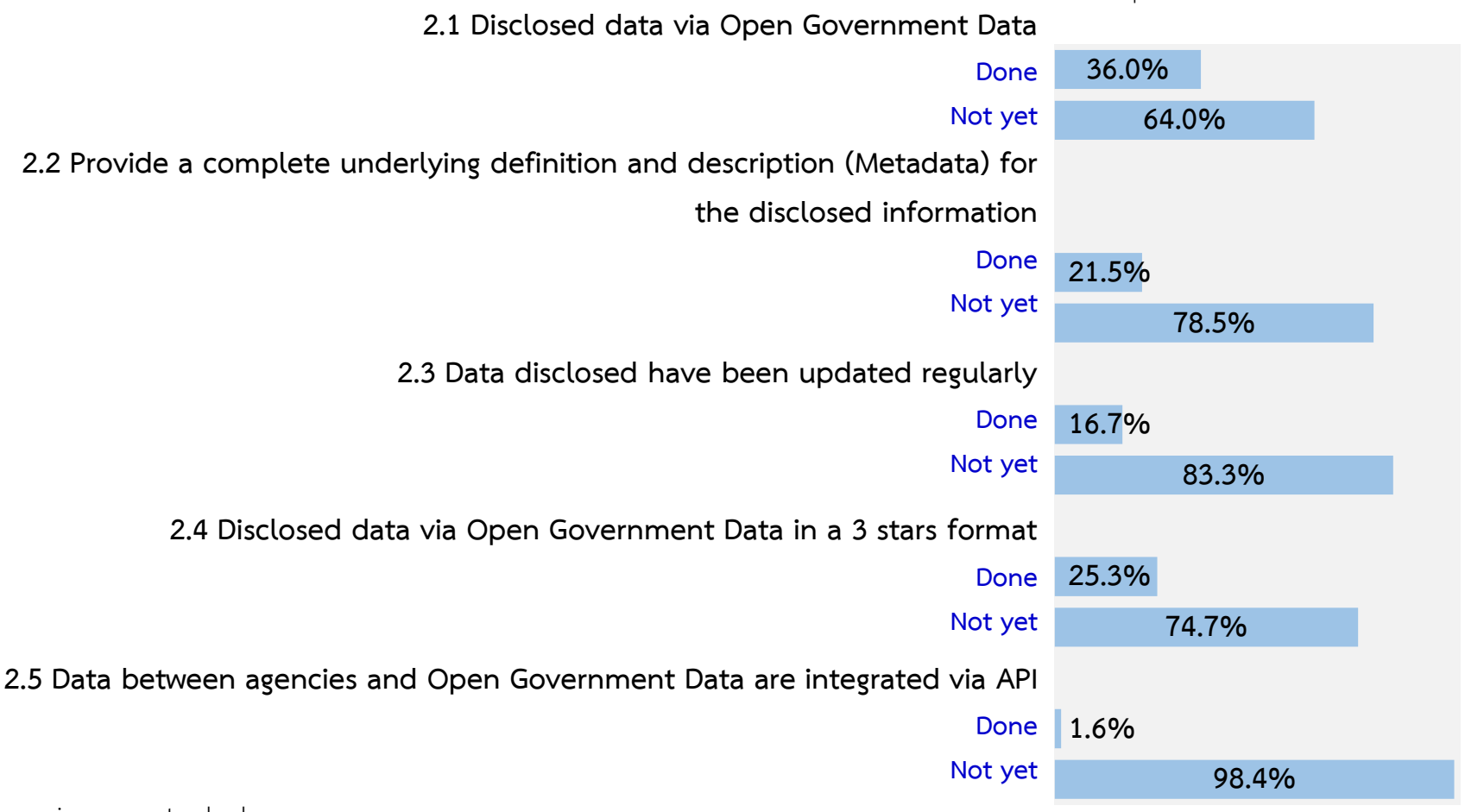
1.2 Data Policy

Disclosure Process via Open Government Data (data.go.th)

2. Format and Quality of Data Disclosed

Departmental agencies

(186 Respondents)



Note : Provincial agencies are not asked

Pillar 1: Policies and Practices

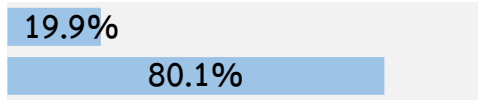
1.2 Data Policy

3. Value and Data Usage

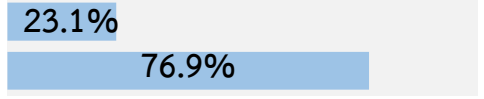
Departmental agencies

3.1 Disclose data that are useful for innovations or other development

(186 Respondents)

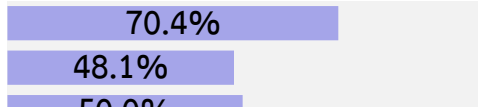


3.2 Used data disclosed in Open Government Data (data.go.th)

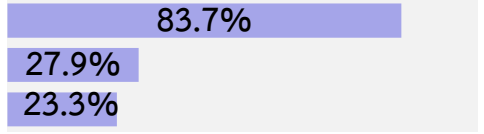


Data Disclosed via Open Government Data (data.go.th)

In Progress



Has already done



Note : Provincial agencies are not asked

Pillar 1: Policies and Practices

1.4 Legal & Regulatory Mechanism

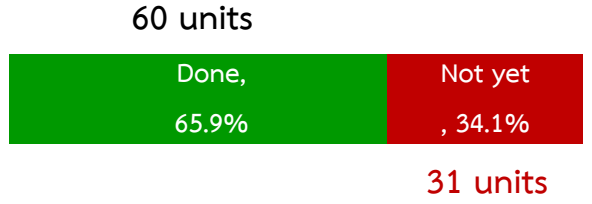
Departmental agencies

(292 Respondents)

Regulatory barriers that affect operation within agencies which involved in Digital Development policies or plans

(91 Respondents)

Amending, terminating or developing regulatory/legal considerations that will enhance digital development



Note : Provincial agencies are not asked

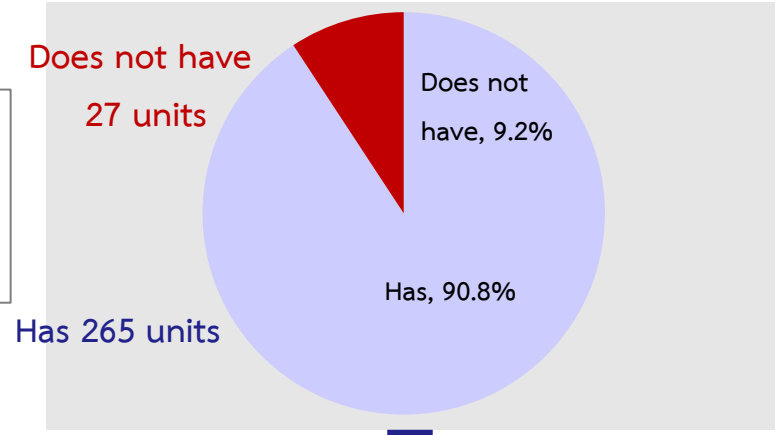
Pillar 1: Policies and Practices

1.5 Budget Allocation

Departmental agencies

(292 Respondents)

2020 Digital Technology Budget Allocation



Budget Allocated Proportion

Objectives of Budget Allocation	
1. To develop personnel digital skill	57.4%
2. To develop internal operation or central sharing system within government sector	31.3%
3. To develop digital service for internal units or to serve people/business/government sectors	73.2%
4. To develop information database and digital fundamental structure for internal use	74.3%
5. To maintain systems and equipment	90.6%
6. To research and apply the use of digital technology within the organization	20.0%
7. Others	25.7%

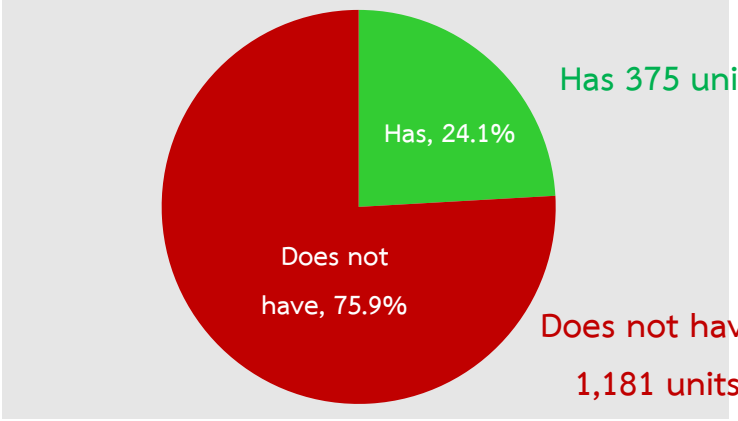
Pillar 1: Policies and Practices

1.5 Budget Allocation

Provincial agencies

(1,556 Respondents)

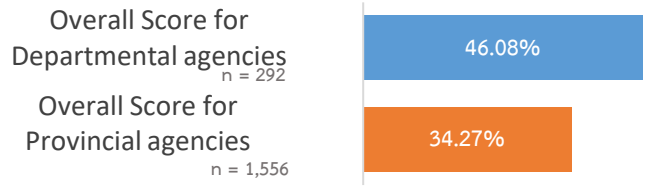
2020 Digital Technology Budget Allocation

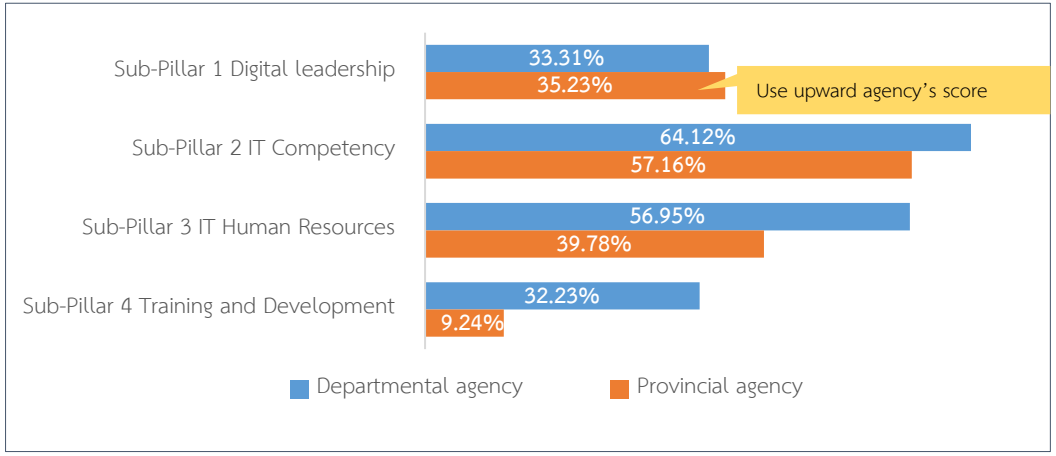


Budget Allocated Proportion

Objectives of Budget Allocation	
1. To develop personnel digital skill	35.5%
2. To develop internal operation or central sharing system within government sector	22.7%
3. To develop digital service for internal units or to serve people/business/government sectors	48.5%
4. To develop information database and digital fundamental structure for internal use	40.3%
5. To maintain systems and equipment	64.0%
6. To research and apply the use of digital technology within the organization	9.9%
7. Others	16.0%

Pillar 2: Digital Capabilities





Overall score

	Highest Pillar	Lowest Pillar
Departmental level	IT Competency	Training and Development
Provincial level		

Summary of Fact finding

Digital leadership:

- Most departmental CIOs have not completed the training course for information technology executives which has the average working period as CIO is 1.9 years.
- CIO has pushed average of 3 projects to within their 2 years of services.
- The main reasons that the CIOs failed to push digital projects are lack of budget and insufficient personnel. This is consistent with fact found in budget allocation and IT human resource.

IT Human resource

- Most agencies have a proportion of a few technology personnel, compared with the total number of personnel
- In addition, only a small percentage of the technology personnel received a certificate of Digital profession.

Training and development

- The Departmental Agencies provide promotion and knowledge covers most topics which is necessity for the agencies.
- Most agencies did get the assessment after the training course.

IT competency

- Personnel skill assessment scores on certain topics does not correspond to the order of topics that the organization prioritizes in training and education such as cybersecurity.

Pillar 2: Digital Capabilities

2.1 IT Human Resource

Total Personnel	Departmental agencies (267 Respondents)	Provincial agencies (1,505 Respondents)
Total Personnel excluding contract and temporary employees	868,031 persons (291 units)	74,785 persons (1,505 units)
Total Technologists	17,718 persons (276 units)	3,740 persons (1,431 units)
Proportion of Technologist : Total Personnel	2.0%	5.0%
Average number of Technologist / organization	64 persons/unit	3 persons/unit

Technologists excluding contract and temporary employees	Departmental agencies (286 Respondents)	Provincial agencies (1,510 Respondents)
1) Specialized Information Technologist	Total IT personnel 11,918 persons	Total IT personnel 925 persons
	67.3% of Total Technologist	24.7% of Total Technologist
2) Other field personnel assigned	Total 5,800 persons	Total 2,815 persons
	32.7% of Total Technologist	75.3% of Total Technologist
IT Personnel with Digital Certificate (not expired)	Total 1,125 persons	Total 72 persons
	9.4% of IT personnel	7.8% of IT personnel

Pillar 2: Digital Capabilities

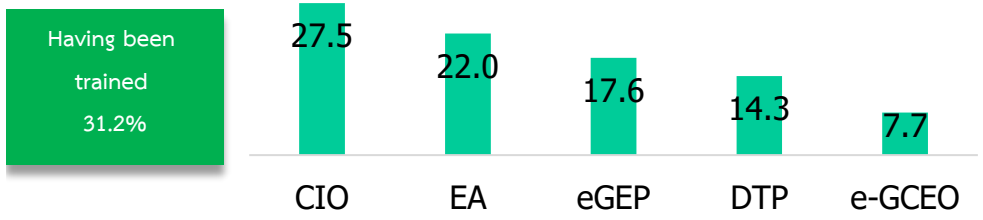
2.2 Digital Leadership

CIO Position Holding

Departmental agencies

Average number of years holding CIO Position	Holding position less than 1 year
1.9 years	31.6%

Trained Courses



Pushing digital projects until success	Has	Does not have
	67.7%	32.3%

(292 Respondents)

Reasons for not pushing digital projects until success

Insufficient personnel	48.9%
Insufficient budget	41.5%
Focus on other projects	8.5%
Others e.g. the duration of holding position is not enough for pushing	41.5%

Success 576 projects from 197 units

Provincial Governor's office

Average number of years holding CIO Position	Holding position less than 1 year
1.1 years	38.2%

Trained Courses

Pushing digital projects until success	Has	Does not have
	47.4%	52.6%

(76 Respondents)

Reasons for not pushing digital projects until success

Insufficient personnel	62.5%
Insufficient budget	65.0%
Focus on other projects	17.5%
Others e.g. the duration of holding position is not enough for pushing	22.5%

Success 91 projects from 36 units

Pillar 2: Digital Capabilities

2.3 Training & Development

Departmental agencies

((292 Respondents)

Regular / Digital Personnel development plan

has 181 units

Does not have 111 units

Number of Technologist that expected to develop this year: 1,583 persons

Number of personnel at other levels that expected to develop this year: 4,087 persons

Note : Provincial agencies are not asked

Pillar 2: Digital Capabilities

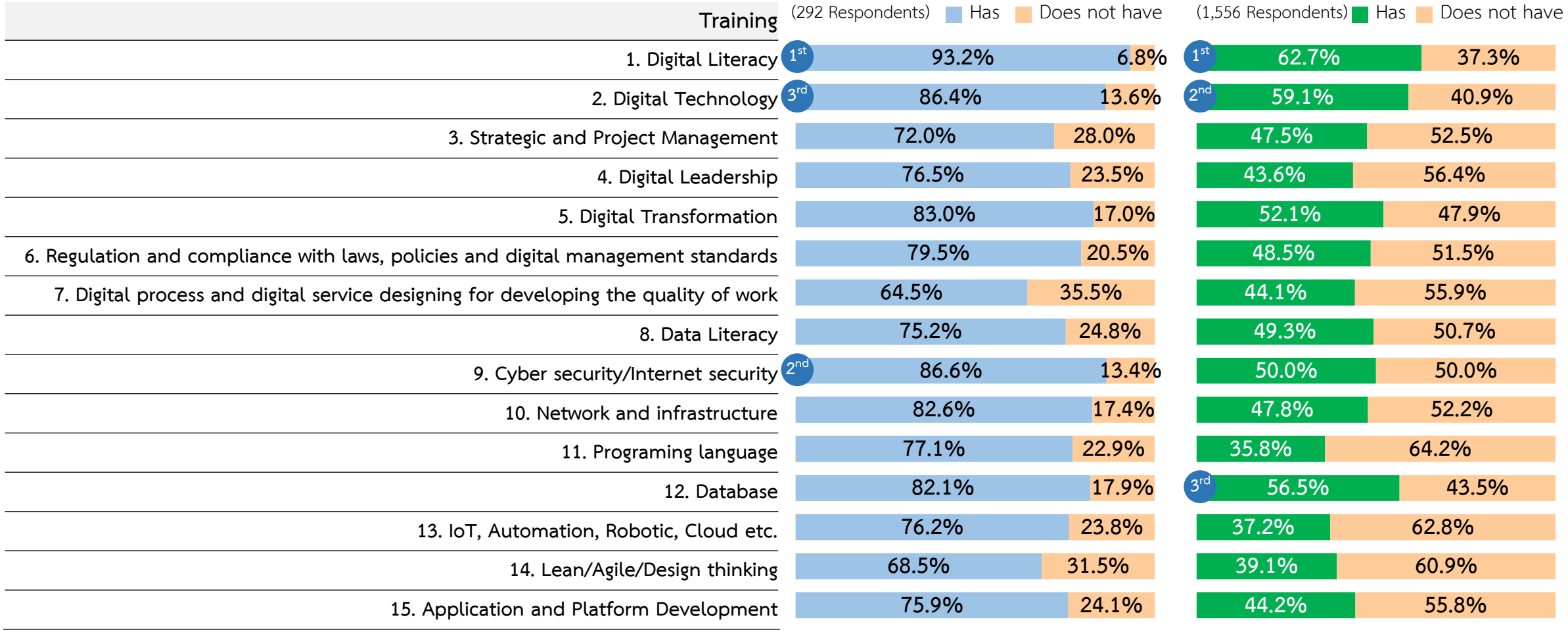
2.3 Training & Development

Building skills in the following areas	Departmental agencies (292 Respondents)		Provincial agencies (1,556 Respondents)	
Necessity for agency to build skills in the following areas	Necessary	Not necessary	Necessary	Not necessary
1. Digital Literacy	100.0%		99.5%	0.5%
2. Digital Technology	100.0%		99.2%	0.8%
3. Strategic and Project Management	98.3%	1.7%	96.6%	3.4%
4. Digital Leadership	100.0%		95.6%	4.4%
5. Digital Transformation	99.3%	0.7%	98.2%	1.8%
6. Regulation and compliance with laws, policies and digital management standards	100.0%		98.1%	1.9%
7. Digital process and digital service designing for developing the quality of work	100.0%		96.0%	4.0%
8. Data Literacy	98.2%	1.8%	97.4%	2.6%
9. Cyber security/Internet security	100.0%		99.0%	1.0%
10. Network and infrastructure	100.0%		96.8%	3.2%
11. Programing language	99.2%	0.8%	84.0%	16.0%
12. Database	100.0%		98.0%	2.0%
13. IoT, Automation, Robotic, Cloud etc.	97.6%	2.4%	95.0%	5.0%
14. Lean/Agile/Design thinking	97.8%	2.2%	91.7%	8.3%
15. Application and Platform Development	97.0%	3.0%	93.6%	6.4%

Pillar 2: Digital Capabilities

2.3 Training & Development

Training & Development and Evaluation in 2020



Pillar 2: Digital Capabilities

2.3 Training & Development

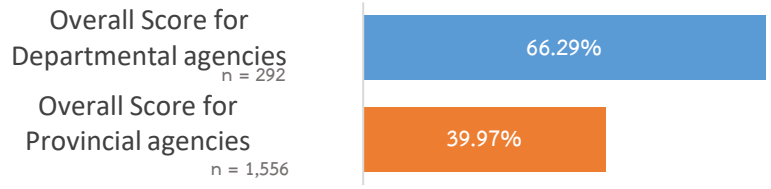
Training & Development and Evaluation in 2020	Departmental agencies (292 Respondents) Has	Departmental agencies (292 Respondents) Does not have	Provincial agencies (1,556 Respondents) Has	Provincial agencies (1,556 Respondents) Does not have
Evaluation after training / completion of the course				
1. Digital Literacy	37.3%	62.7%	9.1%	90.9%
2. Digital Technology	33.1%	66.9%	8.9%	91.1%
3. Strategic and Project Management	23.7%	76.3%	7.5%	92.5%
4. Digital Leadership	26.1%	73.9%	6.3%	93.7%
5. Digital Transformation	26.2%	73.8%	7.0%	93.0%
6. Regulation and compliance with laws, policies and digital management standards	25.8%	74.2%	7.4%	92.6%
7. Digital process and digital service designing for developing the quality of work	18.2%	81.8%	6.4%	93.6%
8. Data Literacy	22.0%	78.0%	5.8%	94.2%
9. Cyber security/Internet security	33.5%	66.5%	7.5%	92.5%
10. Network and infrastructure	24.3%	75.7%	6.7%	93.3%
11. Programing language	22.1%	77.9%	5.1%	94.9%
12. Database	17.9%	82.1%	8.6%	91.4%
13. IoT, Automation, Robotic, Cloud etc.	19.8%	80.2%	5.0%	95.0%
14. Lean/Agile/Design thinking	22.5%	77.5%	6.4%	93.6%
15. Application and Platform Development	18.0%	82.0%	7.1%	92.9%

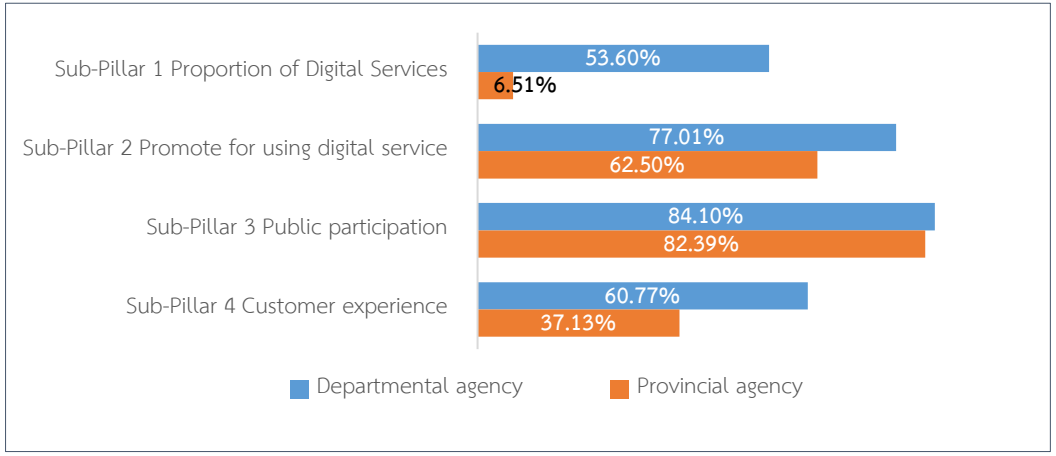
Pillar 2: Digital Capabilities

2.4 IT competency

Average score out of 5	Departmental agencies (292 Respondents)	Provincial agencies (1,556 Respondents)
Digital Skill Level (OCSC's standard)		
1. Digital Literacy	3.59	3.42
2. Digital Governance, Standard, and Compliance	3.48	3.24
3. Digital Technology	3.52	3.23
4. Internal Integration and Service Design	3.38	2.97
5. Strategic and Project Management	3.51	3.13
6. Digital Leadership	3.46	3.02
7. Digital Transformation	3.46	3.07
Fundamental Capability and Knowledge of Government Officers (OCSC's standard)		
8. Technology employment tactics to support work function and compatibility	1st 4.01	2nd 3.68
9. Knowledge about safe technology utilization on social aspects, privacy and morality	3rd 3.71	3rd 3.54
10. Knowledge about Core Data Literacy, Utilization and Comprehension	3.43	3.35
11. Knowledge about Good Governance, Standard, Good Guideline, Digital and other related laws	3.46	3.36
12. Knowledge about organization target, mission, work process and service	2nd 3.98	1st 3.71
Other Fundamental Capability and Knowledge of Government Officers		
13. Cyber Security	3.36	3.01

Pillar 3: Public Services





Overall score

	Highest Pillar	Lowest Pillar
Departmental level	Public participation	Proportion of Digital Services
Provincial level		

Summary of Fact findings

Proportion of digital service

- Most agencies get 0 points because they don't know the actual number of services provided.
- A very small percentage of the provincial agencies have their own developed services.
- Most agencies did not realize the need to connect their agency services to a centralized platform or developing a platform to connect with other agencies.

Public participation

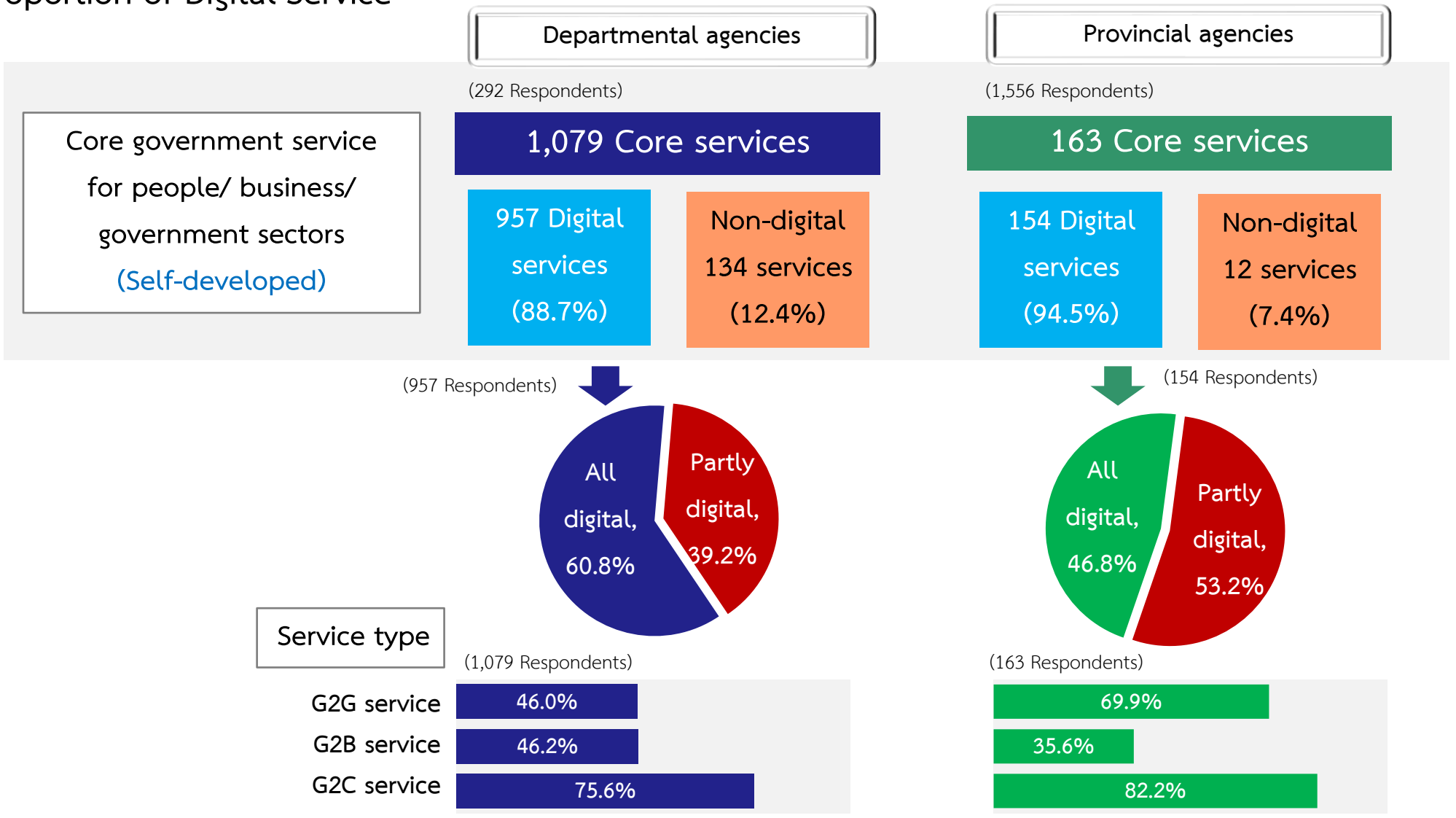
- Most departmental agencies can operate completely for this aspect. In terms of providing information and the opportunity for the public to express their opinions. For the opportunity for service recipients / other sectors to participate in decision-making of service development. The agency did well in allowing people to participate in voting related to the development of the agency's services but lacked in the involvement of the private sector / citizen to participate in their cooperative services.

Promote for using digital service

- Most agencies have driven the services including public relations in digital form, but still a lack of pushing services through a central platform such as the central website that is one stop service.

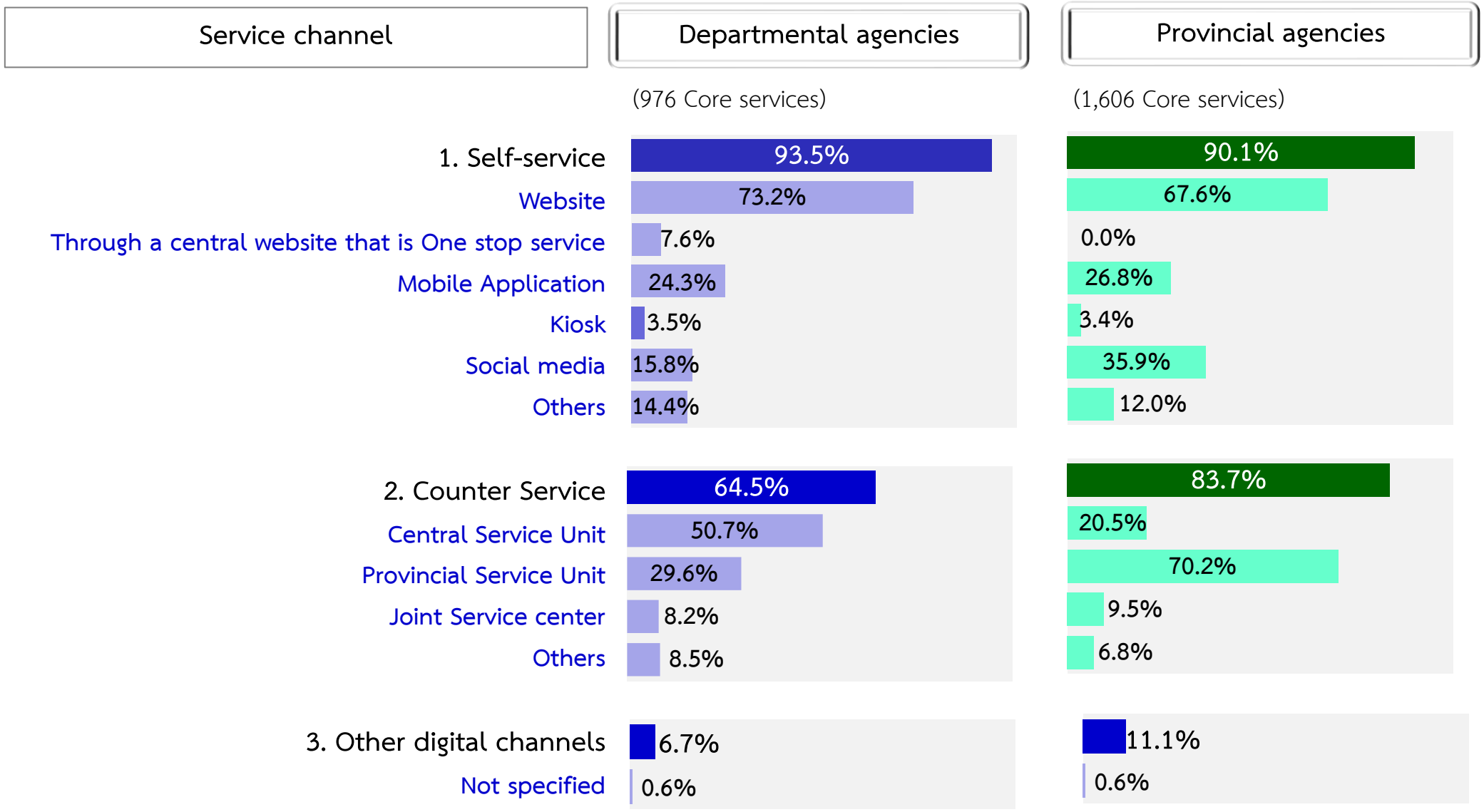
Pillar 3: Public Services

3.1 Proportion of Digital Service



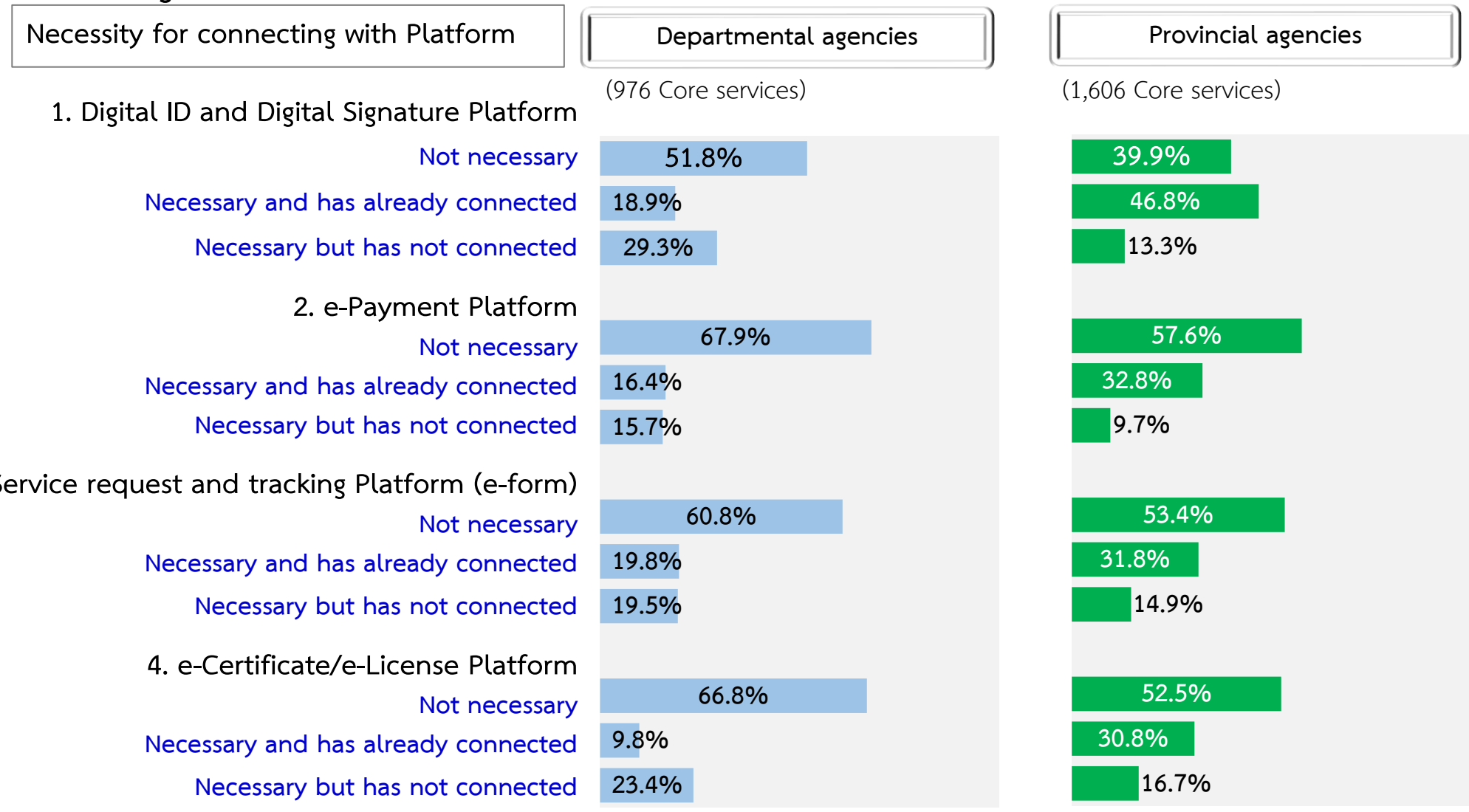
Pillar 3: Public Services

3.1 Proportion of Digital Service



Pillar 3: Public Services

3.1 Proportion of Digital Service



Pillar 3: Public Services

3.1 Proportion of Digital Service

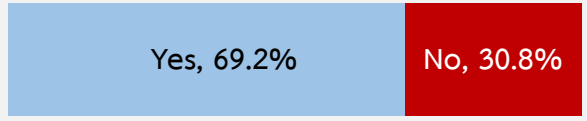
Departmental agencies

(292 Respondents)

Platform that allows other entities to get involved in service for people/ business/ government sectors such as Transport GI Portal, MoF Cloud, and SME Connext

Service without requesting copy of citizen ID and House Registration

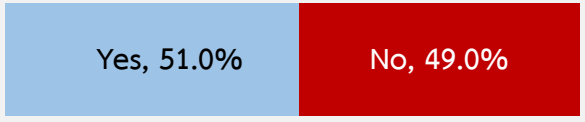
1. Has not requested copy in all service center nationwide



2. Has not requested in all service center nationwide copy before Cabinet resolution

Service without requesting copy of other official documents

1. Has not requested copy in all service center nationwide

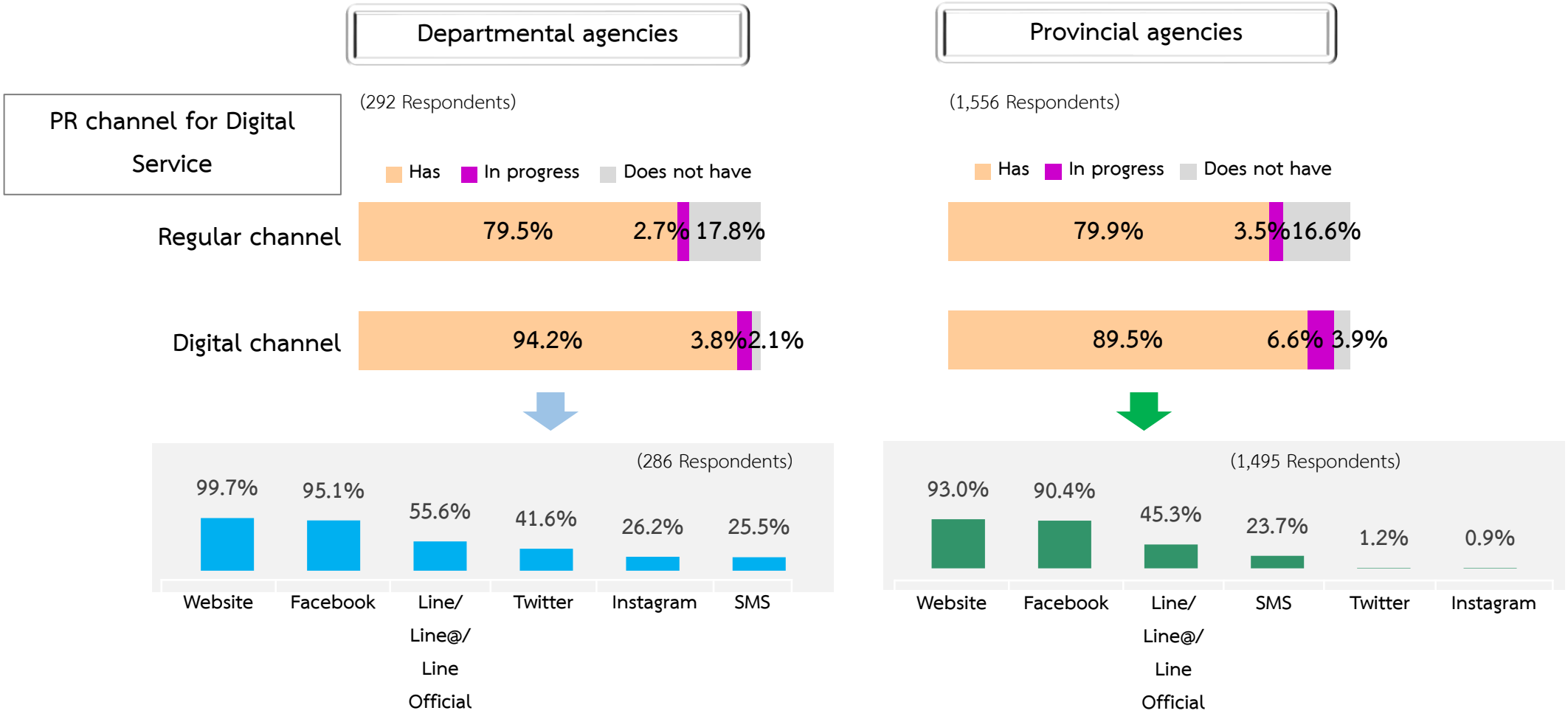


2. Has not requested in all service center nationwide copy before Cabinet resolution

Note : Provincial agencies are not asked

Pillar 3: Public Services

3.3 Promote for Using Digital Service



Pillar 3: Public Services

3.4 Public Participation

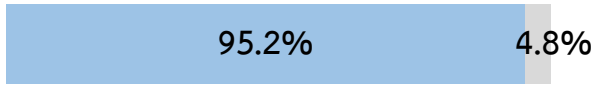
Public Participation: e-Information

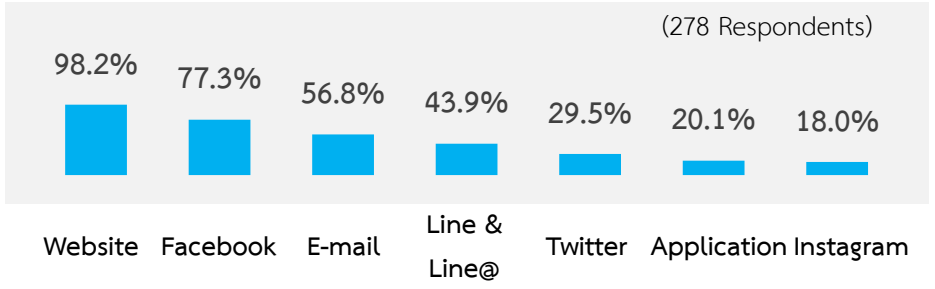
Departmental agencies

(292 Respondents)

Has Does not have

Providing complete and correct data

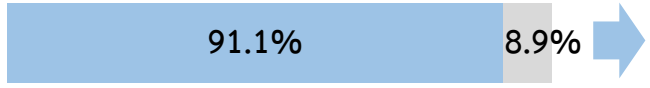


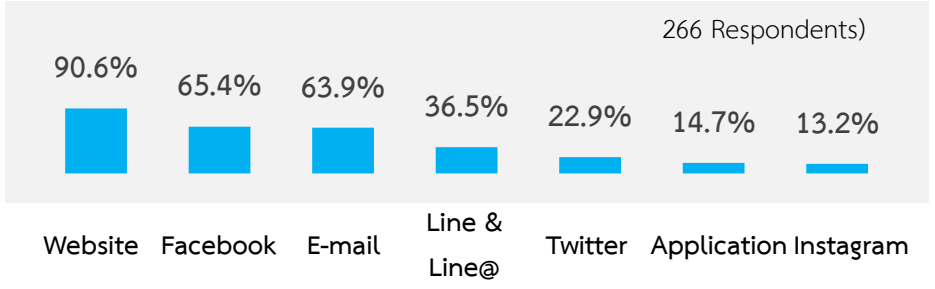


(292 Respondents)

Has Does not have

Channel for people to request data

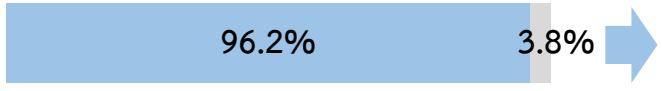


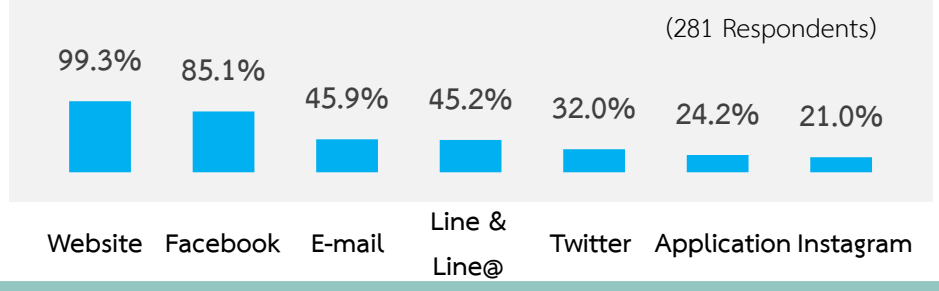


(292 Respondents)

Has Does not have

Regularly updating content on various channels





Note : Provincial agencies are not asked

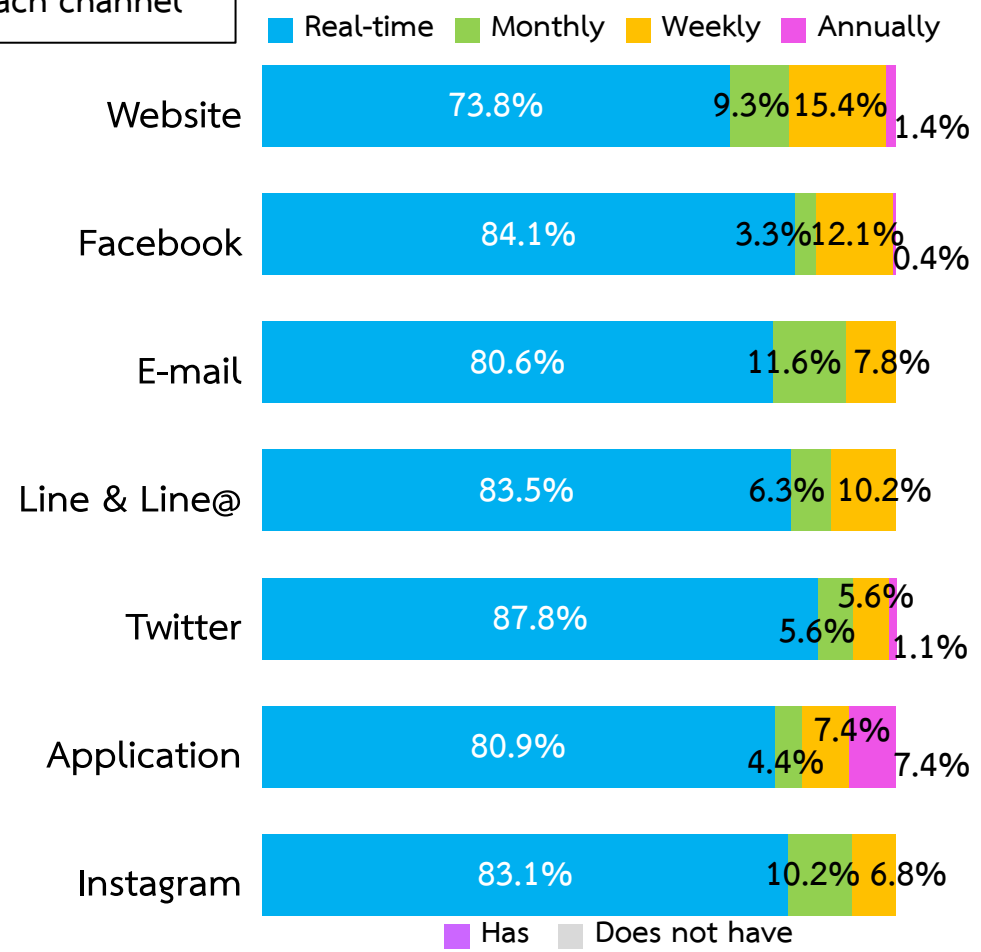
Pillar 3: Public Services

3.4 Public Participation

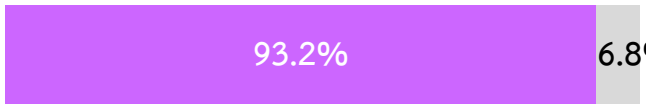
Departmental agencies

(281 Respondents)

Data update frequency of each channel



Visitor Counting on main website



Note : Provincial agencies are not asked

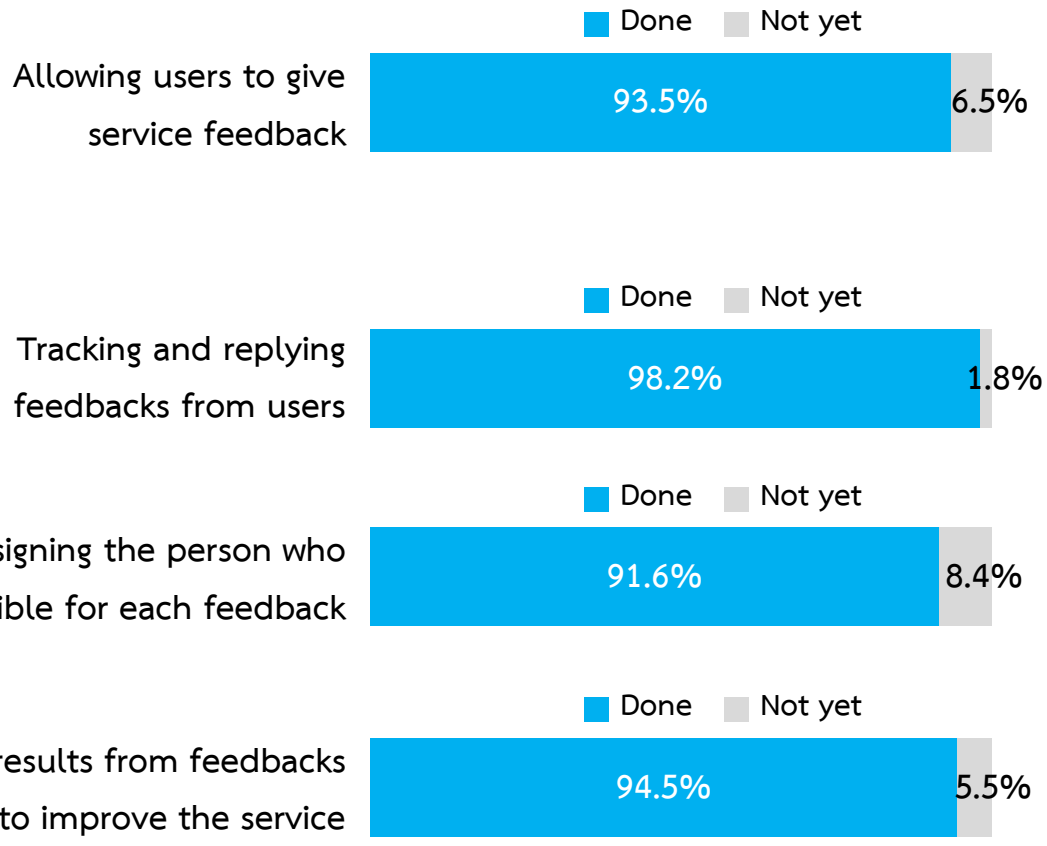
Pillar 3: Public Services

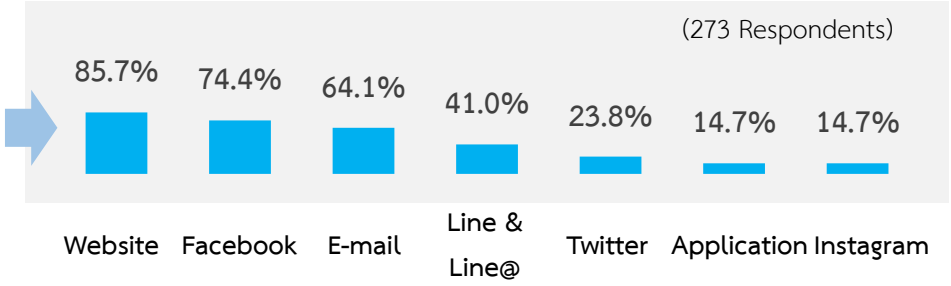
3.4 Public Participation

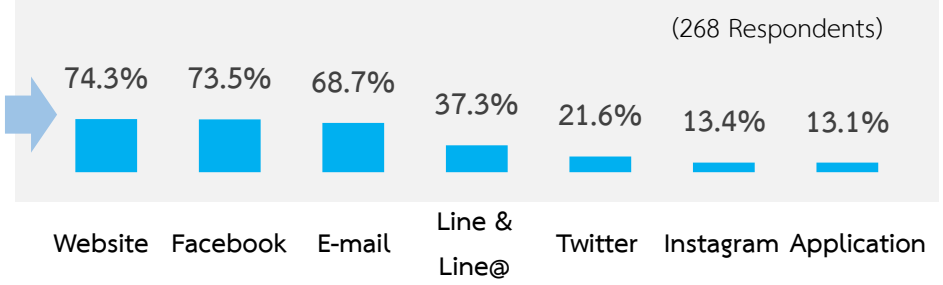
Public Participation: e-Consultation

Departmental agencies

(292 Respondents)







Note : Provincial agencies are not asked

Pillar 3: Public Services

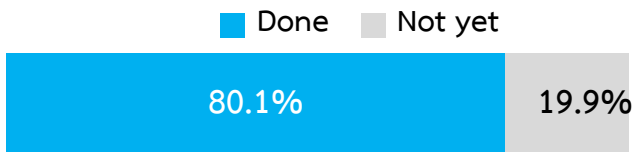
3.4 Public Participation

Public Participation: e-Decision-making

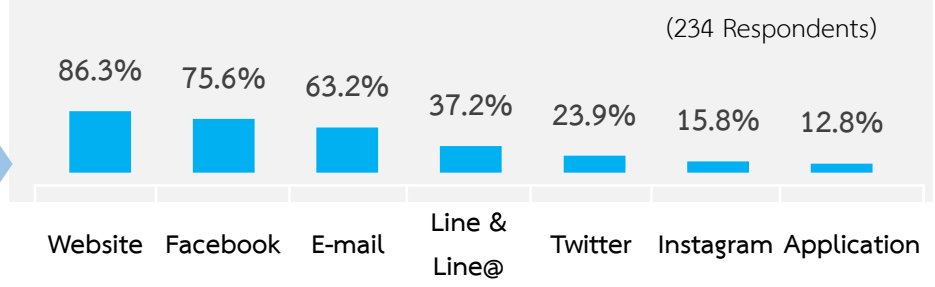
Departmental agencies

Allowing people to participate in voting that related to service development

(292 Respondents)



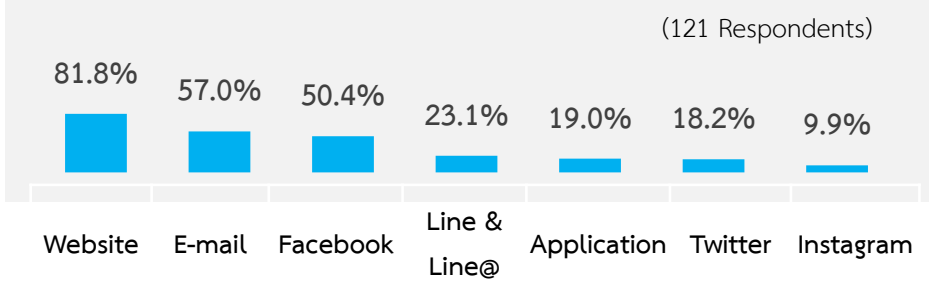
(234 Respondents)



Allowing private/public sector to participate in Public-Private Partnership

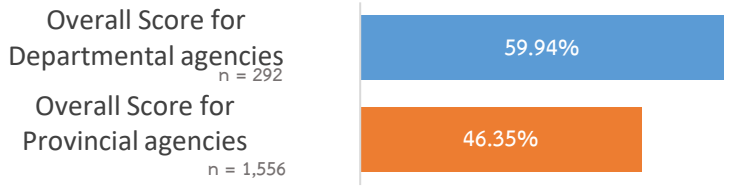
(292 Respondents)

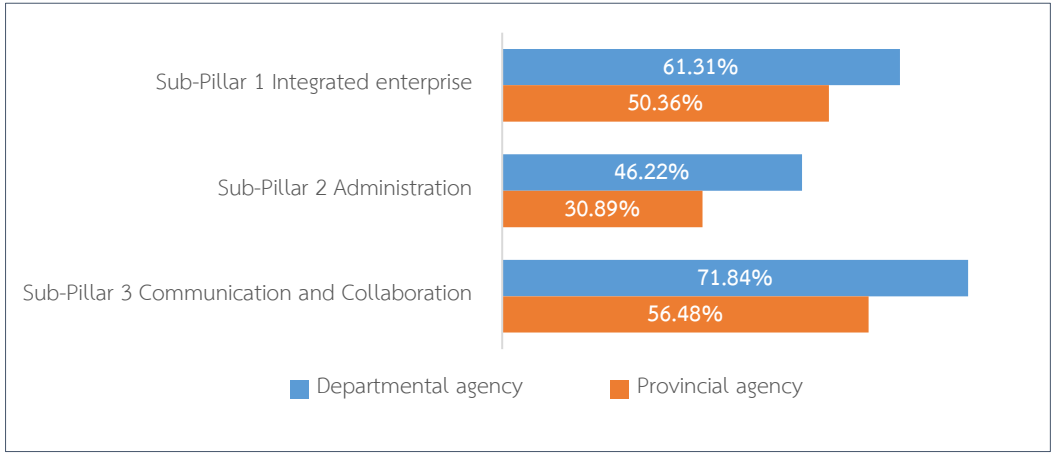
(121 Respondents)



Note : Provincial agencies are not asked

Pillar 4: Smart Back Office





Overall score

	Highest Pillar	Lowest Pillar
Departmental level	Communication and Collaboration	Administration
Provincial level		

Summary of Fact findings

Integrated enterprise

- Most agencies do not use a central system or link their own systems with the central system of government agencies
- The provincial agencies has less internal system links than the departmental agencies because the system structure cannot be connected and there is still a lack of budget.

Administration

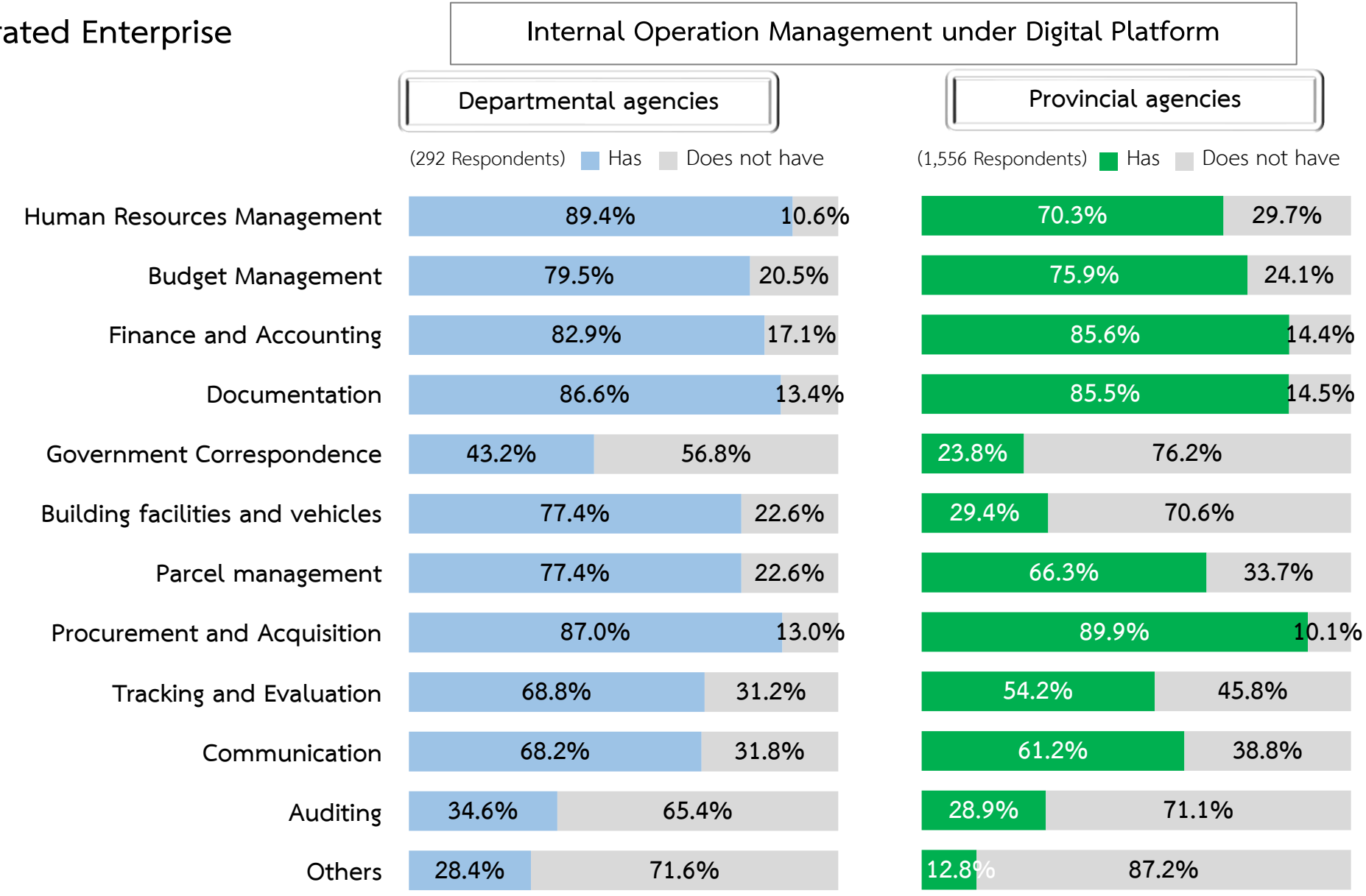
- Most departmental agencies have adopted technology included Process Automation to help reduce work processes, mainly in human resource management
- Most departmental agencies have reviewed their processes before adopting technology such as Process automation. However, it was found that most of the agencies did not review the process because the lack of budget and there is no supportive policy.
- Most agencies also use paper documents transmission because there is no clear policy to cancel the transmission of paper documents.
- Most departmental agencies have technology to support working at home, however, most provincial agencies do not have the technology to support working at home.

ด้าน Communication and collaboration

- Most agencies use communication and collaboration channels within the organization. They can use the channel suitable for the objectives.
- However, it was found that the agencies that did not use shared channels due to the lack of supportive policy or budget.

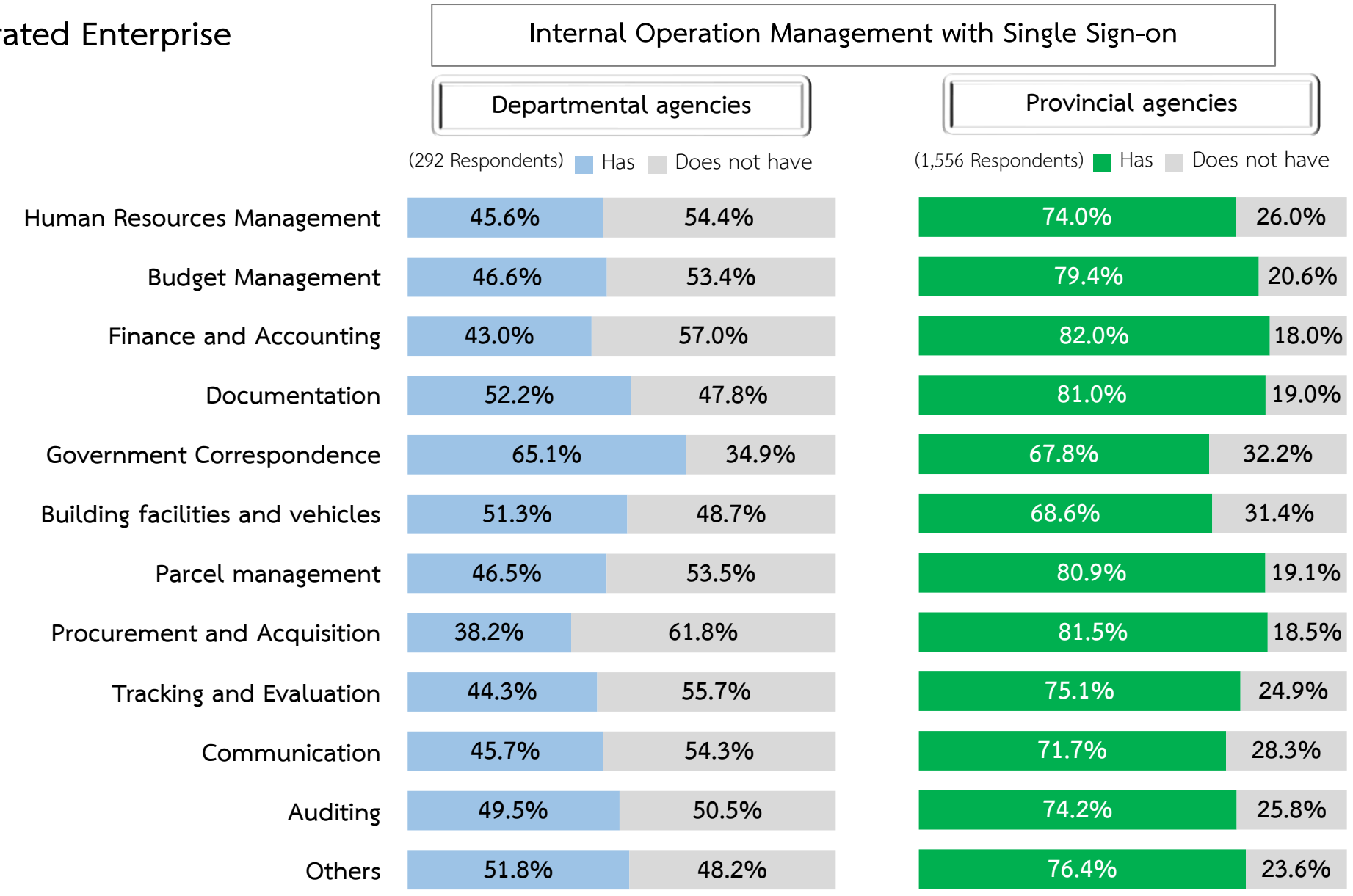
Pillar 4: Smart Back Office

4.1 Integrated Enterprise



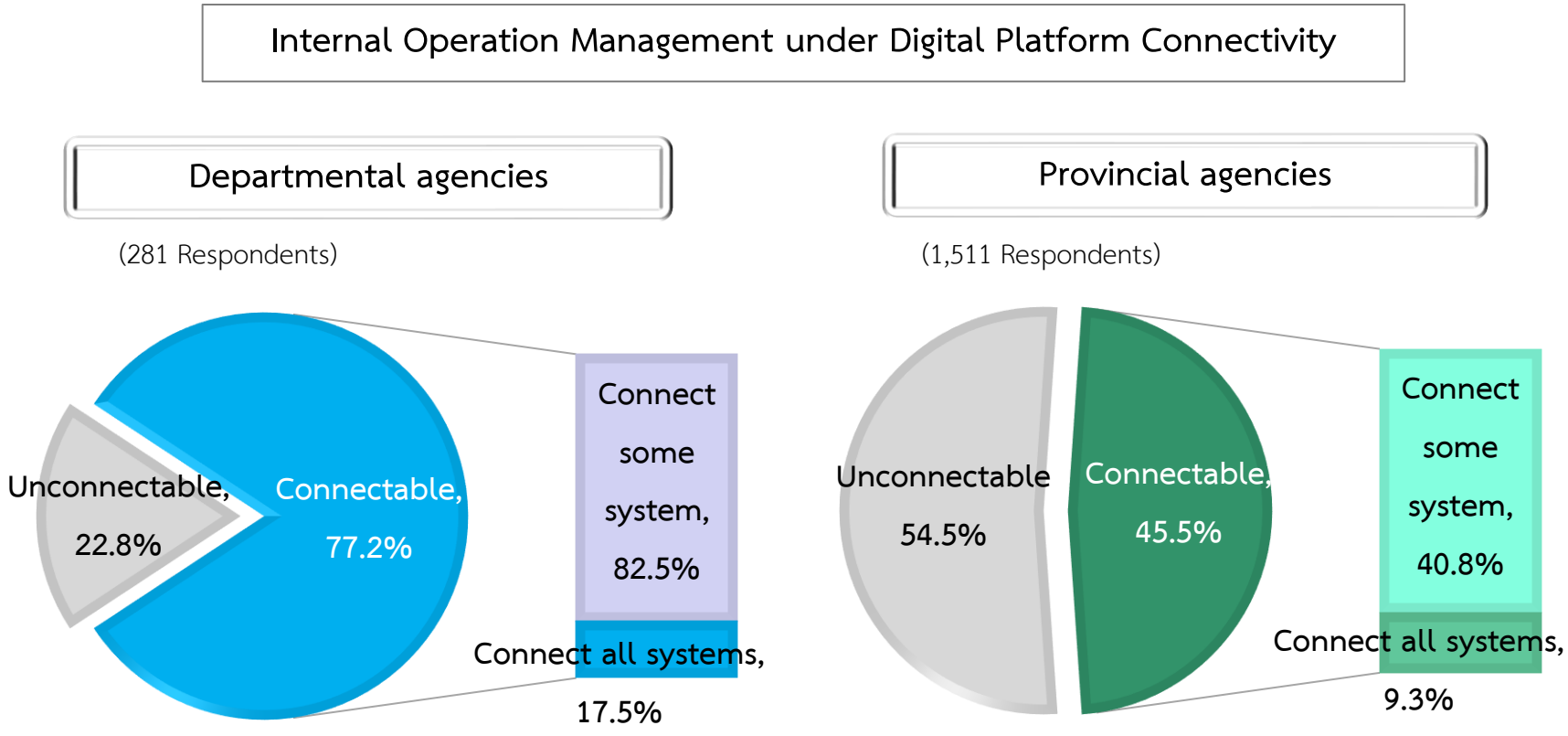
Pillar 4: Smart Back Office

4.1 Integrated Enterprise



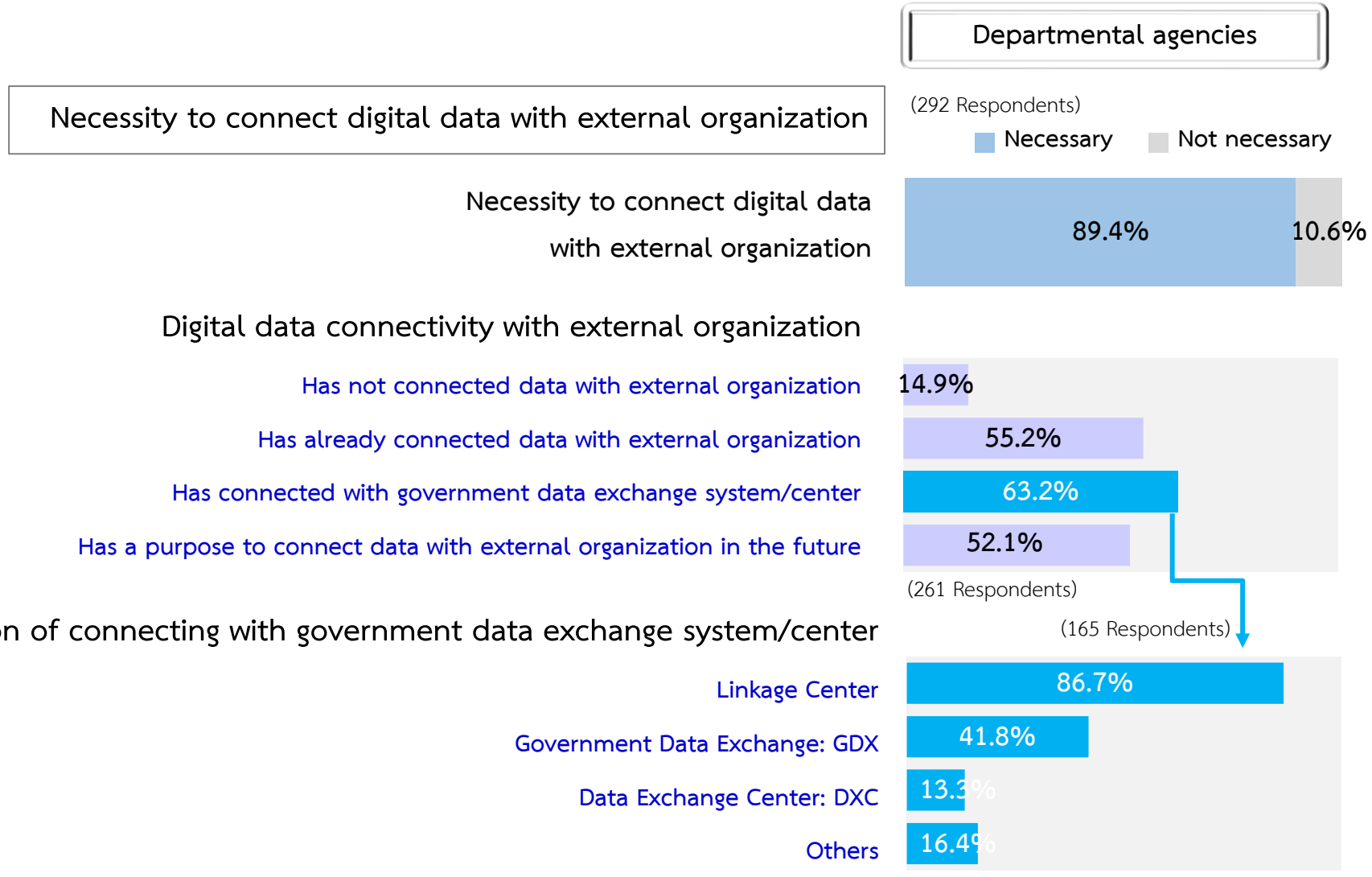
Pillar 4: Smart Back Office

4.1 Integrated Enterprise



Pillar 4: Smart Back Office

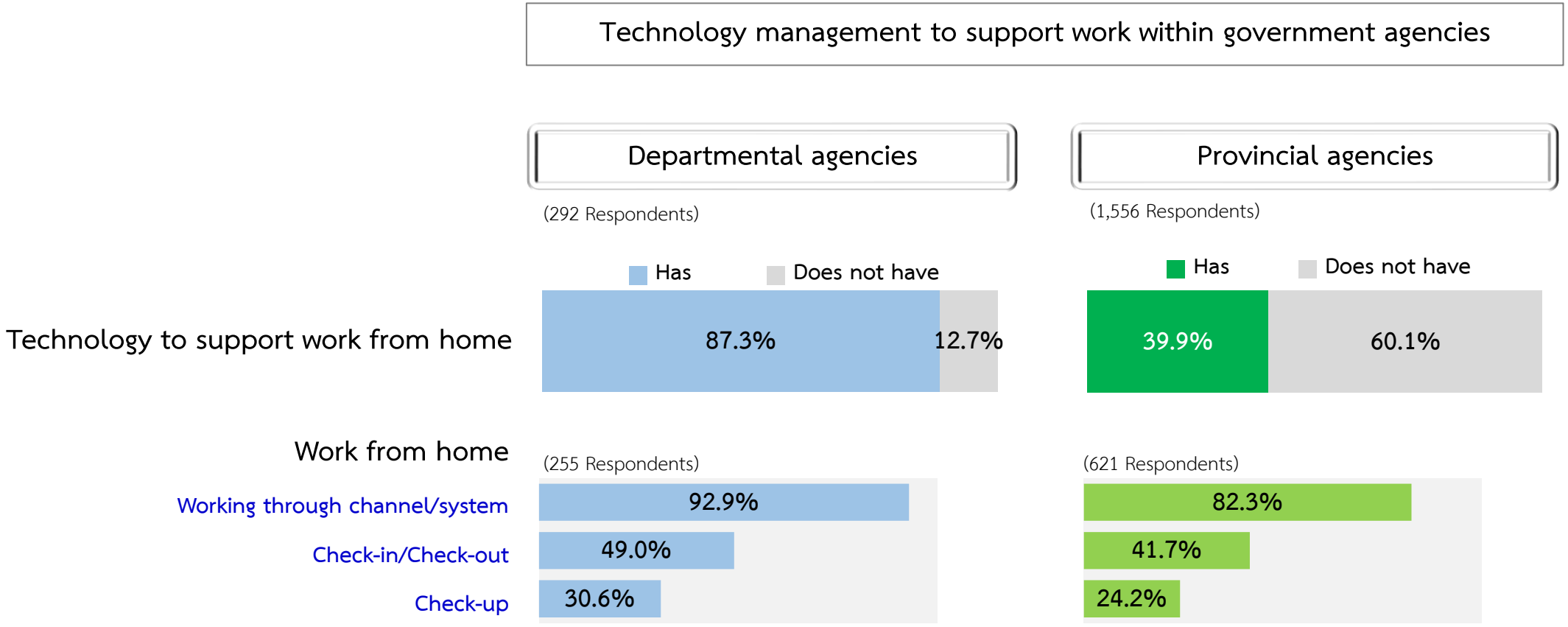
4.1 Integrated Enterprise



Note : Provincial agencies are not asked

Pillar 4: Smart Back Office

4.2 Administration



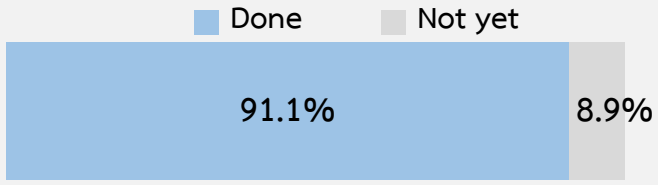
Pillar 4: Smart Back Office

4.2 Administration

Application of digital technology in Process Automation that reducing work processes or working more efficiently

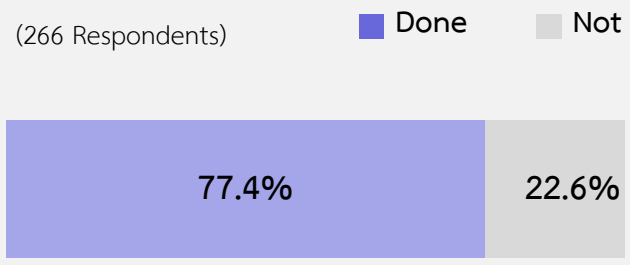
Improvement on work processes before applying technologies

(292 Respondents)



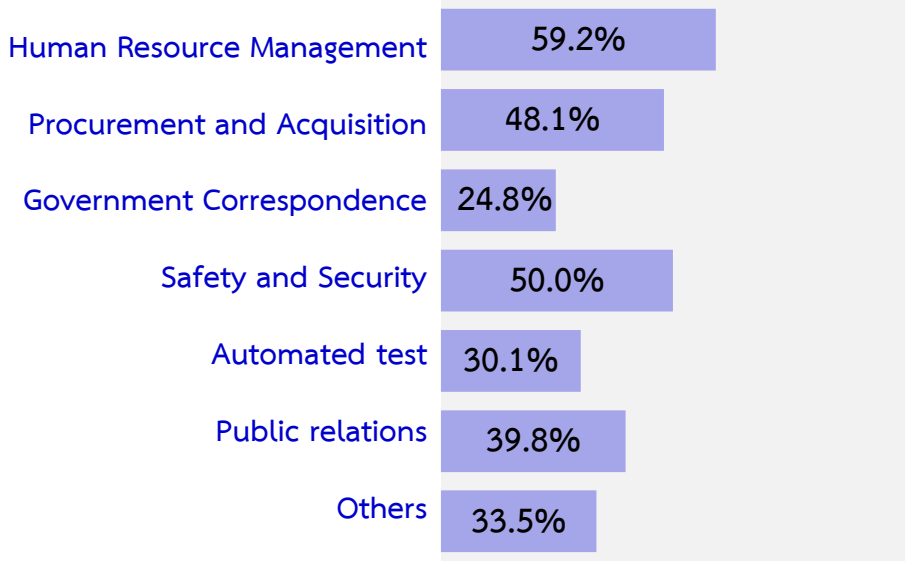
Application of digital technology in Process Automation that reducing work processes or working more efficiently

(266 Respondents)



Departmental agencies

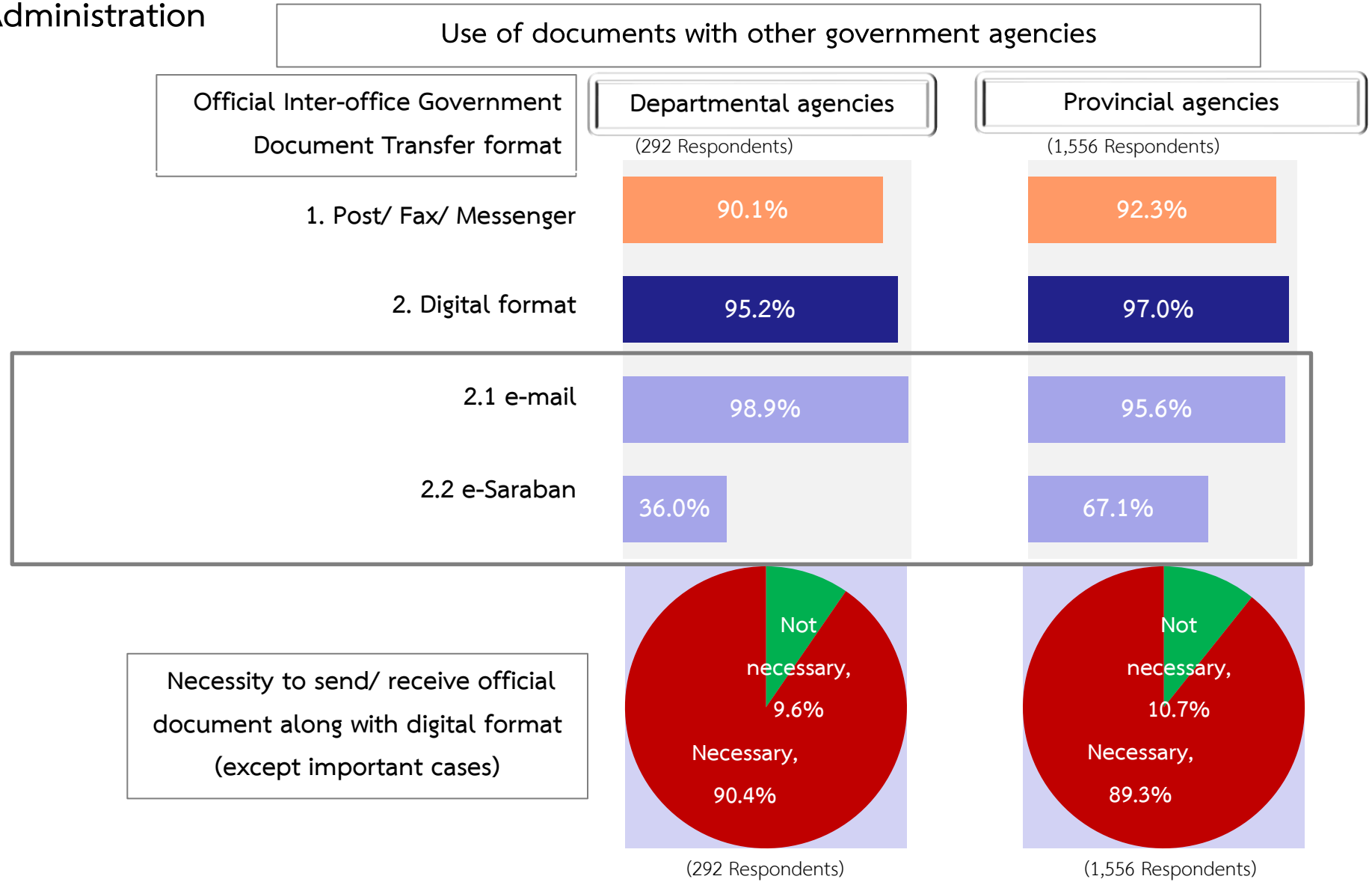
(206 Respondents)



Note : Provincial agencies are not asked

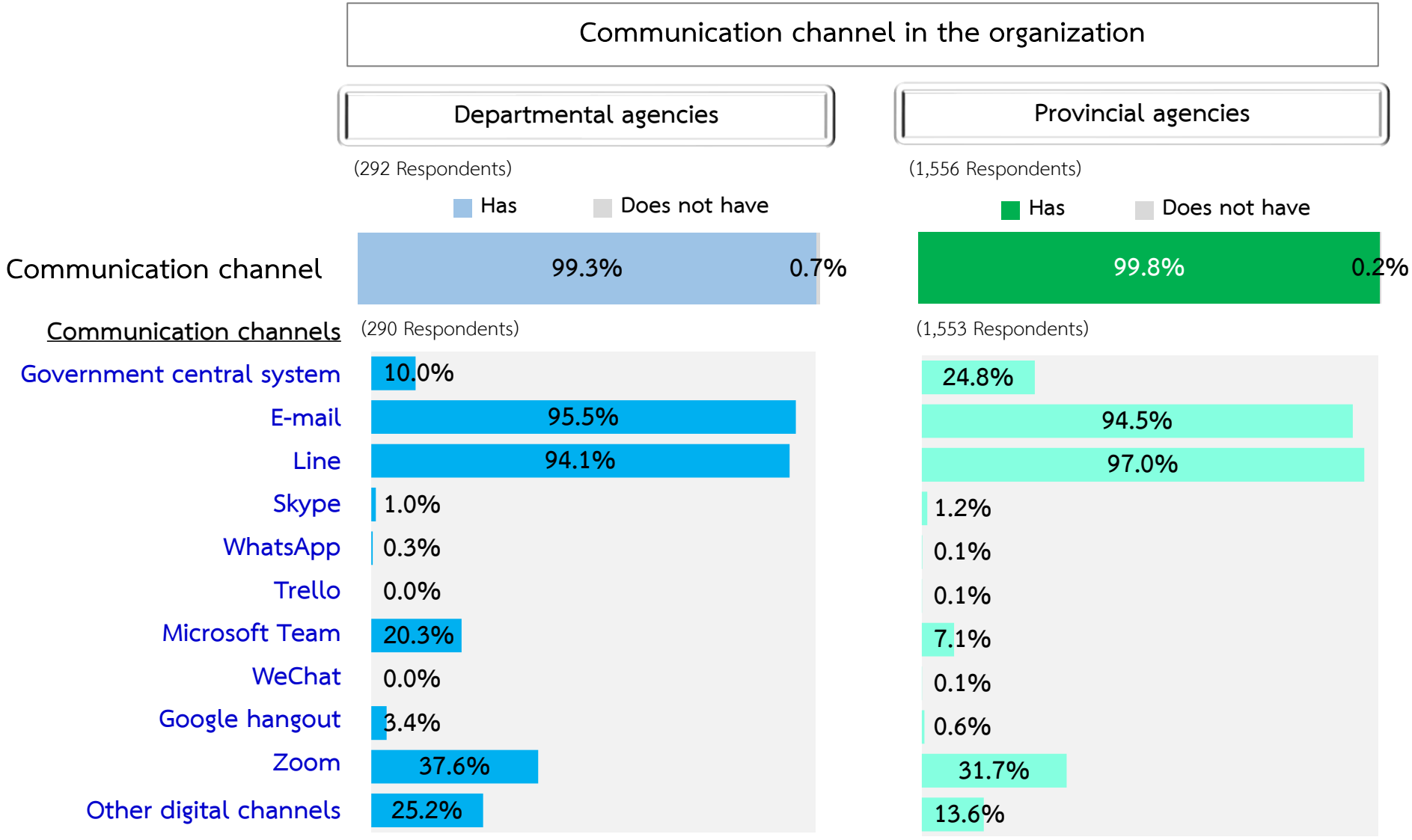
Pillar 4: Smart Back Office

4.2 Administration



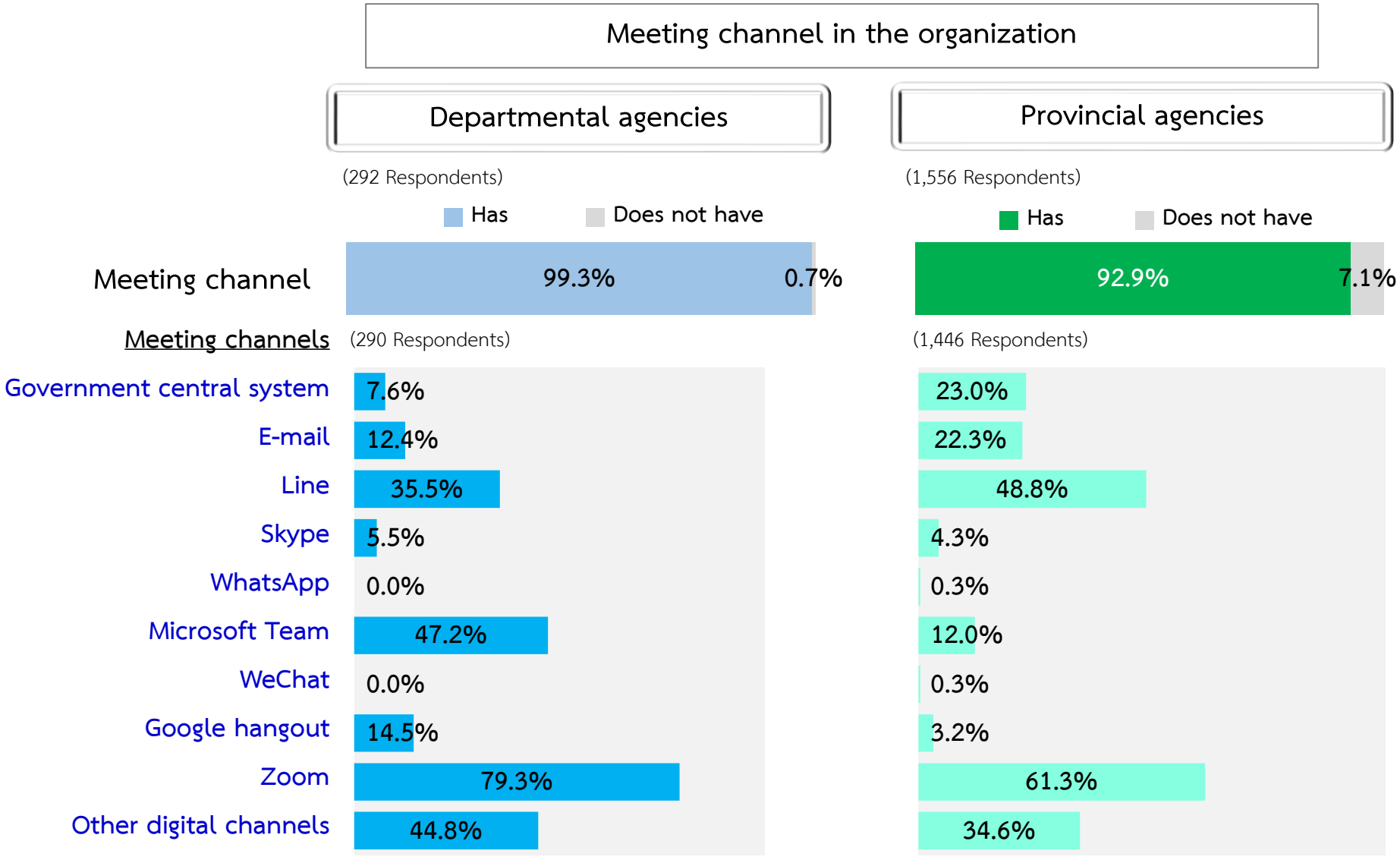
Pillar 4: Smart Back Office

4.3 Communication and Collaboration



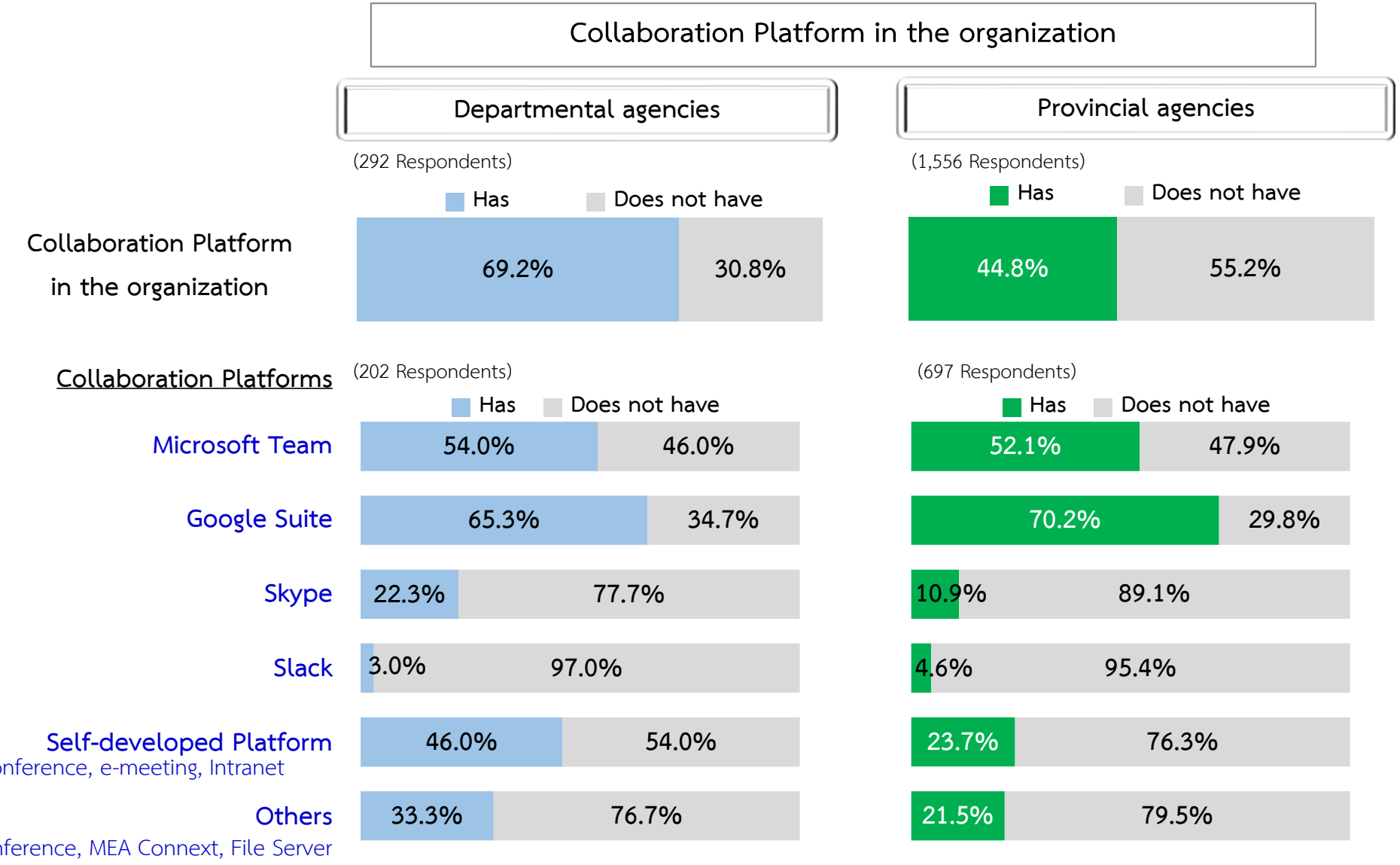
Pillar 4: Smart Back Office

4.3 Communication and Collaboration



Pillar 4: Smart Back Office

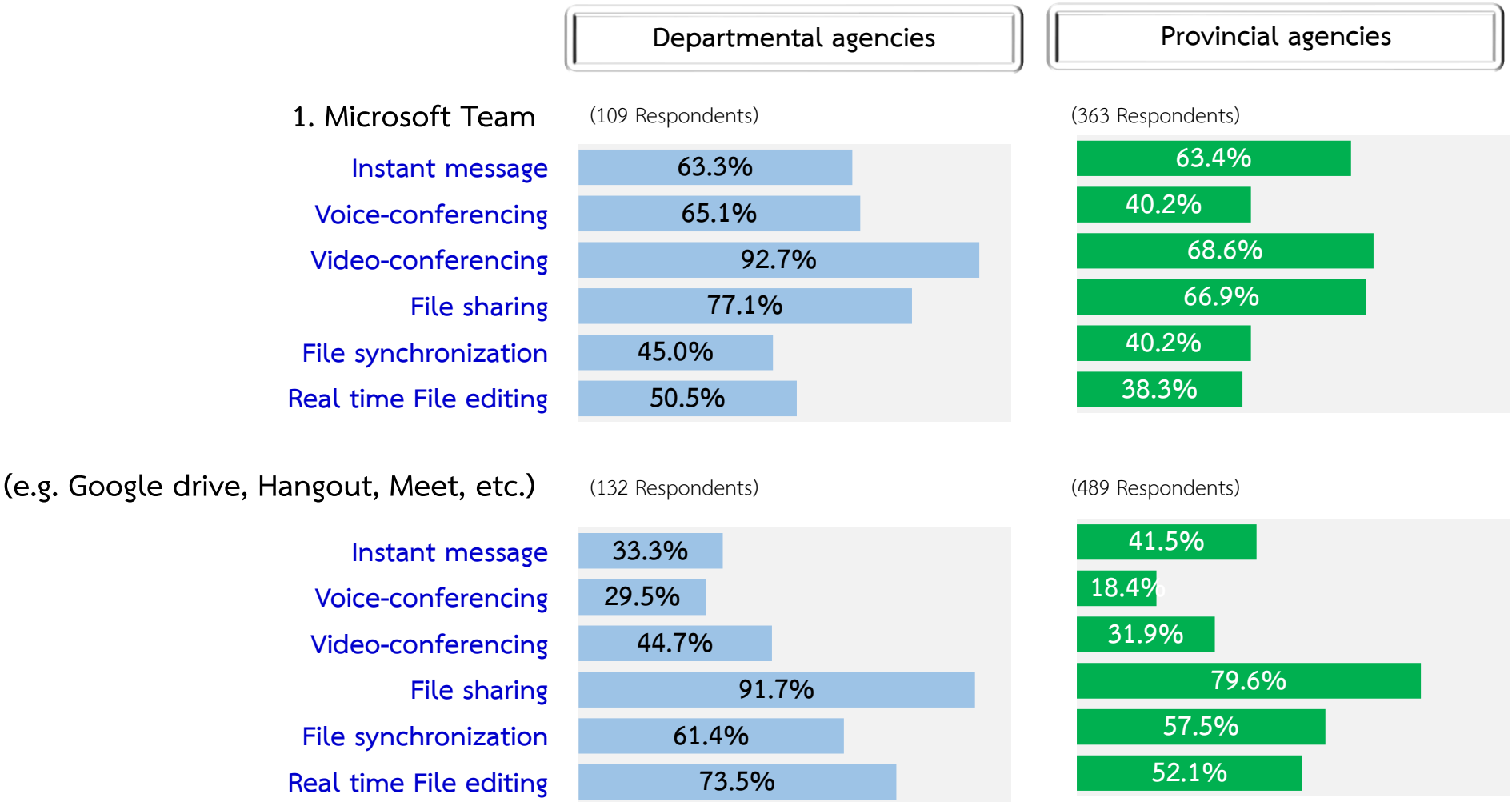
4.3 Communication and Collaboration



Pillar 4: Smart Back Office

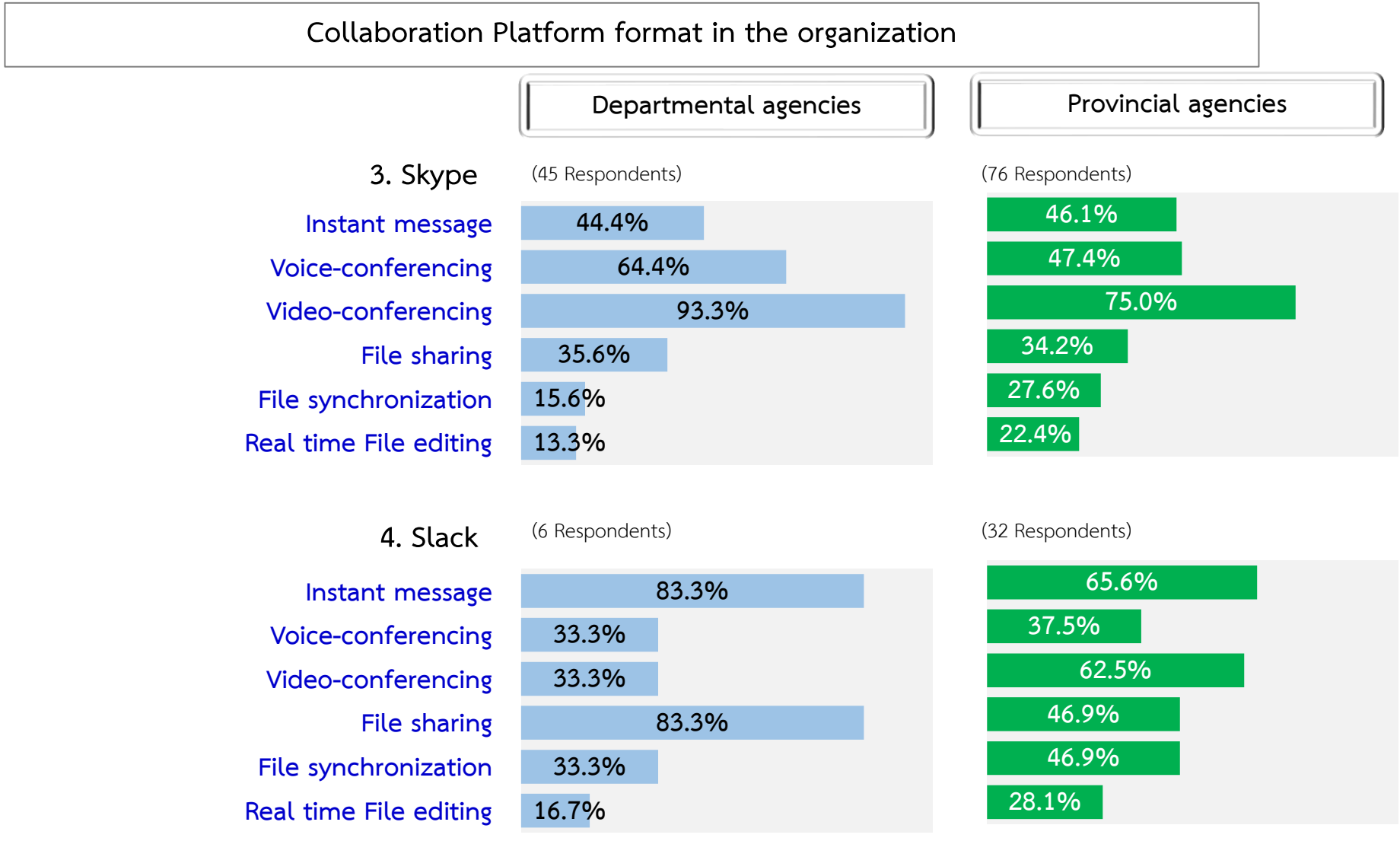
4.3 Communication and Collaboration

Collaboration Platform format in the organization



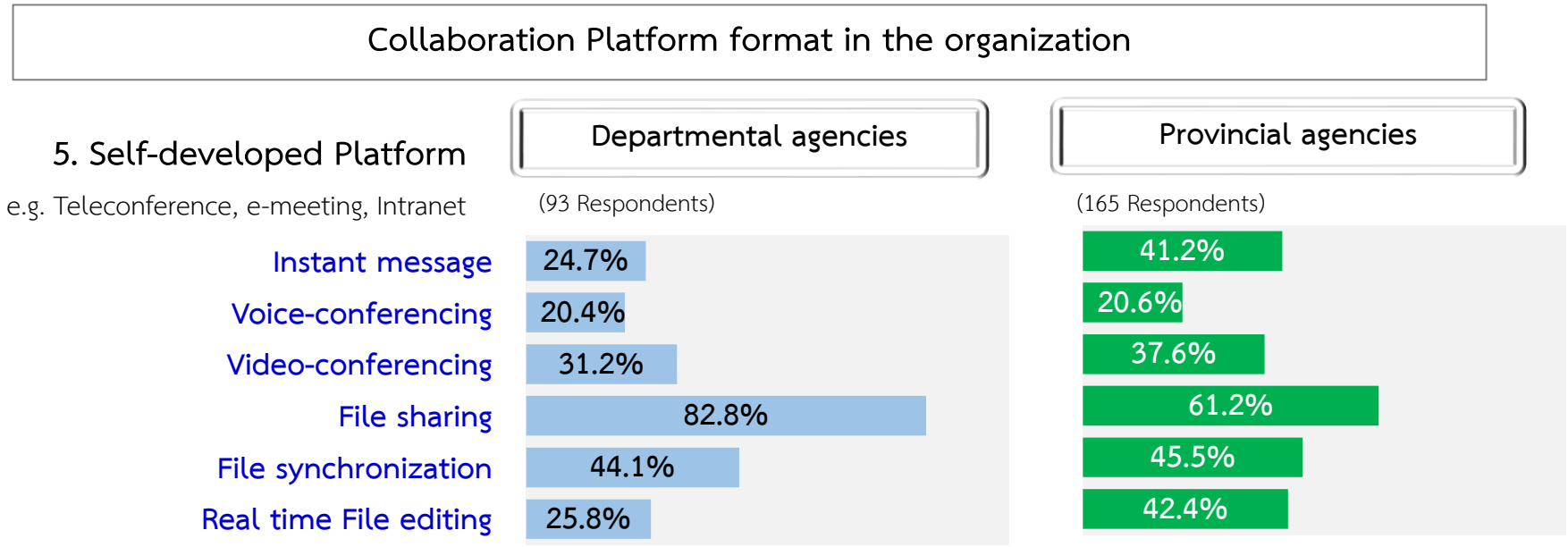
Pillar 4: Smart Back Office

4.3 Communication and Collaboration

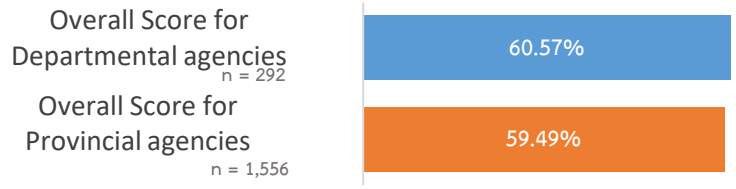


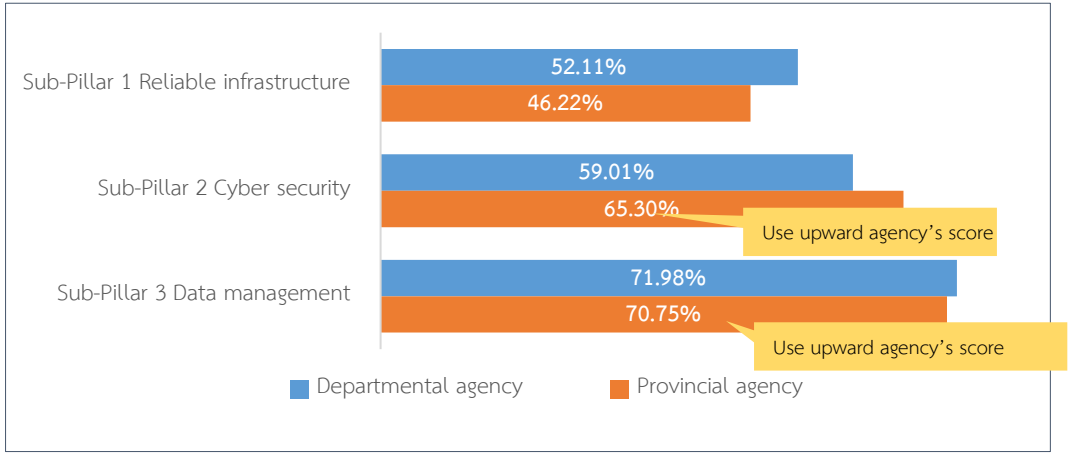
Pillar 4: Smart Back Office

4.3 Communication and Collaboration



Pillar 5: Secure and Efficient Infrastructure





Overall score

	Highest Pillar	Lowest Pillar
Departmental level	Data management	Reliable infrastructure
Provincial level		

Summary of Fact finding

Reliable infrastructure

- Agencies at both departmental and provincial levels have insufficient hardware and software infrastructure. This is against the budget allocation of the departments at both levels which focused on the maintenance of equipment and systems.
- • Most agencies are lack of central structure of the government to apply in the agency

Cyber security

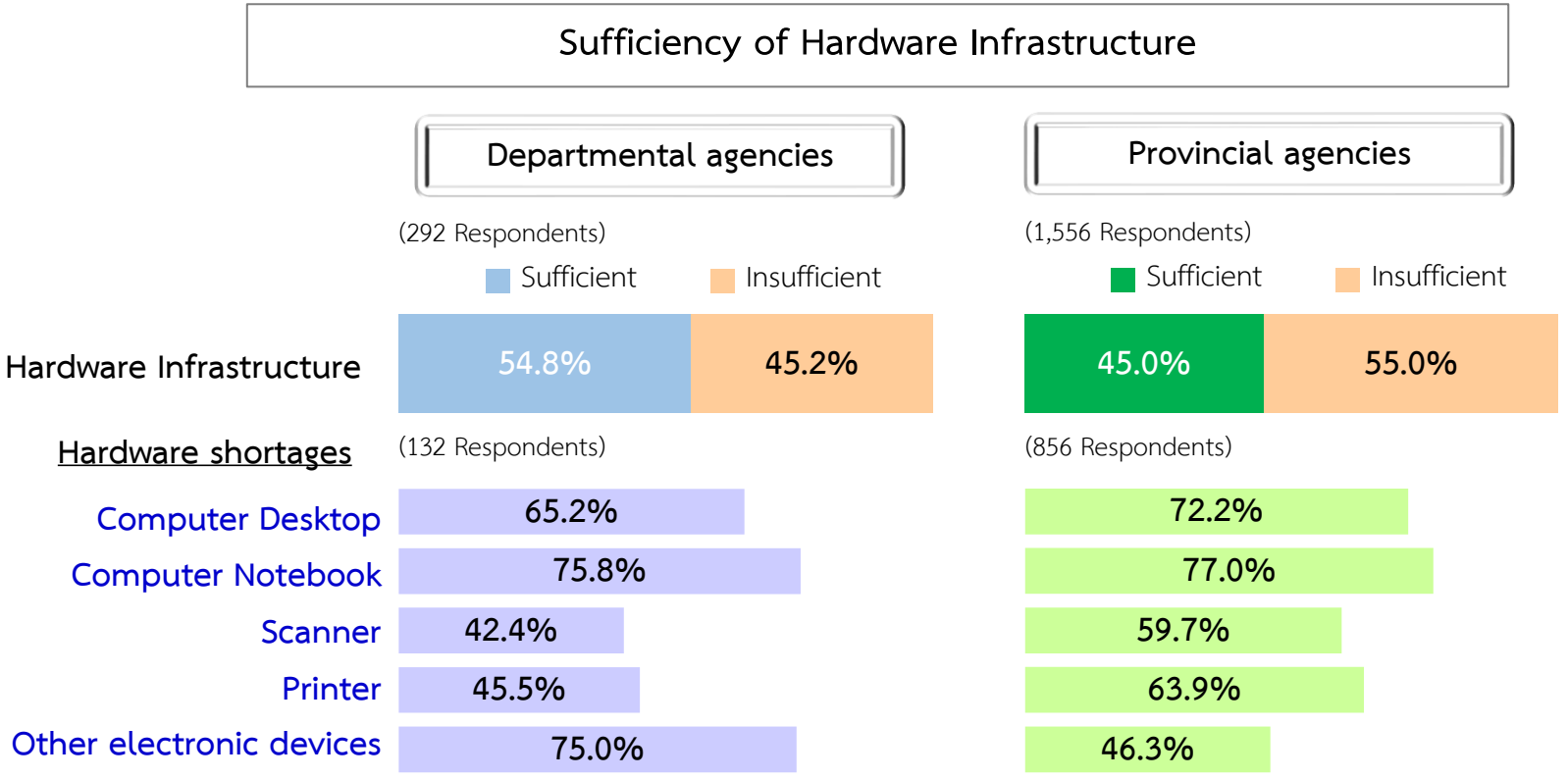
- Most departmental agencies have implemented measures to maintain cybersecurity. In terms of the Integrity of the information in a small proportion.
- The cybersecurity standard has been implemented in accordance with the secure method of the Electronic Transactions Act. Most agencies will only start working if they have a clear policy released as a guideline for them to follow.

Data management

- The departmental agencies have a completed knowledge and understanding of the data storage, especially in terms of data updating which is updated in Real time format.
- However, the agency still need to develop in the field of data for in-depth analysis or analyze to forecast future results.
- Most agencies have been rated with the lowest score on Pillar was 6, which is reflected in the budget allocation of departmental and provincial agencies that minimum focus on research to adopt new technology on all topics

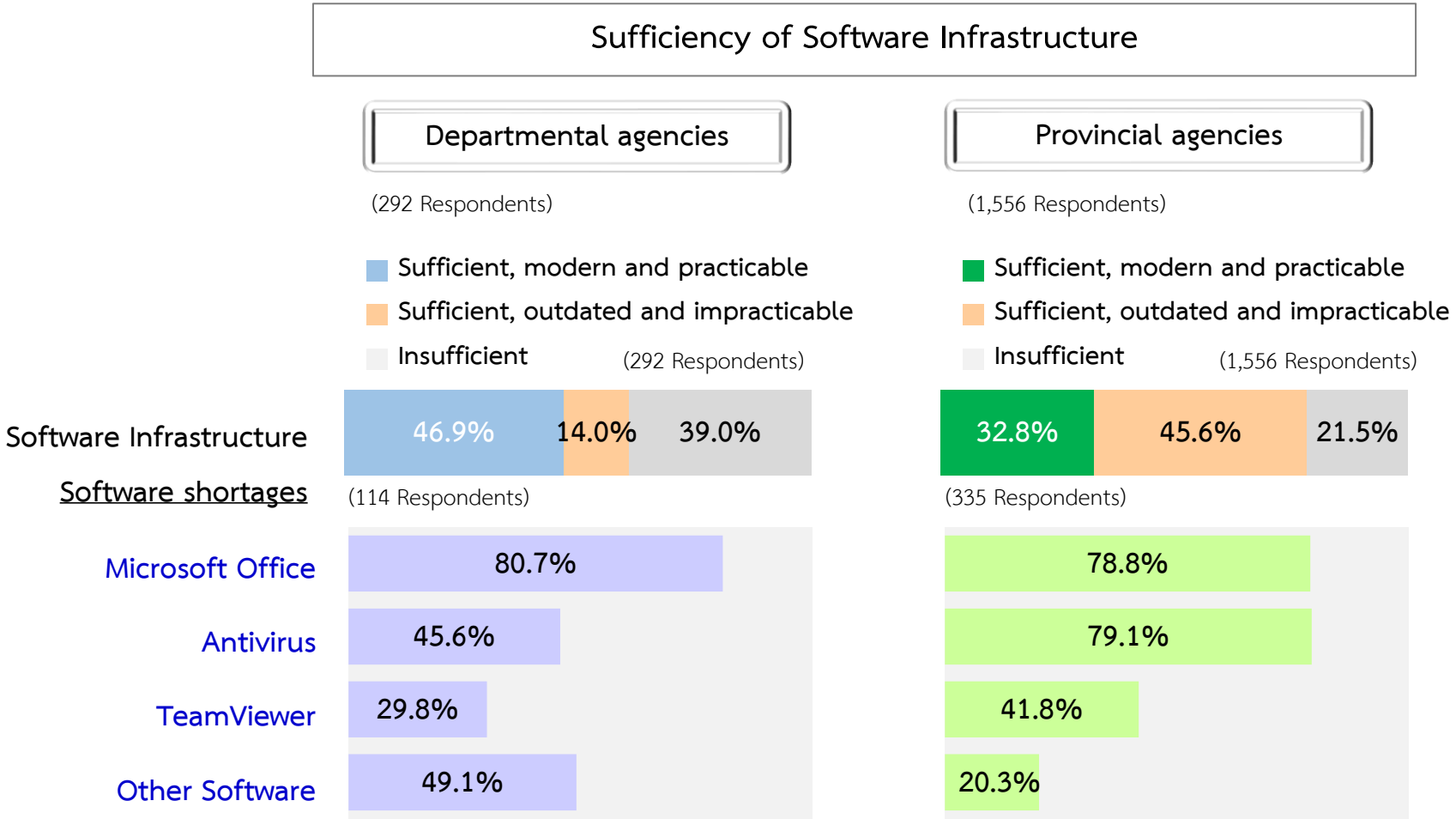
Pillar 5: Secure and Efficient Infrastructure

5.1 Reliable Infrastructure



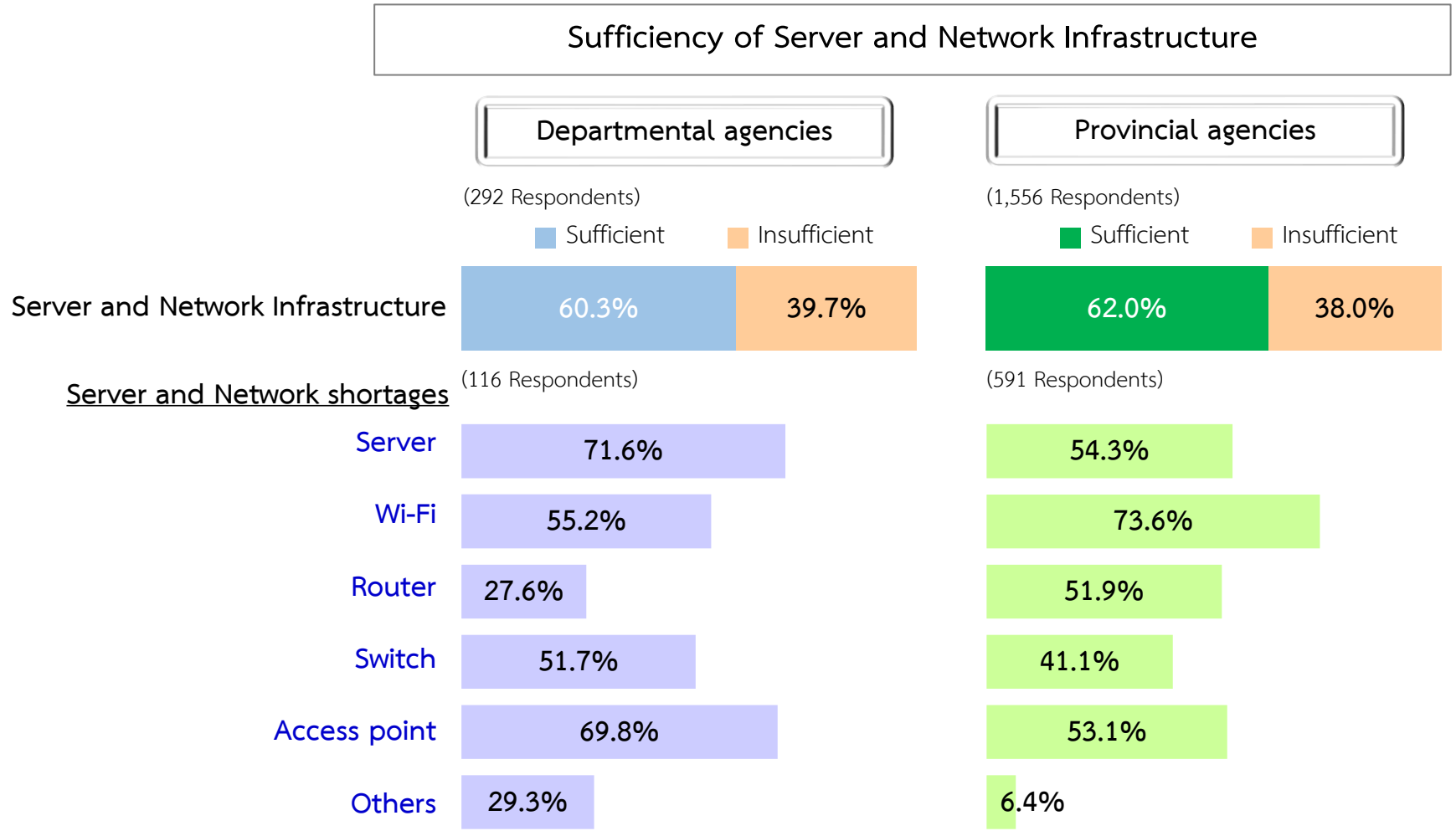
Pillar 5: Secure and Efficient Infrastructure

5.1 Reliable Infrastructure



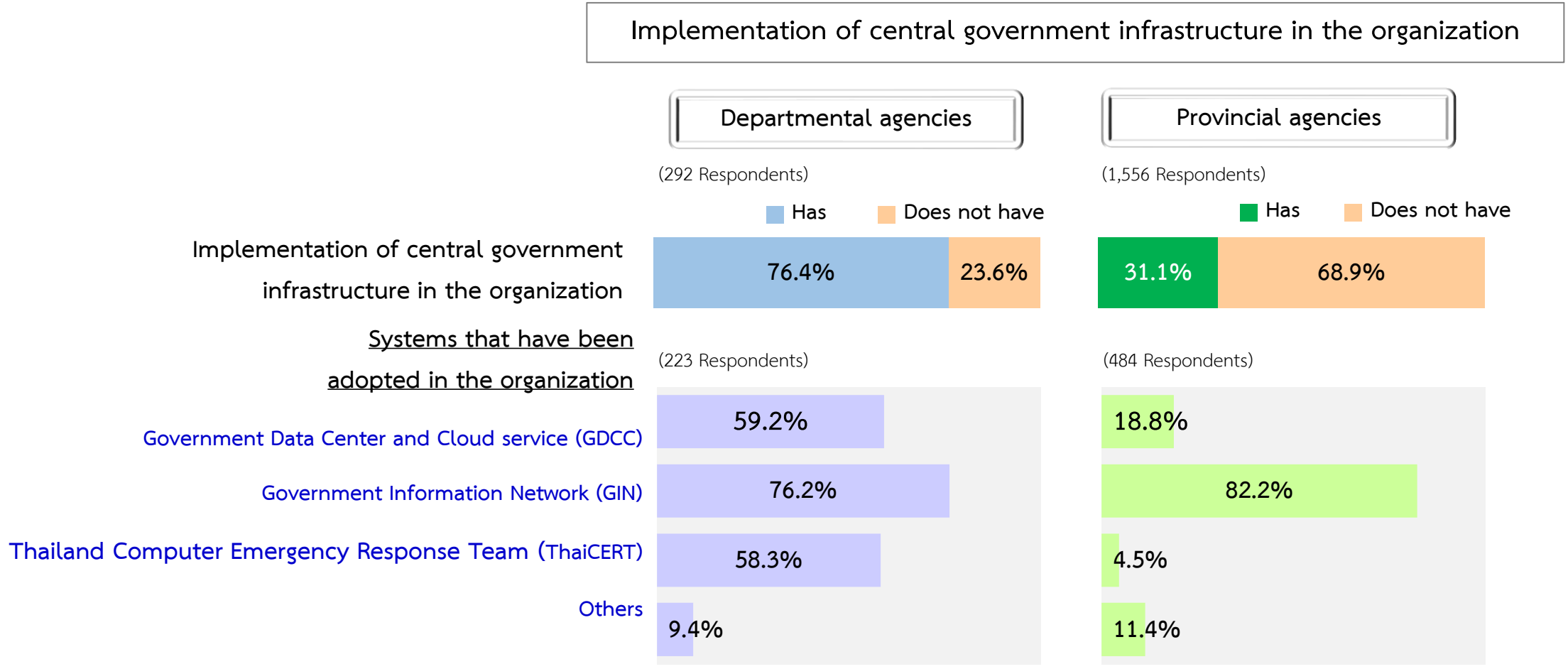
Pillar 5: Secure and Efficient Infrastructure

5.1 Reliable Infrastructure



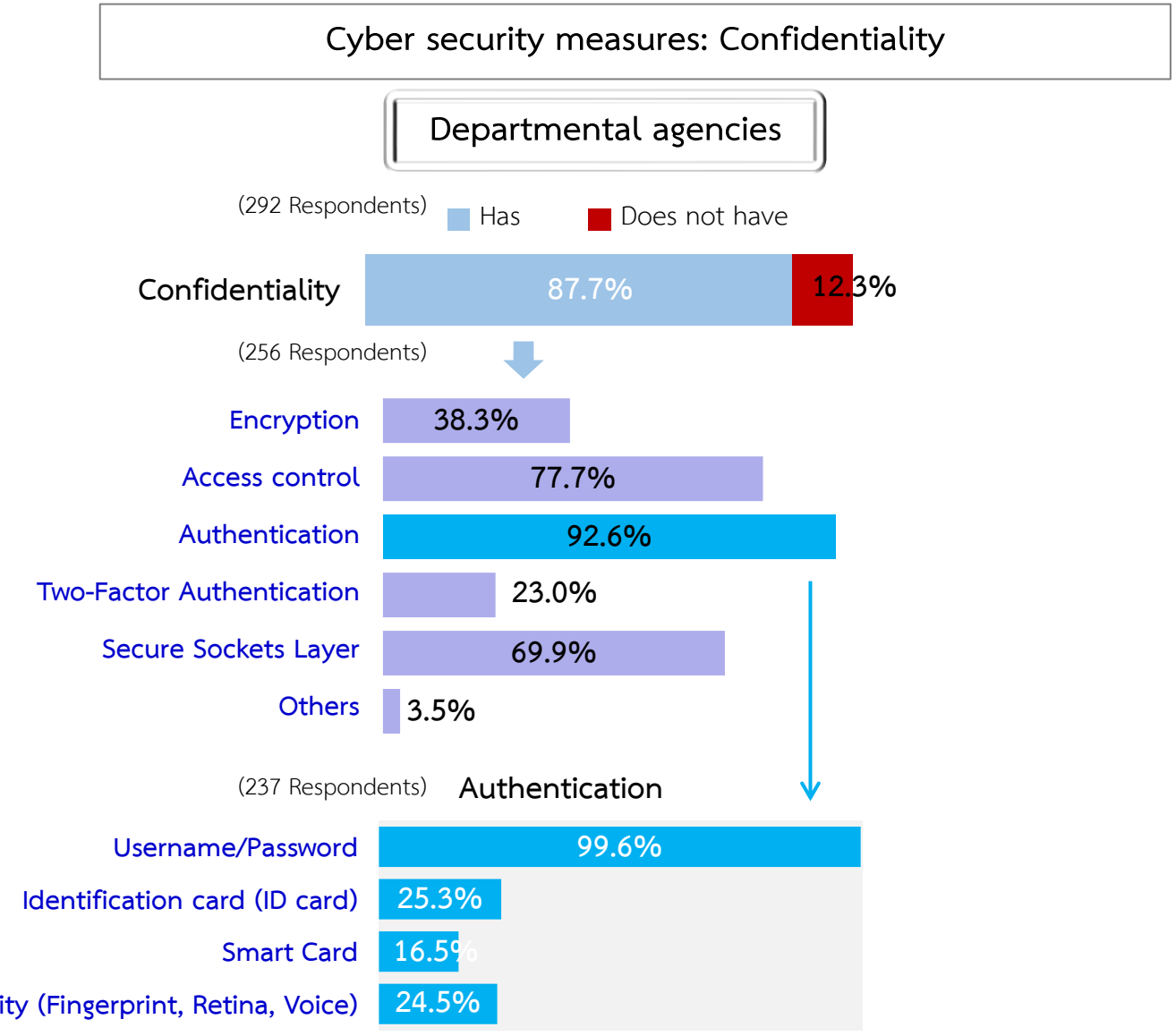
Pillar 5: Secure and Efficient Infrastructure

5.1 Reliable Infrastructure



Pillar 5: Secure and Efficient Infrastructure

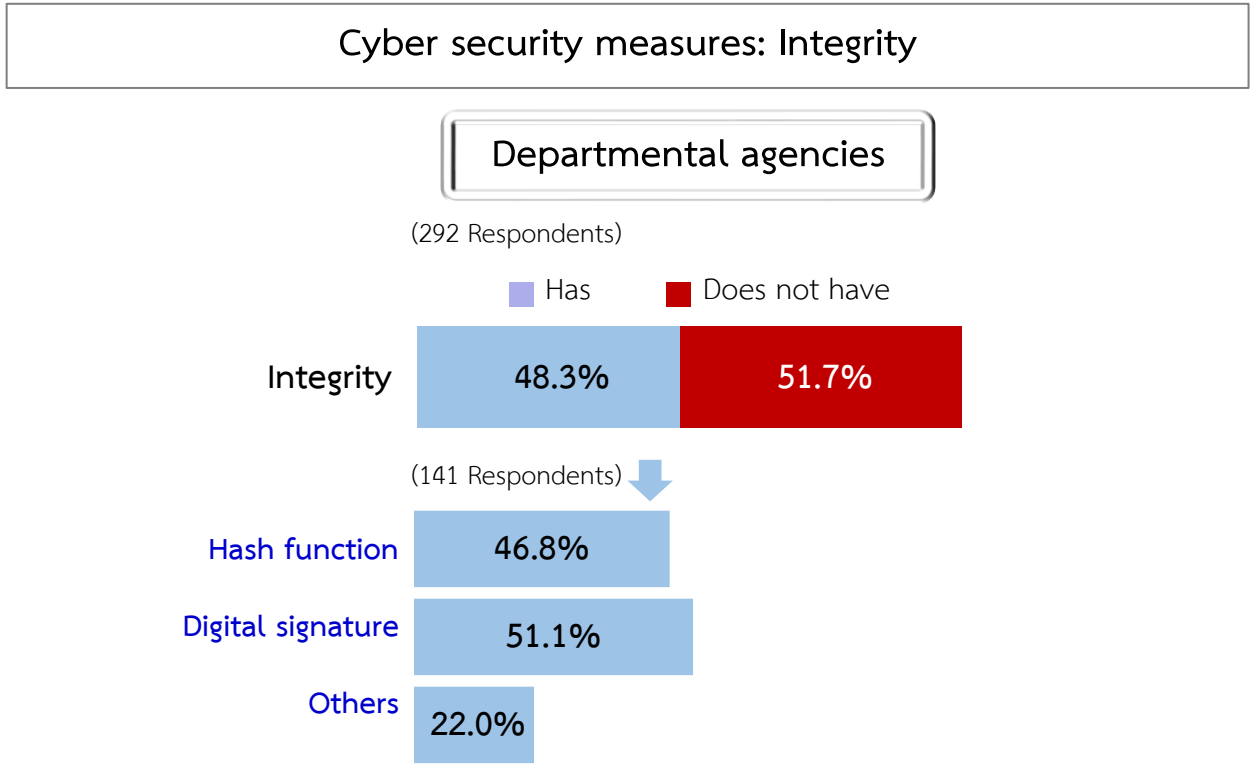
5.2 Cyber Security



Note : Provincial agencies are not asked

Pillar 5: Secure and Efficient Infrastructure

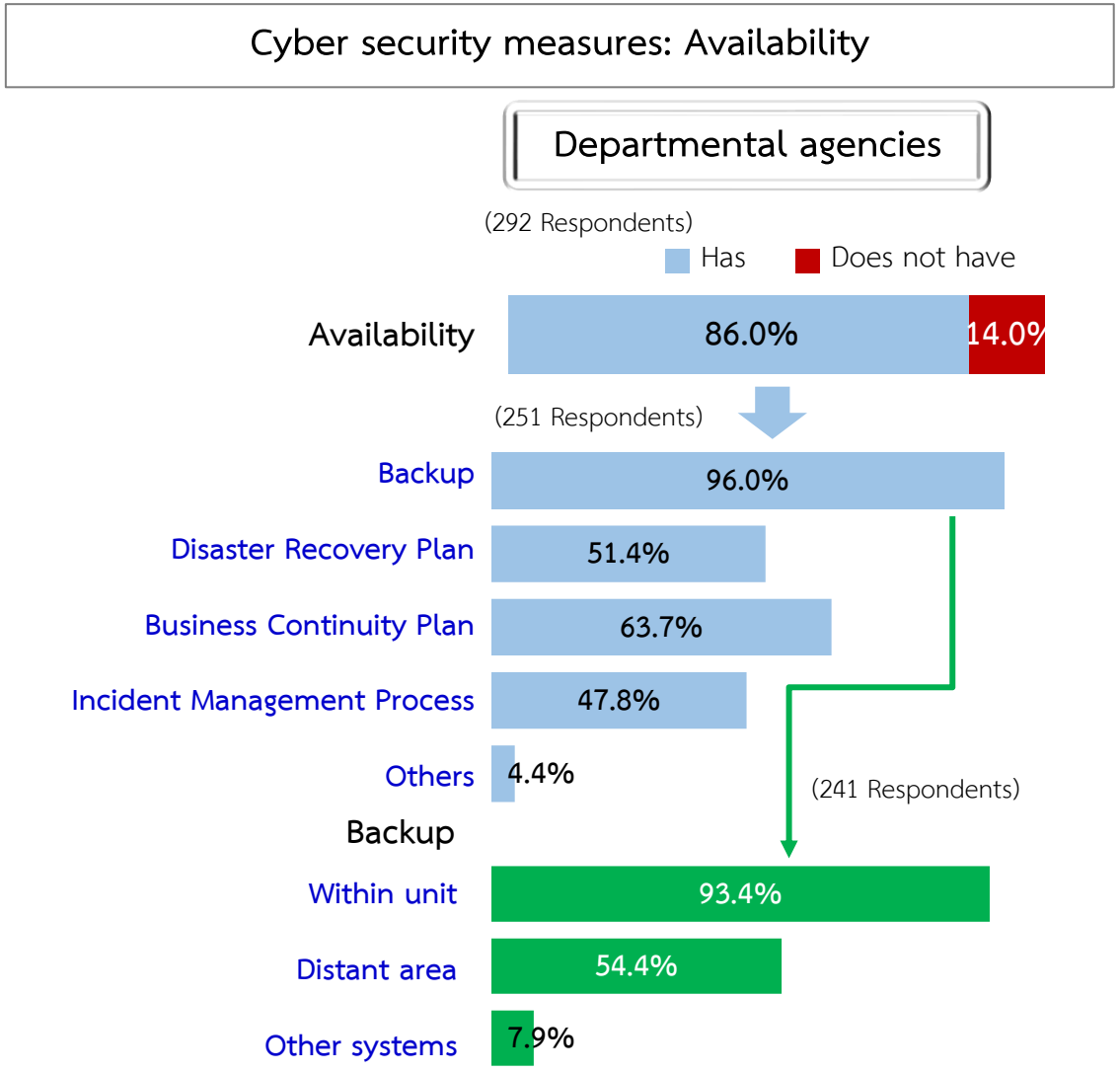
5.2 Cyber Security



Note : Provincial agencies are not asked

Pillar 5: Secure and Efficient Infrastructure

5.2 Cyber Security

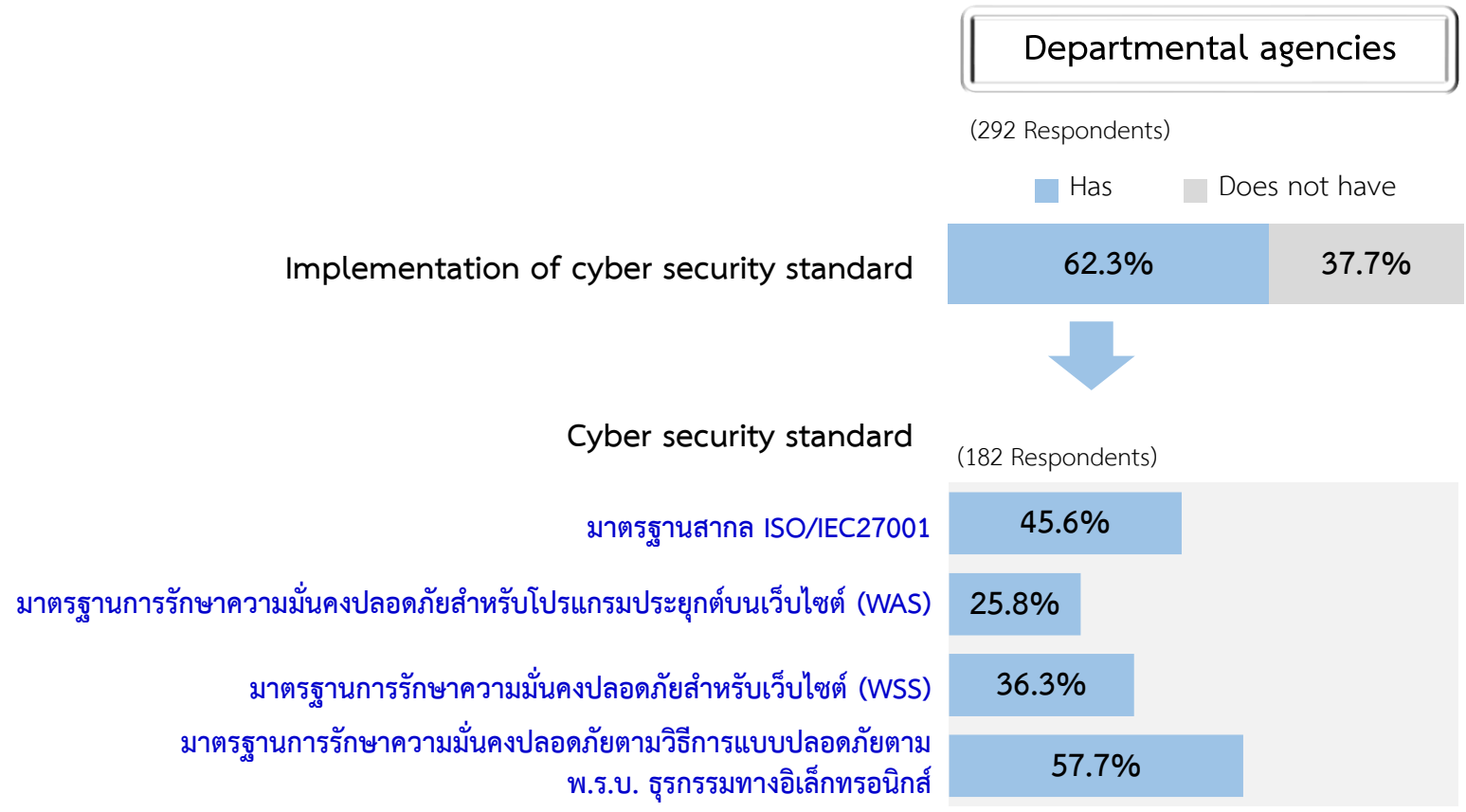


Note : Provincial agencies are not asked

Pillar 5: Secure and Efficient Infrastructure

5.2 Cyber Security

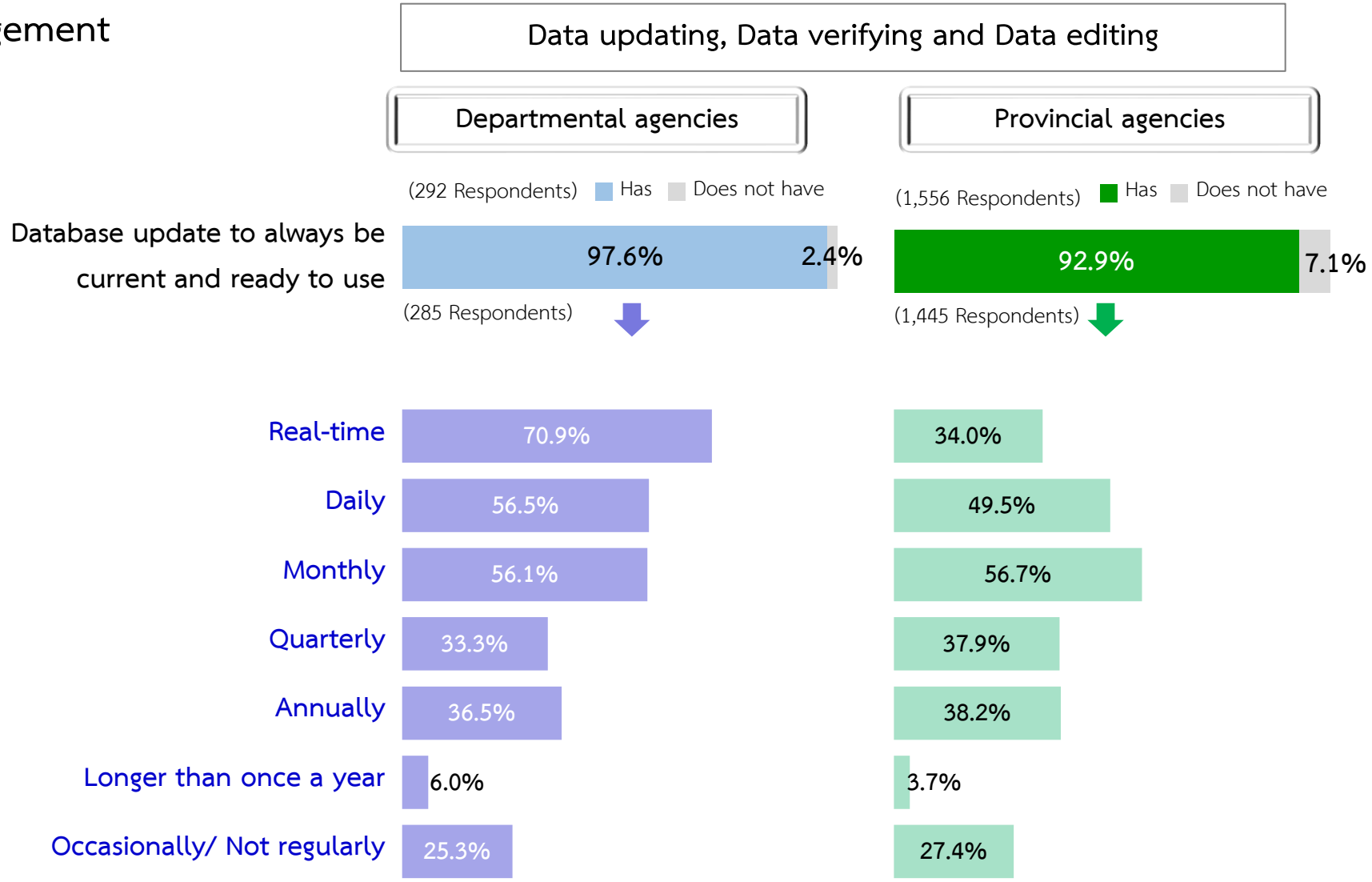
Implementation of cyber security standard



Note : Provincial agencies are not asked

Pillar 5: Secure and Efficient Infrastructure

5.3 Data Management

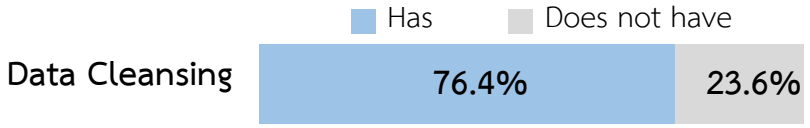


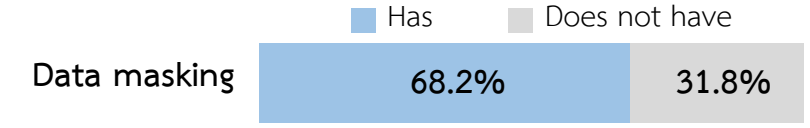
Pillar 5: Secure and Efficient Infrastructure

5.3 Data Management

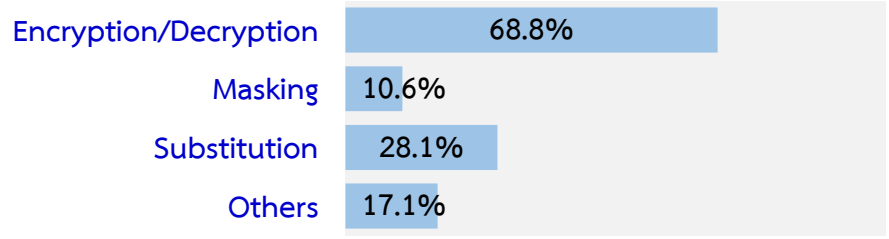
Departmental agencies

(292 Respondents)



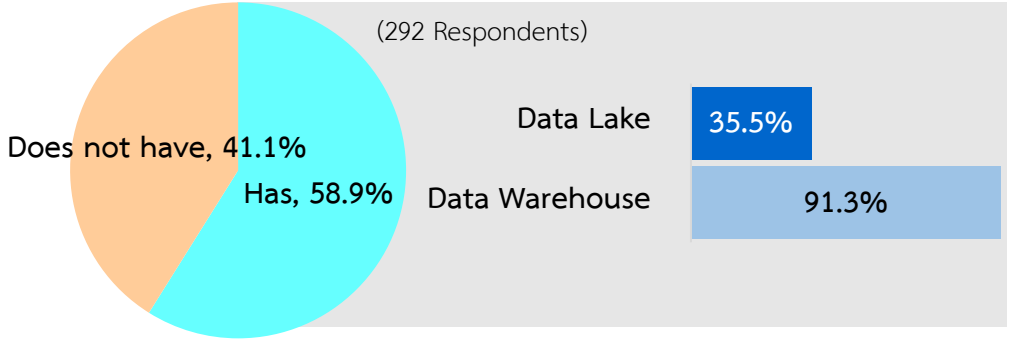


(199 Respondents)

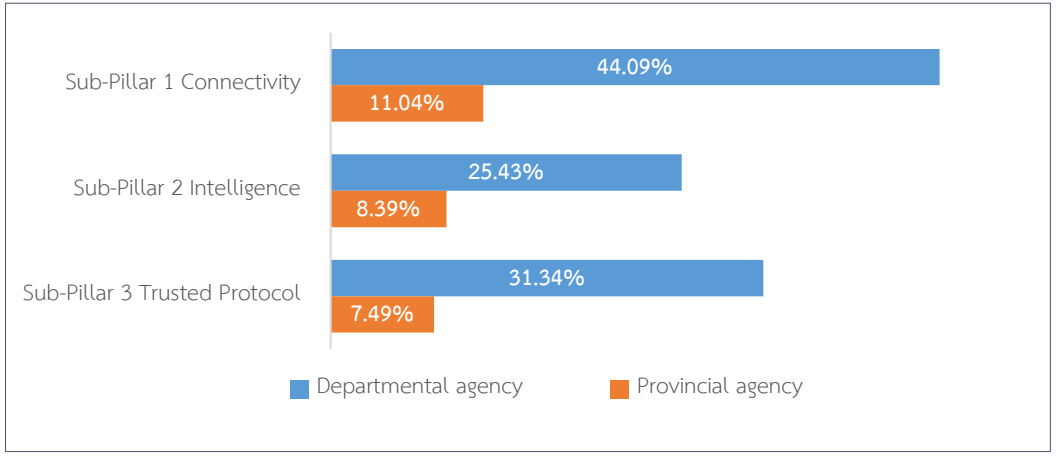


Data Warehouse and/ or Data Lake preparation

(292 Respondents)



Pillar 6: Digital Technological Practices



Overall score

	Highest Pillar	Lowest Pillar
Departmental level	Connectivity	Trusted Protocol
Provincial level		

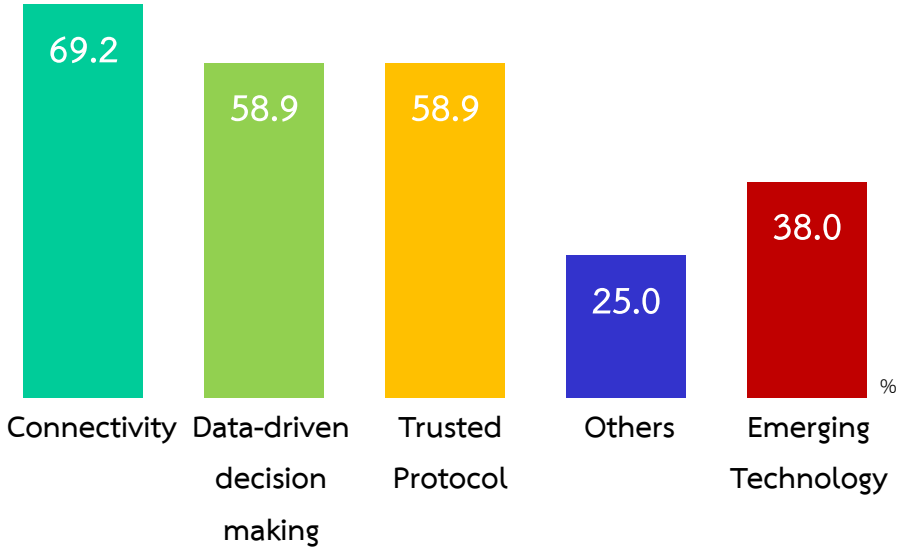
Summary of Fact finding

- Most of the agencies have the least score on this Pillar. This can be clearly support from as per the budget allocation where less amount of the budget has been allocated for technology development both departmental and provincial agencies.
- When considering the technologies implemented in each area, it is found that advanced technologies have not been implemented i.e. API, IoT, Big Data Analytics

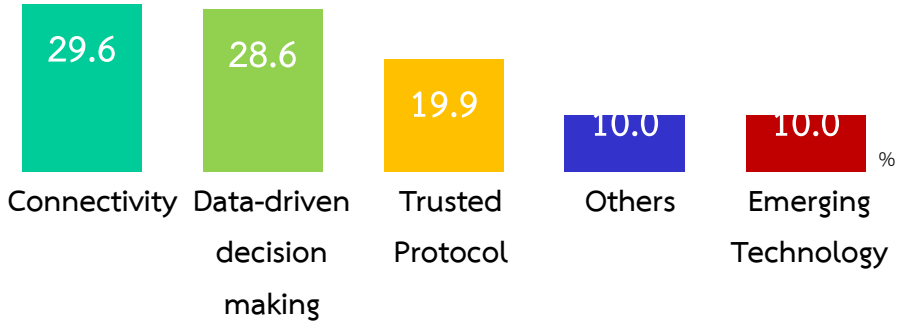
Pillar 6: Digital Technological Practices

Technology adoption in government agencies

Departmental agencies (292 units)



Provincial agencies (1,556 units)



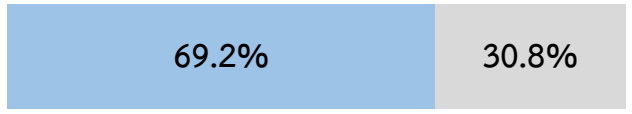
Pillar 6: Digital Technological Practices

Technology adoption: Connectivity

Departmental agencies

(292 Respondents)

Technology adoption: Connectivity



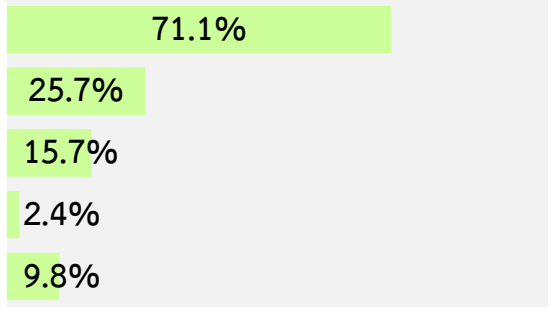
(202 Respondents)

(292 Respondents)

Provincial agencies

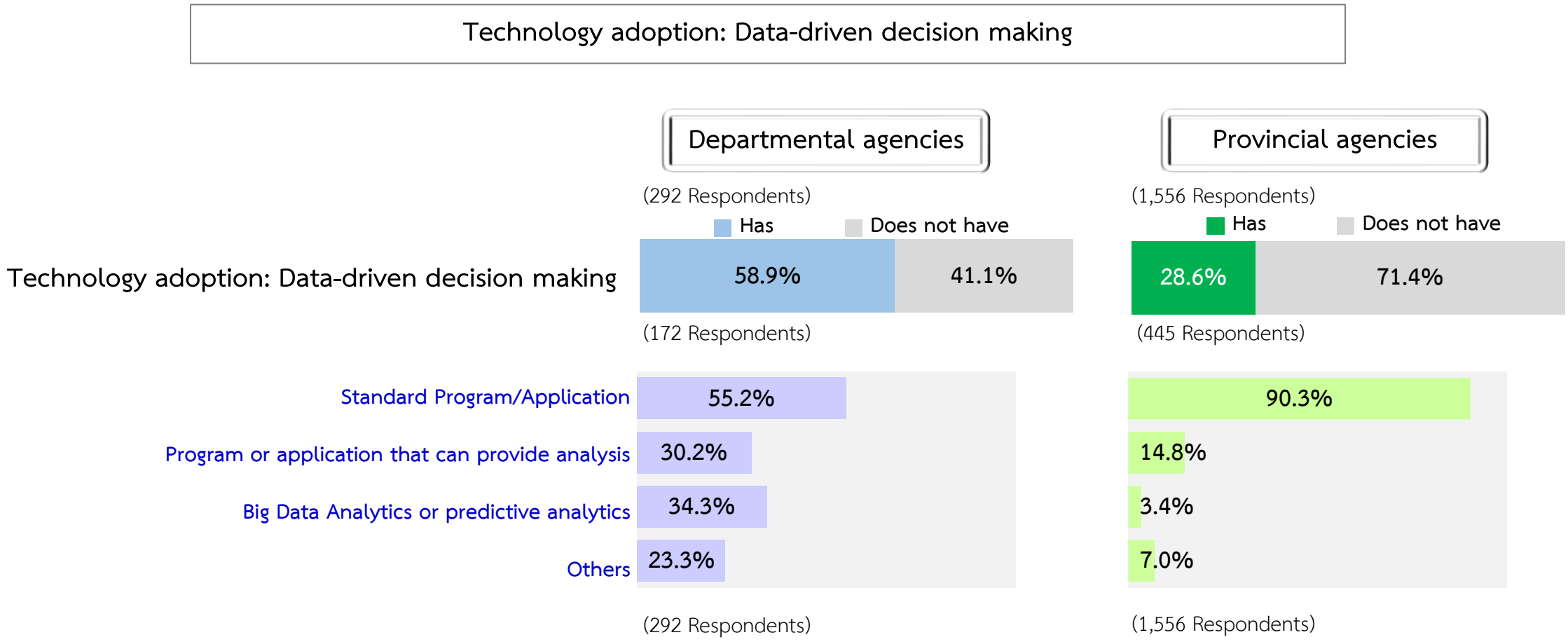
(1,556 Respondents)

(460 Respondents)

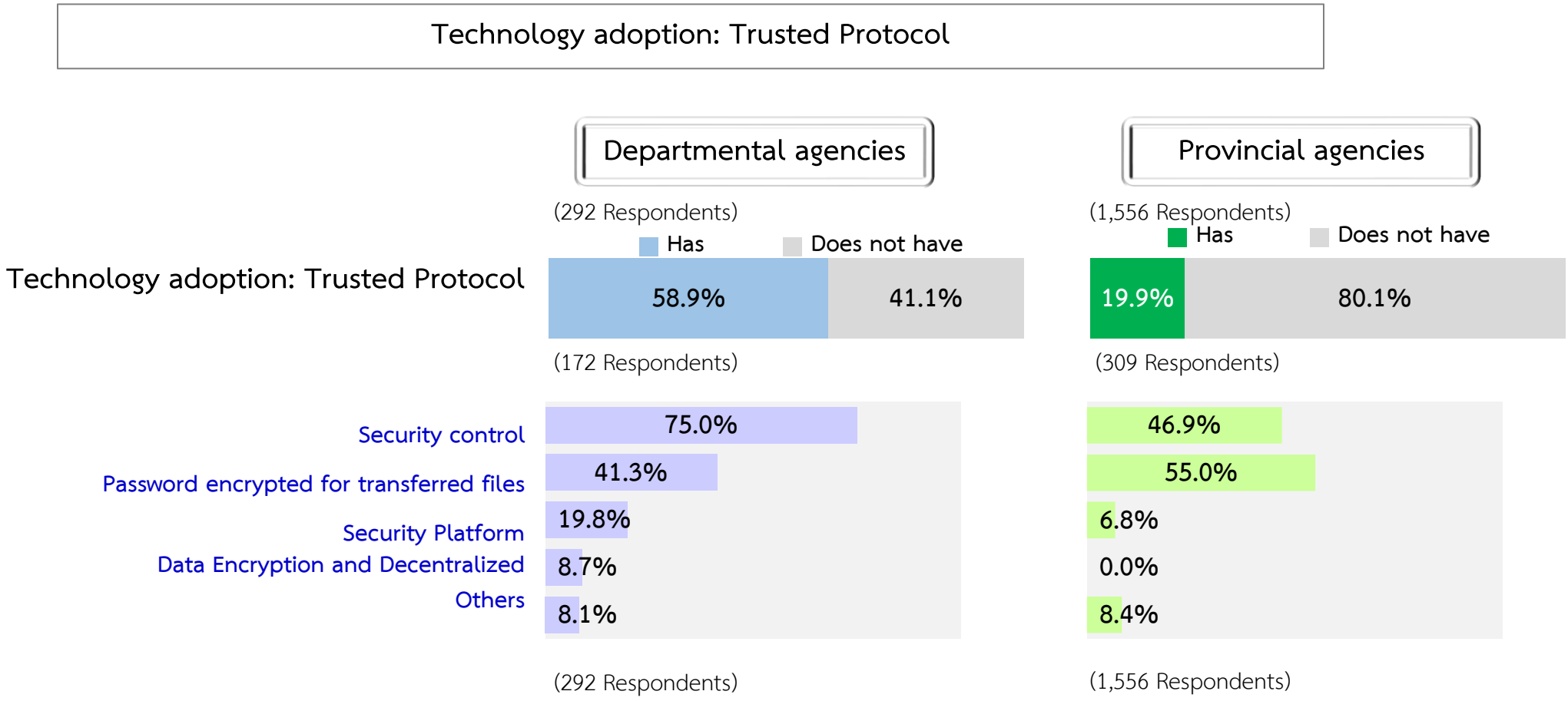


(1,556 Respondents)

Pillar 6: Digital Technological Practices



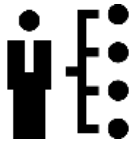
Pillar 6: Digital Technological Practices



Recommendation for Thailand Digital Government Development

Recommendations are based on the survey results for each Pillars

Policies and Practices



Digital Capability

Public Service

Smart Back Office

Secure and
Efficient Infrastructure

Digital Technological
Practices

Recommendations on Policies and Practices (Pillar 1) (1/3)

Summary of Fact finding

Digital policy

- The Departmental Agency: Most of them have good knowledge and understanding of the digital government development plan required by their own agencies and have a plan that is consistent with the digital government development plan.

Data policy

- Most Departmental Agencies have preliminary actions both data governance and open government data but there is still a lack of action to continuously improve or maintain their standards.
- Most agencies with disclosure Information is disclosed in basic file formats such as PDF, DOC, CSV, but there is a lack of disclosure in a format that can be used for in-depth analysis such as RDF files.

Legal & regulatory mechanism

- Most Departmental Agencies have no obstacle in term of Regulations that affect operations, However, the agencies with barriers are largely unresolved of Rules or regulations that hinder their operations.

Budget allocation

- Most agencies focus on budget allocation to maintain on equipment and systems, thus lacking budgets for system development or adopting new technology in the organization. This is one of the obstacles that may prevent the agency to drive the project.
- Most provincial agencies do not allocate funds for technology and digital operation. It showed the provincial agencies are not concerned with technology and digital as expected.

Recommendations

1. Encourage agencies to study digital government direction in order to align plan with digital government direction. Most agencies plan are align with digital direction (54.1%). However, agencies should align their plan with digital government direction as following area
    - Enhance digital process and services to support public usage (71.4%)
    - Develop or link with other platforms for fully digitize public services (61.3%)
    - Develop or link with other platforms for government internal management improvements (72.9%)
    - Encourage using digital platforms in working environment (61.7%)

2. Promote and motivate agencies in implementing data governance in order to obtain accurate, complete, and up-to-date information on the acquisition and use of government agencies. effectively and safely. As currently there are only a small number (less than 18%) of departmental agencies that take action and announce the policy of Data governance

Recommendations on Policies and Practices (Pillar 1) (2/3)

Summary of Fact finding

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Recommendations

3. Encourage agencies to disclose information through the open government data center (data.go.th) to facilitate people to access information through a single channel. Along with disclosing information in a format that allows people and businesses to further use or analyze in-depth analysis. Most of the still not disclose data in a format used for in-depth analysis included the files in the format of CSV, .ODS, .XML, .JSON, .KML, .SHP, .KMZ (62%) RDF (URIs,) (6.6%) and RDF (for Linked: Data) (9.6%)

4. Encourage agencies to complete the task of information sharing through the open government data center (data.go.th) as currently most agencies are aware and in progress of preparing (34.6). Most agencies should focus to complete on following areas.

- Area of Format and Quality of Data Disclosed (less than 36% of agencies have completed this area)
- Area of Value and Data Usage (less than 36% of agencies have completed this area)

Recommendations on Policies and Practices (Pillar 1) (3/3)

Summary of Fact finding

Digital policy

- The Departmental Agency: Most of them have good knowledge and understanding of the digital government development plan required by their own agencies and have a plan that is consistent with the digital government development plan.

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- Most provincial agencies do not allocate funds for technology and digital operation. It showed the provincial agencies are not concerned with technology and digital as expected.

Recommendations

5. Encourage the agency to investigate problems and obstacles of government agencies and work together to find practical guidelines and amendments to facilitate digital development policies or plans. Currently, There are 31.2% of departmental agencies that have regulatory obstacle in the operations, and most of the obstacle is the revised regulations or regulations that hinder operations (65.9%).

6. Encourage agencies to study and consider guidelines for allocating sufficient technology budgets to drive the policy into actual practice and having sufficient budget for ongoing project implementation. Currently, Most departmental agencies allocate a budget for digital technology with the most budget on maintenance and maintenance of equipment and systems (90.6%), while budget requested for research and technology implementation is the smallest proportion (20%). These might be one of the obstacles for the organization to adopt new technology

Recommendations on Digital Capability (Pillar 2) (1/3)

Summary of Fact finding

Digital leadership:

- Most departmental CIOs have not completed the training course for information technology executives which has the average working period as CIO is 1.9 years.
- CIO has pushed average of 3 projects to within their 2 years of services.
- The main reasons that the CIOs failed to push digital projects are lack of budget and insufficient personnel. This is consistent with fact found in budget allocation and IT human resource.

IT Human resource

- Most agencies have a proportion of a few technology personnel, compared with the total number of personnel
- In addition, only a small percentage of the technology personnel received a certificate of Digital profession.

Training and development

- The Departmental Agencies provide promotion and knowledge covers most topics which is necessity for the agencies.
- Most agencies did get the assessment after the training course.

IT competency

- Personnel skill assessment scores on certain topics does not correspond to the order of topics that the organization prioritizes in training and education such as cybersecurity.

Recommendations

1. Encourage and support CIO to attend training courses for information technology administrators for gaining knowledge and competence to fully develop the organization and successfully drive digital initiatives. According to fact finding, There are only 31.2% of departmental CIOs that completed the training course for information technology executives.

2. As departmental CIOs has the average working period of 1.9 years. Therefore, government should support agencies to set up a knowledge sharing session for CIO to share ideas and views. This session will allow CIO to share their outstanding digital initiative in order to influence other agencies to adapt in driving their organization.

3. Recruit an appropriate number of technology personnel and develop the competency of personnel in the department to be ready for the rapid changes in technology in the future. The government should set a salary base and welfare for digital-technology personnel within government agencies to compete with the private sector. The incentives can motivate digital-technology personnel to work with government agencies. Currently, Most agencies have a small proportion of technology personnel compared to the total number of personnel (2 %). Moreover, most of the provincial-level technology personnel were staff recruit from other fields (75.3%)

Recommendations on Digital Capability (Pillar 2) (2/3)

Summary of Fact finding

Digital leadership:

- Most departmental CIOs have not completed the training course for information technology executives which has the average working period as CIO is 1.9 years.
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IT competency

- Personnel skill assessment scores on certain topics does not correspond to the order of topics that the organization prioritizes in training and education such as cybersecurity.

Recommendations

4. Encourage agencies to develop tasks especially for digital development which related operations and support the growing number of digital personnel that will be required to drive the success of the organization's digital initiatives. Agencies should focus on following areas.

- Area of Internal Integration and Service Design which is assessed with the lowest skill for provincial agencies (2.97 points)
- Area of Digital Leadership which is relatively low score compared to other area (3.46 points for departmental agencies and 3.02 points for provincial agencies)
- Area of Digital Transformation which is relatively low score compared to other area (3.46 points for departmental agencies and 3.07 points for provincial agencies)
- Area of Cyber Security which is assessed with the lowest skill for departmental agencies (3.36 points)

Recommendations on Digital Capability (Pillar 2) (3/3)

Summary of Fact finding

Digital leadership:

- Most departmental CIOs have not completed the training course for information technology executives which has the average working period as CIO is 1.9 years.
- CIO has pushed average of 3 projects to within their 2 years of services.
- The main reasons that the CIOs failed to push digital projects are lack of budget and insufficient personnel. This is consistent with fact found in budget allocation and IT human resource.

IT Human resource

- Most agencies have a proportion of a few technology personnel, compared with the total number of personnel
- In addition, only a small percentage of the technology personnel received a certificate of Digital profession.

Training and development

- The Departmental Agencies provide promotion and knowledge covers most topics which is necessity for the agencies.
- Most agencies did not get the assessment after the training course.

IT competency

- Personnel skill assessment scores on certain topics does not correspond to the order of topics that the organization prioritizes in training and education such as cybersecurity.

Recommendations

5. Develop training courses and structures for educating personnel to cover all aspects at the same standard to leverage the potential of technical personnel and apply knowledge to cover all skills that are beneficial to the organization. Most agencies should focus on following areas.

- Area of Internal Integration and Service Design which is the lowest area that departmental agencies have been promoted and educated (64.5%)
- Area of Programing language which is the lowest area that provincial agencies have been promoted and educated (35.8%)
- Area of IoT, Automation, Robotic, Cloud etc. which both departmental and provincial agency are less promoted compared to other areas (76.2% and 37.2% respectively)
- Area of Lean/Agile/Design thinking which both departmental and provincial agency are less promoted compared to other areas (6.5% and 39.1% respectively)

6. Encourage all departments to measure results after personnel training therefore the agencies can extend and develop training courses to be more efficient. According to the fact finding results, most agencies (more than 60%) did not has the assessment after the training course.

Recommendations on Public Service (Pillar 3) (1/2)

Summary of Fact finding

Proportion of digital service

- Most agencies get 0 points because they don't know the actual number of services provided.
- A very small percentage of the provincial agencies have their own developed services.
- Most agencies did not realize the need to connect their agency services to a centralized platform or developing a platform to connect with other agencies.

Public participation

- Most departmental agencies can operate completely for this aspect. In terms of providing information and the opportunity for the public to express their opinions. For the opportunity for service recipients / other sectors to participate in decision-making of service development. The agency did well in allowing people to participate in voting related to the development of the agency's services but lacked in the involvement of the private sector / citizen to participate in their cooperative services.

Promote for using digital service

- Most agencies have driven the services including public relations in digital form, but still a lack of pushing services through a central platform such as the central website that is one stop service.

Recommendations

1. Encourage agencies to integrate the systems including Digital ID/Digital Signature, e-Payment, e-Form and e-License/e-Certificated with government agencies 'digital public service in order to provide one-stop-service within the same channel since over 50% of total agencies have not done yet.

2. Develop the public service on digital platform to encourage public services in order for cost optimization. 53.2% of total agencies were found that there were only few public services on digital platform.

3. Encourage government agencies to improve and comply with laws/regulations regarding the cancellation of the request for a hard copy of the ID card and house registration including photocopies of other documents to provide a fully digital service since 30.8% of total agencies still require ID card for proceeding transaction and over 49% of total agencies still require other copy of documents to proceed transaction.

4. Encourage agencies to realize the importance and understand the user needs in order to develop services to match the user needs as only 29.1% of total agencies offer the personalized services.

Recommendations on Public Service (Pillar 3) (2/2)

Summary of Fact finding

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Promote for using digital service

- Most agencies have driven the services including public relations in digital form, but still a lack of pushing services through a central platform such as the central website that is one stop service.

Recommendations

5. 94.2% of total agencies already promoted the digital public services through digital channel. However, the promotion should be consecutively maintained to create awareness. User feedback should be monitored and analyzed to improve the public services to meet the user needs.

6. Encourage agencies to open for participation from public sector to gain insights on user needs as a guideline for further development as only 41.4% of total agencies already implemented.

Recommendations on Smart Back Office (Pillar 4) (1/2)

Summary of Fact finding

Integrated enterprise

- Most agencies do not use a central system or link their own systems with the central system of government agencies
- The provincial agencies has less internal system links than the departmental agencies because the system structure cannot be connected and there is still a lack of budget.

Administration

- Most departmental agencies have adopted technology included Process Automation to help reduce work processes, mainly in human resource management
- Most departmental agencies have reviewed their processes before adopting technology such as Process automation. However, it was found that most of the agencies did not review the process because the lack of budget and there is no supportive policy.
- Most agencies also use paper documents transmission because there is no clear policy to cancel the transmission of paper documents.
- Most departmental agencies have technology to support working at home, however, most provincial agencies do not have the technology to support working at home.

Communication and collaboration

- Most agencies use communication and collaboration channels within the organization. They can use the channel suitable for the objectives.
- However, it was found that the agencies that did not use shared channels due to the lack of supportive policy or budget.

Recommendations

1. Encourage and encourage agencies to adopt the central government system in monitoring, evaluation and communication as the full integration of information with the government agencies including government correspondence (which only 13.8% of total agencies adopted), Parcel management (which only 11.1% of total agencies adopted), and Tracking and Evaluation (which only 16.9% of total agencies adopted) to support fully system integration.

2. Encourage agencies to develop their own internal systems to be able for linkage with each other to achieve the integration of work within the department and build efficiency between systems since 22.8% of Departmental agencies and 54.5% of Provincial agencies have not implemented system integration.

3. Encourage agencies to develop the system to support system integration with external parties in order to cooperate and exchange useful data . 89.4% of total agencies were in need of system integration with external parties but only 55.2% already implemented.

4. Encourage agencies to develop the technology that supports remote working since 60.1% of total agencies still have not this technology.

Recommendations on Smart Back Office (Pillar 4) (2/2)

Summary of Fact finding

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Communication and collaboration

- Most agencies use communication and collaboration channels within the organization. They can use the channel suitable for the objectives.
- However, it was found that the agencies that did not use shared channels due to the lack of supportive policy or budget.

Recommendations

5. Encourage organizations to adopt digital technology in Process Automation to minimize work processes, increase work speed and reduce redundancy of work processes across types of services especially in secretay work and automate test in which only 24.8% and 30.1% of total agencies already adopted.

6. Amend the regulations and issue the policy to cancel the paper document delivery to lean the work process and reduce the operating cost. From the survey, 95% of total agencies have worked with other agencies on digital platform. However, there was no obvious policy to omit the paper document causing over 90% of them still rely on paper document along with digital files.

7. Educate agencies about online collaboration and communication platform and encourage the appropriate adoption of each platform to increase work productivity. Although most of total agencies have already adopted those platforms, it is noted that over 90% still use Line as a communication channel for both internal and external communication which might cause the confidentiality issues.

Recommendations on Secure and Efficient Infrastructure (Pillar 5) (1/4)

Summary of Fact finding

Reliable infrastructure

- Agencies at both departmental and provincial levels have insufficient hardware and software infrastructure. This is against the budget allocation of the departments at both levels which focused on the maintenance of equipment and systems.
- Most agencies are lack of central structure of the government to apply in the agency

Cyber security

- Most departmental agencies have implemented measures to maintain cybersecurity. In terms of the Integrity of the information in a small proportion.
- The cybersecurity standard has been implemented in accordance with the secure method of the Electronic Transactions Act. Most agencies will only start working if they have a clear policy released as a guideline for them to follow.

Data management

- The departmental agencies have a completed knowledge and understanding of the data storage, especially in terms of data updating which is updated in Real time format.
- However, the agency still need to develop in the field of data for in-depth analysis or analyze to forecast future results.
- Most agencies have been rated with the lowest score on Pillar was 6, which is reflected in the budget allocation of departmental and provincial agencies that minimum focus on research to adopt new technology on all topics

Recommendations

1. Encourage all departments to prepare hardware and software infrastructure that is sufficient for use and is suitable for actual application to increase the efficiency of the works of agency. According to fact finding results, most departmental agencies have insufficient hardware and software infrastructure to operate. Department-level agencies have insufficient hardware infrastructure that reaches of 45.2 % and insufficient software reach of 39 %.

2. Encourage agencies to use infrastructure from the central government especially in the use of Government Data Center and Cloud service (GDCC) to increase the stability and security of data including economies of scale. According to fact finding results, There are only 18.8% of agencies who use infrastructure from the central government.

3. Support agencies to maintain cybersecurity in terms of integrity in order to increase the security of transactions and reduce the risk of counterfeiting by using hash function and digital signature. Currently, there are only 46.8% and 51.1% of departmental agencies that using hash and digital signature to secure transactions.

Recommendations on Secure and Efficient Infrastructure (Pillar 5) (2/4)

Summary of Fact finding

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Recommendations

4. Encourage agencies to develop the Disaster recovery plan: DR plan and Incident Management Process to secure data and to prevent data loss from any uncertainty circumstances. According to fact finding results, there are only 51.4% of departmental agencies that have Disaster recovery plan: DR plan and 47.8% have Incident Management Process

5. Build up understanding and promote the organization to manage the backup system in remote areas to increase the level of security and prevent data loss. Currently, Most of agencies has backup system but they placed the backup data at the same location where their organization is located (93.4%). In fact, backup data should be store at remote areas to prevent the data loss from any uncertainty such as fire or man-made disasters.

Recommendations on Secure and Efficient Infrastructure (Pillar 5) (3/4)

Summary of Fact finding

Reliable infrastructure

- Agencies at both departmental and provincial levels have insufficient hardware and software infrastructure. This is against the budget allocation of the departments at both levels which focused on the maintenance of equipment and systems.
- • Most agencies are lack of central structure of the government to apply in the agency

Cyber security

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Recommendations

6. Only 62.3% of total agencies complied with cyber security standard and most of them only complied with the minimum standard of Electronic Transactions Act. Therefore, the improvement on cyber security standard is needed to secure information technology by covering these following standards:

- ISO/IEC27001 – Only 45.6% of total agencies complied with this standard
- Web Application security Standard: WAS - Only 25.8% of total agencies complied with this standard
- Website Security Standard: WSS - Only 36.3% of total agencies complied with this standard

7. Encourage the real time update or daily update to increase the efficiency of data. 70.9% of Departmental agencies implemented real time update while only 34% of Provincial agencies implemented real time update.

Recommendations on Secure and Efficient Infrastructure (Pillar 5) (4/4)

Summary of Fact finding

Reliable infrastructure

- Agencies at both departmental and provincial levels have insufficient hardware and software infrastructure. This is against the budget allocation of the departments at both levels which focused on the maintenance of equipment and systems.
- • Most agencies are lack of central structure of the government to apply in the agency

Cyber security

- Most departmental agencies have implemented measures to maintain cybersecurity. In terms of the Integrity of the information in a small proportion.
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Recommendations

8. Develop the skills of personnel in data use for analysis, especially, Predictive Analytic and Diagnostic Analytic to increase the effectiveness and applicable results from analyzing data. Currently, Some of departmental agencies that using predictive analytic (50.8%) and diagnostic analytic (67%)

Recommendations on Digital Technological Practices (Pillar 6)

Summary of Fact finding

- Most of the agencies have the least score on this Pillar. This can be clearly support from as per the budget allocation where less amount of the budget has been allocated for technology development both departmental and provincial agencies.
- When considering the technologies implemented in each area, it is found that advanced technologies have not been implemented i.e. API, IoT, Big Data Analytics

Recommendations

1. Government should promote knowledge and understanding of modern technology such as Big Data, IoT, AI, Block Chain, etc., Therefore, the government agencies can select and apply modern digital technology in their management of the public sector and serving people appropriately; suit with the agency context to promote the leverage of government work and create new innovation. According to fact finding results, most of provincial agencies relatively applied the least technology for all areas (less than 30%)

2. Promote the using of technology in communication through mobile application channel which at is the core of Digital transformation. Because mobile application channel can reach to many users and create seamless customer experience to end user. According to fact finding results, only 24.5% of departmental agencies and 29.2% of provincial agencies have service on mobile application

Policy recommendations based on digital government readiness survey (1/2)

Topic	Recommendations
Budget allocation	1. The government should promote or cooperate with the private sector for system development to provide the fundamental software services to support the internal use in order to increase the efficiency of operations within agencies, to reduce costs of system maintenance, as well as to reduce the costs of software license within agencies. The findings from the survey reveals that most agencies are still lacking basic software infrastructure, especially the Microsoft Office (Word, Excel, PowerPoint) which more than 80.7% of agencies are still lacking even though they are the most fundamental software required for all agencies. Government considered for Improve the budget approval system of the government has paced up to the actual practice in various digital projects of government agencies 2. Government should focus on developing 'IT infrastructure as a service' to reduce the needs for outsourcing services from private sector. However, this should be limited to core infrastructure only, each agency can further develop their own systems on infrastructure according to their specific needs. 3. Government should assign an agency to be responsible for the research and the development of technology to be used specifically for the government agencies. This is essential since many of the agencies are still lack of the budget and personnel to research and develop new technology on their own. The survey has found that more than 90.6% of all agencies allocate most of their budget on the maintenance of their IT systems and equipment, while budget allocated on the research and development of new technology has the least priority of only 20% of overall budget. 4. Government should review the budget approval procedures to be flexible for adopting an up-to-date technology at the right time.

Policy recommendations based on digital government readiness survey (2/2)

Topic	Recommendations
People development	1. 1.Government should establish a pooling resource system with a pool of key personnel who owns a desirable skills for digital development. This will solve the problem of lack of tech personnel among all government agencies which resulted in the need to acquire personnel with no technology background to do the work, especially in the provincial agencies with the percentage as high as 75.3%. 2. 2.The government should encourage agencies throughout the nation to develop Digital Transformation Roadmap. Therefore, the agencies can plan people development under their own authority effectively. 3. All government agencies should focus more on front office skill development since back office operation will be gradually eliminated.

Extended recommendations based on digital government readiness survey (1/4)

Topic	Recommendations
Pillars 1: Policies and Practices	1. Government should define the success indicators for digital maturity development in terms of numeric values such as transaction period, service-level agreement (SLA) etc. Because the post training evaluation cannot obviously illustrate the development. Numeric indicators can be a tangible measurement to track agencies' performance. 2. Government should provide incentives for agencies to accelerate the digital maturity development through building awareness of outstanding agencies through public media. It should also promote a role-model agency for each digital topic that is needed to be driven. The outstanding case studies or performance should be published through central government. Top-down encouragement from central government is more powerful to express the intention to drive the digital government. 3. The government should develop a data center for data exchange and digital registrations among government agencies. Some agencies still require ID card or other copies of document to proceed public. Data center will centralize these personal information to share across agencies and reduce redundant document requirement.

Extended recommendations based on digital government readiness survey (2/4)

Topic	Recommendations
Pillars 2: Digital Capability	1. Establish required digital core skillset and courses for government agencies. They may create their own course content or international course standards that are aligned with the required skill. According to fact finding results, most of agencies recognize the need of the organization to enhance digital skills in all aspects. However, the training and education are separately developed by each agency and may not fully meet digital government standard. Therefore, governments should define guideline for required skill set and standardized training course to set up standard but allow each agencies to operate their own training course according to their specific skills needed.
Pillars 3: Public Service	1. Government should set up the central agency to oversee digital infrastructure development for core system such as e-payment for government services, e-personal data, central platform for public services etc. This agency should take role in set up a system infrastructure guideline for these core systems which is widely used across many agencies. Currently, more than a half of total agencies did not realize the importance of core system integration. 2. Central digital agency should motivate the key success indicators for customer experience development to shape the service development direction align with users needs and customer centricity.
Pillars 5: Secure and Efficient Infrastructure	1. The government should establish measures or systems to secure access to the digital services of government agencies to create credibility. Government should set up minimum requirement for agencies to comply with cyber security standard in order to deal with unexpected cyber crime in the future. According to fact finding results, most of agencies has different level of cybersecurity implementation even under the same areas (CIA). Therefore, if there are explicit measurement from government, this will drive each agencies to strengthen cyber security standard.