The Readiness for Moving toward Digital Thailand — A Case Study

Wasinee Noonpakdee, Acharaphun Phothichai, and Thitiporn Khunkornsiri

Abstract—**The digital economy, which is a new economy represented by the inclusion of technology and digital information, has become a dominant force in today's economy. In Thailand, there is an urgent need to leverage digital technology to drive the country forward. Therefore, Digital Thailand Plan is developed to generate social stability and economic wealth in Thailand. This paper presents a study of readiness for moving toward Digital Thailand, a case study in a government sector. The research process consists of three stages: 1) Literature review 2) An in-depth Interview of top-management officers in eight government agencies 3) Analysis and conclusion. In this paper, the readiness for moving toward Digital Thailand is analyzed regarding Information System management, E-Government Service, Staff, Data Management, Digital Technology and Infrastructure, and Organization's culture.**

Index Terms—**Digital economy, digital government, readiness.**

I. INTRODUCTION

The use of information and information technology in the economy allows companies to be competive. Many economy sectors or industies applied Information and Communications Technology (ICT) to create new products and services such as automotive industry, telecomunication industry, energy sector, financial sector, and service sector [1]. Digital economy is the recent way of doing business with the help of ICT, especially the Internet [2]. It is a new economy represented by the inclusion of technology and digital information [3]. The digital economy is a dominant force in today's economy, and is sometimes called the new economy or the Internet economy [4]. There is an opportunity for a country to transform the economy and to contribute to the development of the digital economy [5].

In Thailand, extensive reformation in all socio-economic dimensions is undertaken. There is an urgent need to leverage digital technology to drive the country forward. Consequently, Digital Thailand Plan is developed to generate social stability and economic wealth in Thailand [6]. This research aims to study the readiness for moving toward Digital Thailand, a case study in government sector. The results can be a guideline for preparing Digital Thailand Plan to create social stability and economic wealth.

The rest of this paper is organized as follows. Section II presents literature review of Digital Thailand, Digital Government, and Research framework. In Section III,

research methodology is provided. The results of this research are described in Section IV. Finally, Section V concludes the paper.

II. LITERATURE REVIEW

A. Digital Thailand

Digital Thailand Plan is developed by Ministry of Information and Communication Technology (MICT) and Ministry of Science and Technology (MOST) as a digital blueprint to revolutionize government operations, business practices, and people's lifestyle. The objective of this plan is to generate social stability and economic wealth in Thailand The plan consists of six strategies which are: 1) Build country-wide high-capacity digital infrastructure, 2) Boost the economy with digital technology, 3) Create a quality and equitable society through digital technology, 4) Transform into digital government, 5) Develop workforce for digital era, and 6) Build trust and confidence in the use of digital technology [6].

1) Build country-wide high-capacity digital infrastructure

In this strategy, high-quality broadband will be rolled out country-wide. Broadband subscription rate will be priced under 2% of GNP per Capita. Thailand will become one of the Internet connectivity hubs. Mobile services will be provided in all communities.

2) Boost the economy with digital technology

The goals of this strategy is to increase overall competitiveness of Thai businesses. More SMEs in agriculture, manufacturing, service sectors will leverage digital technology to compete regionally and globally. Thailand will be placed in the top 30 of the World Competitiveness. Digital sector will contribute at least one-fourth of the country's GDP. Thailand's digital industry will become one of the regional leaders.

3) Create a quality and equitable society through digital technology

In this strategy, people of all groups and abilities will be able to access and make use of digital technology. All Thais will become digitally literate. Education, healthcare, and essential public services will be accessed via digital means.

4) Transform into digital government

Government services will meet the demands of people and businesses with respect to convenience, speed, and accuracy. People will be able to easily access government data to ensure transparency and civic participation. Government infrastructure and data will be integrated to link

governmental functions and provide effective services to the people.

5) Develop workforce for digital era

Digital specialists, especially in highly-needed categories, will be developed in both quantity and quality. New jobs and new businesses will be generated. Workforce in all sectors will become digitally competent.

6) Build trust and confidence in the use of digital technology

People will have trust and confidence in online transactions. Digital laws and regulations will be updated to meet the demands of the digital era. Data standards will be introduced and implemented to ensure seamless online transactions.

B. Digital-Government

E-government has emerged in public administration to apply ICT for supporting governments in information and service delivery, efficiency and effectiveness, interactivity, decentralization, transparency, and accountability and also to offer a one-stop services for stakeholders [7], [8]. Instead of e-government, the term can be called 'digital government' or 'virtual state' [8], [9].

In Thailand, Digital government development plan is developed in order to determine the direction of raising digital capacity of the government to be unified and concrete. Moreover, the drive for Thai government toward Digital government is one of the key strategies of Digital Thailand Plan. Digital government development plan comprises four main strategies which are 1) Development of the digital capacity toward Digital Government, 2) Development of People's Quality of Life, 3) Maximized Competitiveness of the Business Sector, and 4) Advancement of Public Security [10].

The first strategy, Development of the digital capacity toward Digital Government, contains six measures which are Data integration, Verification and authorization via Smart Card, One stop service, Proactive complain resolution and need access, Electronic Services Infrastructure, and Government Personnel's Competency Development.

In the second strategy, Development of People's Quality of Life, the measures are Proactive integrated services to support the citizen, and integrated labor market.

The measures of the third strategy, Maximized Competitiveness of the Business Sector, are integrated agriculture, integrated tourism, integration of cross-sector investment services, integration of import-export, proactive SME Promotion to support the growth, and integrated Cross-organization Tax System.

Finally, the fourth strategy, Advancement of Public Security, includes four measures which are Proactive Public Security Using Analysis Tools, Advance Passenger Identification and Passenger Risk Assessment, Integrating Information to Prevent Natural Disasters, and Integrating Information among Agencies for Crisis Management.

C. Conceptual Framework

The worldwide e-government development has passed many different phases, and can be seen from E-government annual benchmarking by several international institutions.

The information readiness and availability is important to improve e-government policies and strategies [11], [12].

In this research, the readiness for moving forward Digital Thailand is divided into six modules: Information System management, E-Government Service, Staff, Data Management, Digital Technology and Infrastructure, and Organization's culture. The conceptual framework is illustrated in Fig. 1.
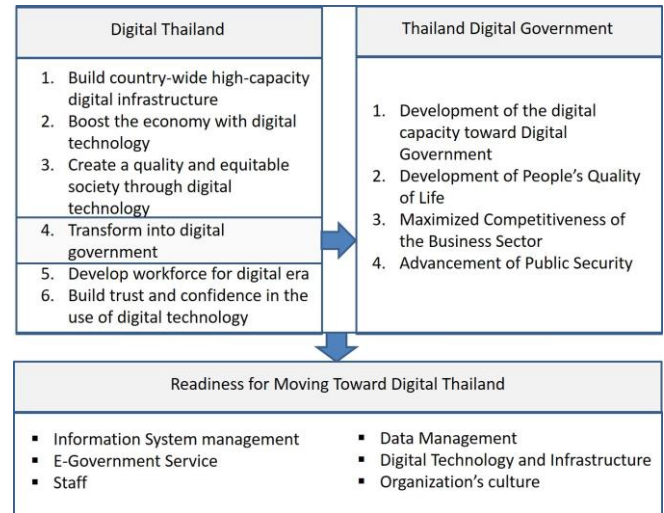

Fig. 1. Conceptual framework.

1) Information system management

Information management is the basis of the emerging concept of network economy, e-economy, specifically, economic activities that are performed via digital telecommunications. [13].

This part emphasizes on the information system of operational management or management of information resources of the organization such as PM (Project Management), ERP (Enterprise Resource Planning), CRM (Customer Relationships Management), SRM (Supplier Relationships Management), SCM (Supply Chain Management), or EAM (Enterprise Asset Management).

2) E-government service

E-Government simply refers to the use of ICT to deliver government services to its citizen [14]. There are three main classifications of e-government systems: government to government (G2G), government to citizen (G2C), and government to business (G2B) [7], [15].

3) Staff

A well-trained and motivated workforce is critical to the success of E-Government [16]. The human capital of a country reflects the extent to which the population is literate and has attained an adequate level of education [17]. Information literacy, which is the ability to effectively use digital media to access, create, manage and evaluate information, plays an important role in today's digital society [18].

4) Data management

The availability and access to government information should be top priority for every government [19]. Regarding data architecture, there are several general patterns and principles that are key to the operation such as Data

ownership, Service unit groups, Data encapsulation, Data sharing, Access locking, Legacy systems, Outsourcing, Legal records, and Data compatibility [20].

5) Digital technology and infrastructure

The use of digital technologies (DTs) as electronic tools for conducting transactions and services has grown considerably. DTs and tools have different architecture and comprise such tangible items like computers and computer accessories; and intangible items such as software packages, communication networks and the internet [21]. ICT infrastructure, such as broadband, has promoted networked innovation and collaboration among universities, industries, and governments. As a technological capability, the ICT infrastructure influences the development, diffusion, and use of innovations [22].

6) Organization's culture.

Organizational culture having interacted with human resource, organizational structure and controlling system has included values and beliefs; as a result, it has established behavioral norms. The culture influenced all aspects of an organization [23].

III. RESEARCH METHODOLOGY

This research is a qualitative research. As shown in Figure 2, the research process is composed of three stages: 1) literature review including digital Thailand and Digital Government, 2) An in-depth Interview of top-management levels in eight government agencies (G1-G8) in Thailand, and 3) Analysis and conclusion of this research. The data acquired from literature study is applied to develop a framework for the study. After In-depth interview, the analysis and conclusion is conducted.
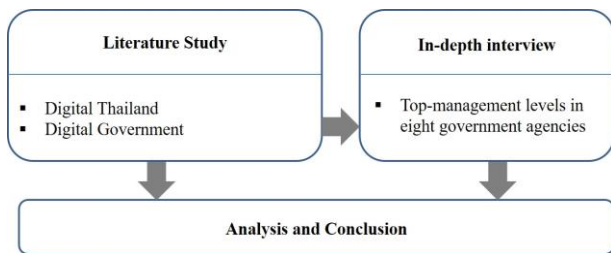

Fig. 2. Research process.

IV. RESULTS

This section presents the result of in-depth interviews of eight government agencies on the readiness for moving forward Digital Thailand which comprised six components: Information System management, E-Government Service, Staff, Data Management, Digital Technology and Infrastructure, and Organization's culture.

A. Information System Management

We analyze how the organization apply the systems for internal resource management, and whether these systems help to work effectively or still have some problems. According to the in-depth interview, all sample organizations apply some system for their management such as ERP, e-document, e-back office. The system facilitates the work of

staff and reduce operational process services. The staff involved in the process of working gradually adopted the system since there are user manuals and clear Policies.

However, there are some issues such as users do not trust the system or human error when inputting data. Therefore, some organizations are still using the paper work together with the system which is paperless. Some officers still use the traditional system (paper work) because they are familiar with the old-fashioned system. The training should be provided, and adequate help desk team should be prepared to answer some questions to solve users' issues. Some laws and regulations do not support the digital procedure. Moreover, digital system do not cover all the electronic processes, so there is a need for paper documents in conjunction with the system.

TABLE I: INTERVIEW RESULT: INFORMATION SYSTEM MANAGEMENT

Government Agency	Detail
G1	System for monitoring performance and expenditure. System for Project Management
G2	ERP, e-Document, Information Management
G3	DPIS (Departmental Personnel Information System), e-Document Systems, Internal Performance Agreement: IPA
G4	ERP, Safety management
G5	Information Operation system
G6	e-Document, e-Meeting
G7	e-Back office
G8	e-workflow, e-document

B. E-Government Service

Regarding the interview, all the agencies (G1 to G8) have their own websites for providing some information and services to the citizen. Some agencies plan to develop new websites and mobile applications for improving the current services and providing new services. However, some agencies that have to contact people in rural areas addressed that they still have to use telephone line (hot line) as a channel to contact the citizen since those people do not have digital literacy. Moreover, some people could not afford the digital device such as smartphone or laptop.

TABLE II: INTERVIEW RESULT: E-GOVERNMENT SERVICE

Government Agency	Detail
G1	Website, e-Map, Sensor network
G2	Website, e-Record service
G3	Website, National Single Window, Web Application, One-stop service
G4	Website
G5	Website, Hotline
G6	Website
G7	Website, Web board, smart phone application (still developing)
G8	Website, e-Service

C. Staff

The interview topics are related to skill, knowledge, attitude of the staff in the organization. The results find that there are some issues related to the generation of the staff. The older generation is difficult to change. There are some

difficulties for this generation to use the new technology. The new generation, who are familiar with digital technology, are learning fast when compared to the older generation. In addition, change management and training should be provided.

TABLE III: INTERVIEW RESULT: STAFF

Government Agency	Detail
G1	Most staff, especially in the middle management, lack the skills, knowledge, and attitude. Most people in the organization are older generation, and they are familiar with traditional system.
G2	Due to the organization size which has nearly 14,000 people, it may take some time for the staff to get ready for adopting the system. Training and change management would be required.
G3	Approximately 50 percent of the staff are ready for Digital Thailand. Digital Economy has been applied in all kinds of tasks in the organization. People gradually adapt themselves to the system.
G4	There are some difficulties for the older generation to learn how to use technology.
G5	Staff are eager to acquire new technology.
G6	The policy for applying digital technology was issued. At first, people did not understand, and there were some resistances. However, they started to accept the technology when they realized the benefits.
G7	Some people are ready for Digital Thailand to a certain extent. The clear direction and strategy are required, and training is also important.
G8	Most staff have some skills and knowledge for digital technology. However, the number of staff is not sufficient.

D. Data Management

The interview considers how agencies manage the data lifecycle process properly. This includes data governance and data analysis. According to the results, data integration has not been fully implemented yet. Some agencies shares data only in the organization. For data analysis, some organization apply data analysis to help improve efficiency and make better decision.

TABLE IV: INTERVIEW RESULT: DATA MANAGEMENT

Government Agency	Detail
G1	The organizations share data with other organizations, both government agencies and other agencies. The information is used for managing the organization and for data integration.
G2	There are some applications of data sharing and data analysis.
G3	Disclosure of data is according to Information Act, and data is accessed within the user's right (access control). The data is shared among related organization. The data analysis is applied for practical use.
G4	Open data is done among related organization. Data analysis is applied in the organization.
G5	Data is shared only in the organization.
G6	Data is disclosed under the information act, and sharing data is done among related organization.
G7	There is an information center which provides some open data for citizens.

Government Agency	Detail
G8	Data is shared with other organizations. Some type of data is confidential and needed to be treated carefully. Data is analyzed in many dimensions. Cooperation with other agencies is required in order to obtain data for analysis.

E. Digital Technology and Infrastructure

Digital Technology and Infrastructure comprise hardware, software, networks, and related equipment used to manage and support digital technology services in the organization. According to the interview, many agencies have infrastructure that is ready for moving forward digital Thailand. Some agency provides cloud computing network and high speed internet. However, for some agencies, the internet is not available everywhere especially in the rural area. If there are some events outside the office, one need to carry the paper documents. Furthermore, the interviewee suggested the central government to support the integration of government infrastructure.

TABLE V: INTERVIEW RESULT: DIGITAL TECHNOLOGY AND INFRASTRUCTURE

Government Agency	Detail
G1	The Infrastructure in the organization such as Hardware, Software, Network, and Internet is ready for moving toward digital Thailand.
G2	The infrastructure is ready to a certain degree. Since the organization is very big and has a lot of branches, there are many projects for providing infrastructure that need to be completed. For example, the project that expands the network for core switch, and building workgroup switch. The network service for operation building, etc.
G3	Hardware, Software, Network, and Internet are provided within the organization. The organization is also providing cloud computing network.
G4	The infrastructure is ready. Although there is not 100 percent readiness, the organization has a plan to improve infrastructure in the future.
G5	The infrastructure is ready to a certain degree, but not 100 percent.
G6	The infrastructure is not ready since there is no integration between the related organizations. The integration should be supported by central government.
G7	The infrastructure is not 100 percent ready. First, the central government's infrastructure should be implemented. Then, other agencies will follow the central government in the same direction.
G8	The infrastructure is ready, especially the network provided by organization and GIN (Government Information Network).

F. Organization's Culture

Some agencies have organization's culture that do not support moving forward Digital Thailand. Many agencies addressed that top management support is one of the most important factors affecting the readiness in digital economy.

TABLE VI: INTERVIEW RESULT: CULTURE

Government Agency	Detail
G1	Some organization's cultures are not ready for moving forward Digital Thailand, such as old-style working method of older generation.
G2	Change management is required in the organization.
G3	Top management supports the adoption of digital technology in the organization.
G4	The baby boom generation has some difficulties to prepare for working with digital technology.
G5	The organization has a culture that the subordinates respect and obey the superiors. If the top management supports digital policy, the organization would definitely move toward digital Thailand.
G6	There should be a clear policy, model, and some budgets to drive for moving toward digital Thailand.
G7	The culture of adaptability, willingness to learn, and clear communication would help the organization to move toward Digital Thailand.
G8	Top management support the use of new technology. Staff is also eager to adopt and learn new technology.

V. CONCLUSION

The purpose of this research is to study the readiness for moving toward Digital Thailand, a case study in government sector. Digital Thailand Plan is developed as a digital blueprint to revolutionize government operations, business practices, and people's lifestyle. One of the strategies of this plan is transforming into digital government. Government services have to be developed in order to meet the demands of people and businesses respecting convenience, speed, and accuracy.

According to the in-depth interview and analysis, the sample government agencies are rather ready to move forward Digital Thailand, considering Information System management, E-Government Service, Staff, Data Management, Digital Technology and Infrastructure, and Organization's culture. There are some issues that need to be handled which are rules and regulations to support digital procedures, data integration and governance, digital divide, and digital literacy. Furthermore, training and change management should be provided in the organization.

The future research is to consider this framework regarding the readiness of Digital Thailand focusing on both government and private sectors. Moreover, the quantitative research could be conducted to confirm factors affecting the readiness. The results of this research can be applied as a guideline for the preparation of Digital Thailand or digital economy plan in other countries to establish social stability and economic wealth.

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