

Draft Final Report

For the Consulting Services of
Report on Design and Implementation of e-Government
(CS-01)

Institutional Capacity Building on ICT Policies in Thailand
Grant No.: TF097929

Submitted to
Office of the Permanent Secretary
Ministry of Information and Communication Technology

By
Institute for Information Technology Innovation
Kasetsart University, Thailand

14 June 2013

Draft Final Report		
Project Title	Report on Design and Implementation of e-Government (CS-01) Institutional Capacity Building on ICT Policies in Thailand	
Project Details	<i>Project Reference:</i> IBRD Grant No. TF097929	
	<i>Project Starting Date:</i> 17 December 2012	
	<i>Project Ending Date:</i> 13 August 2013	
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Report Submission	<i>Date of Report:</i> 14 June 2013	
	<i>3rd Performance Period:</i> 18 April – 14 June 2013	
	<i>Submitted by:</i> Institute for Information Technology Innovation	

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Section 1. Introduction

This Draft Final Report is the third deliverable of the consulting service of ‘Report on Design and Implementation of e-Government’. It provides the study results of existing e-government –related work of Thailand, especially for some parts that are not achieved yet in the Interim Report. The best practices benchmarking with other selected countries have been made and analyzed to find proper application of effective e-government implementation to Thailand. The six sections of the Draft Final Report are:

Section 1: Introduction summarizes the project tasks and activities and progress.

Section 2: Interoperability reports the analysis of e-services development and e-participation development in Thailand, which have been fulfilled by searching into the Government web sites and analyzing their content components using the principles of UN e-Government Survey 2012. This will help us learn how to fill the gap of public e-services and e-participation development. in Thailand. The section presents the topics of draft privacy and data sharing policy to highlight the issues that need consideration when sharing information whether internally (between different departments) or with external organizations based on relevant legislation. The draft supplier management guidelines for ensuring interoperability and the channel integration framework are presented. A consolidated list of reference models and resources available internationally are also provided in this section of the report.

Section 3: Institutional Structures and Governance presents the topics of respective roles of ministers, permanent secretaries, departmental directors and CIOs for implementation of e-government programs; mechanisms for cross agency collaboration and collaboration with the private sector; collaboration tools/dashboards for management of e-government program; and capacity building and training. Those are mainly based on the study results of desk researches into many report papers of foreign governments such as the U.S. Government and Australian Government. Moreover, this section contains, as well, the Thailand’s experience of inter-agency collaboration directly gained from the implementation of the large-scale e-government project, so called National Single Window.

Section 4: Innovation in Public Services presents the topics of enabling structures for fostering innovation in public services; source of funding for innovation in the public sector; approaches on sustaining the Innovation Labs; innovative online public services using crowd sourcing ideas; strategy on use of open source; and Open Government Data Initiative; and some recommendations. Those contents are based on desk researches to learn best practices of other countries.

Section 5: Doing More with Less for More presents the study results of strategy on implementing concepts of radical/frugal re-engineering and radical cost reductions in the use and investment of IT and identify service (s) that could be taken up on priority to demonstrate that concept based on the resources and impact assessment approach. The studies on radical cost reductions have been made through desk researches.

Section 6: Other Related Tasks reports the progress of tasks operation, which are 1) Design of international study visit on e-government; 2) Workshop arrangement; and 3) Recommendations on Thailand's direction for the development of e-government to align with related directions of the Roadmap for an ASEAN Community (2009-2015).

The recommendations on the issues specified in each section will be further proposed in the Final Report.

Section 2. Interoperability

2.1. Introduction

This section proposes recommendations for e-government interoperability development with interconnection between several government agencies in Thailand. This requirement of interoperability among government agencies corresponds to the strategies and planning of development of advanced Thai government e-services which is called "Smart Connected e-Government". The main objective of interoperability is to create the joint-up public online services that provide more efficient and effective citizen-centric government services.

However, development of interoperability and government e-services would be successful when basic back-office e-transactions of each government agency was developed first. Therefore, contents of this section also include the gap analysis and opportunity of development for basic government e-service systems. The e-government maturity development is categorized into 4 stages according to the United Nations e-government guideline which will be mentioned in section 2.1. Section 2.2 proposes the development of interoperability of Thai government e-service system issues which should be developed, and we recommend 2 specific areas, that is, national security and justice interoperability. The content presented in section 2.3 is the analysis and some recommendations for citizen inclusion and e-participation. The levels of citizen participation for public services are categorized into 3 levels which will be further discussed.

This report also presents an approach and policy for personal data privacy and information sharing for government agencies to ensure that personal information is protected and used properly according to the intentions of the government services and as understood by the users. Then, it is the approach of management for the development and implementation of e-government interoperability among government agencies. The involved government officials should be able to use this approach to manage successfully any large and complex project of development of information systems. As well, the topic of service channel integration for delivering public online services effectively will be discussed in this section.

2.2. Analysis and Recommendations for Advancing Thailand E-Government Services

The Interim Report of this project has also presented the research and survey results of Thailand e-government conducted during the first quarter of 2013. The e-government services are classified into four development stages according to the classification recommended by the United Nations E-Government Survey 2012. The survey benchmarking with these four development stages has been conducted for all 20 ministries as well as their departments and independent public agencies. This section presents the gap analysis and recommendations for further e-government service improvement. The four development stages are as follows:

Stage 1 Emerging Information Services:

All Thai government agencies have achieved the development state 1, which is assessed to be at 100%. Therefore, the recommendation for policy decision makers is to maintain these services by keeping updating and useful information relevant to the target citizen and audience. We suggest that government agencies must put the policy and adequate resource in place to constantly sustain these information services to the citizen and business at large.

Stage 2 Enhanced Information Services:

Most of government website provides enhanced information services, which is comparable to 82%. The most developed one is at the Ministry of Tourism and Sport. The Office of the Prime Minister, Ministry of Finance, Ministry of Foreign Affairs, Ministry of Social Development and Human Security, Ministry of Agriculture and Cooperatives, Ministry of Energy, Ministry of Justice, Ministry of Culture, Ministry of Education, and Ministry of Industry have also developed electronic services closed to this level. To ensure that government websites effectively deliver enhanced one-way or simple two-way e-communication between governments and citizen, we recommend the following features for all government agencies:

- a. Downloadable forms** – 87% of government agencies provide online services with electronic downloadable forms. Providing downloadable forms by all government agencies should be encouraged and implemented. All downloadable forms are also the candidates for electronic transaction and online workflow automation which is the key feature toward the e-government development stage 3. This feature will be discussed further in the next sub section.
- b. Audio and video** – 63% of government agencies provide audio and video information on their web sites. These types of information can be used to convey the messages about the organizations and their work, their service procedures and regulation, and knowledge or news about some specific areas.
- c. Multi-lingual website (Thai and English languages).** There are 74% of government agencies' websites that are multi-lingual. However, most of multi-lingual information, e.g. most of English information is too static, whereas useful dynamic information with newly updated, electronic forms and knowledge are mostly presented in Thai. Therefore, the recommendation is to encourage all government agencies to establish dynamic and updated information, and also in more than one language, i.e. Thai and English. English information and services should be offered by online Thai governments because of many reasons including the globalization particularly the AEC 2013 or ASEAN Economic Community agreement.

d. Interaction with citizen - The survey result suggests that one-way or two-way communication of government agencies are provided in the forms of online open forums (61%), online notification (59%), e-mail or website correspondence (89%) as well as information communication through e-mails or websites (46%). However, there are communication channels, e.g. social media and online newsgroups, sending text messages through mobile phones and smart phone applications, so called M-Government (or Mobile Government online services).

The above suggestions are the tools and channels for communication with citizens. These tools are corresponding to the e-participation indicators with 3 progressive development level so called; e-information, e-consultation and e-decision making (described in section 2.4).

Stage 3 Transactional Services:

The development of Thailand's e-government services at stage 3 is assessed at 33%. The average level for each ministry is below 50%. Table 2-1 shows examples of online transaction services offered by the top developed government agencies. These transaction services provide good cases and models for other government agencies that have not developed such services yet especially those agencies having similar services provided to citizens or business clients.

Ministry	Agency	E-Service
Ministry of Finance	The Customs Department	<ul style="list-style-type: none"> - Paperless Customs Declaration Submission with digital signatures for users' authentication. - E-Tracking to tracking the progress of government's services
	The Revenue Department	<ul style="list-style-type: none"> - e-Filing for filing income tax online
Ministry of Information and Communication Technology	TOT Public	<ul style="list-style-type: none"> - e-Invoice
	Company Limited	<ul style="list-style-type: none"> - e-Pay
	(Center)	<ul style="list-style-type: none"> - e-Code
Ministry of Energy	Energy Regulatory Commission	<ul style="list-style-type: none"> - Information of electricity production - e-Pay

Ministry	Agency	E-Service
		- e-Licensing for the energy industry operation
	Department of Energy Business	- e-Registry of Oil Trader
Ministry of Transport	Department of Land Transport	- online payment of car tax
Ministry of Commerce	Department of Business Development	- Business Registration - e-Certificate - B2C E-Marketplace Thailand
	The Agricultural Futures Exchange of Thailand	- Online trade
Ministry of Interior	Provincial Electricity Authority	- e-Bill - PEA-ePay
Ministry of Labour	Social Security Office	- Social Security and Workmen's Compensation fund employer registration - e-filing and payment
Ministry of Industry	Department of Primary Industry and Mines	- e-mining report
	Industrial Estate Authority of Thailand	- E-Privilege & Permission: EPP

Source: KU-INNOVA survey (May 2013)

Table 2-1: Examples of Online Transactional Services from Several Government Agencies

These e-services offer online public services to citizen and business sectors. The benefits of these e-services include time and cost reduction, and efficiency. Moreover, these front-end and back-end online transaction of each department is the important basis for joining up e-services of several departments and creating joint-up or one-stop online services. These joint-up e-services will further create value towards

smarter and connected e-government of stage 4. Therefore, the recommendations for further improvement and development are as follows:

- a. **Having public opinion polls on websites** – The survey result shows that public opinion polls on government's websites are 49%. Public online polls are one of good tools for citizen participation. These polls can be designed as semi-online or full online services, for example, with decision making from the citizen' inputs such as the online voting. In addition, it helps to promote the e-participation policy of the government.
- b. **Having online application services on websites** – The survey result shows that online application services on government's websites are 52%. These government e-services can effectively speed up government operations and increase convenience to citizen through online submission of application forms and electronic workflow automation. This kind of service could be further enhanced with online user's identification, e.g. digital signatures. The below are some recommendations for online public services that should be developed.
 - **Development of electronic services for the Defense Industrial Department¹**. The e-services should include (1) submission of electronic application form (2) A copy of the certificate of corporate registration in an attached electronic file (3) a copy of identification card or passport and a copy of household registration in an electronic file (4) a copy of the business registration (5) a copy of Permit for factory operation (6) the map of manufacturing plant/warehouse (7) layout of manufacturing plant/warehouse (8) a copy of trade/receiving account (9) a proof of duty stamp (10) a copy or photo of feature and property of arms (11) Detail of order, import, produce or possess arms (12) criminal record (from police station), if applicable (13) the work permit. Normally, the applicant is required to submit many documents to renew the license every year and to show the account list every month. The development of online submission and operation should begin with the analysis of current processes, designing the e-forms needed to be submitted electronically. The system should be able to inform results, conduct e-payment with banks, and issue certificates online.
 - **Development of e-services for Department of Consular Affairs** - the online application of the oversea election such that the legitimate citizen living outside the country can submit the election ballot electronically.
- c. **Having fee payment e-services**– The survey result shows that fee payment services on government's websites are 12%. This government service can

¹ Notice of the Ministry of Defense on determination of type of arm permission according to Arms Control Act, B.E. 2530
<http://www.chemtrack.org/Law/Mod-2551.pdf>

reduce burden of the government officials and increase convenience to citizen, especially, those who are in remote area or are difficult to travel.

- d. Having end-to-end electronic transactions for public services** – The survey result shows that full-transaction or end-to-end electronic transactions (e.g. online-application submission, status e-monitoring, online transaction and electronic document approvals) on government's websites are 12%. Services of e-Certification and e-Licensing are only 7%. There are 2% of government transactions using digital signatures.

Nowadays, there are several online public transactions in many government agencies as shown in Table 2-1. Furthermore, there are several emerging projects with online electronic transaction during 2012-2013 such as Transport Single Window e-Logistics of the Ministry of Transport, and import/export e-certificates and e-permits by Department of Agriculture. The other agencies that have not implemented any online transactions yet could utilize lessons learned from these examples and models. However, these online services still require continuous support from the highest policy decision makers as possible, e.g. as the mandate by the Government Cabinet.

Stage 4 Connected Services:

E-government services in Thailand in the development stage 4 is about 22%. Although, these kinds of collaborative and joint-up services are increasing, however, they are still low in number. Therefore, it is necessary to promote and support the development of connected and citizen-centric one-stop services. These connected e-government services should be developed starting with government agencies that have already established their own internal e-transaction systems. The KU-INOVA survey results show that the top 3 ministries with connected electronic services are the Ministry of Information and Communication Technology, the Ministry of Commerce and the Ministry of Interior. These e-services are related to e-Applications, e-Payment, e-Certificates, and e-Licensing with digital signature features. These electronic services should be further extended by interconnectivity and electronic data exchange among those ministries and departments such that joint-up electronic services can be developed for providing towards more efficient citizen-centric services.

The smart connected e-government services with the features of joint-up or one-stop services for citizens and business users are very essential for further development. There are some good international case studies, particularly in Singapore and U.S.A. that could be good models for Thailand.

Thailand e-Government services² should be continuously improved and easy to be accessed. For example, all kinds of forms that the citizens need to submit any

² <http://www.egov.go.th/>

necessary information to government agencies should be downloadable (a suggested feature of stage 2), or electronic form/request submission, online transaction, e-Cert/e-Permit issuing and digital signatures should be further established for all government agencies (the key characteristics of stage 3). However, these electronic services should be maintained and further extended continuously. Regulatory reform must also be conducted to align and support the new processes enabled by these ICT platforms.

Singapore provides several successful cases for one-stop and connected e-government services. These examples are the good models for Thailand to develop joint-up electronic services portals with similar features and functions. Singapore one-stop portals are categorized into three different target groups which are citizens, business and non-residents (or expats). The one-stop portals for citizens and for business are shown in Figure 2-1, and their services for all three target groups are classified as in Table 2-2

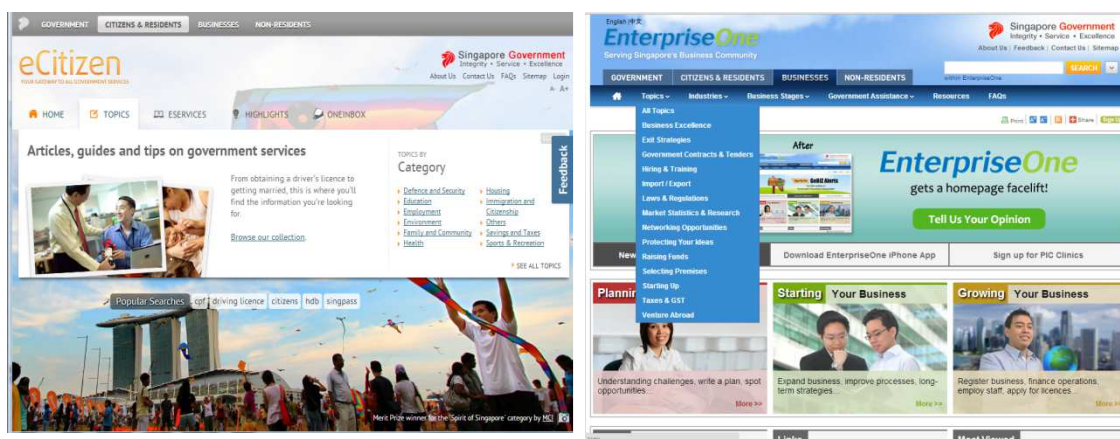


Figure 2-1: Singapore eCitizen and EnterpriseOne websites³

Citizens & Residents (e-Citizen)	Businesses (EnterpriseOne)	Non-Residents
<ol style="list-style-type: none"> 1) Defence and Security 2) Education 3) Employment 4) Environment 5) Family and Community 6) Health 7) Housing 8) Immigration and Citizenship 9) Others 	<ol style="list-style-type: none"> 1) Business Excellence 2) Exit Strategies 3) Government Contracts & Tenders 4) Hiring & Training 5) Import / Export 6) Laws & Regulations 7) Market Statistics & Research 8) Networking Opportunities 9) Protecting Your Ideas 	<ol style="list-style-type: none"> 1) Visiting Singapore 2) Relocating to Singapore 3) Working in Singapore 4) Studying in Singapore 5) Doing Business in Singapore

³ <http://www.gov.sg/>

Citizens & Residents (e-Citizen)	Businesses (EnterpriseOne)	Non-Residents
10) Savings and Taxes 11) Sports & Recreation 12) Transport and Motoring 13) Travel	10) Raising Funds 11) Selecting Premises 12) Starting Up 13) Taxes & GST 14) Venture Abroad	

Table 2-2: Singapore Government Services: Topics by Category

From the Singapore models, the KU-INOVA Consultant Team proposes that the development of connected e-government services should start from observing all back-end electronic transaction systems already established within the government departments, and then searching for opportunities to electronically interconnect these existing e-services to provide joint-up services that could add combined values to the citizens, business entities and each of government agencies. Existing e-transaction or online e-services of all departments have been surveyed and reported in Appendix A. Upon these existing and also emerging e-government services, the sectors with joint-up or one-stop e-services should be developed including those related to daily living, social interest, culture and health concern of citizens as well as for business usages. In this section, we propose some recommendations that should be supported for realization as following:

- a. Daily living services for citizens:** The recommendation is to promote and support more online public services on smart mobile phones. Since the penetration rate of smart mobile phones is quite high among Thai people especially those in the capital city and cities around the country. The example services may include route information about buses and trains schedules, and electronic tax filing through mobiles. The electronic services should easily assessed anytime and anywhere, for example, through public free Wi-Fi available for all bus and train stations around the country.
- b. Social, culture and health services:** Data interoperability and electronic transactions between different government agencies that involve with social, culture and health-related transactions should be developed to provide better services to citizens. The involved agencies are the Ministry of Social Development and Human Security, the Ministry of Labor, the Ministry of Culture, the Ministry of Public Health. The services include, for example, assistance support, culture promotion, social, religion and health-related benefits and transactions.
- c. Business services:** The ministries providing business-related services should establish electronic data exchange and interoperability among them. These ministries include, for example, the Ministry of Commerce, the Ministry of Finance and the Ministry of Industrial. The potential benefits are in term of

government operational efficiency, better compliance, cost and time reduction for both citizens and governments. For example, the processes related to registration of any new business entities should be streamlined and more efficient when all government agencies involving in the business-startup processes, e.g. Department of Business Development, Revenue Department and Social Security Office, can join up their electronic transactions together in such a way the new business entity could submit only one electronic application form and one set of supported documents and can connect to all three departments, and receive back the permission or the results from all those three agencies online with cost cutting, speed and accuracy.

2.3. The Proposed Recommendations for Thailand e-Government Interoperability Further Development Projects

The above argument suggests that more of connected e-Government services with interoperability features should be further promoted and supported by high-level policy decision makers. In this section, we suggest two sectors that are necessities of further development. Those two sectors include one in the national security area and, the other one, the justice-related sectors. These 2 sectors are very important because they are the foundation of any country, particularly for Thailand at the current situation. Therefore, we recommend that the following two sectors and case examples should be seriously considered and mandated for actual implementation.

a. Homeland Security - Connected e-Government for Homeland Security

Homeland security, peace, citizen and asset safety and sovereignty are the important foundation of any country. Applications of information technology, especially, interoperability are one of the key enablers to enhance defense surveillance, monitoring, warning and intelligence analysis. Nowadays, urgent and important issues of Thailand are security and safety in three southern border provinces which now have several unrest incidents.

This section proposes few important scenarios in which the Ministry of ICT and other concern governments should collaborate and support the development of e-Government interoperability among relevant agencies for supporting information for homeland security as described below.

The interoperability which can support safety and security in the three southern border provinces requires a good e-data exchange platform so called "National Security Single Window (NSSW)" system. The unrest in Pattani, Yala and Narathiwat, and four districts of Song Khla which are Jana, Na Thawi, Tepa and Saba Yoi districts occurs in many patterns such as ambush, committed arson, car bombs causing a lot of damages to many people and properties.

The terrorists always include the use of robbed or no-license plate vehicles, and possibly mobile phones. Moreover, it was found that mobile phones are always used as the bomb ignition devices.

Due to many parts and sensitive issues of national security, it can show only some parts of the scenarios, i.e. the improvement suggestion for the road blocks as following.

Generally, polices and militaries have always set up road blocks and checkpoints, however, they lack of any relevant information necessary to support their duties and concerned decisions. For example, officers in the checkpoint area are not able to automatically check or link the suspected car's license information to any useful online database, e.g. the missing car information and database as located at the Royal Thai Police in Bangkok. The preliminary detections or automatic database connectivity systems should enhance efficiency of operations and reduce a lot of risks of the officers at the checkpoints. The supporting tools and equipments of this system may include the license plate character recognition or Optical Character Recognition (OCR) devices that can recognize the license characters and numbers automatically, then link and electronically cross checking through the National Security Single Window (NSSW) to other agencies' databases such as missing/lost-vehicle database of the Royal Thai Police, drivers licenses and car license databases at the Department of Land Transport, and citizen registration database of the Department of Provincial Administration. Other supporting tools for detection are such as smart card reader, handheld RFID reader, and fingerprint reader. The fingerprint reader is for cross checking to databases of other agencies such as Criminal Records Division and Immigration Bureau of Royal Thai Police, Department of Provincial Administration, Office of Foreign Workers Administration of Department of Employment, and The Customs Department. The following Figure shows the to-be scenarios and data interoperability that can be used to enhance the national security and safety at some certain level

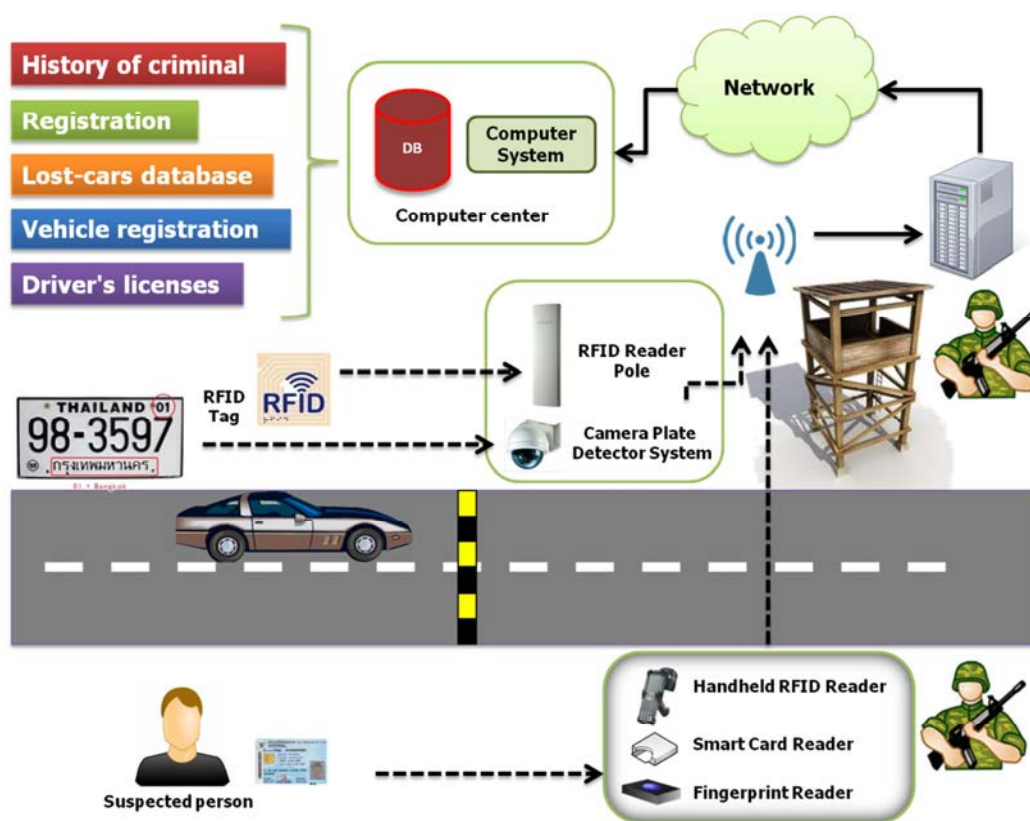


Figure 2-2: Suspected Car Monitoring - A Proposed To-Be Process

Integration and interoperability among these different systems as shown above could improve operations at the police or military checkpoints by providing relevant and real-time information for warning, monitoring and tracking some risks or suspected terrorist activities. Some supporting tools and technologies are:

- 1) Efficient and Intelligent Search Engine System: The databases include vehicle licenses and driver licenses from the Department of Land Transport, Criminal database of the Royal Thai Police, civil registration database and lost vehicle database.
- 2) Optical Character Recognition: OCR for automatic character recognition from the images
- 3) Radio-Frequency Identification : RFID
- 4) Identification card readers
- 5) Finger print reading and checking

Development of biometric data interoperability between government agencies for verifying a person or a suspect in the security process was performed by comparing the new biometric data with the existing one. The fingerprint standard for use by government agencies should be referenced to ISO/IEC 19794-4 and the system for biometric interoperability between government agencies should be developed following these 5 steps, which are:

- 1) Considering information required from government agencies, information collectors and possibility of information interoperability
- 2) Considering scope of law related to biometric data interoperability between government agencies
- 3) Establishing Memorandum of Understanding between government agencies
- 4) Preparing and testing biometric data interoperability
- 5) Involving as a user in Biometric Interoperability for Thailand e-Government (BITeG)

The initial system development may start by studying biometric data interoperability models associated with online fingerprint⁴ of government agency for identifying anonymous corpse and searching lost persons. This could be done under cooperation of Criminal Record Division of The Royal Thai Police, Central Institute of Forensic Science of The Ministry of Justice and the Bureau of Registration Administration of the Department of Provincial Administration, and Ministry of Interior. The development of the biometric data interoperability should be supported and pushed by the Ministry of Defense and Ministry of ICT in order to be another channel for checking suspects along with identity cards and car plate license.

The Connected e-Government for Homeland Security as mentioned above could improve peacefulness and the valuable lives of citizen and officials, and also preserve properties and assets in the fields. The Ministry of ICT or involved agencies should lead this important initiative, and support the development of these connected e-government platforms. All key stakeholders should actively participate. They include at least the Ministry of ICT, Internal Security Operations Command (ISOC), the Ministry of Transport, the Department of Land Transport, the Royal Thai Police. These lead to the integration of IT systems, communication channels, and also information about vehicles, maps and strategic locations, border passing and tools to promptly detect, search, chase any suspected targets. One of the goals is to build a Green Zone to protect life and assets of citizens and the officials. These kinds of systems and information available to concerned officials and agencies could also increase the ability of officials to work with efficiency and safety.

b. Justice Process - Connected e-Government for Justice

The Connected e-Government for Justice is another potential sector to be developed. This section proposes a recommendation to be further promoted and developed. A case scenario is presented here as the Connected e-Government for Justice involving polices, prosecutors, courts, probation and prison-related agencies. The main

⁴ Development of Biometric Data Interoperability Framework for Thailand E-Government Project Ministry of Information and Communication Technology, 11 December 2012

processes are petition in the scene, recordings of cases, information gathering for primary investigation, prosecutor consideration and presentation, and court investigation. Most of the current processes are based mainly on paper documents. Repetitive documentation and filling in different paper forms is extravagant and prone to error. Back tracing on the related documents is extremely difficult and time consuming. Although, each individual agency invests a lot in IT, however, their IT systems are not interconnected. Transferring of data across those agencies is still paper based. These documents are several times further keyed into electronic form that use in only within that agency.

The below figure illustrates some part of complexity of as-is processes and cooperation between justice agencies.

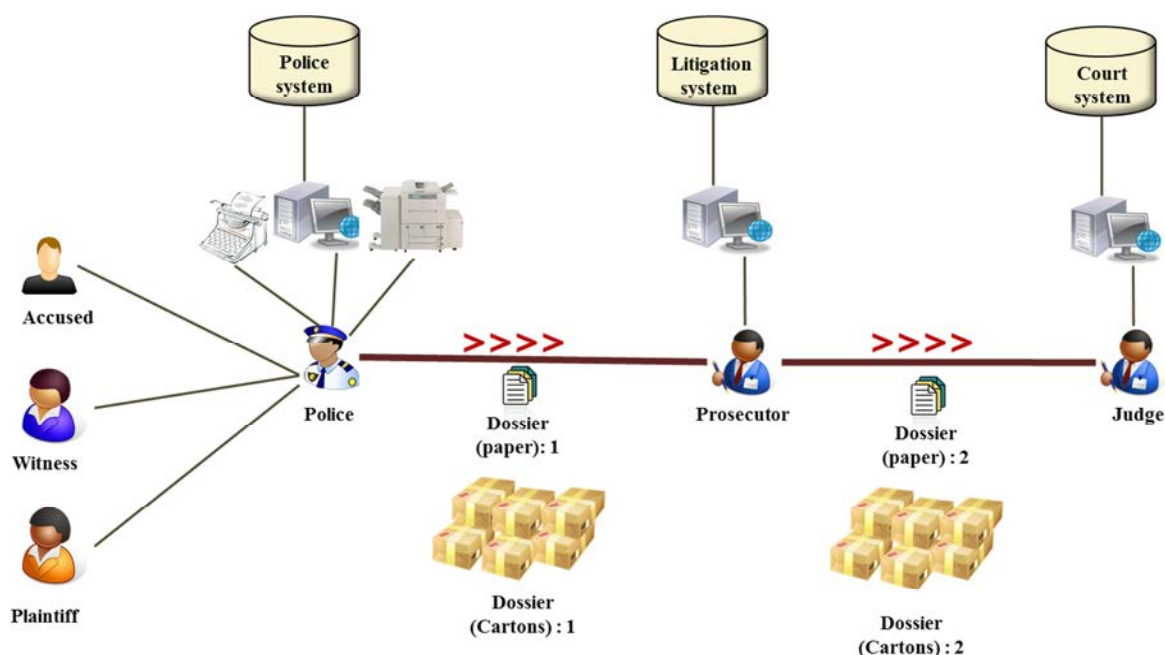


Figure 2-3: Data Transfer between Justice Agencies (As-Is Justice Process Analysis)

Beside the issue of information error, the amount of papers used in the justice process are tremendous. For example, in 2013, there are 1,206,528 cases in Trial Court, 45,875 cases in Appellant Court and 13,294 cases in Supreme Court, respectively⁵. With the average of 100 pages per case, 500,000 million papers would be used in justice process in one year. Moreover, huge and cumbersome document storages are one of the subsequent problems.

1) Concept of Connected e-Government for Justice

We recommend that the Connected e-Government for Justice should be developed based on TH e-GIF guideline. The objectives are to develop interoperability

⁵ <http://www.manager.co.th/Crime/ViewNews.aspx?NewsID=9560000004262&TabID=3&>

among involved agencies by creating a platform so called "Justice Single Window (JSW)." Government officials and citizens can access or receive direct or indirect benefits from this platform. It also reduces time consuming and errors in the data preparation and processing due to the electronic transaction between those agencies. Moreover, it enhances transparency and efficiency of the services. The citizens know the government process information, and they can participate in policy formulation and monitoring to ensure the transparency of government according to Official Information Act, B.E. 2540 (1997).

2) A Proposed To-Be Business Process for Justice

The involved agencies include the Royal Thai Police, Department of Special Investigation, Office of Public Prosecutors, Courts, Department of Corrections, Department of Probation and Department of Juvenile Observation and Protection. The proposed To-Be Process for Justice is shown in the figure below:

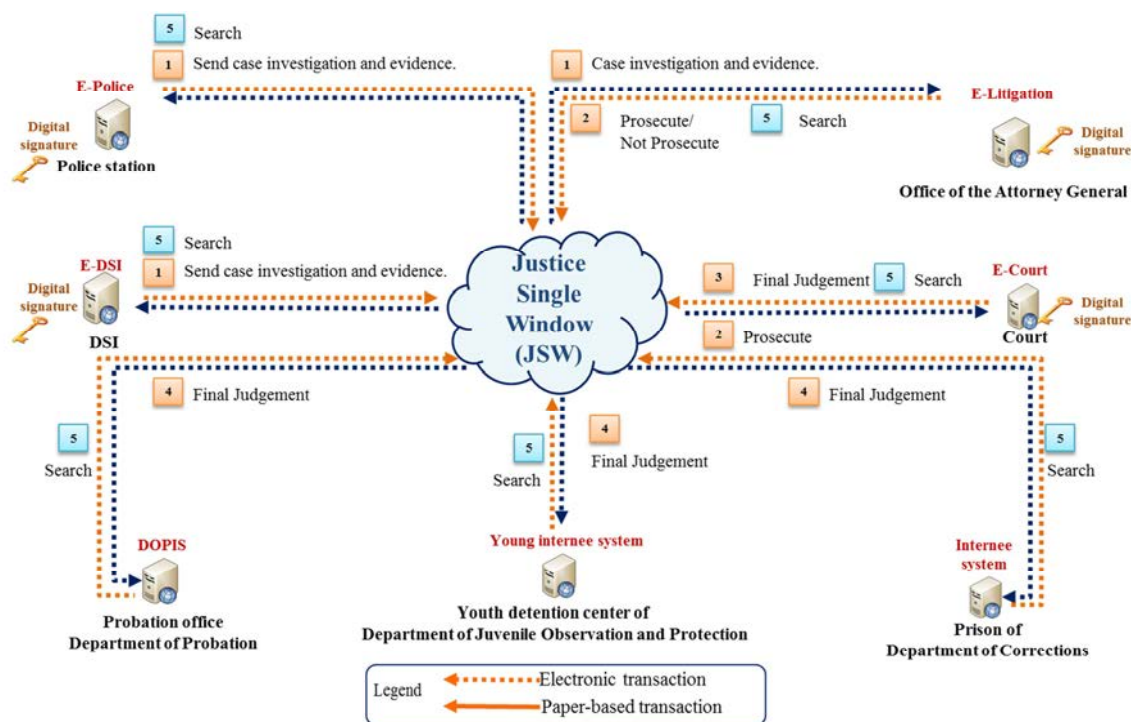


Figure 2-4: The Proposed To-Be Process for Justice

The new process proposes the change from paper document transaction to be electronic documents with electronic transactions. The number of forms to be submitted should be reduced if possible to one or single form and also in electronics. The same data element should be keyed with fewer repetition ideally one time for each same data element. Each of these data elements can be used several times in several processes and/or several agencies. The use of digital signatures should be applied for individual identification and authentication. This platform and interconnectivity among several involved agencies could be handled

through a clearing house or central electronic exchange platform called Justice Single Window (JSW).

There are several potential benefits of this JSW interoperability platform, for example:

- Emergency subpoena: Electronic subpoena from the local police station to the public prosecutor in charge can be very useful since electronic information and digital signature can be obtained without any long-distance and physical visit, especially during the remote applications for subpoena even in the night time.
- There are 48 hours limit of primary investigation. Therefore, the electronic JSW can support the police processes by reducing of time and cutting out physical travelling.
- JSW are also useful for evident information searching as shown in the following figure.

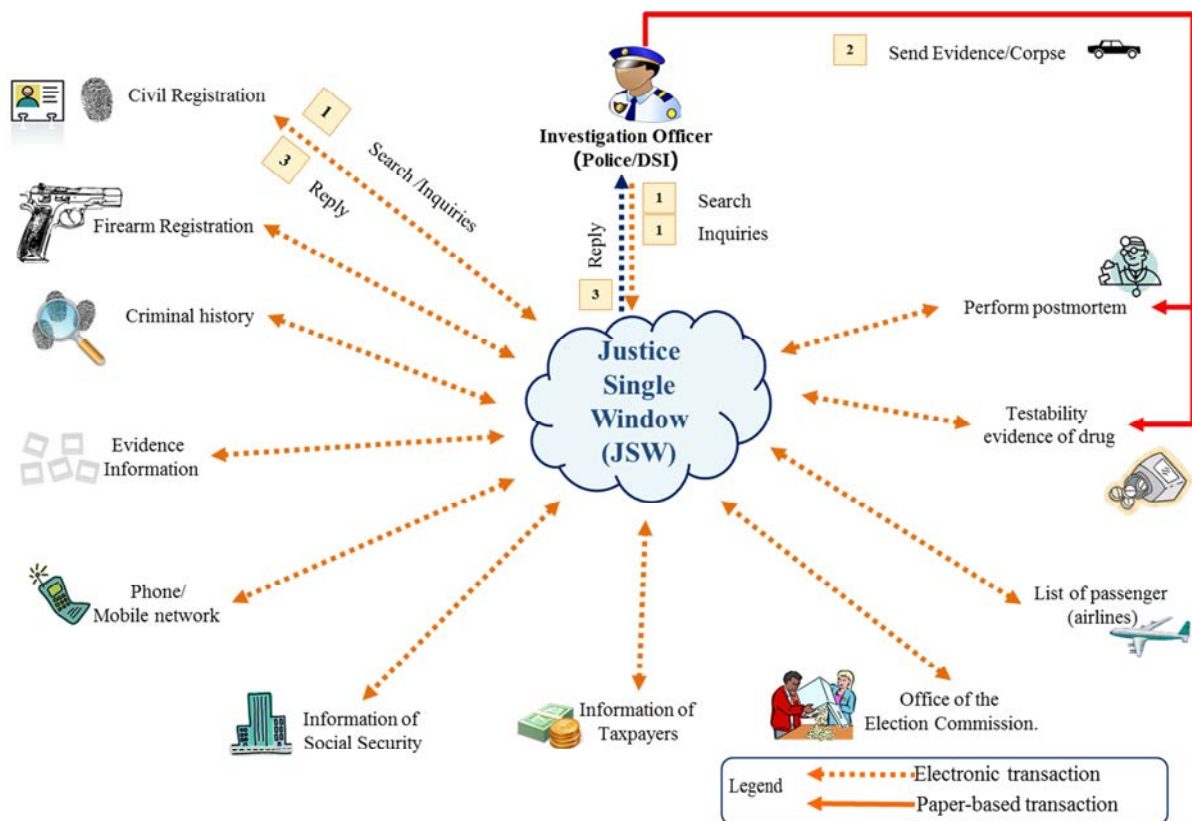


Figure 2-5: Expected Process of Evidence Gathering

The Office of Justice Affairs has developed a Data Exchange Center (DXC) to support information and transaction exchange among different justice-related agencies. Some of the transactions available via the website are as following:

- 1) E-mail and government transaction systems

- 2) Searching for evident and personal information.
- 3) Case statuses
- 4) Charge Postpone/Remand VDO Conference
- 5) Searching for driving licenses and vehicles information

The integration of DXC and JSW will lead to a high value and successful justice-supported system.

2.4. E-Participation Analysis

Citizen participation is one of the key strategies that governments around the world would like to improve. The United Nations e-Government Report suggests that citizen participation in e-Government could be classified into 3 development levels including e-Information, e-Consultation and e-Decision Making.

A survey in 20 ministries conducted during the first quarter of 2013 shows the lack of activities or tools that promote citizen participation in Thailand. The recommendations for improvement are described below:

- 1) **E-Information:** Most of the government websites in Thailand already provide good information about policy, procedures, laws, regulations, rules, services and other involved data. The concept of this e-Information level is similar to stage 1 of e-Government development that Thailand receives 100% score. This score are in disagreement with 0% of U.N. survey result. Therefore, we recommend that E-Government Promotion and Development Bureau, Ministry of ICT should engage actively and provide information with the U.N. e-Government Survey directly to be able to supply correct and full information for their questionnaires so they can receive the accurate and full information for their assessment.

The result of KU-INNOVA survey suggests that existing tools or activities are already in places in each ministry, department and sub-organization. Therefore, e-Information levels should be further and continuously maintained with updated information and as relevant as possible of citizen and target users. The development requires updated information, dynamic tools or activities that respond to citizen requirements, and transparency of the government, and also with adequate resources. In this wireless communication era, text messages through mobiles is one of the good options to fulfill the requirements of e-Information.

- 2) **E-Consultation:** The government websites should be open for citizen inputs such as asking for their opinions and suggestions towards e-government services through the tools such as chat rooms, opinion polls, social media, newsgroups and other interactive tools to support citizen inclusion and e-participation. The score of this level is 30%.

The study of KU-INOVA shows that half of government agencies provide this e-Consultation level of services through Online Polls, Online Surveys or Feedback Forms & web blogs, Chat Rooms or Instant Messaging and website accession of citizen recording. Furthermore, to enhance e-Consultation, it should be further extended and more departments without these kinds of services yet should improve and add them within their e-Government Portals.

There are some good models of e-Participation, e.g. of Singapore eCitizen⁶ that could be applied for Thailand development. The tools are OneInbox and Feedbacks.

OneInbox⁷: OneInbox is a secured platform to receive electronic government letters. It can be accessed from anywhere and anytime by logging in and choosing to receive e-letters from Government agencies including, Ministry of Manpower, Central Provident Fund Board, Housing & Development Board and Inland Revenue Authority of Singapore. This platform also allows the citizen to send comments and suggestions. The OneInbox is the host-master system.

“All your government correspondence in one place.
Access your government statements, advisory notes, reminders, payment
notices, and more from one convenient place.”

Feedback: REACH⁸ was launched in 2006 by restructuring to gather citizen comments and suggestions. It leads to citizen participation and connect citizens to government agencies. REACH was appointed as the Singapore Government’s e-engagement platform in 2009.

“If you have any feedback on a particular government policy or issue, you can use REACH’s **One-Stop General Feedback** Form to submit your feedback. Your feedback/query will be brought to the attention of the relevant government agencies, which will reply directly to you.”

⁶ <http://www.ecitizen.gov.sg>

⁷ <https://www.oneinbox.gov.sg>

⁸ <https://www.reach.gov.sg/feedback.aspx>

Moreover, there are varieties of Singapore government contact channels, either conventional or new one including public online forums, dialogue sessions, SMS, telephone, email, Facebook and Twitter.

One of Thailand e-Participant channels is Public consultation⁹ of Office of the Prime Minister. The citizens are able to comment and suggest government projects through this channel. Other channels are provided by the Ministry of ICT Government Contact Center (GCC1111)¹⁰ and/or Government Hotline 1111¹¹ of the Office of the Prime Minister. These channels allow citizens to send issues, criminal clues, comments and suggestions by themselves through mails, phones, faxes and via websites. The above models are able to be used as a developing model for other agencies. In addition, it can integrate among other things with similar tools, such as OneInbox and REACH of Singapore.

- 3) E-Decision Making:** The government shall allow the citizen to engage in the process of policy and decision making through such channels as online voting or e-Petition. The UN score of this level of Thailand is at only 30%.

The KU-INOVA study found that in many government agencies, e-Decision Making is still lacking clear direction and development. The features that should be developed include Online Discussion Forums, Government Officials Moderate e-Consultations, Government Officials Respond to Citizen Input, and especially the online public decisions provided by citizens, e.g. online voting and online election.

The novel and challenge tools that should be developed in Thailand is the Online Voting or called Online Election especially at the local district level and the national level. However, more research, development and pilot projects are needed before the actual implementation and usage. The formats and feasibility of online voting and electronic election depend not only on technology, but also citizen perception and readiness, appropriate investment and other organizational issues, e.g. trust, confidence and security concern.

Internet Voting: Internet is one of voting channel. Case examples of internet voting are shown in the table below.

⁹ <http://www.publicconsultation.opm.go.th>

¹⁰ <http://www.gcc.go.th/gcc1111/>

¹¹ <http://www.1111.go.th/form.aspx>

Country	Classification	Type of Elections in which internet voting is used
Australia	Currently used in some parts of the country	New South Wales (NSW) State elections
Canada	Currently used in some parts of the country	Local government elections
Estonia	Currently used nationwide	Local government elections, Parliamentary elections, Presidential elections, European elections
France	Currently used in parts of the country	Elections to the Assembly of French Citizens Living Abroad
India	Pilots ongoing	Urban Local Body Elections
Netherlands	Discontinued	Water Board Councils and National Parliament (overseas voters only)
Norway	Pilots ongoing	Local government elections
Spain	Discontinued	City of Barcelona referendum
Switzerland	Currently used in parts of the country	Municipal, cantonal and federal Referenda
United Kingdom	Piloted and not continued	Local government elections
United States	Pilots ongoing	General elections (overseas voters, predominantly military)

Table 2-3: Countries with Internet Voting¹²

From those 11 cases of internet voting, there are 6 countries (Canada, Estonia, India, the Netherlands, Norway and the UK) that firstly use Internet voting at the local government level, often on a trial basis.

Estonia and the Netherlands went on to use Internet voting for higher level elections (although the Netherlands subsequently discontinued its use of all forms of electronic voting). The other use of Internet voting has been, in many cases (Australia, France, the Netherlands, the U.S. and to a lesser extent Estonia), for voters who are overseas or away from their homeland, and in some cases in providing this services solely for those voters.

Estonia is unique in that Internet voting is provided for all voters wishing to use it for all levels of elections, including the supranational European elections. Other countries do use, or have used, Internet voting for national elections, but they have all restricted the voters who could use this voting option in some ways.

¹² http://www.ifes.org/Content/Publications/News-in-Brief/2012/June/~media/Files/Publications/Reports/2012/EVote_International_Experience_2012.pdf

Electronic Voting: This technology has been used for a long time. U.S.A. is the first country that used electronic voting machines in 1975. Since 1990 electronic voting machines were more used in many countries.



Figure 2-6: Global Electronic Voting Usage

From the case examples and experiences of online and electronic voting in many countries, it could be recommended that Thailand should start researching for the possibility of developing online voting/online election by conducting feasibility and readiness study of citizen and government agencies and other related infrastructure. Specific cases with focused scopes of work should be preferred. We recommend that the feasibility study, design and proof-of-concept development could be conducted, for example, for the Bangkok governor election. Similar to other countries, interweaving of voting options which are internet, electronic machines, paper and telephone voting are used to ensure the suitability of certain circumstances. Both online voting and electronic voting machines require substantive financial support. Therefore, the feasibility study and proposed to-be architecture must cover all key success factors including technology feasibility, financial feasibility, organization and social feasibility. Several legal and social issues, e.g. citizen perception and acceptance, data privacy, the proof of identification, security and trust management, are also very important and must be included in the study and design.

2.5. Draft Privacy and Data Sharing Policy

Thailand has drafted and enacted laws concerning personal information including the draft Personal Information Privacy Act, Official Information Act, B.E. 2540 (1997) and personal information protection policy. This policy has been declared by the Office of Electronic

Transactions Commission, with the support by the Office of the Permanent Secretary, Ministry of Information and Communication Technology since 2010. The government agencies are able to use these laws to formulate their policies for personal information protection and information sharing.

This report proposes some guidelines related to data privacy policies such that policy makers and policy managers of Thai government agencies shall consider and adopt as following:

Guidelines for personal information protection policies for government agencies.

The following contents adapts from the guideline and policies of government agencies for personal information protection B.E. 2553 (2010)¹³. The key contents are proposed below:

- 1) Government agencies that collect, record, use, publish or perform with user information must establish and maintain the written personal information protection policy. The policy contains at least the following content:
 - 1.1) The policy must contain scope and method of personal information collection. The collection must receive the consent from the information owners. The collected information must be collected and processed according to the legal authority and the objective or mission of that government agency.
 - 1.2) The policy must contain clear objectives of personal information collection and usage. Changing of objectives must be recorded and inform to the information owners.
 - 1.3) The policy must contain prohibition of publishing or presenting of information that could lead to any disagreement of collection objectives. Unless, the information owners provide the consent or there are some legal allowance.
 - 1.4) The policy must contain proper personal information security measures to prevent losing, illegal accessing, damaging, usage, modifying and changing information as well as inappropriate publishing. The disclosure of the personal information that does not meet the objectives which are declared and acknowledged by information owners, must be prevented.
 - 1.5) The policy must contain the determination of the declaration of personal information operation and policy. Moreover, it must contain methods on how to monitor existence and characteristics of information, information about the usage and information about personal information overseer and their offices.
 - 1.6) The policy must contain the covenant that the personal information overseer shall not refuse to provide explanation or information to information owners, successors,

¹³ http://www.eta.or.th/eta_website/app/webroot/files/1/files/12.pdf

heirs, legal representatives or guardians. In addition, the information overseer must record protestation of information collection or other information owner's activities.

- 1.7) The policy must contain the covenant that personal information overseer shall undertake the above measures to ensure the compliance to the guidelines and policies of the government agency on personal information protection.
- 2) Government agencies must establish and maintain written personal information protection procedures. The key contents are described below:
 - 2.1) Principles of the procedures consist of:
 - 2.1.1) Name of the government agency providing the personal information protection policy
 - 2.1.2) Detail of the compulsion and scope of the personal information protection policy. The government agency must declare the objectives of usage of the personal information.
 - 2.1.3) Changing of objectives of personal information protection policy must be informed to the information owners and calling for consent, for instance, 15 days advanced informing by e-mail or announcing in the first page of the main website of the organization.
 - 2.2) Collecting, Categorizing and Using of personal information.
 - 2.2.1) The Government Agency shows and announces the details of the category of information including the uncollected data and usage of the collected information.
 - 2.2.2) The Government Agency providing website services shall show the details of collecting information such as registration, or questionnaire filling.
 - 2.2.3) The Government Agency that collect and use personal information must undertake the following actions:
 - Inform users for any important information in advance.
 - Identify objectives and utilization of connecting cookies on websites, and provide and collect the right of accepts or the decline of cookies connection
 - The Government agency that will collect any population statistics such as gender, age and occupation that could lead to personal identity must establish, maintain and publish the information collection and recording within the personal information protection policy.
 - The Government agency, that operates the online websites and then collect the IP Address and the browser address that lead to any personal identity, must establish, maintain and public those information within their personal information protection policy.

- The Government agency that operates the data collecting websites must provide the option of "accept" or "decline" of the data providing for the citizen to choose, and provide alternative connecting channels to users who decline to provide information via the website.
- 2.3) The Government agency that involves with data interoperability must declare names of involved agencies as well as categories of the information in use. The relevant operation shall be possibly assessed by the information owner.
- 2.4) The government agencies keeping the personal information that requires to merge the information with other agencies must identify intention of merging data within their personal information protection policy.
- 2.5) The Government agency must identify persons who are allowed to access and use the collected information in their personal information protection policy or operational manuals.
- 2.6) For the government agency that receives, uses and publishes the personal information, if that agency needs to utilize those information with the conditions outside the identified objectives must request the right to use the data from the information owner.
- 2.7) The Government agency must identify and declare procedures of transactions, changing or updating of those personal information to users.
- 2.8) The government agency must identify and establish any necessary security measures related to the collected personal information to prevent inappropriate information changing and unauthorized assess. The security measures should consist of:
 - 2.8.1) Creation of responsibility and government personals for personal information security.
 - 2.8.2) Provision of appropriate access and authorization to relevant government officials.
 - 2.8.3) Risk assessment of ICT security and systems that involve with the personal information at least once a year.
- 2.9) The Government agency must provide appropriate communication channels both online contacts and physical contacts.

This report proposes the above as principles and basic procedures that should be included as the government agency's policy and practices for citizen data privacy protection. Following these policy guidelines, the government agencies should have adequate information to further develop the necessary e-services with better trust and confidence.

2.6. A Project Management Approach for Connected and Interoperable e-Government Development – A Basis for Supplier Management Guidelines

This part is aimed to provide a project management approach for connected and interoperable e-government development as a basis for drafting supplier management guidelines. The project management approach is used to handle a complicated and multi-agency IT project development especially those related to interoperability and connected e-government. Understanding of the approach will foster effective management of other project components, including supplier management. The approach offers critical success factors, tips and techniques to reduce risks in handling the large-scale and complex IT development projects. The next part will discuss the critical success components based on the concept of an enterprise architecture development cycle and the step-by-step project management methodology.

2.6.1. Ten Critical Success Components for Connected and Interoperable e-Government Development

Ten success components for Thailand e-Government interoperability development are shown in Figure 2-7. Objectives and outcome of each of these components are presented below.

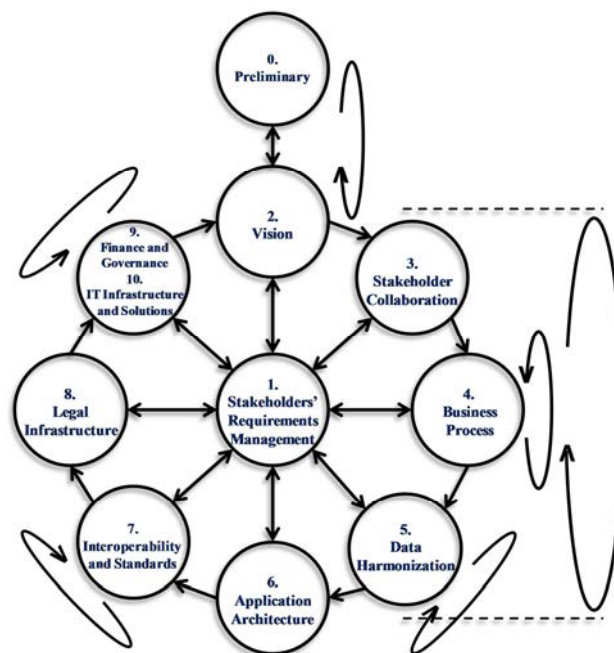


Figure 2-7: Ten Critical Success Components for e-Government Interoperability Development

Preliminary preparation

Objectives

To prepare and conduct a preliminary study on the possibility of interoperability development.

Tasks

A group part of policy managers, or the consultant team, or staffs assigned by the government agency conduct the following:

- A Preliminary study covering the feasibility and benefits of the proposed interoperability and connected e-government development.
- Identify any related policy or mandate to guide the development
- Representatives of the key government agencies participate in the initial project decision to go forward or not.

Outcome

- The relevant policy decision makers approve the preliminary study report of interoperability development which will further assign or grant the next detailed and more official feasibility study and design.
- Considering of possibility and Capability of benefit identity when using interoperability e.g., how increasing of efficiency of service
- Involved government agencies assign the official to further study detail of operation as well as determine the vision and key elements for interoperability development.

1) Component 1 Representatives of government agencies co-determine the common requirements and management

1.1) Objectives

Representatives of government agencies co-determine the procedures and requirement of interoperability to create the properly system that could reach to the identified objectives.

1.2) Tasks

The lead executive or the policy decision makers assign a team of consultant and/or representatives from key stakeholders to conduct the following tasks.

- Collect and articulate the common and more detailed requirements
- Evaluate the consequent effect of changing operation procedures.
- Co-consider the benefits of to-be processes whether they are capable to provide better services to target users.
- Verify to ensure that the new environments designed including new processes, new forms of electronic information, and other related requirements of the to-be connected e-government are feasible and beneficial.

1.3) Expected Output

- Requirement lists of interoperability
- Representatives should co-consider and approve the to-be processes, interoperability of data and operations, and the new systems that are designed and developed.

2) Component 2 Vision for e-Government interoperability

2.1) Objectives

- To determine the target and scope of e-Government interoperability
- To determine necessary resources of collaboration

2.2) Tasks

The lead executive or representatives of government agencies should consider the followings:

- Consider and improve vision, mission, objectives and strategy for this interoperability e-government development project.
- Determine the scope of interoperability development and assign the management and operating team.
- Identify benefits for involved agencies and stakeholders.
- Determine target of interoperability development
- Determine vision and assign interoperability development operation.
- Approve the initial budget of interoperability development operation

2.3) Expected Output

- Representatives of involved government agencies in project management team.
- Chief executive approves main operation procedure with determination of operation and outcome
- Memorandum of Understanding (MOU) among involved agencies

3) Component3 - Collaboration among involved agencies and stakeholders

3.1) Objectives

- To determine guidelines and approaches for collaboration in interoperability development.
- To co-ordinate and collaborate the involved government agencies for the success of the interoperability development.

3.2) Tasks

The lead policy decision makers with the assistance of consulting teams and/or representatives of key stakeholder may conduct the following tasks:

- Identify roles and responsibilities of each government agency and representatives involved in the project.
- Create the environment for effective co-ordination and collaboration among government agencies and stakeholders in the e-government interoperability development project.
- Evaluate readiness of involved government agencies in interoperability development.
- Survey the IT systems of involved government agencies.

3.3) Expected Output

- Co-operation platforms of the involved government agencies and stakeholder, and if possible with some working guidelines for e-government interoperability development.

4) Component 4 - Business Architecture

4.1) Objectives

- To analyze as-is business processes of within and between the involved government agencies and business stakeholders.
- To identify bottlenecks and improvement opportunities of the as-is business processes and documentation requirements.
- To design the to-be business processes for better future, more efficient and effective procedures for both governments and citizen/business users.

4.2) Tasks

The project management team and staffs should conduct the following tasks:

- Collect and understand the current organizational structure of the government agencies and stakeholders in the scope of the project.
- Collect and analyze the current as-is business processes concerning government operations and interactions including documentation and data requirements, and all quantitative indicators as accurately as possible, e.g. cost and time.
- Identify and analyze any bottlenecks, complications, redundancy, duplications and any improvement opportunities of the current as-is business processes in the scope of the project.
- Synthesize new to-be business processes that could provide better operations and services. Present and receive feedbacks from key concerned agencies and stakeholders, and improve them until obtaining common agreement.

4.3) Expected Output

- Analysis results of current as-is business processes.
- Proposed to-be business processes agreed among key concerned government agencies and stakeholders.
- Agreement of the proposed to-be business processes which will be the basis for the development of inter-organization e-government interoperability systems.

5) Component 5 - Data Architecture.

5.1) Objectives

- To reduce complexity of information and documentation requirements within the concerned business processes.
- To develop a set of common and harmonized data elements and appropriate data structures for operations and exchanges.

5.2) Tasks

The project management team and involved staffs conduct the following tasks:

- Identify and analyze all documents and data requirements along the concern business processes.
- Simplify and harmonize those documentation and data requirements.
- Identify and document the list about sources of information, definitions, data types and classifications of information.
- Develop the list of common data elements with harmonized definitions, data types and formats, classifications, standardized codes and data structures.
- Apply any useful internationally-accepted standards as many as possible, e.g. UN/CEFACT CCL (Core Component Library).

5.3) Expected Output

- Representatives of key government agencies and stakeholders approve the proposed set of common and harmonized data elements, and their key characteristics.
- Collaborative operation document.
- A proposed list of data elements and their structures to be electronically exchanged between key government agencies and stakeholders - and this proposed list should be understood and agreed among those involved.

6) Component 6 - Application Architecture - Design of electronic functions, services and their structures

6.1) Objectives

- To design and approve the proposed application architecture that provides a new to-be collaborative and interoperable e-government environment.

6.2) Tasks

The project management team and involved staffs conduct the following tasks:

- Collaborate with stakeholders to design service functions to be provided by application architecture of the proposed systems
- Co-design the system utility requirements to support connected e-government services.
- Determine necessary resources for detailed implementation, setting up of the involved procedures in this new connected e-government environment.

6.3) Expected Output

- Application Architecture Document.
- Agreement on the proposed application architecture of the systems including at least the operational scenarios, the structure of services provided by the proposed systems, definitions and any necessary governing rules and standards for interconnectivity between government agencies.

7) Component 7 - Technical Interoperability and Standards

7.1) Objectives

- To ensure interoperability between different agencies using different IT platforms by determining and agreeing on common standards and protocols.

7.2) Tasks

The project management team and concerned staffs collaborate and work on the following tasks:

- Determine any commonly-agreed standards, protocols and techniques required to ensure interoperability between different government agencies using different IT platforms.
- Use the open and internationally-agreed standards and protocols to develop interoperability between different IT systems.

- Agreement on the usage of common standards, protocols and techniques for interoperability development.

7.3) Expected Output

- A list of agreed standards, protocols and techniques needed for e-government interoperability.

8) Element 8 - Related laws and regulations

8.1) Objectives

- To harmonize laws and regulations needed to legitimize the proposed to-be electronic procedures, electronic transactions and electronic information of the proposed e-government systems.

8.2) Tasks

The project management team and concerned staffs should conduct the following tasks:

- Co-evaluate the present laws, regulations and rules, and identify any concerned issues to enable, legitimize and provide legal statuses on electronic documents and electronic transactions of the proposed systems.
- Propose to improve necessary laws, regulations and rules to correspond to the new procedures and new environments.
- Develop and enact any necessary laws, or officially establish and announce any necessary regulations and rules involving in the new connected e-government systems, e.g., those related to digital signatures, legally-recognized electronic documents, personal information protection/data privacy, and computer-related crime laws.

8.3) Expected Output

- Established laws, regulations and rules that are necessary for connectivity and interoperability of e-government operations and services.

9) Component 9 - Finance and Governance

9.1) Objectives

- To analyze cost and benefits of the proposed connected e-government project, including at least, investment cost and operational cost, potential benefits, risks, comparisons of both cost and benefits in tangible and intangible, and also qualitative and quantitative terms,
- To develop a framework for overseeing and governing the project development, deployment and usage of the proposed systems for the

reason of compliance assessment, lessons learned collection and possible improvement.

9.2) Tasks

The lead policy decision makers, consultants and/or the project management team may take the following tasks:

- Analyze the possible benefits, investigate risks and suggest risk management and mitigation approaches.
- Analyze investment cost and operational cost, and conduct cost-benefits comparisons.
- Analyze and propose a sound business model on how and by whom the finance for investment and sustainable operations can be secured, e.g. 100% by public, 100 by private, or public-private partnership.
- Analyze and propose how to secure the budget for investment and sustainability of the system.
- Create and propose necessary policies and suggestions for overseeing and governing the development, installation and operation of the new connected e-government environments, e.g., suggestions and policies of procurement, service-level agreement and changing management.
- Supervise the implementation, deployment and operation of the system.

9.3) Expected Output

- Cost-benefit analysis results including the proposed business models for investment and sustainability of the system.
- Agreed governance approaches and plans of actions.
- Mechanisms to oversee the development and operations of the e-government system.

10) Component 10 - Implementation and deployment of IT infrastructure and solutions

10.1) Objectives

- To conduct the procurement procedures, select and commission the IT service provider to implement and install the IT infrastructure and solutions.
- To oversee the implementation and deployment of IT infrastructure and deployment of the proposed connected inter-organization e-government systems.

Normally, the external IT service provider is commissioned to implement the IT infrastructure and solutions but needs a very close

collaboration from all relevant government agencies of the project. However, for the deployment and adoption of the system, the government agencies must lead this change management but with the support from the IT technical team.

10.2) Tasks

Project management team and involved staff perform the following tasks:

- Representatives of involved government agencies work in collaboration to provide input and review the analysis and design of application software, the IT infrastructure and network systems, and provide the appropriate support for development, installation, deployment and adoption of the new systems and environments.

10.3) Expected Output

- Plans and architectures for the new to-be connected e-Government system.
- Development and supervision of connected e-government development are well managed and issues are handled properly to ensure that the outcome of the project reach its ultimate goals as best as possible.

The Thailand e-Government Interoperability Framework (TH e-GIF) described these critical success components that need to be worked out such that the interoperability among different government agencies can be accomplished. Objectives, tasks and expected output of each key component are described.

However, in the actual project especially with several stakeholders, the tasks and expected output needed for each component are very complicated and they are not in isolation but interdependence to each others. This is due to the number of involved agencies obviously with different requirements and viewpoints, multi-dimension aspects and the scale of the project. Moreover, required procedures, documentation requirements and their data elements are very complex. Therefore, actual tasks and results of each component above cannot be completed in itself, or in just one sequential step, or one round but most likely in several iterations within a component and around these ten components, as illustrated with some arrows and loops in the figure above.

Therefore, in the following section, we propose a step-by-step project management approach that considers the above nature of the connected e-government project as mentioned above. The concept of iteration but incremental work is embedded in the proposed methodology which will be described in the next section.

2.6.2. Step-by-Step Project Management Phases for Connected and Interoperable e-Government Development

The part is to propose a step-by-step project management approach suitable for innovative, large-scale and multi-agency e-government projects. We recommend that five phases should be conducted as the project management life cycle.

The project of this scale is very sophisticated and there are at least ten critical success components that need to be considered as mentioned in the previous section. All these ten components are very much inter-related. Each one of these components and the relationships with other components need to be analyzed and revisited in iterative fashions for several rounds.

We propose that the analysis and design of these ten components should be conducted in a more systematic way. Therefore, we propose that 5 phases as shown in the Figure below should be conducted.

The first phase is called an inception phase. The objective of this phase is to initially determine the feasibility and worthiness of the project. All the ten critical components as mentioned in the previous section will be analyzed and searched for possible scenarios or feasibility of all those ten viewpoints. But mostly because of the limited time and resources, this initial study is just a preliminary analysis and study. If it is feasible and worth, it shall be further pursued in more detailed feasibility study and design as called "an elaboration phase 2". In this phase, more time, human and funding resources should be invested. The purpose of phase 2 is to conduct a detailed study including the as-is analysis and the proposed design/blueprints of the future "to-be" environments of all 10 critical success components. Representatives of all key stakeholders and agencies should participate actively in this phase to review, comment, improve, and agree on the to-be architecture and blueprints of all ten components. Phase 3 is to receive the agreed and endorsed outcome of phase 2 as input, then articulate the development master plan and implementation plans with a short and long term. In several cases, the work of phase 2 & 3 could be combined together and in several conducted by the external consultant team but work collaboratively and actively with representatives of all key stakeholders. The procurement and implementation of the new connected e-government platform are conducted during the phase 4. The IT implementation is normally carried out by external IT companies, however, all relevant stakeholder must collaborate closely and actively. After the completion of the ICT infrastructure and system implementation of Phase 4, Phase 5 of "go live" is the human change management and the adoption of the new environment by the citizens, internal users and external users at large. This phase is very crucial and it could not be lead any external IT vendor but it is the change management project that highest possible policy decision makers, policy managers and government officials must lead and participate actively in this endeavor.



Figure 2-8: Five Project Management Phases for Connected e-Government Development

Phase 1 - Inception Phase

The objective of the first phase is to conduct a preliminary study on the possibility, business cases and benefits of the connected e-government scenarios of interest. In general, this inception or initial feasibility study may be requested by the policy decision makers, by some national policy strategy, public sentiments, or public problems.

The result of this inception report should be presented to some leading agencies, executives or a group of high-level decision makers to consider whether the proposed connected e-government project is feasible and useful. This inception report should discuss the objectives, basic analysis of as-is and better to-be processes and documentation, rough estimation of the investment and operation costs, possible benefits of the new connected e-government systems possible. The detailed study may not be very deep due to the lack of time and resources, and this is only the initial rough analysis and estimation. This inception findings should be used only for the initial consideration and decision whether the next better detailed feasibility and design should be conducted or not.. The study report should avoid many technical terms but should concentrate more on the strategy, business needs, possible benefits, risks and the proposed directions of investment.

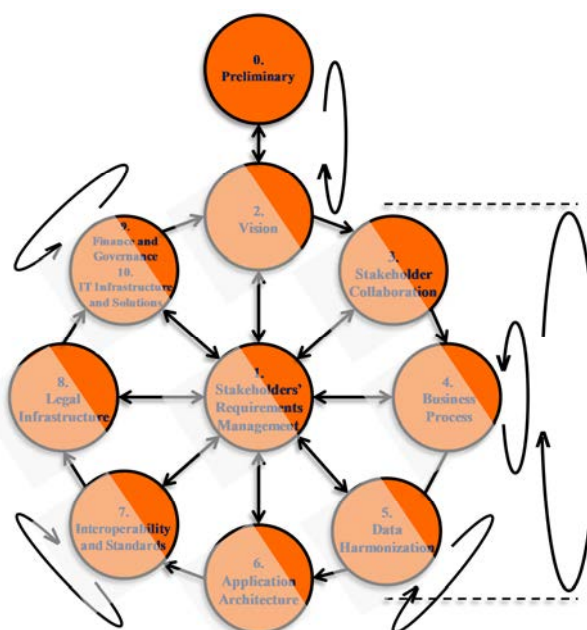


Figure 2-9: Ten Key Components to be Analyzed in Each of the Five Project Management Phases

Figure 2-9 shows the 10 key components that should be included in each of the 5 project management phases. However, the levels of depth in the analysis and design for all components in each phase will be different. For example, during the inception or preliminary phase, the depth of the study for each of the 10 components can't be very deep. This is because during the inception phase the objective is to explore and check the overall to check whether it is possible and beneficial to really deserve more time and resources to continue the more-expensive detailed feasibility study and design or not. However, this phase still need cover as much details as possible, i.e. the as-is situations, obstacles and bottlenecks, more efficient to-be procedures possibly enabled by electronic systems. Possible electronic services and functions, financial and organization support.

After considering the preliminary study result, the policy decision makers in charge along with the representatives of key stakeholders should agree whether the proposed scope and project should be further supported. The inception phase should end with the decision on whether the project should continue or stop. If the project should continue, then the policy decision makers must commission and support the next project management phase, the Elaboration Phase. In some cases, a project steering board or committee may need to be put in place such that some certain authority should be mandated to sponsor and take ownership of this initiative.

Phase 2 - Elaboration Phase

The objective of the elaboration phase is to conduct detailed analysis and design of the proposed connected e-government information system. The project management steering board must commission and support this detailed feasibility study and design

to a working team which could be a consulting team but working closely with key representatives of stakeholders and agencies directly relevant to the project. The study should revisit and obtain the political agreement on the scope of the study, and at least general ideas on the framework, possible source of budget, risks and any time constraints for the whole development. The key objectives of this phase could be mentioned as following:

- To propose the business process and the development framework.
- To determine procedure of each phase operation.
- To describe characteristics and scope of the project, and possibly including pilot projects.
- To determine important outcome of operation.
- To introduce development and operation schedule.

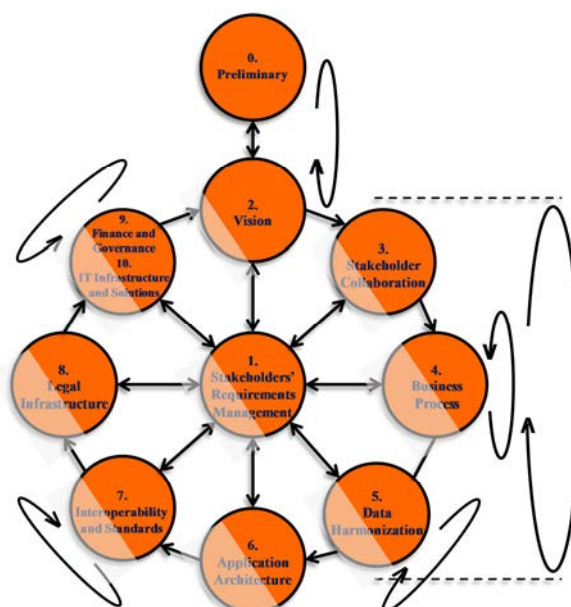


Figure 2-10: Some Depth Levels of Study for All Ten Critical Components During the Elaboration Phase

The elaboration phase should cover the analysis of current or as-is conditions, and also the design of future to-be conditions of all ten components. For example, the analysis of the as-is business processes or current operations, and long with paper documents and/or electronic information currently used. The bottlenecks and any improvement opportunities should be collected and analyzed, such that the better future "to-be" processes and electronic information handling should be designed and elaborated. The components that should be analyzed and design include also to-be process redesign, electronic document and data harmonization, application architecture and their e-service functions, Technology Architecture, legal infrastructure, and the willingness and readiness of the stakeholder agencies and

business. The project management steering board should consider and take ownership of this detailed feasibility study and design of the proposed system.

When the study result is approved, it should propose to the involved agencies to receive feedback and adjustment. The proposed to-be processes, data, electronic functions and the design should be somehow accepted by at least key stakeholders. The following table suggests the topics that should be covered with the report study.

Topic	Content
Benefit of government agencies interoperability system	<ul style="list-style-type: none"> • Contain the possible benefits of the proposed to-be processes enabled by electronic exchange systems between the involved government agencies: <ul style="list-style-type: none"> - Identify involved agencies - Present scope, as-is processes, complexity and bottlenecks of the current processes, and also proposed to-be processes enabled by electronic systems • Discuss security measures for inter-government interoperability system • Contain requirements of interoperability in the programs and network levels. • Determine proper framework of connected e-government interoperability system development. • The support and approval from the highest-level decision makers possible.
Agreement and platform of inter-agency collaboration	<ul style="list-style-type: none"> • Contain how to establish an inter-agency collaborative platform and also overview of the proposed system and functions e.g., <ul style="list-style-type: none"> - Which agencies should be included in the operations? - one-stop information center or the distribution center of information - Should it cooperate with payment or not? - System risks - Should the development be divided into phases?
Staff and training	<ul style="list-style-type: none"> • Contain consideration of official skills and training such that the officials and representatives from different government agencies and business stakeholders can work collaboratively.
Regulations	<ul style="list-style-type: none"> • Contain regulations and rules of engagement, and also the issues of personal information protection and personal identification

Topic	Content
	should be discussed.
Technology	<ul style="list-style-type: none"> • Contain consideration of both the as-is and to-be IT infrastructure and system architectures. • Determine any technical requirements that are necessary for the system development
Information and Document	<ul style="list-style-type: none"> • Contain consideration of documents and information involved, and also possible standard list for electronic information and document exchange in some specific formats, e.g. EDI or XML • Determine authorized person to send document and information • Determine any necessary technical protocols for information exchange. • Consider risks of information usage <p>Note: the creation of the data standard list should follow the existing international standards as much as possible, e.g., applying the UN/CEFACT Recommendation no. 34 for data harmonization, and other standards recommended by the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT).</p>
Impact Evaluation	<ul style="list-style-type: none"> • Contain impact evaluation of using system e.g., who is effected by changing working pattern. • Cost and Benefit analysis of the proposed interoperability systems • Consider social and culture issues that may effect to the system utilization • Framework of impact reduction when using system • Suggestion of management of changing from system utility
Alternative channel of system development	<ul style="list-style-type: none"> • Create alternative operations to allow joint consideration of involved agencies. The consideration factors include readiness of each agency, cost and time of operations.
Public relation	<ul style="list-style-type: none"> • Inform the public about the project, also communicate well with all involved agencies and stakeholders of the project progress.

Table 2-4: Suggested Topics to be Included in the Elaboration Analysis and Design Report

Phase 3 - Planning Phase

The study of phase 1 and 2 should somehow clearly articulate vision, objectives, processes, the target system functions and the design of the proposed system. These analysis and design should be well understood and agreed by all key stakeholders and the project management steering board.

The next phase is to develop the master development plans and also action plans such that the designed conditions and all to-be architectures should be decomposed into sub projects, tasks, schedules with timelines, more detailed estimated budget, and any other management concerns. The overall master plan and action plans shall be used as a mechanism to coordinate the work, guide and monitor the implementation progress of the project. A good plan should consist of the following characteristics:

- Contain explicit objectives, scope, deliverables
- Contain tasks or to-do list, person in charge, time and outcome of the tasks
- Clearly identify roles and responsibility, e.g. the project manager, staffs and organizational team structure, and responsibility of each project team role.
- Clearly identify contact channels and communication methods
- Allocation of adequate budget and staff from the beginning
- Project risk evaluation and risk mitigation plan, as well as any emergency back-up plan to ensure the continuum of project operations. The major risk of the project are the inadequate budget and inadequate staffs.
- Contain the criteria of success.
- Contain the project tracking and revision approaches for operation improvement and project changing management

A recommended table of content that should be include in the master plan and action plan should include at least the following.

1. Executive summary
2. Overview of e-government interoperability development.
 - 2.1. Scope and objectives
 - 2.2. Expected benefits
 - 2.3. Main components of the proposed environment
 - 2.4. Key relevant government agencies and stakeholders
3. Project strategy
 - 3.1. System development
 - 3.2. International standards
 - 3.3. Business process analysis and improvement
 - 3.4. Common standards
 - 3.5. Regulation improvement
 - 3.6. Inter-agency collaboration and coordination mechanism

4. Team structure
 - 4.1. System development team
 - 4.2. Administrative team
 - 4.3. Associated agencies
5. Project operation plan including tasks, resource assignment, schedules and timelines, key deliverables, budget and risk management.

Project action or operation plans may be drafted by the consultant team or the assigned working groups, however, it should be considered by representatives of agencies and approved by lead policy decision makers or the project sponsor.

In several cases, the activities as suggested in Phase 2 and 3 may be combined, for instance, the consultant team may be assigned to conduct not only the detailed feasibility analysis and design of the new architecture and environment but also develop the master plan and action plans including budget and cost-benefit analysis for the project implementation. While the approval of the project and the grant of the budget is the decision of the government high-level policy decision makers or sponsors at a subsequent step.

Phase 4 - Execution Phase

This phase include the procurement procedures including the selection of the contractor to develop the IT systems, capacity building, interagency collaboration and coordination, and change management. This phase should contain mechanism of effective coordination with the contractor, monitoring mechanism and provision for project progress tracking and management of any project issues. The action or operation plan should contain the following topics:

- 1) Monitoring of progression and outcome
- 2) Warning of any project delay and issues
- 3) Properly adjusting the plan and resolving any project issues

The comparison of actual progression with the plan, and tracking any status and issues of the project operations. If any delays or issues occur, the project manager with supported project staffs should coordinate and manage those issues to make sure that the project deliver effective and efficient outputs and outcomes.

Phase 5 Adoption Phase

The objective of this phase is to deploy the system such that the target users both internally and externally. Awareness creation and training should be provided to the public at large. This phase requires a lot of change management at the organization level and user levels. The adjustments of regulation and operations should be established, announced and enforced. The requirements depend also on time, resources and continuous future supports. The analysis, deployment and adoption may concern with again all the ten critical components.

Normally, government agencies usually commission private IT companies to conduct the IT system development as mentioned in Phase 4.. However, we need external entities to assist the government agencies for phase 5 of change adoption, we may need an external consultant team but need to work closely with the IT development team and representatives of government agencies.

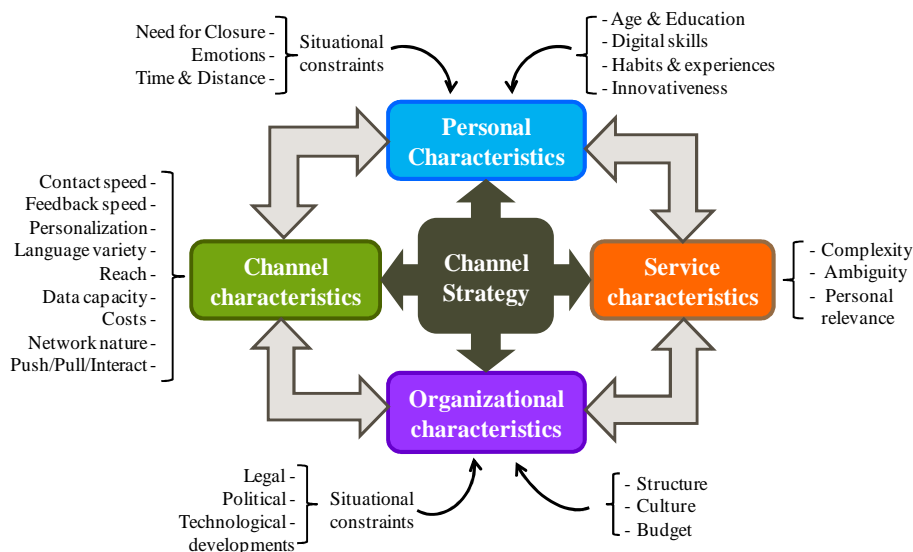
2.7. A Proposed Service Channel Integration Framework

The part is to propose an e-service channel integration framework and recommend some opportunities for improvement of Thailand government service channels for citizens. Nowadays, citizens can access government services via many channels, e.g., websites, phones, e-mails. Therefore, the integration of several service channels can help us identifying gaps and more improvement opportunities, and further enhance public services to citizens more efficiently and effectively.

2.7.1. Components of a Service Channel Integration Framework

The study and analysis of Multi-Channel Management of many countries as discussed in the previous Interim Report suggests that the key components for any service channel integration framework must include the followings:

- **Citizen:** Citizen is the target group of the services. The factors that should be considered are any obstruction of access and usage of services, e.g., age, technology skill, education, availability, locations and traveling distance.
- **Characteristics of services:** The considering factors are simplicity of services and privacy.
- **Characteristics of each service channel:** The considering factors are speed of responding, ability to present large data and cost of services.
- **Characteristics of the service agency:** The considering factors are policy, regulation, budget and organization culture and structures.
- **Strategy of citizen service:** This is an important component of the service channel integration framework. The study of user status, existing services, present service channels and operations of agencies are required to create a better strategy for citizen services.



Source: *Multi-Channel Management: Recent Developments in PES and E-Government* ¹⁴

Figure 2-11: Proposed Government Service Channel Integration Framework

Channels	Characteristics
Call center	<ul style="list-style-type: none"> - direct conversation between users and service providers - IT supported one-stop service - low cost
E-mail	<ul style="list-style-type: none"> - 24 hours service - be able to reply - low cost - probably damaged by threaten programs and spam mails
Lap top computer	<ul style="list-style-type: none"> - all time accessible - wireless service - inconvenient service due to small screen
Personal computer	<ul style="list-style-type: none"> - popular internet access - require internet connecting to access the services
Public internet	<ul style="list-style-type: none"> - suitable for personal internet users - mostly service in high density population public places - provided services in limited areas
Mobile phone	<ul style="list-style-type: none"> - Majority of people have mobile phone - internet accessible - be able to work with web browser
Website	<ul style="list-style-type: none"> - large amount of information accessible - suitably for uncomplicated services - 24 hours services

¹⁴ Multi-Channel Management: Recent Developments in PES and E-Government, Analytical paper, Dr Willem Pieterse & Zachary Johnson July, 2011

Channels	Characteristics
	<ul style="list-style-type: none"> - require instruments and network systems to access services - probably damage by threaten programs

Table 2-5: Channels and Their Characteristics

Therefore, government agencies should consider and analyze these components to create accessible and efficient services. The considerations should be made, for example, on the followings:

- **Personal/Citizen Characteristics:** The various needs and backgrounds of people according to their ages, education, experiences, digital skills, and some situational constraints should be considered.
- **Service Characteristics:** The services should be of personal relevance, meet needs of specific groups, easy to use or access.
- **Channel Characteristics:** Different channels have different characteristics (as shown in the above Table) such as their data capacity, contact speed, network nature, costs etc. These should be matched with the personal and services characteristics for maximum efficiency.
- **Organizational Characteristics:** The natures and cultures, including technological developments and constraints of organizations could affect their development of services suitable or meeting needs of citizens.

2.7.2. Components of Service Channel Integration Planning

1) Operation strategy

The policy decision makers or the executive of the government agent should determine explicit targets of services channel integration based on several factors, such as, operation cost reduction or improvement of service quality.

2) Consideration of service channels

Service channels should be considered by the following characters:

- **Channel suitability of certain services:** Providing news and information through website, communication between government agencies and users through e-mail.
- **Target group:** Due to variation of skill, knowledge and readiness of users, therefore, government agencies should categorize target groups and take care of special requirements of some target groups, e.g., blindness group.
- **Responsible part of agency.**

3) Evaluation and assessment of operation

Success of any new service channel creation depends on the awareness and understanding of the target users of the services. Therefore, criteria of evaluation and assessment should be the satisfaction of users, accessibility and ease of the channels and services. Though, evaluating data should collect via existing service channels. However, the data collecting practices must also comply with the to Personal Information Protection Framework B.E.2553 (2010)

4) Service staff training

The Government agency should provide training to service staffs such that they understand and conduct professional operations and services, as well as the supporting IT service systems.

5) Public relation of new services

When the systems and staff are ready for services, it is necessary to inform the target group to know about the new services and their channels. The government agency should publish the user manuals and provide adequate information to the target users including any concern information, e.g., privacy of personal information.

Creation of new services or improvement of existing services require study of the present characteristics and components of service channels as shown in the channel integration framework, e.g., skills of the target group, service access tools available at the user's side and the simplicity of services that correspond to objectives of services.

2.7.3. Recommendations for Improvement of Government Service Channels

The recent household information technology and communication survey result conducted by the National Statistical Office in 2012 showed that 70.2% of Thai population have mobile phones. This ratio is higher than the computer utilization. Moreover, this trend and internet connected mobile phones penetration are increasing. Therefore, new and improved services should also consider the online services through mobile phones. The proposed recommendations related to channel improvement of all government agencies include the followings:

- Government agencies that already operate their information webs should improve their websites with the options for presenting some of their important information suitable for smart mobile phones or internet-accessible mobile devices.
- The Ministry of Information and Communication Technology should expand the nation-wide network infrastructure and Free Wi-Fi access points to cover

areas that are significant to most citizens, e.g. internet free Wi-Fi within all train and bus stations around the country, government building and service areas for citizens, hospital and public areas across the country. This is to increase chances and access channels to access into government service any time and ways as many areas as possible.

- Government agencies should create database for citizen services improvement to provide information and certain statistics for improvement suggestions, e.g., history of types and frequency of services. This information could help suggesting continuous refinement, improvement and change of the services.
- The Ministry of Information and Communication Technology and all relevant government agencies should mandate and provide resource support for creating more electronic transaction services accessible through smart mobile phones, e.g., electronic form filling, online status tracking, and online approvals.
- The Ministry of Information and Communication Technology and concerned agency should develop, guide and publish security user guidelines and manuals. There are some certain good and bad practices that citizens should be aware of, e.g., the users should not record any of their passwords within their mobile phones.
- The Ministry of Information and Communication Technology and relevant agencies should invest and established telecommunication infrastructure and ICT access points to bridge the digital divide gap, e.g. those in the rural areas, those with disables and senior people. More "physical/hardware" ICT community centers to cover all last kilometers, e.g. in the remote areas, should be invested along with any projects to support and implement more "software/content/e-services" suitable for the community, disables, seniors, farmers, or people in the rural areas,

2.8. List of Reference Models

A consolidated list of reference models of e-government interoperability framework and related resources available internationally, that have been validated through successful use, and that can be re-used by the Government of Thailand is provided in Appendix B

Section 3. Institutional Structures and Governance

3.1. Introduction

The cross-cutting nature of e-government makes it important to devise suitable institutional arrangements that can ensure coordination among various government agencies. E-government institutional structures and governance of foreign countries as well as of Thailand were explored and their findings were presented in the last Interim Report. The existing Thailand's e-government institutional structure are found to base on the policy and investment coordination model led by the Ministry of Finance to enforce policies and priorities through the budget process with decentralization of implementation, and also the technical coordination model led by the Ministry of Information and Communication Technology (MICT) to govern and coordinate e-government activities, with the establishment of Government CIO in all ministries.

MICT has taken the lead to develop governance mechanisms to establish the high-level management control and supervision in the implementation of e-government programs and for cross-agency collaboration and coordination with the private sector. The mechanism is the establishment of an Inter-agency Committee for management and control. Responsibility for overseeing and implementing the e-Government initiatives has been variously allocated, depending on the level of accountability assigned to ministers for the e-government strategy.

In December 2011, MICT had established the e-Government Integration and Development Committee to be responsible for directing the e-government implementation and integration and also for controlling and supervising e-government implementation and management. The Committee is chaired by the Minister of MICT and has the Permanent Secretary of MICT as a Vice Chair. The compositions of the Committee are 12 CIOs from 12 government agencies which are MICT, the Ombudsman Office, the Office of the Prime Minister, the Ministry of Finance, the Ministry of Social Development and Human Security, Ministry of Agriculture and Cooperatives, Ministry of Transport, Ministry of Commerce, Ministry of Interior, Ministry of Public Health, National Economic and Social Development Bureau, National Electronics and Computer Technology Center, plus 2 representatives from Electronic Transactions Development Agency (Public Organization), and Electronic Government Agency (Public Organization), and 3 experts of computer and IT from outside agencies, and 2 representatives from E-Government Promotion and Development Bureau under the Office of the Permanent Secretary of MICT.

To fulfill the key functions of governance and coordination, further studies and desk research have been made on the topics of *respective roles of ministers, permanent secretaries, departmental directors and CIOs for implementation of e-government programs; mechanisms for cross-agency collaboration and collaboration with the private sector; collaboration tools/dashboards for management of e-government program; and capacity building and training*. The findings of those studies are presented in this Draft Final Report. The actionable recommendations for effective management oversight and coordination of e-

government programs and initiatives will be further worked on and provided subsequently in the Final Report.

3.2. Respective Roles of Ministers, Permanent Secretaries, CIOs, Departmental Director Generals, Operational Directors, and ICT-related Directors for Implementation of E-Government Programs

The studies of roles and responsibilities of Ministers, Deputy Ministers/Permanent Secretaries/Senior Managers, Departmental Directors/Program Managers, and Government CIOs in implementing ICT-related and e-government-related programs in other countries and also in Thailand have been conducted. The finding is that there is not any specific roles and responsibilities of those government official positions for implementation of e-government programs having been particularly and clearly defined. The roles for e-government implementation are mostly adapted and extended based on the existing regular portfolio and duties of each position but needing to take into account the e-government nature and characteristics, such as interconnection, integration, innovation, coordination and collaboration, for work assignment. It is, therefore, the followings roles of Ministers, Permanent Secretaries, CIOs, Departmental Director Generals, Operational Directors and ICT-related Directors are defined accordingly, taking into considerations the e-government characters and scope of work in complement with regular portfolio and roles of each specific position. These defined roles shall be applied on the basis of mandates of ministries and departments, as well as their e-government priorities, objectives and requirements.

- **Ministers**

Under the Thai parliamentary system, ministers are accountable to the Prime Minister and to Parliament for presenting and explaining government policies, priorities and decisions to the public. Ministers, both individually and collectively as members of Cabinet, are the principal spokespersons for the Government and its ministries. It is their roles to provide leadership in establishing the priorities and overall themes of e-government development and implementation of their ministries. The roles of ministers for implementation of e-government programs are:

- Direct and approve e-government policies and strategies of their ministries
- Direct and approve e-government priorities, objectives, and requirements of their ministries
- Promote the significance of e-government and innovations for social and economic development of the country

- **Permanent Secretaries**

- Manage to ensure the achievement of e-government policies and strategies for efficiency of e-government services delivery and administration
- Drive the e-government agenda across their ministries
- Approve e-government implementation plans of their ministries
- Drive and oversee e-governance

- Provide high-level advice on innovation in e-government services
- **CIOs¹⁵**
 - Involve in e-government policy and strategy formulation
 - Provide advice and assistance on e-government management
 - Promote effective and efficient design and operation of all major e-government processes for ministries
 - Oversee and support interagency partnerships and innovation in implementing e-government
 - Involve and direct the activities of the CIO Council
 - Provide consultancy and direction on ICT innovation for online services development
 - Approve the ICT investments
 - Identify opportunities for joint and government-wide ICT projects with other agencies
 - Promote and institutionalize enterprise architecture capability within their ministries
 - Oversee specific IT reform initiatives and activities
- **Departmental Director Generals**
 - Direct the development of e-government implementation plans for effectiveness and efficiency of e-government services delivery and administration
 - Strategically manage and evaluate e-government implementation to ensure its alignment with organizational goals and priorities
 - Create aligned and uniform institutional mechanisms for supervision
 - Strategically oversee e-government security policy, standards, and contingency plans for critical national infrastructures
 - Strategically monitor major e-government projects and give advice on major investment decisions
 - Mandate the roles and responsibilities of ministerial staff with respect to e-government
 - Establish effective coordination and collaboration among ministerial staff both within and across ministries
 - Assign adequate resources on capacity building and training for effective e-government implementation

¹⁵Thailand's e-government has two levels of CIOs. One is assigned to Deputy Permanent Secretaries as CIOs at the ministerial level while the other is assigned to Deputy Director General of Departments (or Vice President of State Enterprises) as CIOs at the departmental level. However, their scope of work is rather similar.

- **Operational Directors**

- Provide advice and guidance for effective implementation of e-government (based on specific mandates of specific departments)
- Facilitate implementation of all e-government aspects
- Address issues of e-government integration/ interoperability with other levels of management
- Manage to deliver citizen-centric online services
- Identify and communicate key trends, opportunities, threats and risks of e-government
- Manage top-level relationship with strategic suppliers to their ministries
- Participate actively in the planning, coordination, collaboration, and implementation of e-government, including the use of new technologies
- Promote best practices of e-government across departments
- Establish collaborative relationships (both internal and external relationships)

- **ICT-related Directors**

- Manage necessary information and communication technology and infrastructures significant to the success of e-government systems and implementation
- Lead and monitor implementation of ICT/e-government standards, including common standards for interconnectivity and interoperability, categorization of government electronic information, and computer system efficiency and security
- Leverage enterprise architecture as the enabler of continual transformation
- Lead IT reform initiatives and activities relating to:
 - budget planning and investment control for IT
 - development of enterprise architectures
 - information security
 - privacy
 - access to, dissemination and preservation of government information
 - accessibility of ICT for persons with disabilities
- Establish collaborative relationships (both internal and external relationships)

3.3. Mechanisms for Cross-Agency Collaboration and Collaboration among Government Agencies and with the Private Sector

Successful e-government implementation calls for fulfilling some key preconditions. A critical success factor among them is effective coordination of stakeholders. The cross-agency nature of the e-government implementation that requires extensive engagement of stakeholders from both public and private sectors poses a distinct challenge. Dealing with this challenge requires reliable institutional mechanism and platform for collaboration. Paying

attention to establishing effective collaboration mechanisms for e-government development and implementation would pay off in terms of trust, two-way communication, and ownership.

The surveyed report by the Professors of Syracuse University (2012)¹⁶ in the U.S.A. found that nearly all those 304 federal executives use collaboration as a management strategy with the following five categories of reasons:

- **Explicit Mandate** by external forces: Mandated by boss (including the President); Directives from agency; Legislative mandate
- **Implicit Mandate** by internal organizational culture; Personal values; and “Right thing to do”
- **Improve Outcomes:** Goal and mission achievement; Better results; Effectiveness; Capacity building; Better service delivery; Efficiency; More sustainable solutions
- **Improve Problem-Solving Process:** Achieve consensus; “Harmonization”; Integration; Teamwork; Bring in a diversity of ideas; Broaden options; Boundary spanning
- **Build Relationships and Credibility:** Build alliances; Build credibility with others

Those five reasons should be the motivations and approaches for Thailand as the key strategy to drive the collaboration and coordination among government agencies and private stakeholders also.

3.3.1. Theoretical Concepts of Cross-Agency Collaboration¹⁷

Given the numerous possible approaches to working together, there is no standard definition for cross-agency collaboration. The term has often been used interchangeably with cooperation and coordination, with difference probably in the intensity of participation and effort as well as the extent to which participating agencies are connected in terms of vision, goals, power, resources, responsibility and accountability. It is the collaboration that represents the highest form of connectedness and participation. It involves an interactive process where collaborative actions, such as planning, coordination of task-specialized activities, determination of norms/rules and institutional structures, are jointly made.

Derived from field experience, Imel (1995)¹⁸ proposed a framework for setting up a linkage team to serve as a platform for interagency collaboration. The framework includes these following steps: 1) (Stakeholders) perceiving needs and climate for interagency partnership; 2) Identifying stakeholders for the linkage team; 3) Forming the cross-agency

¹⁶ *Collaboration Across Boundaries: Insights and Tips from Federal Senior Executives* by Rosemary O’Leary and Catherine Gerard, The Maxwell School of Syracuse University, the IBM Center for The Business of Government, 2012

¹⁷ This part is mainly based on the research paper on *Harnessing Interagency Collaboration in Interorganizational Systems Development: Lessons Learned from an E-Government Project for Trade and Transport Facilitation* by Thayanan Phuaphanthong, Tung Bui, and Somnuk Keretho, the International Journal of Electronic Government Research (IJEGR), Vol. 6, No. 3, July-September 2010 and the brief of *Achieving Effective Stakeholder Coordination*, prepared by Sangwon Lim and Shamika Sirimanne, Trade Facilitation Section of UNESCAP, the UNNExT Brief No. 07, September 2011, <www.unescap.org/unnext>

¹⁸ *For the Common Good: The Guide for Developing Local Interagency Linkage Teams* (Revised Edition), Susan Imel, The Ohio State University, 1995.

team; 4) Establishing a collaborative relationship. Factors that contribute to collaboration include (i) regular contact through purposeful meetings; (ii) frequent communications through telephone and mail; (iii) a client-centered focus; and (iv) leadership that helps develop and maintain a shared vision.

For a team to be productive, it has to achieve (i) strategic integration which involves the continuous engagement and mutual commitment among high-level decision-makers; (ii) tactical integration which brings the management together to plan the implementation of the project; (iii) operational integration which involves essential elements that enable practitioners at the operational level to perform their task; (iv) interpersonal integration which builds foundation necessary for sustaining collaborative partnerships; and (v) cultural integration which includes skills and ability for stakeholders under the collaboration to bridge individual differences¹⁹.

Although there is no commonly accepted definition for "collaboration", for the purpose of this report it will be defined as "any joint activity by two or more organizations that is intended to produce more public value than could be produced when the organizations act alone." According to this definition, collaboration can involve several governmental and non-government organizations at different levels, e.g. ministries, departments, divisions, other regulatory agencies, business and industry associations.

3.3.2. Study on Mechanisms for Cross-Agency Collaboration of the U.S.A.²⁰

Mechanisms for Cross-Agency Collaboration

Upon realizing that many of the meaningful work results require the coordinated efforts of more than one federal agency and often more than one sector and level of government and upon recognizing the need for improved collaboration across the federal government, the U.S. Government asked the Government Accountability Office (GAO) to examine and identify the mechanisms for interagency collaboration, as well as issues to consider when implementing these mechanisms.

Federal agencies of the States have used a variety of mechanisms to implement interagency collaborative efforts. *Experts have defined an interagency mechanism for collaboration as any arrangement or application that can facilitate collaboration between agencies.* The followings are selected mechanisms that the federal government uses to facilitate interagency collaboration.

- 1. Presidential Assistants and Advisors:** A Presidential appointee who is solely focused on an issue of great magnitude, or policy collaboration in the Executive Office of the President.

¹⁹ *Collaborative Advantage: The Art of Alliances*, Rosabeth Moss Kanter, Harvard Business Review, 72(4), 96-108, 1994

²⁰ This part is mainly based on *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, Report to Congressional Requesters by United States Government Accountability Office (GAO), September 2012, and *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, Report to the Chairman, Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Committee on Homeland Security and Governmental Affairs, U.S. Senate, by United States Government Accountability Office, October 2005

- 2. Collaboration Structures within the Executive Office of the President:** Permanent or temporary groups that are sometimes referred to as task forces, councils, commissions, committees, or working groups.
- 3. National Strategies and Initiatives:** A document or initiative that is national in scope and provides a broad framework for addressing issues that cut across federal agencies and often across other levels of government and sectors.
- 4. Interagency Groups:**
 - a. Interagency Group Led by Agency and Department Heads:** These groups are sometimes referred to as task forces, working groups, councils, and committees.
 - b. Interagency Group Led by Component and Program-Level Staff:** These groups are sometimes referred to as task forces, working groups, councils, and committees.
- 5. Designation of Leadership:**
 - a. Lead Agencies:** Designation of one agency or department to be accountable for an initiative, particularly if it requires the efforts of several different agencies exercising different statutory authorities.
 - b. Shared Leadership:** Designation of, or agreement by, more than one agency or department to be accountable for an initiative.
- 6. Geographic-Based Offices/Co-location:** One office maintaining responsibility for collaborating with federal agencies or departments that are located in the same geographic region. Also, in some cases, the location of more than one program office from different federal agencies into a facility with the intention of personnel from the agencies collaborating with one another.
- 7. Positions and Details:**
 - a. Interagency Collaborator Positions:** The designation of an individual within one federal agency or department to collaborate within or between agencies or departments.
 - b. Liaison Positions:** An employee of one organization assigned to work primarily or exclusively with another agency.
 - c. Personnel Details:** A specialist or professional designated to perform certain tasks for another agency while remaining employed by his or her home agency.
- 8. Specially Created Interagency Offices:** An office with its own authority and resources with responsibility to cover a policy area that crosses a number of separate agencies or departments.
- 9. Interagency Agreements and Memorandum of Understanding:** A written agreement between more than one federal agency or department.
- 10. Joint Program Efforts:**

- a. **Joint Budgeting and Funding:** A set of resources that are administered by more than one federal agency.
 - b. **Joint Exercising and Training:** Exercising or training that involves participants from more than one federal agency.
 - c. **Joint Development of Policies, Procedures, and Programs:** More than one federal agency developing a policy, procedure or program.
- 11. Conferences and Communities of Practice:** A meeting that brings together representatives of different agencies or departments for the discussion of common problems, the exchange of information, or the development of agreements on issues of mutual interest.
- 12. Collaboration Technologies:** Tools that facilitate collaboration, such as shared databases and web portals.

Key considerations for implementing interagency collaborative mechanisms

Although collaborative mechanisms differ in complexity and scope, they all benefit from certain key features, which raise issues to consider when implementing these mechanisms. Key considerations for implementing interagency collaborative mechanisms are, for example:

- **Outcomes and Accountability:** Have short-term and long-term outcomes been clearly defined? Is there a way to track and monitor their progress?
- **Bridging Organizational Cultures:** What are the missions and organizational cultures of the participating agencies? Have agencies agreed on common terminology and definitions?
- **Leadership:** How will leadership be sustained over the long-term? If leadership is shared, have roles and responsibilities been clearly identified and agreed upon?
- **Clarity of Roles and Responsibilities:** Have participating agencies clarified roles and responsibilities?
- **Participants:** Have all relevant participants been included? Do they have the ability to commit resources for their agency?
- **Resources:** How will the collaborative mechanism be funded and staffed? Have online collaboration tools been developed?
- **Written Guidance and Agreements:** If appropriate, have participating agencies documented their agreement regarding how they will be collaborating? Have they developed ways to continually update and monitor these agreements?

Key practices that can help enhance and sustain federal agency collaboration

Collaboration can be broadly defined as any joint activity that is intended to produce more public value than could be produced when organizations act alone. Agencies can enhance and sustain their collaborative efforts by engaging in the practices identified below:

- **Define and articulate a common outcome.** To overcome significant differences in agency missions, cultures, and established ways of doing business, collaborating agencies must have a clear and compelling rationale to work together. The compelling rationale for agencies to collaborate can be imposed externally through legislation or other directives or can come from the agencies' own perceptions of the benefits they can obtain from working together. In either case, the collaborative effort requires agency staff working across agency lines to define and articulate the common federal outcome or purpose they are seeking to achieve that is consistent with their respective agency goals and mission. Moreover, the development of a common outcome takes place over time and requires sustained resources and commitment.
- **Establish mutually reinforcing or joint strategies** To achieve a common outcome, collaborating agencies need to establish strategies that work in concert with those of their partners or are joint in nature. Such strategies help in aligning the partner agencies' activities, core processes, and resources to accomplish the common outcome.
- **Identify and address needs by leveraging resources** Collaborating agencies should identify the human, information technology, physical, and financial resources needed to initiate or sustain their collaborative effort. Collaborating agencies bring different levels of resources and capacities to the effort. By assessing their relative strengths and limitations, collaborating agencies can look for opportunities to address resource needs by leveraging each others' resources, thus obtaining additional benefits that would not be available if they were working separately.
- **Agree on roles and responsibilities,** Collaborating agencies should work together to define and agree on their respective roles and responsibilities, including how the collaborative effort will be led. In doing so, agencies can clarify who will do what, organize their joint and individual efforts, and facilitate decision making. Committed leadership by those involved in the collaborative effort, from all levels of the organization, is also needed to overcome the many barriers to working across agency boundaries.
- **Establish compatible policies, procedures, and other means to operate across agency boundaries,** To facilitate collaboration, agencies need to address the compatibility of standards, policies, procedures, and data systems that will be used in the collaborative effort. Furthermore, as agencies bring diverse cultures to the collaborative effort, it is important to address these differences to enable a cohesive working relationship and to create the mutual trust required to enhance and sustain the collaborative effort. Frequent communication among collaborating agencies is another means to facilitate working across agency boundaries and prevent misunderstanding.
- **Develop mechanisms to monitor, evaluate, and report on the results** Government agencies engaged in collaborative efforts need to create the means to

monitor and evaluate their efforts to enable them to identify areas for improvement. Reporting on these activities can help key decision makers within the agencies, as well as clients and stakeholders, to obtain feedback for improving both policy and operational effectiveness.

- **Reinforce agency accountability for collaborative efforts** Federal agencies can use their strategic and annual performance plans as tools to drive collaboration with other agencies and partners and establish complementary goals and strategies for achieving results. Such plans can also reinforce accountability for the collaboration by aligning agency goals and strategies with those of the collaborative efforts. Accountability for collaboration is reinforced through public reporting of agency results.
- **Reinforce individual accountability for collaborative efforts** High-performing organizations use their performance management systems to strengthen accountability for results, specifically by placing greater emphasis on fostering the necessary collaboration both within and across organizational boundaries to achieve results.

*The U.S. Government's Actual Practices to Increase Collaboration*²¹

Among the three principles of openness (i.e. transparency, participation, and collaboration), collaboration has the focus on finding innovative strategies to address problems. Collaboration actively engages everyone in the work of government. Executive departments and agencies begin to adopt innovative tools, methods, and systems to encourage cooperation, such as:

- **Increasing Collaboration among Government Employees:** In 2009, the President announced the SAVE Award²², which requested ideas from employees on how to make government more efficient and effective. In just three weeks, OMB (Office of Management and Budget) received more than 38,000 ideas. OMB staff assessed the ideas, passing back the most promising ones to agencies to include as part of their budget plans. Some of these proposals have already become a reality. Additionally, OMB narrowed the submitted ideas down to four, and the American people voted on these final four. The Administration also held the second SAVE Award and expanded the process so Federal employees could both submit ideas and vote on ideas submitted by others in a collaborative process. Agencies are also decentralizing work that used to be under tight control. This kind of employee brainstorming has become so popular in the last year that a Community of Practice has arisen to enable agencies to share best practices about how to collaborate with employees.

²¹ *Open Government* <http://opengov.performance.gov/>

²² SAVE Award (Securing Americans Value and Efficiency) was launched in 2009 to seek ideas from federal employees to make government more effective and efficient and ensure taxpayer dollars are spent wisely. Tens of thousands of ideas on how to make government more efficient and effective were sent to OMB. Each year OMB narrows the best ideas to a "final four." The American people vote online to choose the winner. The winner then comes to Washington to present their idea to the President. Source: <http://www.whitehouse.gov/save-award/about>



See the announcement for the 2012 save award winner: <http://www.whitehouse.gov/blog/2012/12/21/2012-save-award-winner>

<p>Shift to Senior Transit Fares Frederick Winter of Arlington, Virginia <i>Program Officer at the Department of Education</i></p> <p>Frederick from the Department of Education proposes that all Federal employees who receive public transit benefits shift from regular transit fare to the reduced senior fare as soon as they are eligible. In the D.C. area, this change would lower the cost of the employee's travel by 50 percent, with no loss in the effective benefits for the employee.</p>	<p>Reduce Employee Shuttle Buses Angela Leroux of Locust Grove, Virginia <i>Accountant at the Internal Revenue Service</i></p> <p>Many Federal agencies maintain buses to shuttle employees from one government office to another for work purposes. Too often these vehicles sit idle, or travel their routes with just a few passengers. Angela at the Internal Revenue Service recommends that agencies eliminate or consolidate the bus service and encourage the use of conference and video calls, or provide metro cards to those with a need to travel.</p>
<p>Use Digital Transcription James Szender of Anchorage, Alaska <i>Land Transfer Resolutions Specialist at the Department of the Interior</i></p> <p>A written transcript of Federal meetings or hearings is often required. James from the Department of the Interior proposes, whenever possible, using digital equipment for transcripts instead of hiring a court reporter, as using digital transcription is significantly less expensive than getting a certified court reporter to attend, record, and transcribe the proceedings.</p>	<p>Post Customs Inspection Information Online Laurie Dempsey of Alexandria, Virginia <i>Branch Chief at the Department of Homeland Security</i></p> <p>Customs and Border Protection is required to post a bulletin weekly that lists all imported items that have completed the customs inspection process. Currently, Customs ports across the country print this bulletin, which can be hundreds of pages long, and post it in the customs house. Laurie from the Department of Homeland Security suggests instead posting the bulletin electronically on CBP.gov. This change would save paper, reduce costs, and make it easier for the public to find out about what items have been inspected without having to visit the facility in person.</p>

Source: U.S. Government <<http://www.whitehouse.gov/save-award>>

Figure 3-1: The U.S. President's SAVE Award to Increase Collaboration among Government Employees

The other example is that the Wikified Army Field Manual invites military professionals to participate in writing Army tactics, techniques, and procedures on all aspects of military life collaboratively. By inviting participation in writing Army doctrine, the men and women who serve our nation participate in and have access to the best possible information when they need it.



Wikified Army Field Guide

U.S. Army, Department of Defense

Soldiers collaboratively update Army Doctrine from the field



The Challenge

Army Field Manuals (or "Army Tactics, Techniques, and Procedures") instruct Soldiers on all aspects of Army life. As the battlefield changes rapidly, the field manuals must keep pace. Under the traditional process – in which a select few were charged with drafting and updating the field manuals– the manuals often failed to reflect the latest knowledge of Soldiers on the ground.

The Solution

Using the same free software behind Wikipedia, the Army's "wikified" field manuals invite military personnel– from the privates to the generals –to collaboratively update the Army Tactics, Techniques, and Procedures in real time. In so doing, the Army provides a secure means for battle-tested Soldiers to share their experience and advice from the field.

The Benefit

Wikified Army Field Manuals ensure that the men and women who serve our nation have access to the best possible information when they need it.

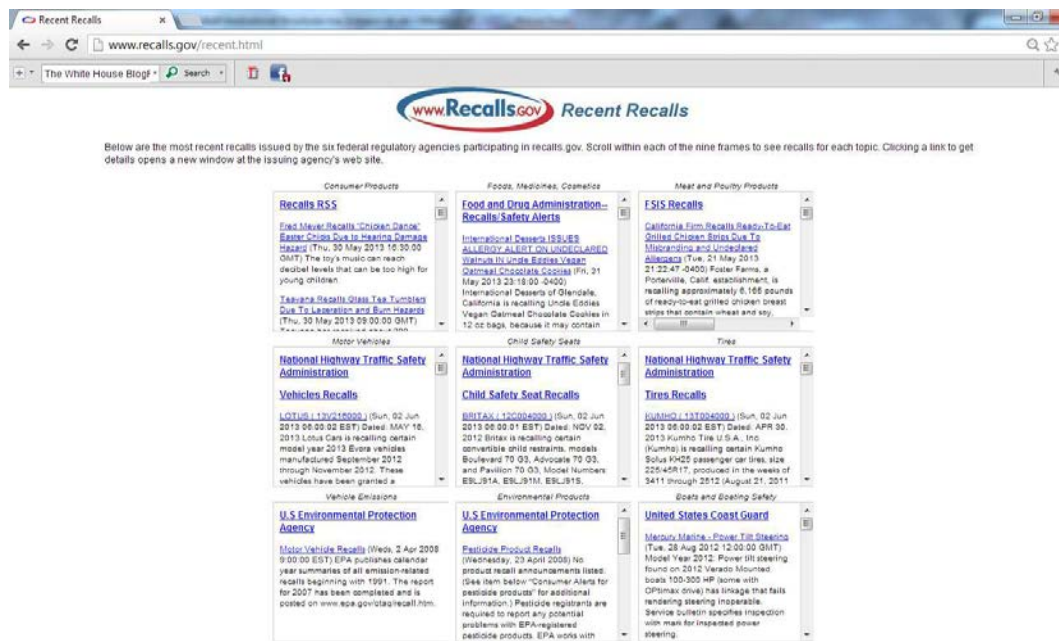
For more information, email leav-cadd-web-cadd@conus.army.mil

Source: U.S. Government <<http://www.whitehouse.gov/open/innovations/wikifiedArmy>>

Figure 3-2: Wikified Army Field Guide to Increase Collaboration among Government Employees

- **Increasing collaboration across government institutions:** To provide better service in alerting the American people to unsafe, hazardous, or defective products, six federal agencies with vastly different jurisdictions have joined together to create a "one stop shop" for Federal government recalls, providing consumers with up-to-date product safety information. Website visitors can also download mobile phone apps to find the information by typing a product's name into a phone and learning immediately whether that product has been recalled because of a safety concern. Consumers can also see photos of recalled products and learn what to do with recalled products in their homes.





Source: U.S. Government <http://www.recalls.gov/>

Figure 3-3: "One Stop Shop" for Federal Government Recalls to Increase Collaboration Across Government Institutions

- Increasing collaboration with the private sector:** By inviting the collaboration of people across the United States to develop novel software applications that transform raw HHS (Department of Health and Human Services) data into powerful knowledge, the Community Health Data Initiative is fostering game-changing solutions to problems in public health. For example, a team of innovators is working with the National Association of Counties to develop a "Network of Care for Healthy Communities" dashboard that allows citizens and civic leaders to see local health performance compared to other counties, and automatically ties in "best practice" information from around the nation showing how other communities have tackled similar issues and generated positive change. Building these kinds of tools helps to focus attention on what works and enables people to reach out to one another to develop and share best practices.

Source: U.S. Government <<http://www.healthdata.gov/>>

Figure 3-4: Community Health Data to Increase Collaboration with the Private Sector

3.3.3. Mechanisms for Cross-Agency Collaboration and Collaboration with Private Sector in Thailand

Activities that aim at managing stakeholders and ensuring interagency collaboration span throughout the life cycle of e-government implementation. Efforts to achieve such objectives are one of the most critical success factors to realize this nation-wide scale of reforms.

3.3.3.1. National and Regional Collaboration

In year 2004, the National Competitiveness Development Committee (NCDC)²³ identified and reported to the Cabinet the needs to improve efficiency, reliability, security, and responsiveness of Thailand's logistics sector. The Cabinet consequently assigned top priority to the enhancement of the logistics sector and commissioned the development of the Thailand Logistics Master Plan (2005-2009). Thailand Logistics Master Plan (2005-2009) was later refined to better reflect economic and social changes and renamed as Thailand's Logistics Development Strategy (2007-2011).

In addition to the responses to the national policy directives, the National Single Window (NSW) implementation in Thailand, one of the five strategic agendas within the above National Logistics Master Plan, also reflects the need to foster regional integration and realization of an ASEAN Economic Community by 2015. The Thai government together with governments of ASEAN member economies signed the "Agreement to establish and implement the ASEAN Single Window" in 2005. Because of this Agreement, the government is obligated to develop the system. Such political commitment strengthened the need to implement NSW. It forced the creation of a platform for interagency collaboration among several government agencies and business stakeholders, and strengthened the justification for budget allocation.

3.3.3.2. Interagency Collaboration in Interorganizational Systems Development: Thailand's Experience and Lesson Learned from the E-Government Project for Trade and Transport Facilitation²⁴

Action Research by KU-INOVA

The four-year long action research was conducted by the KU-INOVA consultant team in cooperation with a Thai doctoral student and a professor of information technology management at the Shidler College of Business of the University of Hawaii with the focus on the organizational and managerial aspects of interagency collaboration in the implementation of a large-scale e-government project, called National Single Window (NSW) project, in Thailand. The research sought to identify critical success factors for establishing and maintaining interagency collaboration in a large-scale interorganizational system development project. The findings were drawn from direct

²³ National Competitiveness Development Committee (NCDC) is a high-level committee chaired by Thailand's Prime Minister. NCDC is comprised of all economic-related Ministers as well as representatives from key industry sectors.

²⁴ *Harnessing Interagency Collaboration in Interorganizational Systems Development: Lessons Learned from an E-Government Project for Trade and Transport Facilitation* by Thayanan Phuaphanthong, Tung Bui, and Somnuk Keretho, the International Journal of Electronic Government Research (IJEGR), Vol. 6, No. 3, July-September 2010

experiences during the implementation of the cross-border internet-based system for trade and transport facilitation in Thailand which required an involvement of more than 40 governmental and business stakeholders. The paper suggests a stepwise approach for the establishment and maintenance of interagency collaboration derives methodological and practical implications from this large-scale experience.

Interagency Collaboration in Interorganizational Systems Development for an E-Government Project – Results and Findings

From the actual experience as action researchers and the lead consultant of the project, the KU-INOVA consultant team assisted the government of Thailand in establishing collaborative relationship among stakeholders of the National Single Window (NSW) project, and also extended its own domain knowledge in the process. In line with Blum (1955)²⁵, the activities that had been carried out according to the theoretical framework discussed earlier to foster the process of interagency collaboration were examined. The interplay between units were observed and documented, and potential problems were identified as they occurred. Then possible solutions were explored and introduced to improve the situation along the collaboration process.

Following the framework for setting up a linkage team (Imel 1995), the National Competitiveness Development Committee (NCDC)²⁶ took the first step in identifying needs to improve efficiency and effectiveness of the national trade and transport facilitation system. Thailand Logistics Master Plan (2005-2009) was thereafter developed to address NCDC's political will, commitment, and national long-term vision in this matter. The need for national ICT development for trade facilitation was strengthened after Thailand officially signed the Agreement to Establish and Implement the ASEAN Single Window. Such political commitment created a platform for interagency collaboration and strengthened the justification for budget allocation.

After the need and political mandate was perceived, most stakeholders of the NSW were identified. The Cabinet formulated and institutionalized a National Committee on Logistics Development (NCLD). NCLD consists of ministers and permanent secretaries from economic-related Ministers and representatives from trade- and industry-related associations. NCLD's members are responsible for planning and monitoring sub-projects carried out under each ministerial boundary. While the engagement of NCDC in the project reinforced strategic integration and thus mutual commitment among high-level decision-makers, the appointment of NCLD was a strategic move. The commitment at this level made relevant stakeholders accountable to the project and obligated them to render collaboration.

²⁵ Blum, F.H. (1955). Action Research – A Scientific Approach?. *Philosophy of Science*, 22(1), 1-7.

²⁶ National Competitiveness Development Committee (NCDC) is a high-level committee chaired by Thailand's Prime Minister. NCDC is comprised of all economic-related Ministers as well as representatives from key industry sectors.

National Economic and Social Development Board (NESDB) was appointed as NCDC's and NCLD's secretary. While NCDC and NCLD provided a certain level of formality to project realization, NESDB played an important role in ensuring project continuity even under the vacuum of leadership resulting from instable political situations.

The Cabinet also appointed a linkage team to lead and manage the project implementation, particularly the development of the NSW exchange system and the integration of other components with the NSW exchange system. The appointment was based on existing organizational role, responsibility, and capability. As Bardach (1998)²⁷ argues, participants' capability has great influence on the project success. Recognizing that Customs Department possesses in-depth knowledge of the business domain and relevant technologies, the Cabinet designated Customs Department as a lead agency to coordinate/lead NSW implementation and drive the information exchange between Thailand's NSW and NSWs of other ASEAN countries. The Cabinet also designated Ministry of Information and Communication Technology (MICT) as an agency responsible for managing some earlier parts of the projects, handling allocated initial budget, and identifying the best appropriate business model for a smooth operation of NSW. Nevertheless, having one agency in charge of the implementation and another in charge of the project management at the beginning of the project has proved to be a disadvantage. The ministerial bureaucracy and too many position changes of related ministers because of instable political situations held back budget allocation that lead to project implementation delay at least during the year 2007-2009.

As a lead agency, Customs Department initiated a working group to serve as an organizational mechanism to facilitate communication and coordination among NSW stakeholders. The working group had representatives from controlling government agencies as well as relevant trade and transport community. Analysis of existing business processes was conducted to further identify intended users, receivers of the system's output, and intended developers/operators. A list of all stakeholders is provided in Table 3-1. Captured business processes were codified using UML²⁸ Use Case and Activity diagrams. The diagrams were used as a medium to communicate with identified stakeholders for further stakeholder identification. Two sub-working groups were formed. One worked on streamlining business processes and aligning data requirements. The other dealt with technical communication protocol and related security issues. With close communication among stakeholders, interests and expectations on the system were regularly addressed, managed and aligned by the lead agency.

²⁷ Bardach, E. (1998). *Getting Agencies to Work Together: The Practice and Theory of Managerial Craftmanship*. Washington, DC: Brookings Institution Press.

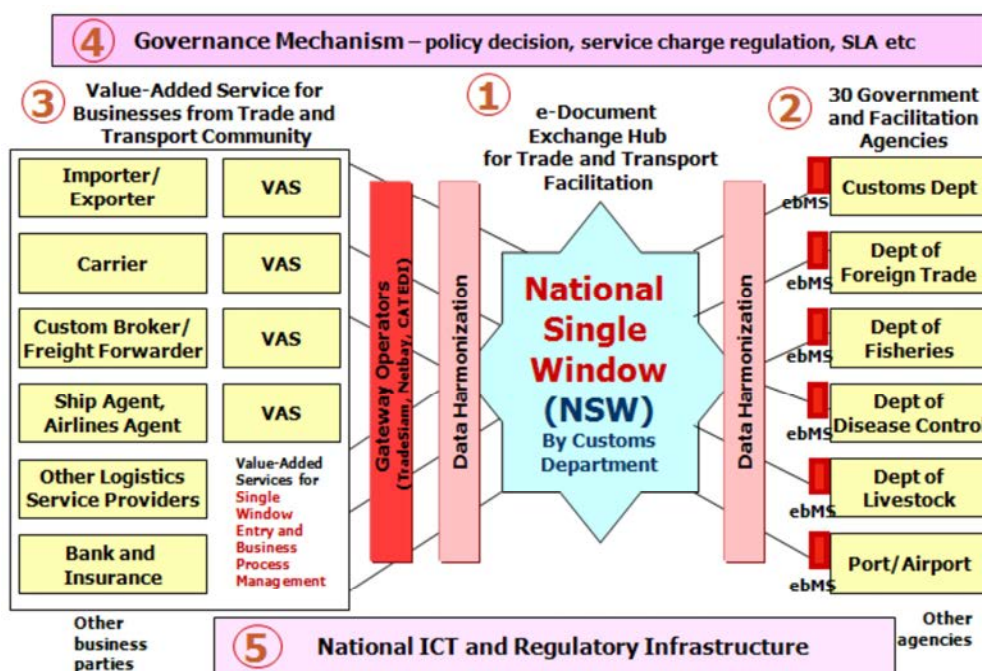
²⁸ Unified Modelling Language

Categories of Stakeholders	Stakeholders
NSW operators and CA providers	<ul style="list-style-type: none"> - NSW operators: TradeSiam, Netbay, CAT Telecom - National root certification authority (CA) - CA providers: CAT Telecom, TOT, Thai Digital ID
Permit/license/certificate issuing agencies (participating government agencies)	<ul style="list-style-type: none"> - <u>Ministry of Finance</u>: Royal Customs Department, Department of Revenue, Excise Department - <u>Ministry of Agriculture and Cooperatives</u>: Department of Agriculture, Rubber Research Institute of Thailand, Department of Fisheries, Department of Livestock, National Bureau of Agricultural Commodity and Food Standards - <u>Ministry of Commerce</u>: Department of Foreign Trade, Department of Export Promotion, Office of Commodity Standards - <u>Ministry of Industry</u>: Department of Industrial Works, Board of Investment, Industrial Estate Authority of Thailand, Thai Industrial Standards Institute, Office of the Cane and Sugar Board - <u>Ministry of Public Health</u>: Food and Drug Administration, Department of Medical Science, Department of Disease Control - <u>Ministry of Natural Resources and Environment</u>: Royal Forest Department, National Park, Wildlife and Plant Conservation Department - <u>Ministry of Foreign Affairs</u>: Department of Consular Affairs - <u>Ministry of Energy</u>: Department of Energy Business, Department of Mineral Fuels - <u>Ministry of Transport</u>: Department of Land Transport, Marine Department, Department of Aviation, Port Authority of Thailand, Airport of Thailand PCL, State Railway of Thailand - <u>Ministry of Science and Technology</u>: Office of Atom for Peace - Thai Chamber of Commerce - Board of Trade of Thailand
Value-added service providers (VAS)	<ul style="list-style-type: none"> - Software companies - Value-added service providers

Categories of Stakeholders	Stakeholders
Trade and transport community	<ul style="list-style-type: none"> - Traders: exporters, importers - Logistics service providers: freight forwarders, customs brokers, carriers, shipping agents, ship/vessel/airplane operators, port operators, terminals, inland container depot - Insurance companies - Banks
Strategic Partners in charge of governance Mechanism and provision of relevant ICT and regulatory infrastructure	<ul style="list-style-type: none"> - National Competitiveness Committee Chaired by Prime Minister - Ministry of Information and Communication Technology - National Economic and Social Development Board - ASEAN Single Window Technical Working Group
Regional and international stakeholder	Single Window of other countries and Thai trading partners

Table 3-1: Stakeholders of Thailand's National Single Window

The appropriate appointment of lead agencies and the formation of sub-working groups provided the foundation for operational integration. The high-level architecture of Thailand's NSW in Figure 3-5 was developed and used as means to clarify project definition and roles of each stakeholders. It provided a clear overall picture and common vocabularies, promoted common understanding among stakeholders, and strengthened integration at the operational level.



Source: Keretho 2009

Figure 3-5: Thailand's NSW High-Level Architecture

A lead consultant from the academia was hired by NESDB and MICT to assist the project formation and project implementation in technical and managerial aspects. As part of contract, several high-level awareness-raising events were arranged to educate relevant parties on policy framework towards NSW and foster common understanding about the project. Those events were supplemented by informal and formal information-sharing sessions on relevant methods, tools, techniques, and standards. With a more informed idea on benefits and positive impact of the system, affected parties were less likely to resist the project implementation. The constructive engagement and diplomatic qualities of the lead consultant such as patience, perseverance and persuasion were acknowledged as critical factors that helped create collaborative partnerships, bridge individual differences, thus enlist commitment and participation from independent agencies. Stakeholders accepted and recognized the leadership of the lead consultant not only because of his academic credibility and neutrality but also because he is a consultant authorized by NESDB and MICT. Nevertheless, disinclination to collaborate was experienced from time to time due to a personal rivalry and the complication of the project involving with different perspectives and needs of so many stakeholders. Placing an emphasis on a circle of influence rather than the circle of concern (Covey 2004)²⁹ was a technique used to avoid conflict and deal with individual differences. The communication, communication and communication among stakeholders is the key success endeavor.

²⁹ Covey, S. (2004). *The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change* (15th Ed.), New York, NY: Free Press.

A team of consultants was installed to undertake interagency tasks including business processes streamlining and data harmonization. These activities required a great deal of communication between consultants and designated persons-in-charge from participating agencies. The use of relevant standards shortened negotiation process. The communication sessions, where its goal was to collect procedural and data requirements and validate the documentation of the analysis outcome, were often arranged informally. Groundwork was done before the meeting to ensure effective data collection and that data collection was completed in as fewer meetings as possible.

Table 3-2 summarizes the interagency collaboration process, issues associated with each step, and key experiences regarding interagency collaboration captured from the initial phase of the NSW.

Interagency Collaboration Process	Issues in Interagency Collaboration	Experiences from Thailand's NSW Project
Step 1: Perceive needs for interagency partnership	The ideal needs are those that combine factors of human needs, public sentiment, legislative priorities, and institutional readiness.	Need to implement the NSW system was based on economic rationale and perceived threats in the international trade.
Step 2: Identify stakeholders	Stakeholders include initiators, sponsors, implementers, intended users, receivers of the system's output, intended developers and operators of the system, those impacted and affected by the system, and those who will win or lose from existence of the system	<ul style="list-style-type: none"> - Stakeholders were identified at the project initiation phase. - Business process analysis conducted after project initiation for Thailand's strategic industry sectors enabled further identification of intended users, receivers of the system's output, and intended developers/ operators. - Captured business processes were codified using some visualized forms for ease of understanding (e.g. UML Use Case and Activity diagrams). The diagrams were used as a medium to communicate with identified stakeholders for further stakeholder identification.

Interagency Collaboration Process	Issues in Interagency Collaboration	Experiences from Thailand's NSW Project
Step 3: Form the interagency team	The most productive team requires the integration at five levels - Strategic integration	Strategic integration was facilitated by National Economic and Social Development Board (NESDB). It was addressed with high formality by initiators and sponsors of the system. The regional Agreement further strengthened the tie.
	- Tactical integration	The appointment of National Committee on Logistics Development (NCLD) was a tactical move. It brought together the high-level management to plan and monitor project implementation. The commitment at this level made stakeholders accountable to the project and obligated them to render collaboration.
	- Operational integration	Besides budget allocation for each individual government department, Customs Department was designated to lead project implementation and Ministry of Information and Communication Technology (MICT) to handle initial project management. Working groups were formed to facilitate communication and coordination on cross-organizational issues among stakeholders at the operational level. The study on the high-level architecture of Thailand's NSW Figure 3-5 helped clarify project definition and roles of each stakeholders thus reduced confusion.
		Lead consultant's diplomatic

Interagency Collaboration Process	Issues in Interagency Collaboration	Experiences from Thailand's NSW Project
	<ul style="list-style-type: none"> - Interpersonal integration 	quality was also crucial for enlisting commitment and participation from independent agencies.
	<ul style="list-style-type: none"> - Cultural integration 	Incompatibility on broad values, principles, and strategic grounds caused the personal rivalry. Conflict avoidance approach was employed in dealing with this issue.
Step 4: Establish a collaborative relationship	Factors that contribute to collaboration include: <ul style="list-style-type: none"> - Regular purposeful meetings; frequent mediated communications; client-centered focus; and leadership that promotes shared vision - Interagency collaboration capacity, i.e. formal agreements; resources; administrative services; accountability associated with each task; individuals' expectations of others; and their availability and competency for delegated tasks 	These qualities were found throughout the setting up of the interagency collaboration for NSW implementation.

Table 3-2: Summary of Experience and Lessons Learnt from Interagency Collaboration in Thailand's NSW Project (observed during the years 2007-2010)

Lessons Learned and Issues from Thailand's NSW Project

Based on the research findings, lessons learned that offer some practical ideas for policy-makers and project managers are generated and summarized. Factors that are critical to ensure the effectiveness of the interagency collaborative platform including formal communication, informal communication, as well as the role of third-party professionals, standards, and communication-enabled technology are described below.

- **Collective Needs for the Common Good**

The most pertinent needs that drove the motivation to participate are grounded in economic rationale and perceived threats in the international trade and potential benefits of the project towards increasing national competitiveness. The statement regarding these issues had been repeatedly addressed in various occasions, particularly in awareness-raising seminars and conferences.

The perceived needs identified for this project also represent the collective action that is conducted on behalf of collective needs for the common good. The proclamation “Thailand will be the world-class logistics hub for Indochina” had always been repeatedly used by several senior government officials to reinforce a sense of patriotism embedded in Thai society. Such statement reflects the attitude towards collectivism.

- **Official Mandate and Legitimacy**

In the project, a formal interagency collaborative platform was established. At the strategic level, high-level policymakers play an important role of the conveners who use their authority to establish, legitimize, and guide the collaborative alliances. Mandate designation is used as means to identify and induce stakeholders to collaborate. At the tactical level, the establishment of the National Committee on Logistics Development (NCLD) and the appointment of lead agencies were a critical requirement that kept the formal collaboration working. At the operational level, the appointment of responsive working groups has positive impact on maintaining collaborative activities and relationship. Even for a project that seems to make it possible to use a flatter organizational structure, the bureaucratic nature of enforcing hierarchical power remains prevalent.

- **Formal and Informal Aspects of Communication**

Formal collaboration helps align expectations and solidify commitments. Through formal communication channels, stakeholders learned about mandate and benefits of the project. While the mandate informed stakeholders about their role and responsibility in the project, the perceived benefits that the project would bring increased stakeholders’ motivation to participate.

In our study, as we moved along the project, the support from the high-level policymakers was not as stable as project stakeholders would want. The political situation in Thailand for the past five years (2005-2010) yielded high rate of turnover in ministerial and senior-official positions. It caused discontinuity of support from high-level policymakers and delayed several activities required to push the implementation forward. Given the frequent turnover of top-level management, the middle management took the initiative to move on with the project. They employed informal communication to fine-tune collaborative relationship, kept stakeholders informed of the project progress, and sought cooperation at the operational level. The informal communication helped get all stakeholders “tow one rope in the same

direction.” As most middle-level managers recognized, “90% talking and 10% doing is necessary.” As noted by Bardach (1994)³⁰, self-organizing relationships do have the potential to promote communications and thus facilitate working relationships.

- **Expert/Consultant as one of the Collaboration Driving Forces**

The study found that although rational/economic argument and technical feasibility are necessary for building collaborative relationship, individual relationship such as personal chemistry and compatibility among all stakeholders must also be in place for such relationship to flourish and mature. The evidence was found from the project that stakeholders’ incompatibility on broad values, principles, and strategic grounds was one crucial factor that caused the personal rivalry.

In our project, the consultant from the academic was perceived by stakeholders as being professional, neutral and knowledgeable. With a career as an academic, an external consultant increased stakeholders’ trust and confidence in the development approach and expected deliverables that they learned through a series of information-sharing seminars and training.

Our experience with project stakeholders indicated that the diplomatic quality of the lead consultant such as patience, perseverance, and persuasion was another critical factor that helped enlist commitment and participation from independent agencies. Other skills found necessary include the consultant’s ability to identify issues that each stakeholder is skeptical about; collate relevant information; produce a coherent picture of those issues; pinpoint issues in which decisions are needed; determine which options are available; negotiate an acceptable solution for everyone involved; and present complicated concept in an easily understandable manner. Given that Thai society is characterized by high uncertainty avoidance and high perception of power distance, conflict avoidance proved to be an effective approach to solve differences and risks of disintegration among participating agencies. This mixture of quality is referred as the ability to create an effective circle of influence and gradually extended to complete a circle of concern. We acknowledge that the role and contribution of expert-consultants were critical, and this importance appeared to be even possibly important for the implementation of an e-government project than for an IT project in the private sector.

- **The Role of Standards and Communication-Enabled Technology in Collaboration**

The role of technology in supporting collaboration and the necessity to use technology to support information exchange and sharing has been widely discussed. In this e-government project, the use of electronic means was insignificant. It was typically a one-way communication process. The comments and opinions that receiving parties had towards the message content were normally prolonged and addressed in face-to-

³⁰ Bardach, E. (1998). *Getting Agencies to Work Together: The Practice and Theory of Managerial Craftsmanship*. Washington, DC: Brookings Institution Press.

face meetings. Full COTS³¹ (commercial off-the-shelf) tools were employed. However, they were used by the consultants in the documentation of business process models and the harmonization of cross-agency data requirements only. They were not perceived as collaborative tools.

On the other hand, we found that standards related to business process documentation and data played an important role in the interagency collaboration process. These standards provide a grammar for the documentation of knowledge which in turn facilitate the collaborative construction of shared representations. The documented knowledge in visual or textual form is known as an external representation that facilitates the negotiation of meanings and collaborative construction of shared representations through dialogic discourse. It is this shared representations that serve as a common ground for e-government architectural design and development.

In this research project, Unified Modeling Language (UML)³² provided standard graphical notations for documenting business process. The draft business process models were used as a medium for the consultants to communicate with relevant stakeholders to ensure the accuracy and completeness of the information collected, and to obtain feedback on how the models could be improved to reflect actual situations.

Data standards were employed as a tool to reconcile data definitions, data element names, data element representations, and data structures for used in electronic messages. The use of these data standards eased the negotiation process and enabled the consultants to rationalize and harmonize data requirements from 21 regulatory agencies related to trade and transport.

- **Stakeholder Collaborative Platform Establishment**

Establishment of a lead agency, inclusive membership and participation and effective interagency collaborative platform and participation of the business community is essential. Apart from the need for political will, the project will need a strong, resourceful and empowered lead organization to launch it and see it through its various phases. This organization must have the appropriate political support, legal authority, human and financial resources, and links with other relevant Government agencies and the business community. In addition, it is essential to have a strong individual within the organization who will be the project “champion”.

A Single Window is a practical model for cooperation between agencies within Government and also between Government and traders. It presents a good opportunity for a public-private partnership in setting up and operating the system. Consequently,

³¹ Short for *commercial off-the-shelf*, used for describing software or hardware products that are ready-made and available for sale to the general public.

³² Unified Modeling Language is a general-purpose notational language for specifying and visualizing complex software, especially large, object-oriented projects.

representatives from all relevant public- and private-sector agencies should be invited to participate in developing the system from the outset.

This should include participation in all levels of the project, from developing the objectives, situational analysis, and project design right through to implementation. The ultimate success of the Single Window will depend critically on the involvement, commitment and readiness of these parties to ensure that the system becomes a regular feature of their business process.

The most powerful stakeholders must be identified early such that their input can be used to shape the future direction of the Single Window. Support from the powerful stakeholders will help the engagement win more resources, thus making the implementation more likely to succeed.

Communication with other stakeholders early and frequently is very important. A more formal collaborative platform, e.g. a SW steering committee including supportive working groups with representatives from concerned regulatory agencies and related business associations should be established to create an environment for effective interagency coordination and collaboration.

In Conclusion

The research focuses on the organizational and managerial aspects of interagency collaboration in the implementation of a large-scale e-government project. It confirms the usefulness of a process for setting up a linkage team. Additional findings further suggest process elements necessary for successful establishment and maintenance of the collaborative platform for e-government implementation which by nature involves stakeholders from various government agencies and business communities.

Field observations suggest that common needs that involve economic interests are perceived as most pertinent in reinforcing stakeholders' participation. These common needs build up political will and commitment which in turn provide and create a conducive environment for interagency collaboration and justification for the allocation of resources.

The processes observed in this study reflect the necessity of control that the conveners from the top-level management exercise in orchestrating the collaborative partnership. The role of high-level policymakers in mandating has proved to remove confusion as to how independent agencies would function as a coordinated entity with problem-solving authorities. Voluntary participation and self-regulation may be appropriate for setting up the collaborative partnership in other domain, but not in a large-scale e-government project involving stakeholders from government agencies across Ministries and private sector.

The study also affirms the role of formal communication in aligning project expectations and solidifying commitments while stressing the importance of informal collaboration as a factor that drives implementation progress. This finding is a priori

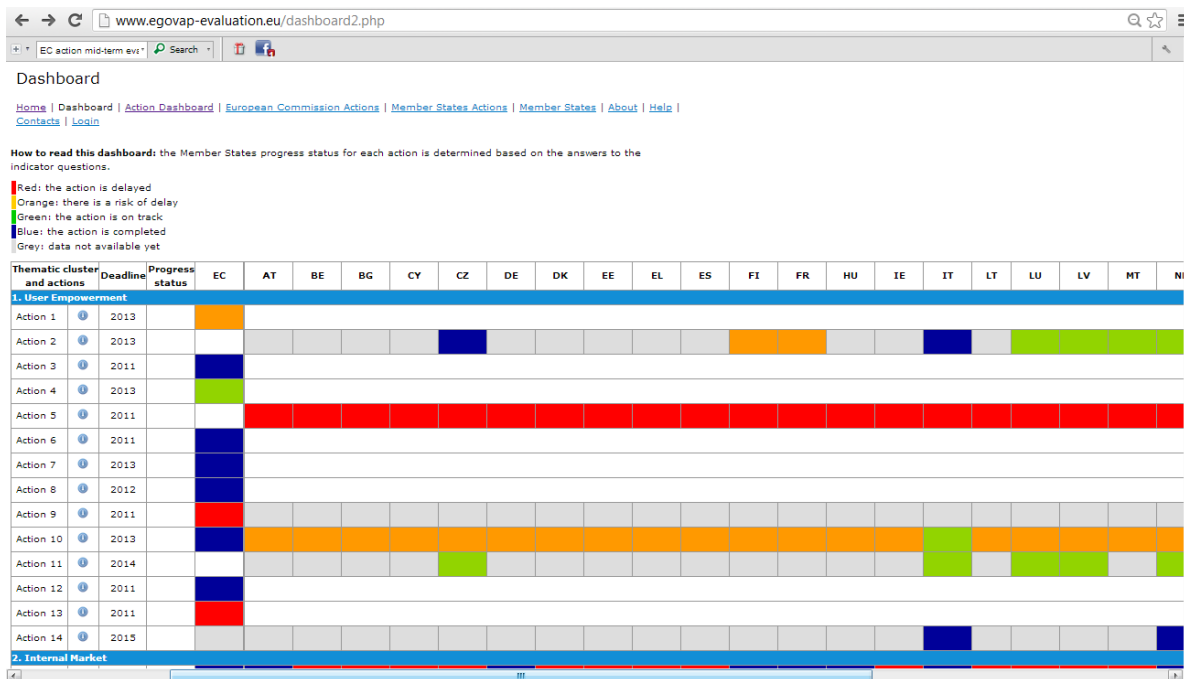
counter-intuitive as we expected that, for a project that involved loosely coupled institutions, and given the wide-spread use of informal communications such as emails, desktop and mobile telephones, the spirit of the mandate was sustained through formal communications. E-government is an application domain which is affected by political environment to a large degree. Political instability can easily cause project interruption and delay. Frequent informal communications among stakeholders at the middle-level management is proved to be essential to mobilize collaboration and move the project forward.

Based on our observations, sophisticated communication-enabled technology is not critical in the building collaborative relationship. Third-party professionals and IT standards, on the contrary, play an important role in mediating different sociopolitical and technical incompatibility among stakeholders.

3.4. Collaboration Tools/Dashboards for Management of E-Government Program

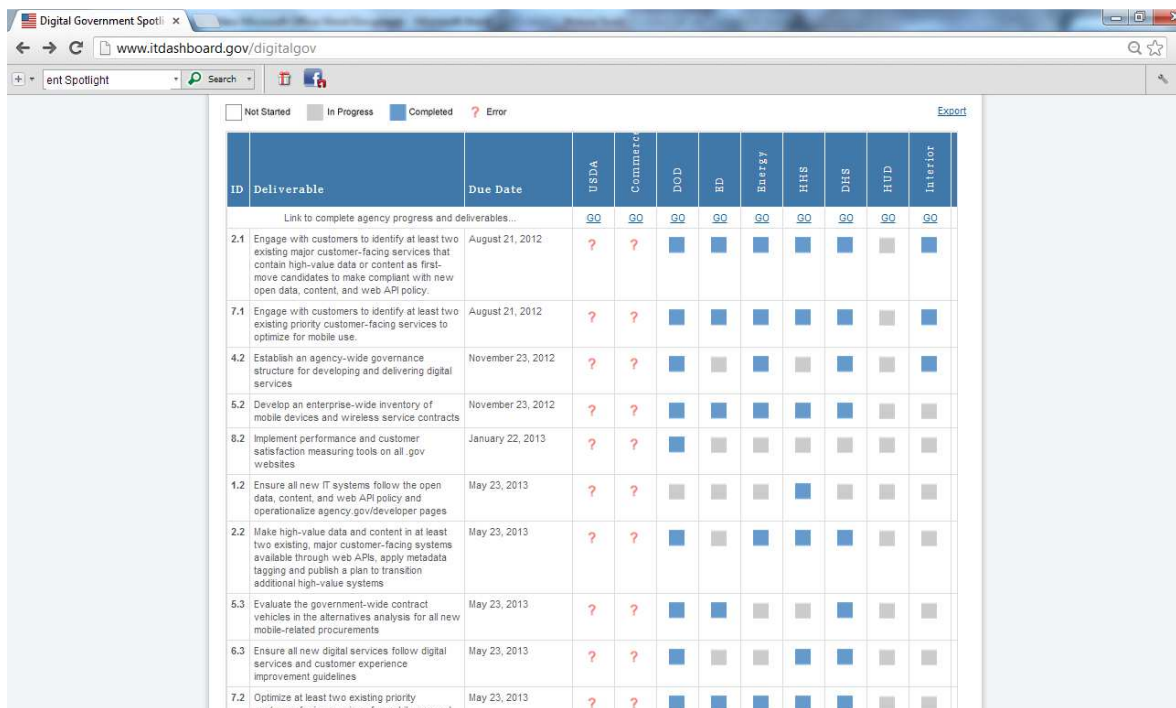
To manage an e-government program, it needs to develop an integrated instrument for evaluation and improvement of the performance of e-government applications. A dashboard becomes an effective and efficient electronic instrument for it. A conceptual framework of e-government dashboard will help to form the overall structure in which the data of the dashboard are embedded. However, there are other tools to be used for management of the e-government program. In this part, use of collaboration dashboards and national collaboration framework are specifically presented.

As examples, the below Figure 3-6 and Figure 3-7 illustrate the looks of dashboards used for evaluating e-government implementation in Europe and in the U.S.A.



Source: European Commission <<http://www.egovap-evaluation.eu/dashboard2.php>>

Figure 3-6: Dashboard for Mid-Term Evaluation of the eGovernment Action Plan of European Commission



Source: U.S. Government <<http://www.itdashboard.gov/digitalgov>>

Figure 3-7: IT Dashboard for Report of Progress in Implementing the Digital Government Strategy

3.4.1. Study on Use of Dashboards in the U.S. Government³³

3.4.1.1. Conceptual Framework of a Dashboard

A dashboard is defined as "a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance."

Dashboards are becoming an important means of tracking key performance indicators for private, nonprofit, and public organizations. Dashboards summarize key performance metrics of organizations. They typically integrate data from different sources and display performance measures through informative graphics with explanatory captions. The data visualization allows readers to understand complex data in less time than it would take to read similar material located in the text of a full report. The dashboards should be self-contained in explanation. In terms of their display, dashboards can be either static (providing performance metrics for a specific time or period of time; not interactive and cannot be updated on the fly, such as printed report) or dynamic (providing metrics in real time, such as interactive web dashboards). Organizational dashboards can provide executives with an instant view of the organization's performance metrics on selected dimensions. In terms of their use, dashboards can be of three types:

- **Operational dashboards** are used mainly for monitoring purposes. Front-line workers use operational dashboards to monitor operational processes, events, and activities on a real-time basis.
- **Tactical dashboards** are used mainly for analytical purposes. Executives use tactical dashboards to review and benchmark performance of departmental activities and processes. Departmental managers use the dashboards for monitoring their unit's progress.
- **Strategic dashboards** are used by executives to track progress toward achieving strategic objectives. These dashboards are often implemented using the balanced scorecard framework.

There are two key elements that are crucial to the implementation and use of dashboards

- **Dashboard design:** The design is for easy grasp of actionable data and information. Leading dashboard experts highlight three core principles of design: the dashboard should fit on a single page; the dashboard should be simple; and it should use the best display medium (i.e., the graphic visual) for communicating data effectively.

³³ *Use of Dashboards in Government* by Sukumar Ganapati, Public Administration Department, School of International and Public Affairs, Florida International University, IBM Center for The Business of Government, 2011

- **Dashboard performance measures:** An agency must carefully select performance metrics to reflect its strategic goals. The measures should be useful to agencies in improving performance. The measures should also serve the broader goal of public accountability. The four types of performance measures in the private sector are:
 - **Key Results Indicators (KRIs)** explain how an organization has performed on a specific perspective or a critical success factor.
 - **Results Indicators** explain what an organization has done.
 - **Performance Indicators** describe what an organization does.
 - **Key Performance Indicators (KPIs)** represent measures focusing on those aspects of organizational performance that are most critical for the current and future success of the organization.

In the context of government organizations, government agencies are required to establish performance goals and identify a set of performance indicators to be used in measuring progress toward each goal. These indicators are, such as,

- customer service measures (service delivery assessments e.g. quality, timeliness, and satisfaction);
- efficiency measures (ratio of inputs, e.g., employee costs or hours, to outputs, e.g., amount of products or services delivered); and
- outcome measures (assessment of the results of a program activity compared to its intended purpose).

However, these measures need to be customized to the agency's strategic mission and goals.

Government organizations use dashboards to both monitor internal organizational performance and management and make available performance information to the public for transparency and accountability.

3.4.1.2. Use of Dashboards in the U.S. Government

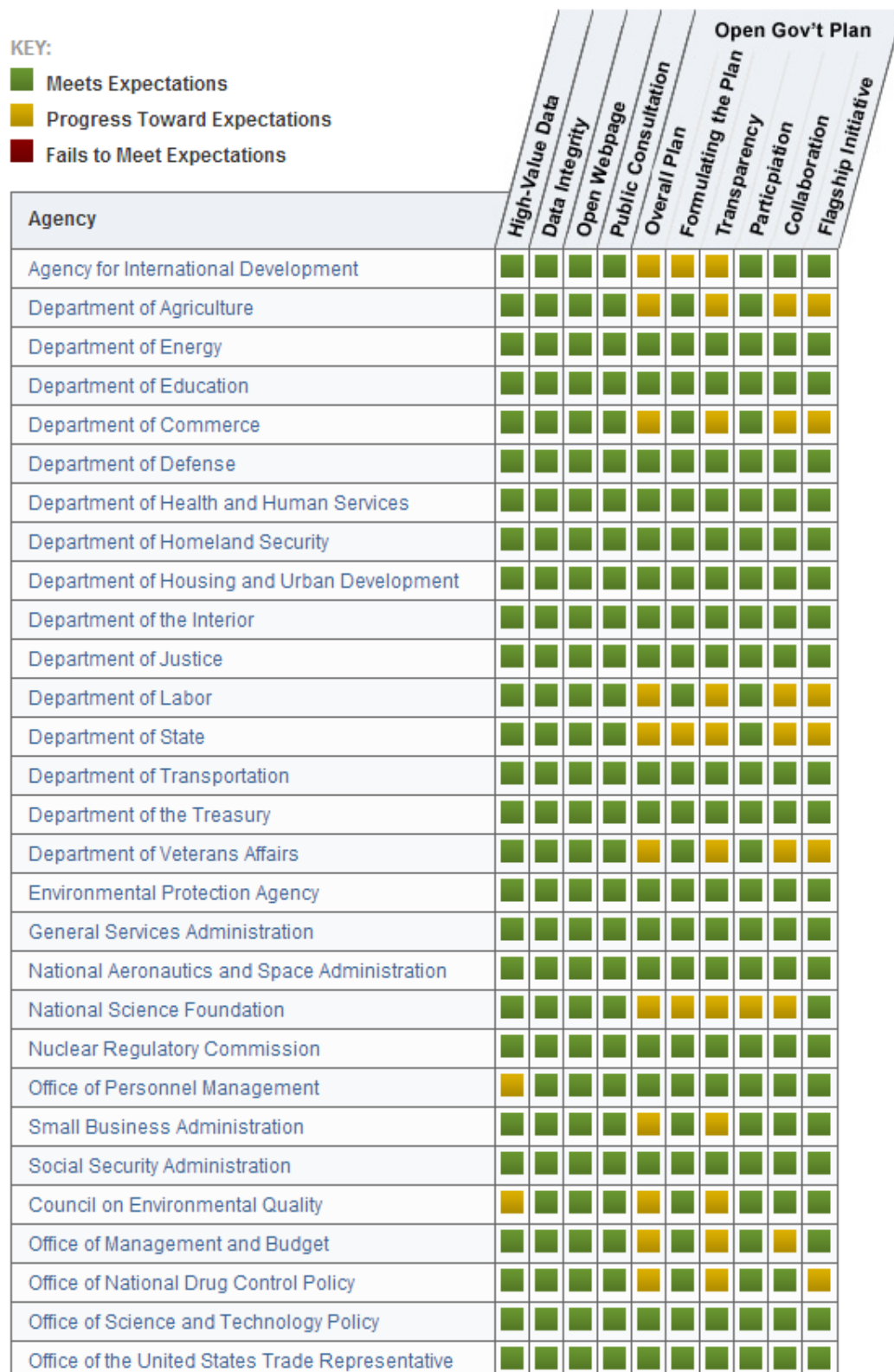
The use of dashboards increased in the U.S. federal government after the inauguration of President Obama. One approach that the Obama administration has pursued is the creation of dashboards to make sense of the deluge of data it receives. By using online dashboards presenting performance data, government organizations can track key performance metrics of both individual agencies and cross-departmental activities. The administration has convinced the benefits of dashboards as a way of organizing and filtering performance data so that it makes sense to decision-makers. One goal of dashboards is that decision-makers will be able to both clearly understand their organization's performance and act on that information.

When President Obama took office in January 2009, he issued a *Memorandum on Transparency and Open Government*. The *Memorandum* explicitly identifies the following as key components of open government:

- **Transparency** implies that government agencies should disclose information about their operations and decisions online in publicly accessible ways.
- **Participation** implies public engagement to enhance government effectiveness, tapping on collective expertise and information distributed across the society.
- **Collaboration** implies using innovative tools, methods, and systems to cooperate among government agencies and with nonprofit organizations, businesses, and individuals in the private sector.

The three principles of transparency, participation, and collaboration form the cornerstone of an open government. Transparency promotes accountability by providing the public with information about what the Government is doing. Participation allows members of the public to contribute ideas and expertise so that their government can make policies with the benefit of information that is widely dispersed in society. *Collaboration improves the effectiveness of Government by encouraging partnerships and cooperation within the Federal Government, across levels of government, and between the Government and private institutions.*

The Open Government Directive, issued in December 2009, requires agencies to have specific open government plans, incorporating those three aspects of open government in the Presidential Memorandum. The directive specifically requires the creation of an “Open Government Dashboard”. The Open Government Dashboard will make available each agency’s Open Government Plan, together with aggregate statistics and visualizations designed to provide an assessment of the state of open government in the Executive Branch and progress over time toward meeting the deadlines for action outlined in this Directive.



Source: U.S. Government <<http://www.whitehouse.gov/open/around>>

Figure 3-8: Open Government Dashboard of the U.S. Government

For **collaboration**, an agency's Open Government Plan should explain in detail how the agency will improve collaboration, including steps the agency will take to revise its current practices to further cooperation with other Federal and non-Federal governmental agencies, the public, and non-profit and private entities in fulfilling the agency's core mission activities. The specific details should include proposed changes to internal management and administrative policies to improve collaboration³⁴.

- (i) The Plan should include proposals to use technology platforms to improve collaboration among people within and outside one's agency.
- (ii) The Plan should include descriptions of and links to appropriate websites where the public can learn about existing collaboration efforts of one's agency.
- (iii) The Plan should include innovative methods, such as prizes and competitions, to obtain ideas from and to increase collaboration with those in the private sector, non-profit, and academic communities.

Evaluation of collaboration is based on the following list of criteria drawn from the Open Government Directive:

- 1) Does the plan list steps the agency will take to revise its current practices to further collaboration with other Federal and non-Federal government agencies? Including the use of technology platforms to this end?
- 2) Does the plan list steps the agency will take to revise its current practices to further collaboration with the public? Including the use of technology platforms?
- 3) Does the plan list steps the agency will take to revise its current practices to further collaboration with non-profit and private entities? Including technology platforms?
- 4) Are there links to websites that describe existing collaboration efforts of the agency?
- 5) Does the plan describe the Innovative methods (e.g. prizes and collaborations) to increase collaboration with the private sector, non-profit, and academic communities?

However, many case studies found the common features that offer lessons on the uses of dashboards, which are:

- First, dashboards (especially the cross-agency ones) face data quality issues. Such problems compromise dashboard performance measures, and eventually could adversely affect the credibility of the dashboard.
- Second, the dashboards have different design approaches. Although the designs can be idiosyncratic and vary based on technical capacity within the

³⁴ Open Government Directive, 2009 <http://www.whitehouse.gov/open/documents/open-government-directive>

organization, evolving a few best practices or standards would enhance the design quality (and increase the use).

- Third, the performance measures differ based on agencies. Cross-agency dashboards have common measures. The essential approach should be to align the performance measures to the organizational goals.
- Last, but not least, the dashboards are only tools to visualize performance data. Their effectiveness depends on how organizations use them to enhance internal organizational performance and external accountability and transparency.

3.4.2. Study on National Collaboration Framework of the Australian Government³⁵

The National Collaboration Framework (NCF) was created to assist Australian Government agencies, State/Territory and Local jurisdictions to work collaboratively to achieve government objectives. The focus of the NCF is on collaboration within and between government at all levels for projects. As a general guide, the NCF can be used for any intra or cross-jurisdictional project which would typically use a memorandum of understanding. It provides a tiered approach for agencies to follow when seeking to collaborate and reduces costs, time and risk associated with program or project development and delivery. The NCF provides processes and tools, including a suite of template agreements (which includes a Collaborative Head Agreement). It defines a process where parties first agree on collaboration principles and also provides a suite of re-usable documents and tools that aim to provide enhanced collaborative service delivery arrangements across government departments and agencies. The former Online Communications Council endorsed the NCF as the preferred agreement-making mechanism for collaborative service delivery within, and across jurisdictions. The NCF has been successfully implemented by all levels of Government (Local, State and Federal). The NCF tiers include:

Tier One	In principle commitment to collaborate	Statements of Principles to Collaborate: Explicitly recognize and capture the principles and values that guide collaborative service delivery across jurisdictions
Tier Two	Business commitment to collaborate	Statements of Intent: Agree in advance the business basis to collaborate across multiple initiatives

³⁵ *National Collaboration Framework*, The Australian Government Information Management Office, Australian Government, 2011. http://agimo.gov.au/collaboration-services-skills/national-collaboration-framework/#NCF_Background_and_Benefits

Tier Three	Collaborative Head Agreement	Collaborative Head Agreement: Agree in advance those elements of a cross agency agreement that can be reapplied to multiple collaborative initiatives
Tier Four	Commitment to collaborate on specific projects	Project/Initiative Specific Agreements: Agree those elements that are specific to a particular project/initiative
Tier Five	Commitment to collaborative tools, standards and procedures	User Guide: Includes checklists specific to collaborative service delivery

As a default position, the NCF agreements are not legally binding, although, this position can be changed. Given this, the Collaborative Head Agreement and Project Agreement should not be used for commercial arrangements, where a legally binding relationship is in the Commonwealth’s best interest. Some high-level examples of projects for which the NCF may be appropriate include:

1. Data collection and provision between agencies;
2. Where two or more agencies collaborate to jointly implement or undertake a project (e.g. joint surveys, mapping, climate change initiatives);
3. Where agencies collaborate in the delivery of services to the public (eg, collaboration between a policy agency and service delivery agency).

Whole of Government benefits of the NCF include:

- Improved service delivery, through quicker agreement making and improved risk management
- More effective leveraging of the Government’s information assets
- Less duplication of cost and effort across agencies
- Enhanced flexibility during future machinery of government changes

3.5. Capacity Building and Training

The major challenge that remains to be addressed in e-government capacity building and training endeavors is determining who required training—among the diversity of profiles within public administration—and establishing what content must be delivered to which group and with what workload.

3.5.1. Competencies for E-Government Program

In the past, the adoption of e-government solutions has been hampered by leaders’ lack of knowledge about how technology can be used as a tool to accomplish or improve

government processes. Today, in many OECD countries³⁶ it is leaders' understanding of IT that enables them to set and manage the information strategy and match government processes with appropriate technical solutions. Leaders understand how technology can be incorporated into existing government functions, and how e-government applications can build new government services and products or open new channels of communication. A solid understanding of the options and their strengths and weaknesses gives managers confidence to negotiate and to specify characteristics for developing projects that will work.

Broad competencies help IT managers and e-government program managers engage in e-government decision-making. Expertise includes an understanding of information technology, information management and the information society. In terms of information technology, leaders need the means to evaluate different technologies and understand product life cycles, key players and the various risks involved. In terms of broader skills, agency heads, government-wide e-government coordinators and politicians must be able to lead (and not be led by) the organization's IT department and outside partners. With the appropriate skills, leaders can help integrate the organization's IT strategy with the broader goals of the organization. Furthermore, traditional management expertise can be updated and strengthened to deal with the complex governance challenges that arise from increased inter-governmental collaboration. Additional competencies may also be useful in areas such as organizational change, coordination and collaboration across agencies, public-private partnerships, accountability frameworks and performance management.

3.5.2. Skills for Successful Collaborators

According to the Senior Executive Service (SES) survey³⁷ in the U.S.A., the report shows the most important skills for the successful collaborator, in order of importance, as follows:

- *Individual attributes* - The most important *individual* attributes include having an open mind, patience, and self-confidence
- *Interpersonal skills* - The most important *interpersonal* skills are being a good communicator, an excellent listener, and working well with people
- *Group process skills* - include facilitation, negotiation, and collaborative problem-solving
- *Strategic leadership skills* - include big-picture thinking, strategic thinking, and facilitative leadership
- *Substantive/technical expertise* - includes technical knowledge of the subject area, followed by project management and organizational skills

³⁶ *Checklist for e-Government Leaders*, The OECD Policy Brief, Organisation for Economic Co-operation and Development (OECD), September 2003

³⁷ *Collaboration Across Boundaries: Insights and Tips from Federal Senior Executives* by Rosemary O'Leary and Catherine Gerard, The Maxwell School of Syracuse University, the IBM Center for The Business of Government, 2012

Effective collaboration is deeply dependent on the skills of individual collaborators. The necessity of having the right people at the table with the subject area expertise, leadership, motivation, and willingness to collaborate, as well as the necessary skill set, is a salient lesson for the government executives surveyed.

3.5.3. Designing Capacity Building and Training Programs for E-Government

Increasingly, the deployment of e-government initiatives in the public administration arena has become mandatory. However, the adoption of this new paradigm needs to be followed up with training processes involving all the professionals within public organizations. The major challenges that remain to be addressed are: who requires training among the diversity of profiles within public administration, and determination of what content must be delivered to which group and with what workload. Consequently, it becomes clear that there is a pressing need to link all the aspects involved in e-government training efforts into a single integrated framework so as to allow capacity-building endeavors to achieve the outcomes sought by policy makers.

Capacity building programs has to be developed according to the country's own reality and cultural factors, which contribute to its needs and abilities to integrate ICT in governmental activities. Abilities for managing knowledge and communicating ICT issues to other actors are essential for the government CIO. Therefore, the academic formation of the candidate is important but must also be completed with relevant experience in project management. From these observations, establishment of a specific training model for countries by taking their diversities into account is evidently needed. On the other hand, *these statements stress the need to broaden the training scope from mere technical issues in order to encompass legal and context-based issues, citizen (quoted as "customer" by the participant) relationship management, organizational design, change management, negotiation, knowledge management, and project management.*³⁸

The research paper of the Rio de Janeiro State University (Joia 2005) that aims to develop and present a framework to enable the creation and deployment of regional capacity-building networks in e-government, reported that public administration personnel must be divided into groups according to a specific taxonomy so as to schedule the most adequate training for the most suitable actors. The findings from this research show that specific hierarchical and professional profiles within public administration deserve differentiated e-government training endeavors; that is, *legislators* and *politicians* need to be submitted to awareness initiatives rather than training courses about the potential benefits of e-government. Conversely, *top management civil servants/senior managers*, *ICT-related civil servants/ technicians*, and *ordinary staff* need specific training programs.

³⁸ Research Report on *A Framework for Developing Regional E-Government Capacity-Building Networks* by Luiz Antonio Joia, Rio de Janeiro State University, © 2006 The Massachusetts Institute of Technology Information Technologies and International Development, Volume 2, Number 4, Summer 2005, p. 61–73

Contents of the trainings were, therefore, divided into general and context-based programs. The general courses address content that is similar for participants from all countries while the context-based courses must be customized in line with the different realities of each country. From the research conclusion, *the following areas were considered important aspects to be addressed during training as global courses (i.e., the same content for all countries involved in the Capacity-Building Network):*

- ***Process Management:*** As e-government deals with processes, the aim of this course is to show the professionals the important role that processes play in the e-government realm, as well as how to map and manage them.
- ***Customer Relationship Management:*** As in the business arena, which has changed its focus from product-centric to customer-centric, it is important to explain the importance of citizens as customers of public administration to the professionals.
- ***Information and Communication Technology:*** In this dimension, the aim is to present basic concepts about internet technology (including intranet and extranet), back-office technologies (including enterprise systems), information security, and Web services.
- ***Change Management:*** The introduction of e-government processes generates change. It is thus important to understand user resistance to new information systems and technologies, and the crucial need for a new procedure. Similarly, it is important to know how to manage the above changes.
- ***Knowledge Management:*** One of the major potential benefits of e-government is enabling public administration to manage its knowledge. This aspect aims at developing skills about how knowledge is generated, stored, and accessed, as well as the role ICT plays in this context.
- ***Organizational Design:*** Public organizations traditionally present functional and bureaucratic designs, which are rarely flexible enough to adapt to changes in the environment. On the other hand, process-based structures are much more suitable for the efficient and effective use of ICT. This module presents the principal structural typologies (the study or systematic classification of types that have characteristics or traits in common), as well as the organizational schools that generated them, enabling the participants to better understand the interaction between ICT and organizational structure.
- ***Project Management:*** E-government initiatives are, by nature, projects that need to be well managed. The management of time, cost, scope, risk, communication, human resources, quality, acquisition, and integration of e-government enterprises are analyzed.

Meanwhile, the following knowledge areas were selected as requiring customized content according to each country’s peculiarities, and are thus considered specific rather than general courses:

- **Context Analysis:** Initiatives of e-government depend on political, economic, social, and cultural factors specific to each country. It is therefore important to know a country’s own reality—at local, regional, and national levels—to establish the best e-government solutions. This module seeks to train the professionals in these issues.
- **Legal Issues:** Public activity is severely limited by regulatory, legal, and constitutional constraints. The development of e-government policy demands that some of these frames of reference be changed. Issues such as privacy, data protection and sensitivity, digital signatures, electronic documentation, and copyright are analyzed in this course.

In order to achieve this capacity building and training, Joia (2005) presented the above findings in an incidence matrix that clearly set forth the priority level of each training course within an e-government capacity-building network encompassing the entire public administration. Table 3-3—based on the W2 (Who-What) framework—was generated and the consolidated outcomes are presented therein.

What? (Content)	Who? (Actors)*				
	Legislator	Politician	Senior Manager	Staff	Technician
Process Management	1	3	10	8	8
Customer Relationship Management	5	4	10	10	10
ICT	2	1	8	8	10
Change Management	6	8	10	7	8
Knowledge Management	2	6	10	9	9
Organizational Design	1	1	9	8	5
Project Management	1	1	10	10	10
Context Analysis	7	9	9	4	6
Legal Issues	10	9	8	4	4
Average	3.9	4.7	9.3	7.6	7.8

Source: Joia (2005)

*Value scale: (-)0 - 10 (+)

A score of 10 indicates that the topic is of maximum importance to that specific actor; therefore, the curriculum for that actor should include all content on that topic. A value of 0 indicates that the topic is not relevant for that actor; the curriculum to train that actor should therefore not include any content related to the topic.

Table 3-3: W2 (Who–What) Framework– An Example of e-Government Capacity Building Framework

The average for each professional profile showed that the importance of providing adequate training to the senior manager in public administration for the success of e-government policy implementation becomes apparent, followed by the importance of ICT personnel and staff training. The legislators and politicians—although important— need to be submitted to awareness endeavors via workshops, rather than long, formal training programs.

3.5.4. Capacity Building and Training for E-Government in Thailand

Ministry of Information and Communication Technology

In realizing the Second Thailand Information and Communication Technology (ICT) Master Plan (2009-2013) with the strategy of using ICT to improve governance in public administration and services, the Ministry of Information and Communication Technology (MICT) has initiated the project of “Capacity Building on ICT for Management and E-Government for Government Officials” with the aim to strengthen ICT capacity for CIOs at the ministerial, departmental, and provincial levels, along with personnel in charge of ICT at all levels of the local administrative organizations to enhance knowledge and skills as appropriate and in keeping with their roles and responsibilities. The project has started to run the training activities since the year 2007.³⁹

The training courses were designed based on 7 domains of basic competencies, which were 1) ICT Leadership; 2) ICT Governance; 3) e-Service Management, 4) e-Service Delivery Management; 5) ICT Project Acquisition Management; 6) Business Management; and 7) ICT Awareness and Literacy. The training programs were for government officials of high-level and middle-management level.

An e-Government Executive Management Program was arranged for training of high-level executives and CIOs with the course contents of e-government leadership, IT resources planning, outsourcing and contract management, ICT risk management, ICT policy and efficiency management, e-service planning and development, cooperation in joint e-service development and ICT projects, e-service management, e-government project management in excellence, ICT governance, ICT project management, change management, information management, and related laws. Furthermore, the course of CIO for e-Province Development was arranged for provincial and local public administration with the similar contents.

For the middle-management executives, the training contents were arranged in 3 tracks for 3 types of participants, which were:

1. Owners of ICT Projects: ICT project management, ICT outsourcing and supplier management, ICT strategic planning, ICT risk management, e-procurement management

³⁹ Source: <http://www.nstdaacademy.com/egovtraining/index.php?page=project>

2. Users of ICT: e-services management and implementation, IT principles and management, collaborative project management, IT security, information management
3. Management of ICT Organizations: e-governance, management for ICT projects, internet technology, wireless technology

In addition, the Cabinet has recently approved in February 2013 that MICT takes responsibility of e-government training arrangements for both operational and high-level government officials, including CIOs.

Electronic Government Agency

The Electronic Government Agency (EGA), which is the key organization responsible for promoting and supporting the development of e-government services, has initiated various projects to support e-government development progress, including the ICT training project. The ICT training project is aimed at surveying and preparing updated ICT personnel database in the public sector to support ICT human resource planning and expand ICT managers' vision and administration skills as well as enhancing IT knowledge among public sector's officials. Moreover, with an aim to promote understanding on e-government to government officials and to promote vision and skills related to ICT management to high-ranked ICT managers, EGA has provided e-government-related trainings for government officials, such as IPv6 Workshop for e-Government, e-government management.

In conclusion, e-government implementation cannot be reduced to a mere technical issue. Several organizational changes are required, in which skills in management, communication, and legal issues play a key role. Thus, it is in this context that training efforts for senior managers were identified as the priority targets for e-government capacity building, followed by the training of both ICT specialists and government staff. Legislators and politicians also need to be trained. The capacity building and training content must be adapted to the needs of each target group. Specific hierarchical and professional profiles within public administration deserve differentiated e-government training endeavors. Government agencies must foster professional development among staff to ensure they are well practiced in the current tools and techniques. They have to plan for their staff training requirements, allocate adequate resources for staff training and development, and evaluate the effectiveness of training programs; and also facilitate trainings for employees and managers to assist them in developing the skills needed.

3.6. Conclusion

Topics	Analysis/Findings
Respective roles of ministers, permanent secretaries, CIOs, departmental director generals, operational and ICT-related directors for implementation of e-government programs	The roles of Ministers, Permanent Secretaries, CIOs, Departmental DirectorGenerals, Operational and ICT-related Directors are defined based on the e-government characteristics and scope of work, which are mainly interconnection, integration, innovation, coordination and collaboration, in complement with regular portfolio and roles of each specific position. For effective use, these defined roles shall be applied properly to suit specific mandates of each ministries and departments, as well as their e-government priorities, objectives and requirements.
Mechanisms for cross-agency collaboration and collaboration with the private sector	<p>Selected mechanisms to facilitate cross-agency collaboration (both among government agencies and with the private sector:</p> <ul style="list-style-type: none"> • <i>Collaboration Structures within the Office of the Government Head</i> referred to as task forces, councils, commissions, committees, or working groups • <i>National Collaboration Strategies and Initiatives</i> to provide a broad framework for addressing issues in a national scope • <i>Designation of Lead Agencies</i> to be accountable for an initiative requiring efforts of several different agencies exercising different statutory authorities. • <i>Specially Created Interagency Offices</i> - An office with its own authority and resources with responsibility to cover a policy area that crosses a number of separate agencies or departments. • <i>Interagency Agreements and Memorandum of Understanding</i> - A written agreement between more than one government agency for collaborative effort • <i>Collaboration Technologies</i> - Tools that facilitate collaboration, such as shared databases and web portals. <p>Key practices to enhance and sustain collaborative efforts:</p> <ul style="list-style-type: none"> • Define and articulate a common outcome of a collaborative effort

Topics	Analysis/Findings
	<ul style="list-style-type: none"> • Establish mutually reinforcing/joint strategies to accomplish a common outcome • Identify and address resource needs by leveraging each others' resources • Agree on roles and responsibilities of collaborating agencies • Establish compatibility of policies/procedures/other means to facilitate collaboration • Develop mechanisms/means to monitor and evaluate collaborative efforts, and report on the results • Reinforce agency accountability for collaborative efforts using their strategic and annual performance plans as tools to drive collaboration • Reinforce individual accountability for collaborative efforts using performance management systems to strengthen accountability for results
<p>Collaboration tools/dashboards for management of e-government program</p>	<p>Dashboards are used to provide executives with an instant view of organization's performance metrics on selected dimensions. There are 3 types of dashboards as per their use:</p> <ul style="list-style-type: none"> • <i>Operational dashboards</i> for monitoring purposes • <i>Tactical dashboards</i> for analytical purposes • <i>Strategic dashboards</i> for tracking progress toward goal <p>Government organizations use dashboards to both monitor internal organizational performance and management and make available performance information to the public for transparency and accountability.</p> <p>Evaluation of collaboration is based on these criteria:</p> <ol style="list-style-type: none"> 1) Is there collaboration with other government agencies? 2) Is there collaboration with the general public? 3) Is there collaboration with non-profit and private entities? 4) Are there links to websites that describe existing collaboration efforts of the agency? 5) Are there innovative methods (e.g. prizes and collaborations) to increase collaboration with the private sector, non-profit, and academic communities?

Topics	Analysis/Findings
	<p><i>National Collaboration Framework (NCF)</i> is used for any intra or cross-jurisdictional project which would typically use a memorandum of understanding. It defines a process where parties first agree on collaboration principles and also provides a suite of re-usable documents and tools that aim to provide enhanced collaborative service delivery arrangements across government departments and agencies. As the preferred agreement-making mechanism for collaborative service delivery within, and across jurisdictions, the NCF could be successfully implemented by all levels of Government. Benefits of the NCF include:</p> <ul style="list-style-type: none"> • Improved service delivery through quicker agreement making and improved risk management • More effective leveraging of the Government’s information assets • Less duplication of cost and effort across agencies • Enhanced flexibility during future machinery of government changes
Capacity building and training	<p>Establishment of a specific capacity building/training model by taking the diversity of profiles within public administration into account is essential. All aspects involved in e-government training efforts need to be linked into a single integrated framework to achieve capacity-building endeavors. The capacity building and training content must be adapted to the needs of each target group. Specific hierarchical and professional profiles within public administration deserve differentiated e-government training endeavors. The training scope needs to be broadened from only technical issues to cover other issues such as organizational design, change management, process management, project management, citizen/customer relationship management, knowledge management, negotiation, legal and context-based issues, and context analysis</p>

Section 4. Innovation in Public Services

4.1. Introduction

The purpose of this chapter is to provide recommendations to drive innovation in online public services for Thailand. The proposed recommendations are derived from the results of case studies of IT-enabled Innovations in Public Services from many countries and the recent situations in Thailand as presented in the Interim Report. This chapter also includes some recommendations related to approaches for establishing e-government innovation centers, online platform and crowdsourcing, and key strategies for open source software.

Section 4.2 starts the discussion with the definition of innovation and some key concepts related to enabling structures for fostering innovation in public services. The recommendations for establishing and funding innovation labs are provided in this section. Section 4.3 presents some guidelines and ideas for sustaining the operation of e-government innovation labs. Some case examples of laboratories that have successfully in operation for over 10 years are also described.

Section 4.4 covers the concept of crowdsourcing for public services with the online platform. Finally, Section 4.5 recommends strategies related to open source software development and adoption for Thailand.

4.2. Enabling Structures for Fostering Innovation in Public Services

4.2.1. Why do we need Innovation in Online Public Services?

Technological innovation has always been at the heart of economic and social development. And as such, it is therefore essential to the further evolution of the developing world.⁴⁰ Public sector is huge area of expenditure, employment, etc. – and under heavy political pressure and facing challenges of social change. Innovation is, therefore, vital for increasing efficiency, for delivering new and better quality services⁴¹, particularly, any online public services resulting in convenience and flexibility for users. Those innovative online services shall be accessible from different areas, e.g. through internet or kiosks. Some of those services can also contribute to increasing the transparency and efficiency, and reducing cost of government. For example, end-to-end online procurement services are gaining popularity in many countries.

4.2.2. What Is Innovation?

The definition of "innovation" according to the Organization for Economic Cooperation and Development (OECD), is that "innovation consists of all those scientific, technical, commercial and financial steps necessary for the successful development and marketing of new or improved manufactured products or services, the commercial use of new or

⁴⁰ Innovation Policy A Guide for Developing Countries , World Bank,

<https://openknowledge.worldbank.org/bitstream/handle/10986/2460/548930PUB0EP111C10Dislosed061312010.pdf>

⁴¹ <http://www.slideshare.net/IanMiles/public-service-innovation>.

improved processes or equipment or the introduction of a new approach to a social service." We can notice that research and development is only but vital one of these many steps of innovation.

Michael Porter defined the innovation to include both "improvements in technology and better methods or ways of doing things." It can be manifested in product changes, process changes, new approaches to marketing, new forms of distribution, and new concepts of scope and services. The innovation results as much from organizational learning as from formal research and development⁴².

Innovation processes germinate and develop within what are called "innovation systems." These are made up of private and public organizations and actors that connect in various ways and bring together the technical, commercial, and financial competencies and inputs required for innovation.

It should be the key role of governments to facilitate the innovation process especially for creating better public services to her citizens. General approaches that the governments should pursue are, at least the following

- supporting innovators through appropriate incentives and mechanisms,
- removing obstacles to innovative initiatives,
- establishing responsive research structures, and
- forming a creative and receptive population through appropriate educational systems.

4.2.3. Fostering Innovation in Public Service

To encourage innovation in public service continuously, **many countries have established agencies for research and promotion of the implementation of various forms of innovation, e.g. supporting the creation and on-going work of some e-government innovation centers and laboratories.** In Thailand, there are some agencies that have roles similar to e-government innovation laboratories which are already mentioned in the previous interim report, such as the e-Government Promotion and Development Bureau, Electronic Government Agency (Public Organization) (EGA), and the National Innovation Agency (NIA). These agencies have created some work programs to promote, support and developed innovative government services. However, this chapter provides some guidelines and recommendations for further strengthening the public innovation development and institution, especially about further fostering and strengthening e-government innovation laboratories in Thailand as discussed below.

Why we should create and strengthen e-government innovation labs?

Ambitious public sector reform necessarily will range from new policies, to new ways of engaging with provincial and national innovation ecosystems, and to creating and

⁴² Innovation Management, http://www.palgrave.com/business/goffin/about/1403912602_02_cha01.pdf

strengthening e-government innovation labs that support change makers inside government.

Lab strategies create more engagement — and improved ongoing relationships — with the public. Labs generate new ways to attract new resources. Labs reduce the cost of how things are done.⁴³

The concept is based on a systematic user co-creation⁴⁴ approach integrating research and innovation processes. These are integrated through the co-creation, exploration, experimentation and evaluation of innovative ideas, scenarios, concepts and related technological artifacts in real life use cases⁴⁵.

For example, the paperless customs declaration system of Thailand now allows the traders to submit customs declaration electronically. However, there are some responsibility and liability bestowed on those users, e.g. if they declare some wrongful information they will have some penalties. The decisions on "harmonized codes" and "valuation" are some examples that several traders have some difficulties or several times unintentionally make un-correct decisions. Here, the governments should think of "new (innovative) services" which previously may need to hire consultants or vendors or many government personnel to provide some certain services - but instead we can use and create some "co-creation" solutions, e.g. if a form of "social network" or "social forum" could be created such that the community, traders, customs brokers, business, and other individuals can assist each other for a better decision making, or provide more information, and more know-how exchange. The idea is that "co-creation" means the participation of users or community themselves that co-creates more values for the environment.

The approach taken in establishing an innovation platform or Lab will determine the scale and type of innovation generated.

NESTA, the UK's leading innovation center, suggests that public innovation should solve the country's major economic and social problems. This center describes "radical efficiency" as "all about different, better and lower cost public services. It is about innovation that delivers much better public outcomes for much lower cost. Radical efficiency is not about tweaking existing systems. Radical efficiency is about generating

⁴³ <http://sigeneration.ca/blog/?p=169>

⁴⁴ Co-creation – defined as a close collaboration between companies or governments, and their customers-involves re-thinking the business model and is in need of a robust definition of value beyond profit. (<http://mackinstitute.wharton.upenn.edu/events/innovation-through-co-creation-engaging-customers-and-other-stakeholders/>)

⁴⁵ http://en.wikipedia.org/wiki/Living_lab#cite_note-5

new perspectives on old problems to enable a genuine paradigm shift in the services on offer – and transform the user experience.”⁴⁶

4.2.4. What is an Innovation Lab?

A lab is a space and set of protocols for engaging young people, technologists, private sector, and civil society in problem-solving. By using new technology and ideas in its program work⁴⁷.

Innovation Labs are powerful spaces that foster radical innovation and can help the country to deliver different, better, lower cost services.

There is a growing recognition of the role of innovation units or Labs to:

- Perceive and articulate a common understanding of a challenge
- Creatively identify possible solutions
- Experiment, prototype, test, outreach
- Implement

The establishment of the innovation lab should be the collaboration from stakeholders in different sectors including public sector, educational institutions and private sector. The initial startup of the innovation center may rely very much on the budgets from the government. Supporting staff, specialists, researchers should be participated also from the educational institutions. In addition, to increase the diversity and broad development, some funding scheme, e.g. a government fund, university matching funding, and joint venture capital, should be established to encourage and assist the private sector in a joint venture to develop and produce innovation in the public services. Some of these of these issues will be further discussed in the following sections.

4.2.5. Source of Funding for Innovation in the Public Sector

Funding is a very important resource to create and sustain any innovation centers. The following are some schemes to be seriously considered as the source of funds with examples in other countries.

- Top slicing* government or departmental budgets for innovation, for example, 1% of turnover as a rough benchmark (similar to the proportion of GDP now devoted to government support for technological and scientific research and development).
- Dedicated innovation funds and internal public venture funds*, such as the UK’s ‘Invest-to-Save Fund’⁴⁸ (£40 million) for cross-cutting innovations in

⁴⁶ <http://sigeneration.ca/blog/?p=169>

⁴⁷ <http://www.unicefinnovationlabs.org/?p=53>

⁴⁸ *Invest-to-save Fund*, Welsh Government, U.K.

<http://wales.gov.uk/topics/improvingservices/better/vfm/i2savefund/?lang=en>

public services; the Singapore's Enterprise Challenge⁴⁹ (a \$29 million Fund) to provide funds for innovative proposals that have the potential to create new value or significant improvements to the delivery of public service of Singapore; and the Investing in Innovation Fund⁵⁰ (\$700 million) of the U.S. Department of Education aimed to expand the implementation of, and investment in innovative practices having an impact on improving student achievement and growth. In the UK, the National Health Service (NHS) has established a five-year £220 million innovation fund⁵¹ to be distributed through the 10 Strategic Health Authorities with the aim to enable ideas to be developed and tested, with £20 million to be spent on a public competition for medical breakthroughs.

4.3. Approaches on Sustaining the Innovation Labs

More examples on approaches on sustaining and running innovation labs are provided in this section. These cases provide initial ideas that the government of Thailand shall consider for adaptation.

4.3.1. National Endowment for Science, Technology and the Arts (NESTA)⁵²

NESTA is an independent charity that works to increase the innovation capacity of the United Kingdom. The organization acts through a combination of practical programs, investment, policy and research, and the formation of partnerships to promote innovation across a broad range of sectors. NESTA's Innovation Lab supports innovators in public services, society and business to develop radical new responses to the most pressing social and economic challenges.

How is NESTA funded?

NESTA receives funds from the NESTA Trust, which received the National Lottery endowment of the NESTA. The interest from this endowment is used to fund activities. These activities must be used to promote the charitable objects of both the NESTA Trust and the NESTA charity. The returns from NESTA investments and income from working in partnership with others are also re-used to fund further work.

In addition NESTA continues to act as an investor, from technology start-ups and accelerators, to social enterprises and social finance intermediaries. All of these activities are in line with NESTA charitable objects. Now, NESTA operates investment activities in two distinct areas:

⁴⁹ *The Enterprise Challenge*, National Library, Singapore, <http://was.nl.sg/details/www.tec.gov.sg.html>

⁵⁰ *Investing in Innovation Fund*, U.S. Department of Education
<http://www2.ed.gov/programs/innovation/index.html#program>

⁵¹ *Strategic Health Authorities*, National Health Service, U.K.
http://www.institute.nhs.uk/cost_and_quality/new_ideas/where_to_go_with_your_idea.html

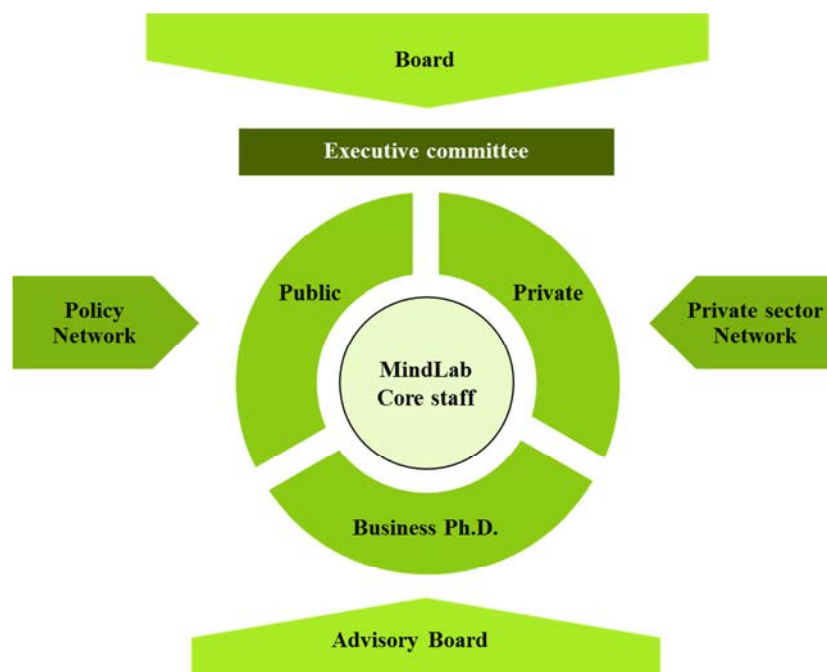
⁵² <http://www.nesta.org.uk/>

- *Venture investment*: NESTA supports innovation in the UK through partnerships, networks and a portfolio of early stage investments
- *Impact investment*: NESTA finds out more about the new Impact Investment Fund which will support ventures that can help addressing major social challenges.

4.3.2. MindLab⁵³

MindLab is another example of an innovation lab created in Denmark. This center is a cross-ministerial innovation unit which involves citizens and businesses in developing new solutions for the public sector.

Innovation labs are designed to foster collaboration. To fulfill these wishes of a "center of excellence", a triple helix organization was defined as the goal. The helix included the ambition of involving Ministries, universities and private companies. **These three key components are recommended as a model of collaboration for establishing e-gov innovation units in Thailand also.**



Source: Internal MindLab strategy document, 2007

Figure 4-1 Planned Organisation of MindLab 2.0

The helix was to be complimented by a number of networks – public policy to help cross-governmental collaboration, private sector to strengthen public-private cooperation, and

⁵³ <http://mind-lab.dk/en>

professional academics with the aim of establishing a more robust methodological foundation for MindLab's work.

MindLab's way of working is based on the laboratory idea, where new methods and approaches to strengthen citizen involvement – where possible across the three Ministries⁵⁴ – are examined and the applicability of potential solutions is tested and developed.

The strategy was unanimously adopted for sustainable innovation. It pointed to several further evolutions in MindLabs work, building on two key strands:

- *Change strand*: Engaging in "change partnerships", to increase innovation impact through concrete project portfolios within selected agencies, to assist top management and staff to realize a strategic agenda for change – either across several organizations or together with a single entity.
- *Think strand*: Using MindLab's research capability, including Ph.D. students, to identify and develop new findings on important new policy trends. The first major research project was on co-production of public services, building essentially on ideas about value networks and collaborative governance.

	First generation Creative platform	Second generation Innovation unit	Third generation Change partner
Process focus	Ideation	Value-Creation	Insights to drive innovation
People	Employee-oriented	User-centered	User- <i>and</i> organization-centered
Capacity focus	Training and facilitation	Innovation projects	Core business transformation
Tools	Creativity tools; emphasis on individual coaching etc.	Research, project, facilitation tools; involvement of users + teams	Co-creation with users, professional empathy, rehearsing futures
Management	Management not involved	Management passively supportive	Management actively involved
Main role of design	Graphic design	Plus interaction design, service design	Plus systems design, organization design, managing as designing
Key challenge	Buy-in to new ways of working	Integration of innovation processes in wider organization	Adopting new narrative in the organization

Source: *The Innovation Journal: The Public Sector Innovation Journal, Volume 17(1), 2012, article 4.*

Table 4-1: Three Generations of Innovation Labs

⁵⁴ the Ministries of Business & Growth, Taxation, and Employment

The public sector, sustaining an innovation will involve six key things:

- 1. A business model that runs parallel to the core idea of the venture and which sets out how it can become sustainable.**
- 2. A governance model that provides a clear map of control and accountability, as well as protective safeguards (not least to protect it from predators if the project is a success).**
- 3. Sources of finance, both start-up capitals in the short term and income streams over the longer term.**
- 4. A network and communications model to develop what we refer to as the venture's 'relational capital'.**
- 5. A staffing model including the role of volunteers.**
- 6. A development plan for operational systems – including management information, reporting and financial systems, IT, supply chain systems and systems for risk management.**

4.4. Innovative Online Public Services Using Crowdsourcing Ideas

In general, "crowdsourcing" is "a type of participative online activity in which an individual, an institution, a non-profit organization, company, or a public agency proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task. The undertaking of the task, of variable complexity and modularity, and in which the crowd should participate bringing their work, time, money, knowledge and/or experience, always entails mutual benefit. The user will receive the satisfaction of a given type of need, be it economic, social recognition, self-esteem, or the development of individual skills, while the crowd sourcer will obtain and utilize to their advantage that what the user has brought to the venture, whose form will depend on the type of activity undertaken"⁵⁵.

The fundamental challenge on how to engage the crowd sourcing to help solve a problem includes: How to recruit and retain users? 2. What can users make contribution? How to combine user contributions to solve the target problem? How to evaluate users and their contributions?

Discussion of Crowdsourcing Challenges and Solutions

- 1. How to recruit and retain users?** There are several alternative solutions. First alternative, we could motivate and engage the target users to participate. Second, we need to provide a way to pay or provide some certain incentives to users on the web for helping with a task. Third, we can request for volunteers to participate. This kind of solution is relatively low cost and easy to execute and hence is most popular. The

⁵⁵ <http://www.crowdsourcing-blog.org/wp-content/uploads/2012/02/Towards-an-integrated-crowdsourcing-definition-Estell%C3%A9s-Gonz%C3%A1lez.pdf>

fourth solution is to make users pay for services. The basic idea is to require users to "pay" for using like leverages the response to help build a data integration system. The fifth solution is to piggyback on the user traces of a well-established system.

2. **What can users make contribution?**⁵⁶ What users can make are somewhat limited. For example, users may be able to evaluate with *users review or rating*; to share, to add with *ideas or items to a central Web site*; to network by *linking to other users*; In a more complex environment, users can make a far wider range of contributions..
3. **How to combine user contributions?** For example, Wikipedia lets users manually merge edits automatically. Automatic solutions are more efficient, but they work only for relatively simple forms of contributions (such as voting), or forms that are complex but amenable to algorithmic manipulation. Manual solutions are still the currently preferred way to combine "messy" conflicting contributions.
4. **How to evaluate users and contributions?** We need to manage malicious users by using a combination of techniques that, for example, can block, detect, and deter.

Crowdsourcing has a number of advantages; however, it can also result in intellectual property (IP) issues, including ownership issues and confidentiality of IP. An appropriate governance process is required to ensure that the disadvantages of crowdsourcing are minimized.

Some of the **advantages of using a crowdsourcing** approach can include⁵⁷:

- Reducing transaction costs of organizations
- Finding new business opportunities
- Building appropriate teams by finding the right external people
- Re-using previous work
- Building user defined products and services
- Solving difficult problems

Crowdsourcing begins by defining one or more challenge questions and presenting them to an online community. Engaged respondents then work towards solving the challenge and submit their contributions online. Contributions can vary in their sophistication; crowd members might submit a detailed solution, a loose idea, discuss an idea presented by someone else, provide feedback on existing ideas, rank ideas, or share an idea with a network of contacts. Meanwhile, the sponsoring organization manages the technology platform, facilitates submissions, and rewards best responses. The sponsoring organization is also responsible for acting on the crowd's ideas to implement them in the marketplace

Crowdsourcing does still require significant investment to host an online platform, brand it, craft challenge questions, moderate forums, and identify winning ideas. You

⁵⁶ http://delivery.acm.org/10.1145/1930000/1924442/p86-doan.pdf?ip=158.108.42.98&acc=OPEN&key=782525BEA428F891C47A0316A5533171A8BC5EF81EC3A6B290831E9E8EDCA539&CFID=220914792&CFTOKEN=54225460&acm=1369992240_aab795c2faa7df0cac665adb116e1896

⁵⁷ <http://www.nwoinnovation.ca/article/crowdsourcing--open-innovation-strategy-663.asp>

must curate, engage, motivate, and incentivize your crowd of contributors. Yet it can be measured as cost per idea, or cost per person working on the problem, nevertheless crowdsourcing comes out a winner.

Financial Capital: The inherent nature of crowdsourcing initiatives does not make them very capital intensive, especially if based on existing telecommunications infrastructure such as mobile phones and networks. Additional investments to **improve infrastructure can enhance crowd participation substantially**. Also, in low income countries, performance-based donor-funding of local community development could be used to create a positive incentive for governments to allow for greater citizen scrutiny and participation, e.g., through crowd sourced monitoring and reporting platforms⁵⁸.

“Roimue-sangmuang (Strings of Hundred Hands to Build Urban Communities)”⁵⁹ project having been initiated early in 2013 with the support of the Prime Minister that allows Thai citizens to submit any good ideas about development of their urban communities for their good quality of livings. Project proposals can be presented to obtain the financial support of 500,000 up to 2,000,000 THB. The qualified project proponents are villages or communities with 100 households or more or a group of city residents of 50 households or more. The proposed projects must prove to be useful in the development and promotion of quality of life, the well-being, and the good environment.. There are Sub-Committees to scrutinize and select the qualified projects as per the established criteria. Those selected projects will be publicized through the TV channel for final judgment by the Committee and some civil representatives to be the winner projects which will be ultimately funded for actual implementation.

4.5. Strategy on Use of Open Source

This section presents the strategy on the promotion and usage of open source for public services. Open source software (OSS) is an alternative for proprietary software (PS), particularly in the government sector for reasons such as lowering software costs, and growing local software development industry.

Open-source software (OSS) is computer software that is available in source code form and is provided under a software license that permits users to study, change, and improve the software. Open source software is very often developed by communities in a public, collaborative manner where programmers create a program and make it available for others to use, as well as modify the source code and redistribute the modifications to the software user/developer community.⁶⁰

⁵⁸ <http://fletcher.tufts.edu/Praxis/~media/Fletcher/Microsites/praxis/xxvii/4BottYoungCrowdsourcing.pdf>

⁵⁹ <http://www.xn--72ca0fbfc9cyace1d5cg7ktfh.com/>

⁶⁰ http://ec.europa.eu/dgs/informatics/oss_tech/index_en.htm

Recommended Strategy for the use of OSS:

The key components to the strategy are highlighted in the following:

1. For IT developments, any products that support well-established standards and consistent with technical specification, especially those within TH e-GIF for interoperability, should be encouraged.
2. OSS will be alternative for the procurement in any case used whenever possible.
3. The government will consider OSS solutions alongside proprietary in IT procurement. Contracts will to be aware of “Value for money” basis.
4. The government will facilitate and encourage the creation of communities for OSS products, promoting partnerships and other stakeholders in the field of OSS. This strategy includes the development of guidelines, best practices and more solutions with OSS.
5. The government shall promote activities by allocation of the fund for conference to share knowledge between experts and the users.
6. The use of OSS shall be promoted by providing training to stakeholders that participate with the use and development of OSS.
7. Any Open Source applications that developed should be stored on well-known online repositories or government interoperability repositories.

To implement the strategy and to create the prerequisites for use of Open Source Software (OSS)⁶¹, the following critical success factors must be addressed.

- **Standardization:** The already well-established standardization process for software products in the government administration specifies that in each case it should be established whether appropriate OSS solutions exist for the area of application in question.
- **Organization:** The strong OSS support is to be set up by the existing user support organizations. Coordination and standardization of OSS deployment should be ensured via the established process used by the specialist groups, which are coordinated by association confederation or communities’ network involved to set up a dedicated web platform to address OSS issues.
- **Training:** An OSS training and information program is being devised and the external certification of employees in the OSS sector is being promoted.
- **Economic Efficiency:** Methods and tools are being developed with which the economic efficiency of the deployment of OSS (and CSS) can be analyzed. An effective way to advance to the same principles and interoperability both internally and externally of government agencies.
- **Legal aspects:** Recommendations concerning procurement and deployment of OSS and concerning the transfer of software developed or enhanced by relevant government agencies will be published and unresolved legal issues will be clarified.

⁶¹ <http://www.isb.admin.ch/themen/strategien/00745/00750/index.html?lang=en>

The relevant contractual terms in the government administration will be examined and modified as needed.

Impact of Open Source

The adoption of open source software has a lot of good advantages. The following advantages should be conveyed to our high-level policy decision makers, policy managers, government officers, and general public.

- Encourages **reuse**
- Enables **innovation, flexibility**, easier **integration**
- Drivers down **price** of software
- No single vendor means fewer reasons to hide defects
- No single vendor means diversity of support and services choice, **competition** is customer benefit
- No single vendor means no reason to avoid free and **open standards**, a customer benefit
- Lower barriers to entry, **widens participation** to SMEs

4.6. Open Government Data Initiative

A number of countries have started to pursue “open government” initiatives with a focus on transparency, easy access to public information, and new means for citizen participation. Approach towards the goal of open government requires mechanisms and collaboration of many sectors to drive information transparency.

Open government is the governing doctrine which holds that citizens have the right to access the documents and proceedings of the government to allow for effective public oversight. In its broadest construction, it opposes reason of state and other considerations, which have tended to legitimize extensive state secrecy.

Approaches to advance open government⁶²

- **Open Data**, which is about offering government data in a more useful format to enable citizens, the private sector and non-government organizations to leverage it in innovative and value-added ways. This concept also allows citizens to access data to learn about and participate in the Government.
- **Open Information**, which is about proactively releasing information, including on government activities, to citizens on an ongoing basis. By proactively making government information available it will be easier to find and more accessible for citizens.

⁶² <http://www.open.gc.ca/index-eng.asp>

- **Open Dialogue**, which is about giving citizens a stronger say in government policies and priorities, and expanding engagement through online platform with crowdsourcing.

New era of open government meant to bridge the gap between the citizens and government as following:

- Reducing the influence of special interests by writing new ethics rules that prevent lobbyists from coming to work in government or sitting on its advisory boards.
- Tracking how government uses the money with which the people have entrusted
- Empowering the public – through greater openness and new technologies – to influence the decisions that affect their lives.

4.7. Conclusion

All discussions and case examples in this chapter provide useful recommendations on public innovation in Thailand. The establishment of the innovation laboratory, which requires mechanisms and collaboration of many sectors to drive for a substantial and sustained. Concept of crowdsourcing idea with online platform for produce or solve problems. Finally, strategy use OSS to achieve efficiency and effectiveness. The following table summarizes the key issues and recommendations.

Issues	Recommendations / Conclusions
Establishment of the innovation labs	<ul style="list-style-type: none"> - Should be the collaboration from public sector, educational institutions and private sector - Initial the budgets from the government with human resources (staff, specialists, researchers) from the educational institutions - In addition, to increase the diversity and broad development, some funding schemes, e.g. government funding, university matching funding, and joint venture capital, should be established to encourage and assist the private sector in a joint venture to develop and produce innovation in the public services.
Source of funding for innovation in the public sector	<ul style="list-style-type: none"> - Top slicing government or departmental budgets - Dedicated innovation funds and internal public venture funds
Elements in the implementation of innovation.	<p><i>Key factor for evolution and sustainability of innovation are "Change" and "Think" include:</i></p> <ul style="list-style-type: none"> - Process focus: Insight to drive innovation - People: User and organization centric

Issues	Recommendations / Conclusions
	<ul style="list-style-type: none"> - Capacity focus: Core business transformation - Tools: Co-creation with users, professional empathy, rehearsing futures - Management: Management actively involved - Main role of design: Plus systems design, organization design, managing as designing - Key challenge: Adopting new narrative in the organization
Sustainability an public innovation.	<ul style="list-style-type: none"> - A business model that runs parallel to the core idea of the venture and which sets out how it can become sustainable. - A governance model that provides a clear map of control and accountability, as well as protective safeguards (not least to protect it from predators if the project is a success). - Sources of finance, both start-up capitals in the short term and income streams over the longer term. - A network and communications model to develop what we refer to as the venture's 'relational capital'. - A staffing model including the role of volunteers. - A development plan for operational systems – including management information, reporting and financial systems, IT, supply chain systems and systems for risk management.
Establish of crowdsourcing ideas	<ul style="list-style-type: none"> - Require significant investment to host an online platform, brand it, craft challenge questions, moderate forums, and identify winning ideas.
Strategy for the user of Open Source Software	<ul style="list-style-type: none"> - Encourage IT development, that support well-established standards and consistent with technical specification, especially those within TH e-GIF. - OSS will be alternative for the procurement. - Consider OSS solutions in IT procurement to be aware of "Value for money" basis. - Facilitate and encourage the creation of communities for OSS products. - Promote activities by allocation of the fund for conference to share knowledge between experts and the users. - Provide training to stakeholders that participate with the use and development of OSS - Store the information on well-known online repositories or government interoperability repositories.

Issues	Recommendations / Conclusions
Open Government Data Initiative	<ul style="list-style-type: none">- Open Data, which is about offering government data in a more useful format to enable citizens, the private sector and non-government organizations- Open Information, which is about proactively releasing information, including on government activities, to citizens on an ongoing basis.- Open Dialogue, which is about giving citizens a stronger say in government policies and priorities,

Section 5. Doing More with Less for More

5.1. Introduction

Strategies and implementation concepts of public services re-engineering/radical change in four selected countries (i.e. Malaysia, Ireland, U.S.A.,U.K.) has been studied and the findings were presented previously in the Interim Report. The public service reform/re-engineering initiatives in those studied countries are found to be commonly put into practice through the approaches and activities such as reform/implementation plan, information sharing and customer service, shared services, business process improvement, procurement reform, external service delivery, rationalization and reorganization. In complement with those actions to achieve the intended overall reform, there are other interesting initiatives that need consideration for actual implementation, such as the evaluation of government-wide operational performance management, operational metrics and performance assessment; improvement of capacity and capability across the public service through consolidation of performance management systems; renewal of the focus on organizational performance and enhanced reporting of performance and progress. However, they are already reflected in Section 3 of this Draft Final Report, especially in the part of tools for management of e-government programs.

In addition to the implementation of overall public services re-engineering/radical change, the project assignment requires the strategy on implementing concepts of radical re-engineering and radical cost reductions in the investment and use of IT to be particularly studied and reported. This part of the Draft Final Report is thus presenting the topic of strategies on implementing concepts of radical re-engineering and radical cost reductions in the investment and use of IT and also identification of service (s) priority that could be taken to demonstrate such concept.

5.2. Strategy on Implementing Concepts of Radical Re-engineering and Radical Cost Reductions in the Investment and Use of IT

The dependence of all government agencies on ICT has been increasing especially during the last two decades. ICT has enabled organizations to handle large volumes of transactions, increase reach, eliminate intermediaries, and introduce new business channels. ICT becomes an important contributor to social mobility and economic growth while it is a significant area of government spending. Fully exploiting the capability of ICT is of critical importance to the delivery of modern government services. Citizens and businesses who use government ICT systems may demand ever greater functionality and availability in the future.

The current economic climate forces government agencies as well as businesses to thoroughly examine their cost structures. All organizations seek ways to cut costs. And if, over time, ICT costs make up higher percentage of the revenue, government agencies should do more with less within aggressive timeframes.

5.2.1. ICT Cost Savings Strategies of the U.K. Government

ICT is used in many ways across governments but five broad applications for operational uses are generally recognized (U.K. National Audit Office 2011) These are:

- **Online services.** A growing number of public services are now available online, reflecting trends in the private sector and the need to reduce the costs of delivering services.
- **Business intelligence systems.** These systems typically automate the collation, analysis and presentation of financial information, management information and metrics about business performance and relevant progress indicators across an organization.
- **Business systems.** These systems sit at the heart of public service delivery. They can range from simple database applications through to large transactional systems supporting the operation of tax collection and benefits payments. Many areas of government have been made more efficient through the deployment of business systems, but these have also presented the biggest challenges to value for money.
- **Back office systems.** These systems deliver core functions (e.g. finance, human resources, procurement and facilities management systems) that all organizations need to manage operations effectively and for strong financial control.
- **Infrastructure.** ICT provides all of the basic tools necessary for the modern working environment and for efficient government operations. They are ICT commodities that are available from the market. Infrastructure can directly affect other costs such as office accommodation. It influences how productive and mobile the front line and civil service workforce is, and the extent to which flexible and collaborative working is possible.

With those ICT operational uses, there are some concerns raised by the U.K. Government on the government's performance on ICT with the focus on:

- a lack of accurate ICT spend data
- the dominance of large ICT suppliers
- high procurement costs and delays in delivery
- fragmented and duplicated procurement and supplier management
- difficulty in integrating systems so they can communicate with each other
- high numbers of bespoke and legacy systems and poor use of innovative ICT solutions
- poor ICT project management leading to projects that were too complex and risky for the civil service to manage

The key initiatives were, therefore, created to save on ICT and reform broader public services.

In achieving ICT costs reduction, the U.K. Government had introduced five ICT reform strategies. Three are designed to reduce ICT spend under the ICT strategy and the other two further strategies aim to restructure government's relationship with its suppliers:

- **ICT spend control.** The IT Reform Group in the Cabinet Office reviews all ICT business cases from central government that exceed £5 million (7.5 million USD/228 million THB approx.). The minister for the Cabinet Office has final approval of these business cases. This ensures that:
 - plans comply with the government's ICT strategy and represent best commercial and technical practice;
 - government agencies are reusing and sharing existing assets and not buying new ICT unnecessarily; and
 - costs and technical solutions are challenged and compared between agencies.
- **Shared ICT infrastructure program.** Led by the Chief Information Officer (CIO) Delivery Board, this program aims to reduce the over-provision of ICT by ensuring departments adopt common technical standards and share ICT assets wherever possible. The focus so far has been establishing and sharing communication networks through a program known as the Public Services Network. There are four elements to the initiative, each has had its own senior responsible officer, program board and team:
 - data and telecommunication networks (the Public Services Network);
 - data centers;
 - end user devices (such as laptops and desktop computers); and
 - business software applications made available through the CloudStore.
- **Centralized ICT procurement.** The Government Procurement Service, a trading fund of the Cabinet Office, negotiates procurement frameworks with suppliers, enabling departments to buy ICT at the best price.

Two further initiatives aim to restructure government's relationship with its suppliers. As ICT is a significant part of government procurement, these initiatives also impact on ICT spend.

- **Managing suppliers as a single customer.** Under the leadership of the Government Chief Procurement Officer, Crown Commercial Representatives⁶³ are renegotiating government's relationships with major suppliers to make savings and improve performance.

⁶³ In 2011 the Cabinet Office introduced a new approach for how government engages with its key suppliers, introducing the 'Crown Representative' network to act as a focal point for particular groups of providers looking to supply to the public sector. Crown Representatives help the government to act as a 'single customer'. They co-ordinate across departments to ensure a single and strategic view of the government's needs is communicated to the market, identify areas for cost savings, and act as a point of focus for cross-cutting supplier-related issues.

Source: <https://www.gov.uk/government/organisations/cabinet-office/groups/crown-representatives>

- **Making government contracts more accessible to small- and medium-sized businesses.** The Cabinet Office has introduced a package of procurement measures, including reducing procurement timescales and advertising forthcoming work, to increase the value of contracts going to small- and medium-sized businesses, shorten and simplify contract opportunities, move to cloud services, and apply open standards to increase competition.

It is the responsibility of government agencies to manage the consequences of these ICT savings and ensure they do not affect the performance and quality of public services. However, as part of the approval process for substantial items of ICT spending, the Cabinet Office does consider the risk of individual ICT spend proposals submitted by agencies.

Those savings were further analyzed using the following criteria to describe their sustainability:

- *Long-term savings that are likely to recur for the foreseeable future.* These may result from a supplier agreeing to provide goods at a lower price, purchasing a cheaper ICT solution without affecting business requirements or changing the business model, for example reducing staff numbers with the result that less of a commodity is required. These are considered to be *the most sustainable type of saving*.
- *Savings that will last for more than one year but are not open-ended.* These may result from suppliers agreeing to give a short-term, or one-off benefit to government, or where ICT requirements are reduced by extending the use of an existing ICT asset.
- *Savings from spending that has been stopped in the current year but may be submitted for approval in future years.* Examples of this include removing contingency provision from a project, approving contract extensions for 6 rather than 12 months, or deferring a decision on a project to allow for more work on the business case. This is *the least sustainable type of saving*.

The followings are claimed to be main enablers of progress and the challenges of delivering further ICT savings and reform:

- **Leadership from the Cabinet Office along with cross-government and cross-profession collaboration, have been important for delivering ICT savings that exceed targets so far.** Responsibility for delivering the five initiatives is shared among senior civil servants from the ICT, commercial and procurement professions in departments and the Cabinet Office.
- **The introduction of ICT spend controls by the Cabinet Office has been a powerful lever in driving government agencies to make ICT savings and to comply with the ICT strategy.** Despite tensions, this new process is encouraging

agencies to become more disciplined in planning future ICT spend and preparing more feasible proposals for scrutiny.

- **Government has made a good start on reducing ICT spend and reforming supplier relationships. The Cabinet Office is now facing the challenge of moving its initiatives from saving money in buying ICT, to ICT solutions that reform public services and the way that government works.** Two ways in which the Cabinet Office is facing this challenge are identified:
 - Until recently, there has been insufficient resource for the ICT spend control process leading to delays. The IT Reform Group is now at its full complement and is able to increase the expert assistance it gives to departments, allowing them to save money and making deeper ICT reforms that put users at the heart of public services.
 - Complex governance arrangements have existed for the five initiatives. The Cabinet Office is currently considering how to reform these arrangements so as to streamline governance and clarify roles and responsibilities.
- **Relevant skills remain a challenge across government.** There is progress in developing the ICT, digital and commercial professions in government. For example, the Cabinet Office is increasing the number of Crown Commercial Representatives and strengthening the seniority of the team that supports them. However, the pace, breadth and depth of the change required by the Cabinet Office's ICT reform initiatives is opening up capacity and capability gaps across central government

5.2.2. Strategy for an Effective ICT Cost Reduction – Business Perspective⁶⁴

From the business points of view, there are 2 reasons why IT cost reduction strategies are difficult. Firstly, many of the benefits of ICT are *intangible* and it is difficult to trace their origin. It is hard to determine the value of increased customer service or the increase in productivity from better search and retrieval of information. Secondly, many of the inputs which actually make IT systems work are left unaccounted for and unaccountable. The management and the project tools, systems and methods which build/customize the system (because IT, unlike standard capital goods, is often maintained as a going concern under constant development, e.g. upgrades, customization, workflows etc) are very difficult to cost.

The key to an effective ICT cost reduction and management program is a detailed cost modeling of ICT which can analyze the organization's technology in its place as a business capability enabler. Most financial systems do not capture costs at the right level

⁶⁴ This part is mainly based on *The Complexity of Cost (Pt.2): a 3-tiered strategy for an effective ICT cost reduction program* by The Citadel Project (The Citadel is a non-profit "distributed think-tank" of associated enterprise architects, ontologists, data modelers, corporate lawyers, systems specialists, commercial business people and engineers), 2012. <http://precision-blog.com/2012/12/15/the-complexity-of-cost-pt-2-a-3-tiered-strategy-for-an-effective-ict-cost-reduction-program/>

of detail for businesses to perform accurate and detailed cost reductions. An organization needs to perform intricate spend analyses and build up intricate cost models for ICT which highlight the following:

- The capabilities which various ICT components support (and where in the Value Chain they lie). Only through this level of visibility can the business consolidate their ICT spend.
- The HR and process dependencies which are indirectly attributed to various ICT elements. Only with this level of detail can ICT remove duplication and redundancy.

In the absence of this granularity, cost reduction programs invariably fail. In order to reduce costs effectively without impact on capability as well as making new costs stick, it is essential to view costs and spend at the most granular level possible.

For sustained cost management in ICT the cost reduction program needs to cover: (i) *soft costs* (indirect spend), (ii) *managerial costs* and (iii) *program costs* as well as all the standard *hard costs*.

- **Hard Costs** relate to all the direct spend, basically on tangible items.
- **Soft Costs** relate to all the indirect spend which flows from ICT procurement. This may include travel for non-IT personnel involved in change, training and customization or process change etc.
- **Managerial Costs** are the accumulated costs of decision making from management. This is pure overhead and rather shows up in general administrative accounts.
- **Program Costs** are the costs of running ICT programs beyond the costs accounted for in the various cost allocation systems. These can be the cost of running distributed teams, the cost of low development capability etc. Such cost coefficients are statistically generated.

Standard IT cost models only account for the hard costs of the goods and services necessary to implement and maintain the infrastructure, applications and conditional services. Anything more is believed to be a project cost needed to be funded by the overhead, which is unsatisfactory. The value of technology systems (embedded systems excluded) is in the ability of information workers to apply their knowledge by communicating with the relevant experts (customers, suppliers etc) within a structured workflow (process) in order to achieve a corporate goal. Capturing the dependencies of knowledge and process within the cost model, therefore, is critical. Showing how the IT system enables the relevant capability is the critical factor. Financial models for IT should therefore focus not only on the cost of technology and but also on the cost of **capability**.

Ultimately the organization must streamline its work/business processes and align cost structures accordingly and then lower its non-discretionary spend. The key is to (i) see the whole process, (ii) understand the dependencies, and (iii) engage locally.

The solution is to run a **3-tiered cost reduction strategy**:

- **Minimize (Hard Costs) - Tactical Cost Reduction.** Grab the low hanging fruit and take out the obvious costs; the costs in plain sight. Engage locally with account managers and business unit leaders to reduce headcount but understand and model the dependencies by seeing the whole capability.
- **Optimize (Soft & Program Costs) - Proactive Cost Governance.** This involves detailed spend analysis and process optimization. Indirect process costs always grow. The longer they are there the more they are accepted but ultimately they increase the financial drag on a business. All the invented tasks have to be removed by modeling the organization's value chain and seeing where the processes fit into larger business capabilities. Once this is done, executives can optimize the key cost drivers and their inputs. This improves the delivery model for ICT and enables better demand management. Accompanying these *operational* actions the business should improve cost governance. This can be achieved by removing the management structures around excessive process governance. Most importantly, it needs to simplify processes and remove the '*cost of complexity*' i.e. vertical integration and complex workflows which increase process time and transactional costs.
- **Re-design (Program & Managerial Costs) - Strategic Cost Management.** In order to achieve significant and lasting cost reduction benefits the organization *must* lower its *discretionary spend*. However, managerial cost structures (which are significant) can only be made redundant when the overall complexity is reduced. Once this happens shared services may be implemented and rationalized. The ICT offering can be standardized and the organization can create re-usable technology components. Then the organization can change its transfer pricing models and look towards offering the customer-facing strategic business units a more sophisticated multi-channel mix of capabilities, i.e. give them the agility to increase their high-end customer offerings.

The key is to look at ICT as a *capability enabler* and not as a business unit in its own right.

5.2.3. Establishment of Committee of Computers Procurement for the Public Sector - Thailand's Initiative

In compliance with the Cabinet's approval dated 3 May 2011, MICT appointed the Committee of Computers Procurement for the Public Sector, in particular for the procurement of computers valued 100 million THB (approx. 3.3 million USD) upwards. The Committee is responsible to consider and recommend how to spend wisely the budget on procuring public computers valued 100 million THB upwards, based on the principles of sharing and re-use of resources (i.e. budget, technology, and data/information) to reduce duplication of process and spending. All Government

agencies have to follow the established standards and criteria for procurement optimization of computers and their related systems. Also, the Committee establishes and publicizes the computer specifications and prices suitable to certain tasks and advises procurement practices and solutions. This initiative helps to reduce costs of IT investment and use in the Thai Government sector.

In summary, the strategic IT cost reduction needs organizations to examine all sources of IT spend and prioritize the sustainable IT cost reduction opportunities. It is critical for organizations to have visibility into investments and expenses associated with assets and IT capability because it helps prioritize realistic IT cost reduction opportunities. Organizations need to understand fixed and variable costs of their IT supply and invest in appropriate capabilities. Typically, organizations can reduce the IT costs of a business process by consolidating IT solutions supporting common business processes. IT cost reduction efforts must be aligned with business priorities. However, establishing measures of success and the time frame are vital to achieve the cost reduction goals.

5.3. Priority Services to Demonstrate the Concept of Radical Re-engineering and Radical Cost Reductions in the Investment and Use of IT

IT cost reduction in delivery of government services through concepts of IT assets re-use

The Governments in many countries have commissioned and implemented numerous e-government programs to improve the efficiency of public services. With the cost containment pressures, government organizations are forced to explore new avenues of cost reduction which is possible in many areas including **sourcing, procurement, e-government integration, and cost reduction in IT investment and effective use of IT assets in the public sector**. Maximizing the value of an IT asset is accomplished by getting as much use and result from that asset.

Assembling solutions from things that have been previously built can achieve the kind of step-change in productivity that the public sector needs. **Asset re-use is, therefore, a central pillar of the Government Enterprise Architecture**. The overall goal of asset re-use is to achieve a step change in responsiveness to requirements, at a lower cost and risk point, by investing in a core set of assets selected according to needs. **It can include the re-use of architecture, requirements, design, test cases and data. It may even include the hardware, software and services configured to deliver a fully working service or client solution. The value of asset re-use could be demonstrated as results in cost savings, faster implementation and reduced risks to new implementations**⁶⁵.

⁶⁵ This part is based on *Doing more with less: Asset re-use and UK public sector transformation*, A series of papers on Strategic Technical Architecture for Government Enterprises, IBM Corporation 2007.

Implementation of Thailand's National Single Window (NSW) for Import, Export and Logistics⁶⁶

One of the key components of the THAI-NSW introduced in 2007 is called the “e-Customs Paperless Service,” which enabled automated cargo release and clearance nationwide since 2008. The THAI-NSW began its official operation in July 2008, enabling the exchange of electronic documents among government authorities and business communities in paperless service environment. As of November 2011, THAI-NSW has about 8,000 subscribers, serving about 100,000 traders and 36 government authorities involved in import, export, logistics and supply chains. Government and business sectors have agreed upon the adoption of ebXML standard, public key infrastructure (PKI), and digital signature for secure electronic document exchange within the single window environment. The THAI-NSW has been established in accordance with international standards, best practices and recommendations of relevant international bodies such as World Customs Organization (WCO), United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT), International Organization for Standardization (ISO), Organization for the Advancement of Structured Information Standards (OASIS).

In establishing the THAI-NSW System, funded by the Government of Thailand, the Customs Department, Ministry of Finance, purchased a turnkey solution to develop and maintain the THAINSWS system. The cost of the THAI-NSW's developments (phase 1 & phase 2) was about US\$ 14 million, excluding expenditures individually incurred by relevant government agencies and trading communities. All government agencies and traders can participate in the Single Window environment free of charge. Traders pay only a small fee for electronic document submission through the service provider (VAN/VAS). The minimum charge is 25 Thai Baht (approximately US\$ 0.80) for less than 25 Kbytes of information. One Thai Baht is charged for each additional one Kbyte. However, no matter what the size of document, the maximum charge may not be over 300 Thai Baht (approximately US\$ 9.60). The service fees are reviewed by the Steering Committee on Regulatory Framework and Quality Assurance of Thailand National Single Window. Government agencies and trading communities have gained significant benefits from participating in the THAI-NSW service since 2008, as illustrated in Table 5-1. It is estimated that logistics cost savings from the implementation of the THAI-NSW may reach US\$ 1.5 billion annually.

Trading across border	2007	2008	2009	2010	2011
Export					
No. of Documents to Export (number)	9	7	4	4	4
Time to Export (days)	24	17	14	14	14
Cost to Export (US\$ per container)	848	615	625	625	625
Import					

⁶⁶ <http://www.unescap.org/tid/unnext/pub/brief8.pdf>

Trading across border	2007	2008	2009	2010	2011
No. of Documents to Import (number)	12	9	3	3	3
Time to Import (days)	22	14	13	13	13
Cost to Import (US\$ per container)	1042	786	795	795	795

Table 5-1: Improvement of Trade Efficiency through TH-NSW

Priority government services to demonstrate IT cost reduction

E-government services in Thailand have been developed and delivered based on ICT and improved timely with potential emerging technologies such as cloud computing technology, mobile technology, and open technology. To identify a service/services to be taken up on priority to demonstrate the concept of IT cost reduction, an organization shall take into considerations the amount/value of resources (e.g. time and cost) spent on development of those services and how much impact they set to the general public (as shown below in Figure 5-1). **The highly potential government services demonstrating the concept of IT cost reduction will tend to be the one(s) that uses low resources while impacting widely the economics and society in overall.**

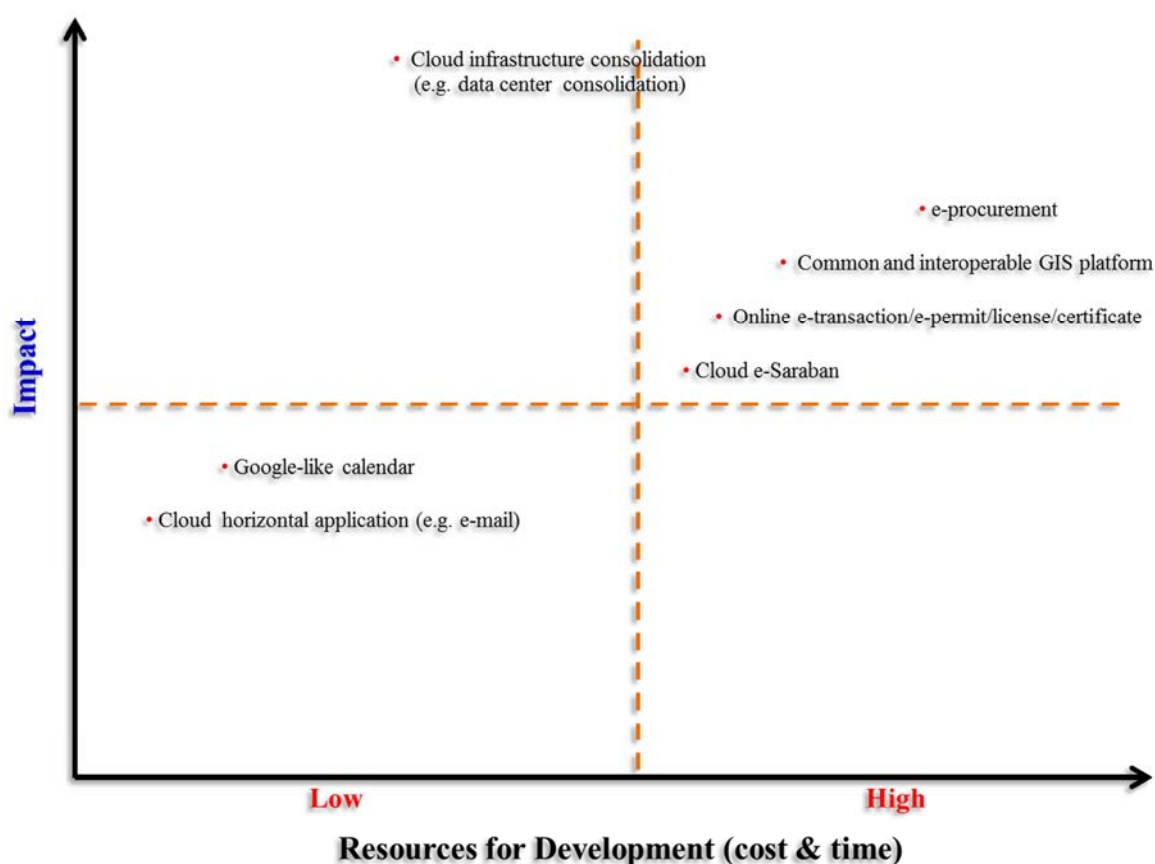


Figure 5-1: Resources and Impact Assessment for the proposed Thailand's e-Government Services

Based on those concepts and practices, the following Thailand's e-government services are proposed as priority service(s) to be taken for demonstrating the radical cost reduction in IT investment and use:

1. *Data Center Consolidation on ICT infrastructure*, i.e. gradually migrating physical data centers to the central Government cloud infrastructure as those provided by Electronic Government Agency (EGA).
2. *Cloud horizontal applications on EGA*, e.g. the national common e-mail system for all governments, common e-calendars, central e-Saraban,
3. *Cloud vertical applications on EGA*, e.g. e-Procurement, common but customizable platforms for e-Permit/e-Licensing/e-Certificates, common GIS systems
4. *More mobile government applications*, e.g. mobile e-tax filing,

5.4. Conclusion

With the cost containment pressures, government organizations are forced to explore new paths of cost reduction which is possible in many areas including sourcing, procurement, e-government integration, and cost reduction in IT investment and effective use of IT assets in the public sector. The strategic IT cost reduction needs organizations to examine all sources of IT spend and prioritize the sustainable IT cost reduction opportunities. Organizations should look into investments and expenses associated with assets and IT capability to prioritize realistic IT cost reduction opportunities. Typically, organizations can reduce the IT costs of a business process by consolidating IT solutions supporting common business processes. IT cost reduction efforts must be aligned with business priorities of organizations. However, establishing measures of success and the time frame are vital to achieve the cost reduction goals.

The Government agencies may use these strategies to reduce IT costs: ICT spend control; Shared ICT infrastructure program; Centralized ICT procurement; Managing suppliers as a single customer; and Making government contracts more easily accessible to SMEs. Moreover, the ICT cost reduction program is suggested to cover all those of the hard costs, soft costs, managerial costs, and program costs by using the 3-tiered cost reduction strategy, which are to minimize the hard costs by consolidating data centers; to optimize the soft and the program costs by detailed spend analysis; and to re-design the program and the managerial costs by implementing shared services and re-usable technological components.

To identify the priority services to demonstrate the concept of radical cost reductions in IT investment and use, the analysis approach of assessing the amount/value of resources (e.g. time, cost) spent on development of government services against how much impact they set to the general public is based on to get the result that the one (s) that uses low resources while impacting widely the economics and society in overall tends to be the highly potential service(s) with IT cost reduction concept. For example, the followings are proposed as priority services: Data Center Consolidation on ICT infrastructure; Cloud horizontal applications on EGA (e.g. the national common e-mail system for all governments, common

e-calendars, central e-Saraban etc.); and Cloud vertical applications on EGA (e.g. e-Procurement, common but customizable platforms for e-Permit/e-Licensing/e-Certificates, common GIS systems)

The below Table summarizes ICT cost savings strategies with high impacts or radical changes

Strategies	Concept	Recommendations and case examples
Online services	A growing number of public services are just emerging online in Thailand, with the need to reduce the costs and also delivering better public services.	<p>Mobile public applications, e.g. e-Tax filing on mobile devices</p> <p>Electronic application submissions, e.g. for applying for government permits, licenses or certificates.</p>
Business intelligence systems	These systems typically automate the collation, analysis and presentation of financial information, management information and metrics about business performance and relevant progress indicators across an organization.	<p>Business intelligence and monitoring systems, e.g. geographical information systems for monitoring public buses movement and safety around the country.</p> <p>However, most of the successful business intelligence systems must be implemented only after having good transaction and database systems to provide basic data for analytical and intelligent processing, e.g. the development of PMOC (Prime Minister Operation and Intelligent Center) can be implemented only after having very good Minister-level Operation and Intelligent Center (MOC), and MOC can be implemented only after having very good Department-level Operation and Intelligence Center (DOC).</p>
Business systems	These systems sit at the heart of public service delivery. They can range from simple database applications through to large transactional systems supporting the operation of tax collection and benefits payments. Many areas of	Common online public applications on central clouds, e.g. common e-permits, e-certificates and e-licenses with digital signatures at the user levels.

Strategies	Concept	Recommendations and case examples
	<p>government have been made more efficient through the deployment of business systems, but these have also presented the biggest challenges to value for money.</p>	
<p>Back office systems</p>	<p>These systems deliver core functions (e.g. finance, human resources, procurement and facilities management systems) that all organizations need to manage operations effectively and for strong financial control.</p>	<p>Government e-Procurement for end-to-end procurement operations (<i>not just e-Auction that Thai Government has already adopted</i>).</p> <p>Common HR systems, office automation, e.g. Google-like calendar systems but on our own country cloud computing systems, e.g. for national security reasons.</p>
<p>Infrastructure</p>	<p>ICT provides all of the basic tools necessary for the modern working environment and for efficient government operations. They are ICT commodities that are available from the market. Infrastructure can directly affect other costs such as office accommodation. It influences how productive and mobile the front line and civil service workforce is, and the extent to which flexible and collaborative working is possible.</p>	<p>Data Center Consolidation with Cloud Infrastructure</p>

Table 5-2: ICT Cost Savings Strategies with High Impacts or Radical Changes

Section 6. Other Related Tasks

6.1. Introduction

This section reports the progress of other related tasks, which originally are 1) design of international study visit on e-government; 2) workshop arrangement; and 3) recommendations on Thailand's direction for the development of e-government to align with related directions of the Roadmap for an ASEAN Community (2009-2015).

While the design of international study visit on e-government, including its expected results has been already proposed in the previous Interim Report, the further work on planning workshop arrangement and preparation of recommendations toward ASEAN Roadmap directions has been conducted. The progress report of those operations is provided here in this Draft Final Report.

6.2. Design of International Study Visits

The design of international study visit on e-government has been completed. The two options of the policy level visit to European countries and the middle management level visit to either Republic of Korea Singapore or U.S.A. and their itinerary plans, including the expected results from the visits are proposed.

6.2.1. Proposed Countries and Programs for Option 1: Policy-Level Visit to European countries

The destination countries, visit programs and contact points for further coordination of meetings are proposed, based on their best practices in modern e-government development, online public services and e-participation of citizens in the government processes, as well as the creation of pan-European e-government. The proposed countries are Switzerland, Austria, and Poland (in sequence of farthest distance and flight duration). In coordination with the existing partner of KU-IONA in Europe, the Europe visit programs could be designed in more detail with support of the partner having assisted in approaching some potential organizations in advance.

1) *Switzerland*

Switzerland is ranked the 15th of top twenty world leaders in e-government development while ranked the 9th of top ten leaders in e-government development in Europe region, according to the world e-government rankings by the United Nations E-Government Survey 2012⁶⁷. As well, the e-Government project «geo.admin.ch» (by the Coordinating Agency for Federal Geographical Information, aimed to foster the exchange of geodata in a significant way) of Switzerland has achieved the 2nd place

⁶⁷ The UN e-government assessment in 2012 focused on the concept of integrated services that exploit inter-linkages among different public services on a functionally and/or thematically similar one-stop-shop portal.

in the 2012 United Nations Public Service Award⁶⁸ in the category of “Advancing Knowledge Management in Government”.

Target Topics: e-Government strategy (especially the principles of ‘develop once, use many times and open standards’); e-Government architecture; Open government; Federal Office Automation; Implementation of cloud computing strategy; Nationwide exchange standard for electronic records and documents for interoperability in e-government

Proposed Organizations and Programs

(a) Federal IT Steering Unit (FITSU)

(Informatiksteuerungsorgan Bund ISB <http://www.isb.admin.ch/>)

FITSU ensures implementation of the ICT strategy of the Federal Council. For this purpose, it issues guidelines for the administrative units and centrally manages the standard services of information and communication technologies (ICT) i.e. IT services that the administrative units of the Federal Administration require with the same or similar functionality and quality. FITSU coordinates cooperation between the Confederation, the cantons and the communes in the field of e-Government, and manages the Reporting and Analysis Centre for Information Assurance (MELANI). The Programme Office of eGovernment Switzerland of FITSU takes the role to facilitate coordination of eGovernment Switzerland activities between the Confederation, the cantons/districts, as well as the cities and municipalities

Related Initiatives of FITSU:

- Federal Office Automation

The Federal Office Automation program aims to introduce uniform electronic workplaces throughout the entire Federal Administration by 2012. This helps bundle purchasing volumes and takes advantage of technical synergies, thereby significantly reducing IT costs in the Federal Administration.

- eGovernment Map Switzerland

The eGovernment Map aims to further improve the networking of e-government efforts and thus to achieve a major synergy effect. This promotes the nationwide reusability of services. The principle “develop once, use many times” will be promoted especially for basic infrastructures.

- Open Government Data

Data generated in the course of administrative activity may be of benefit to the population and the private sector. They contain major potential for innovation and

⁶⁸ The United Nations Public Service Awards is claimed the most prestigious international recognition of excellence in public service. It rewards the creative achievements and contributions of public service institutions that lead to a more effective and responsive public administration in countries worldwide. Web site <<http://www.unpan.org/unpsa>>

added value when reused and refined by the private sector and may create greater transparency for government and administrative activity. The administration aims to make all non-personal data generated in the course of administrative activity accessible and reusable, to the extent possible according to the principles of the Open Knowledge Foundation (<http://okfn.org>).

Proposed Visit Program

Meeting with the Director of FITSU for discussion on such topics as e-government strategy and how to formulate and realize the action plans, how to get involvement and collaboration from several government agencies and stakeholders, how to achieve the federal office automation and open government data initiatives.

Duration:

0.5 day approximately

Location:

Federal IT Steering Unit

Schwarztorstrasse 59, CH-3003 Bern, Switzerland

Tel. +41 (0)31 322 45 38, Fax. +41 (0)31 322 45 66

(b) *Bern University of Applied Sciences*

(*Berner Fachhochschule BFH, <http://www.bfh.ch/>*)

Bern University of Applied Sciences has the ‘*Competence Centre for Public Management and e-Government*’ established as a scientifically independent service, research, and development institution for public management and e-government. The nationally and internationally oriented Competence Centre is part of the Research and Services Division of the Business and Administration Department. The Competence Center for Public Management and e-Government is managed by Prof. Dr. Reinhard Riedl. He is also an editor-in-chief of "e-Gov Präsenz" scientific periodical journal (two issues per year).

Proposed Visit Program

It is proposed that if the delegation from Thailand will agree on participation in 1-2 lessons-learned presentations, a half-day workshop* could be organized with the scientists from the University. The subjects will be about the e-government in Switzerland, the interrelation between e-government and open government, the current strategy and state-of-the-art of e-Government in Thailand (by members of the Thai delegates), and discussion (**Note: This can be decided to make it a public workshop, open for researchers and students of the University.*)

Proposed Tentative Agenda of a Workshop

- Welcome address by the Head of the Department (Prof. Dr. Jürg Römer - former Chief of the Government ICT Strategy Board)
- E-government in Switzerland (presentation by Prof. Dr. Reinhard Riedl, Director of Competence Center for Public Management and e-Government)
- The E and the O of the Government: the interrelation between e-government and open government (presentation by Prof. Dr. Thomas Myrach, Director of the Institute of ICT at the University of Bern)
- Presentation of the current strategy and state-of-the-art of e-government in Thailand (by members of the Thai delegations)
- Panel-mutual discussion of the participants
- Open questions from other participants
- Conclusions

Duration

0.5 day approx.

Location

Bern University of Applied Sciences
Falkenplatz 24, CH-3012 Bern, Switzerland
Tel. +41 31 848 33 00, Tel. +41 31 848 33 51 (International Relations Office)

- (c) During the visit to FITSU and to Bern University of Applied Sciences, a discussion meeting with the Vice-Minister in charge of economical development at the Ministry of Economy may be arranged for exchange of views on how Switzerland can participate in e-government development in Thailand. (within the duration of 0.5 - 1 hour)

Contact Person for Switzerland Visit:

Professor Bogdan Lent, Ph.D.
University of Applied Sciences, Bern, Switzerland
University of Technology and Life Sciences at Bydgoszcz, and National Defense Academy, Poland,
E-mail: bogdan.lent@lent.ch

Expected Results:

2) Austria

Austria and Portugal belong to the leading e-Government countries in the European Union, ranking first and third respectively, in terms of full online availability of

public services. From the results of the ninth e-Government Benchmark 2010 Austria was declared the 'European Champion in e-Government' for the fourth time in a row. Also Austria is ranked by the United Nations E-Government Survey 2012 as the first emerging leader in e-government development while ranking the 7th of the top ten leading countries in e-government development in Western Europe.

Target Topics: Innovative e-Government platform, citizen-centric e-government, inclusive e-government (e-inclusion), Pan-European Public Procurement Online, e-Health directory service

Proposed Organizations and Programs

(a) Federal Computing Centre

(Bundesrechenzentrum BRZ <http://www.brz.gv.at/>)

The Federal Computing Center is the market leader in IT services and e-Government partner for the Austrian federal government. The BRZ has one of the largest data centers in Austria. With the latest hardware and software, and a parallel data center, it offers high system availability and reliability.

Proposed Visit Program

Half a day visit for operations experience in managing e-Government applications with the following tentative agenda:

- Welcome by the Head of the BRZ (Dr Roland Jabkowski)
- Government Cloud: pro and cons, by Chief e-Gov at BRZ (Dr. Klaus John)
- Premises of the BRZ in Vienna (operations experience in managing e-Gov applications)
- Conclusion and closing

Duration

0.5 day approximately

Location

Federal Computing Centre (Bundesrechenzentrum GmbH)

Hintere Zollamtsstraße 4, A-1030 Vienna, Austria

Tel: +43 (0) 1 71123 0

E-Mail: <Kundenservice@brz.gv.at>

(b) Ministry of Finance

(<http://www.bmf.gv.at/> or <http://english.bmf.gv.at/>)

The Ministry of Finance has developed innovative e-Government solutions and has already received multiple awards as a result. The aim of the Federal Ministry of

Finance is to offer both citizens and businesses the best possible service and to structure an increasing number of official channels electronically so as to render them in a simple, swift and efficient way. The BMF serves as a central electronic service platform for public administration in Austria entrepreneurs.

Proposed Visit Program

1-2 hours meeting and experience exchange in subjects of financing of the e-Government effort in Austria and business plans of the e-Government.

Duration

1-2 hours approximately

Location:

Ministry of Finance

Hintere Zollamtsstraße 2b, 1030 Vienna, Austria

Tel: +43 (0)1 51433 0

(c) *Vienna University of Technology (upon interest)*

(<http://www.tuwien.ac.at/> or http://www.tuwien.ac.at/en/tuwien_home/)

Vienna University of Technology (TU Vienna) is located in the heart of Europe, in a cosmopolitan city of great cultural diversity. For nearly 200 years, the TU Vienna has been a place of research, teaching and learning in the service of progress. The TU Vienna is among the most successful technical universities in Europe and is Austria's largest scientific-technical research and educational institution. Its mission is "technology for people".

Proposed Visit Program

Possibility to arrange a half-day workshop on e-Government Strategy Implementation in Austria, implementation risks and experiences, and e-government implementation experiences in Thailand (by members of the Thai delegates) at Vienna University of Technology, with this tentative agenda

- Welcome by the senior University member (person to be chosen)
- e-Gov Strategy Implementation in Austria by Chief e-Gov at BRZ (Dr. Klaus John) or other person
- Implementation risks and experiences, presentation by Dr. Andreas Ehringfeld (researcher of Industrial Software Institute at TU Vienna)
- e-Gov implementation: experiences of Thailand by member of Thai delegation
- Discussion and conclusion

Duration

0.5 day approx.

Location

Vienna University of Technology
Karlsplatz 13, 1040 Vienna, Austria
T: +43 (0)1 58801 0

Contact:

Mag. DI Dr. Andreas Ehringfeld
Industrial Software Institute, TU Vienna (<http://www.inso.tuwien.ac.at/>)
Wiedner Hauptstraße 76, Stiege 2, 2. Stock; 1040 Vienna, Austria
E-mail: <andreas.ehringfeld@inso.tuwien.ac.at>

(d) *The Austrian Federal Chancellery*
(*Bundeskanzleramt* <http://www.bka.gv.at/>)

In addition, the coordination has been made to facilitate a visit of Thai delegates to the Austrian Federal Chancellery for discussion on e-government policy issues

Duration

2 hours approx.

Location

Federal Chancellery (Bundeskanzleramt)
Ballhausplatz 2, 1014 Vienna, Austria
Tel: +43 (0)1 531 15 0

Contact Persons for Austria Visit:

Dipl.-Ing. (FH) Klaus J. John
Professional Architect
E-Government
Federal Computing Centre, Dept. E-DC,
Hintere Zollamtsstraße 4, 1030 Vienna, Austria
Tel: +43 (0)1 71123 3424, Mobile: +43 664 8340306
E-mail: klaus.john@brz.gv.at

Professor Bogdan Lent, Ph.D.
E-mail: bogdan.lent@lent.ch

3) *Poland*

European Union raised the Electronic Communication System for Public Administration (SEKAP) initiative of Poland as an example of innovative regional solutions to e-government and good practice for other regions. Other interesting initiatives are such as e-Court, e-Tax, e-Land and mortgage systems. Poland is

ranked the fifth of the top ten countries in e-government development in Eastern Europe.

Target Topics: Security issues in e-government, Electronic communication system for public administration/SEKAP Project (innovative regional solution to e-government), Reforming organizational structures of public administration, Coordination of interoperability between the administration systems, Government Cloud

Proposed Organizations and Programs

(a) *Ministry of ICT and Administration / Ministry of Administration and Digitization*
(<https://mac.gov.pl/> or <https://mac.gov.pl/eng/>)

The Ministry works in response to the governmental strategies, especially on the digitization for a digital boost for the country's development, based on the state's needs to focus on developing the broadband infrastructure, support the development of web content and services and promote digital literacy among its citizens. Efficient digitization is promoted based on three pillars: providing Internet access; developing web content and resources; and promoting digital literacy.

Proposed Visit Program: One day visit for the following tentative agenda:

- "Panstwo 2.0" (Country 2.0) -- Poland's strategy in e-Gov developments
- State organization of the e-Government Project selection
- Relation of the governmental processes and EU-policies (Innovation Economy)
- Polish experience with implementing e-Government
- ICT Centre of the Polish Government
- Discussion
- Closing remarks and conclusion on possible further cooperation

Duration

1 day approx.

Location

Ministry of Administration and Digitization

27 Królewska St., 00-060 Warsaw, Poland

Tel: (+ 48) 22 245 59 31 (The Minister's Office)

Tel: (+48) 22 245 59 10 (Department of Public Administration)

- (b) *National Defence Academy* (<http://www.aon.edu.pl>)
(*This can be arranged with at least 6-8 months advance notice.)

Proposed Visit Program

1-day conference or workshop on “Security issues in e-Government” with the tentative agenda such as:

- Security policy of the Ministry of ICT
- Data security
- Access security
- Government Cloud issues
- Panel discussion on topics of e-government security
- Closing

Duration

1 day approx.

Location:

National Defence Academy

Al. gen. Antoniego Chruściela "Montera" 103, 00-910 Warsaw, Poland

Contact Person for Poland Visit:

Professor Bogdan Lent, Ph.D.

University of Technology and Life Sciences at Bydgoszcz, and National Defense, Poland

E-mail: bogdan.lent@lent.ch

6.2.2. Proposed Countries and Programs for Option 2: Middle-Management Level Visit to Republic of Korea / Singapore / U.S.A.

The countries for a middle-management and implementation level visit are proposed including Republic of Korea, Singapore, and U.S.A., depending upon specific interests of MICT. The consultant team is in the process of coordination with the World Bank for its recommendations on some names of organizations for a visit. The visit program will be presented in the next report.

1) Republic of Korea

The e-Government of Korea is cited as a major success case in numerous international economic indexes, and has served as one of the most successful best practice models in the global community. Republic of Korea is the top world e-government development leader ranked by the United Nations e-Government Survey 2012.

Target Topics: Smart e-government, m-Government, broadband policy, institutional governance, single sign-on integrated services, and uTradeHub/NSW for paperless trade.

Proposed Organizations

(a) *Informatization Strategy Office, Ministry of Public Administration and Security*
(<http://www.mopas.go.kr/gpms/view/english/about/about06.jsp>)

Ministry of Public Administration and Security (MOPAS) develops policies and implements services for Korea's e-government, which received first place in the 2010 UN e-Government Survey. In promoting smart administrative services, MOPAS provides different smart services to raise users' convenience and satisfaction such as smart civil affairs service, smart security, smart disaster management. The Ministry has established the Smartwork Center in selected regions, allowing long-distance commuters to work closer from their homes. MOPAS plans to create mobile offices using smart phones and tablet PCs.

The Informatization Strategy Office is responsible to coordinate policies on national informatization and e-government; operate e-government services and portal; promote global cooperation in informatization and e-government; develop policies related to personal information protection and cyber security, as well as promotion of healthy information societies.

Duration

0.5-1 day approx.

Location

Ministry of Public Administration and Security
209 Sejong-daero(Sejong-ro)
Jongno-gu, Seoul, Republic of Korea

Contact:

Bo Young Rhim
e-Government
Tel: +82-2-2100-3518
E-mail: byrhim@mopas.go.kr

(b) *National Computing Information Agency (affiliated organization of Ministry of Public Administration and Security)* (<http://korea.ncia.go.kr/index2.html>)

National Computing Information Agency (NCIA) manages computerized administrative systems of government agencies and promptly responds to cyber attacks such as DDoS (Distributed Denial-of-Service), hacking, and computer viruses.

For economical operation of national information resources, the national information communication network and e-Government enables integrated purchase and usage of information resources, thus promoting more cost-efficient way of information management. Furthermore, to respond to a fast changing administrative environment to support smart e-government infrastructure with cutting-edge technology, NCIA works with MOPAS to further promote smart work, mobile administration, and cloud computing services. It develops and provide modular platforms to be shared by ministries: G-Cloud platform service; G-Mobile platform service; and Smart Office platform service. The interesting activities of NCIA are that it has established the e-ANSI (Advanced National Security Infrastructure) – a comprehensive e-government security monitoring system (2011), deployed G-Cloud – a government cloud computing platform for e-government, and recently opened the Mobile e-Government Service Support Center (2012).

Duration:

1 day approx.

Location:

National Computing Information Agency
305-718 793 Daedeokdae-ro
Yusung-gu Daejeon, Republic of Korea
Tel: +82 42 250 5000 up to 5114
Tel: +82 42 250 5270 (general)
E-mail: nciaadm@korea.kr

(c) *Korea Trade Network Co. Ltd (KTNET)*

http://homepage.ktnet.co.kr/company_eng/global_01.jsp

The Ministry of Knowledge Economy and the Korea International Trade Association ("KITA") have carried out a project to build "e-Trade (paperless trade) services" as a part of the "e-Government agenda" since 2003. As a result, the uTradeHub was introduced as a new concept of a national e-Trade network and as a single online window for trading activities. The uTradeHub processes overall trade affairs seamlessly ranging from marketing to settlement by linking networks of trading related entities for each process.

The uTradeHub has simplified complicated trading procedures by providing online services, making it unnecessary to visit banks or trade-related authorities.

The Ministry of Knowledge Economy designated KTNET as the e-Trade service provider for operating the uTradeHub services and systems under the e-Trade promotion law.

Duration:

0.5 day approx.

Location:

Korea Trade Network Co., Ltd.(KTNET)
Room 1104, World Trade Tower
Samsung-dong, Kangnam-gu, Seoul, 135-729 Republic of Korea
Tel: +82 2 6000 2114

2) Singapore

Singapore is recognized as an e-government leader by international benchmarking agencies. It is consistently ranked amongst the top 3 in the e-government indices of the World Economic Forum Global IT Report from 2009 to 2011. As well, Singapore is ranked the world's top 10 e-government leaders and also the 2nd top e-government leaders in Asia, after Republic of Korea, by the UN E-Government Survey 2012.

Target Topics: e-Citizen, Cloud computing for government, Cloud security standard, Whole-of-Government Enterprise Architecture and e-Service Development, collaborative social-networking platform for public offices, government web services exchange, m-Government/Services, Cluster development and Government Chief Information Office (GCIO)

Proposed Organizations

(a) *Infocomm Development Authority of Singapore*
(<http://www.ida.gov.sg/>)

As the Chief Information Officer (CIO) for the Singapore Government, Infocomm Development Authority of Singapore (IDA) is responsible for master planning, project-managing and implementing various infocomm systems and capabilities for the Government. It oversees IT standards, policies, guidelines and procedures for the Government, and manages the infocomm security of critical infocomm infrastructure and the implementation and management of e-government programs (Ministry of Finance :MOF) is the e-government owner, responsible to set the policy direction on use of ICT in government, champions and provides funding for whole-of-government programs and projects.)

IDA also works with other public agencies to increase the reach and richness of e-Government services. Connecting the industry's innovative solutions to the Government's needs, about 1,600 public sector services are available online today. To make these services even more accessible, IDA is working closely with agencies to make them available on mobile platforms for users to transact with the Government while on the move.

IDA oversees whole-of-government ICT initiatives to maintain Singapore Government's leadership position as an innovative user of infocomm technologies to provide public services; and to co-create and connect with its people. This includes eGov2015 master plan and sectoral infocomm initiatives to support the transformation of the education, financial, tourism, trade, healthcare sectors.

eGov2015 seeks to bring integration of systems, processes and service delivery from within the Government to beyond the Government. The vision of eGov 2015 is to be a Collaborative Government that Co-creates and Connects with our People. To achieve the vision of a Collaborative Government, the new master plan focuses on three strategic areas: Co-creating for Greater Value; Connecting for Active Participation; Catalysing Whole-of-Government Transformation

Duration

2 days approx.

Location

Infocomm Development Authority of Singapore
10 Pasir Panjang Road, #10-01 Mapletree Business City
Singapore 117438
Tel: +65 6211 0888 (mainline), +65 6211 2100 (general inquiries)
Fax: +65 6211 2222

3) *United States of America*

U.S.A. is the top five world e-government development leader, according to the UN E-government Survey 2012, and the top ranked country in the Americas. U.S.A. was found a best practice example of an integrated portal that provides easy to navigate design and collects and consolidates all information and services for citizens in one place, including agency services at the state and local level, which vastly increases the effectiveness of user search and uptake.

Target Topics: e-government business process outsourcing, open government initiative, e-participation, cloud IT services, mobile government, cyber security, and data privacy.

Proposed Organizations

- (a) *Office of Citizen Services and Innovative Technologies and Federal Risk and Authorization Management Program (FedRAMP) – the Agencies under the U.S. General Services Administration*

- *Office of Citizen Services and Innovative Technologies (OCSIT)*
(<http://www.gsa.gov/portal/category/25729>)

The Office of Citizen Services and Innovative Technologies (OCSIT) is the nation's focal point for data, information and services offered by the federal government to citizens. In addition, it is also a leadership role in identifying and applying new technologies to effective government operations and excellence in customer service in the government e.g. GSA open government initiatives, mobile government, Cloud IT Services, Data Center Services.

The Office of Innovative Technologies focuses on initiatives that enable agencies to deliver most effective and efficient services to citizens, Information technology initiatives that advance the President's technology agenda, including e-Government initiatives and Cloud computing initiatives under the Federal Cloud Computing Program Management Office (PMO.)

- *Federal Risk and Authorization Management Program (FedRAMP)*
(<http://www.gsa.gov/portal/category/102371>)

FedRAMP is a government-wide program that provides a standardized approach to security assessment, authorization, and continuous monitoring for cloud products and services. It is the result of close collaboration with cyber-security and cloud experts from GSA, NIST (National Institute of Standards and Technology), DHS (Department of Homeland Security), DOD (Department of Defense), OMB (Office of Management and Budget Policy), the Federal CIO Council and its working groups, as well as private industry.

The FedRAMP assessment process is initiated by agencies or cloud service provider (CSPs) beginning a security authorization using the FedRAMP requirements which are FISMA (Federal Information Security Management Act) compliant and based on the NIST 800-53 rev3 (Information Security - Recommended Security Controls for Federal Information Systems and Organizations).

Duration

1- 1.5 days (for open government initiatives, mobile government, Cloud IT Services, FedRAMP)

Location:

U.S. General Services Administration
One Constitution Square
1275 First Street, NE, Washington, DC 20417
Tel: +202 501 1231
Tel: +202 501 0705 (Office of Citizen Services and Innovative Technologies)

Contact points of OCSIT

Gwynne Kostin

Tel: +202 501-1797

E-mail: gwynne.kostin@gsa.gov

Leader Authority of OCSIT

Mr. David L. McClure

Associate Administrator

Tel: +202 501 0705

E-mail: david.mcclure@gsa.gov

(b) *Department of Homeland Security (DHS)* <http://www.dhs.gov/>

- *DHS Privacy Office* (<http://www.dhs.gov/about-privacy-office>)

The mission of the Privacy Office is to protect all individuals by embedding and enforcing privacy protections and transparency in all DHS activities. It works with every component and program to ensure that privacy considerations are addressed when planning or updating any program, system or initiative. It strives to ensure that technologies used at the Department sustain, and do not erode, privacy protections. The Privacy Office uses the DHS Fair Information Practice Principles (FIPPs) as its policy framework to enhance privacy protections by assessing the nature and purpose for all personally identifiable information (PII) collected to fulfill the Department's mission. The CIO Council has just released new 'Recommendations on Standardized Digital Privacy Controls' in December 2012.

- *International Trade Data System (ITDS)* <http://www.itds.gov/>

ITDS provides all appropriate agencies a single point of access to consolidated import information through a secure web portal, and will continue to expand existing public-private partnerships in order to seek and share recommendations and best practices within the importing community. It is the program that assists Participating Government Agencies (PGAs) in identifying, documenting, and executing their plan to leverage ACE (Automated Commercial Environment) to improve business operations and further agency missions. The ITDS's mission is to implement a secure, integrated, government-wide method for the electronic collection, storage, use, and dissemination of international trade data. ITDS' overarching goal is the utilization of the concept commonly known as the Single Window that will provide the trade with the ACE functionality through which they can electronically submit all information to comply with CBP (Customs and Border Protection) and other government regulations. The information would then be assessed electronically by the relevant government departments and agencies, resulting in border-related decisions which would be transmitted electronically back to the trade.

The U. S. Customs and Border Protection (CBP) International Trade Data System (ITDS) Concept of Operations (ConOps) was developed (published 2010) to serve as the foundation to incorporate the future vision of CBP business practices into the modernization effort called ACE (Automated Commercial Environment). This document is the first step towards achieving the concept most notably known as the automated “single window.” This CBP ConOps includes the modernization of CBPs cargo processing in ACE and the creation of the single window data input. It also includes data sharing between Trade and federal agencies, between federal agencies themselves, and accomplishes significant objectives of the CBP Trade Vision and Strategy.

Duration:

1-1.5 days (for privacy and cybersecurity-related issues and single-window ITDS services for secure trade)

Location:

Department of Homeland Security
245 Murray Lane SW, Washington, DC 20528-0075
Tel: +202-343-1717 (Privacy Office)
Email: privacy@dhs.gov

6.2.3. Expected Results of the International Study Visit

Target Study Topics	International Study Visit						Expected Results
	Policy-Level Visit			Middle-Management Visit			
	Switzerland	Austria	Poland	Korea	Singapore	U.S.A.	
<p><i>e-Government Strategy</i> & how to formulate & realize action plans</p> <ul style="list-style-type: none"> • networking of e-government efforts for synergy effect; • collaboration mechanisms • reusability of services /develop once use many times 	x	x	x		x	x	Experiences & lessons learnt from policy integration; soft and hard measures; local coordination; strategic planning; & services reusability <i>to be applied for development of online government services in Thailand based on the concepts of ‘interoperability’ & ‘doing more with less for more’ through networking of e-government efforts for synergy effect</i>
<p><i>Open Government & Open Government Data</i> initiatives (supports open data community, explores innovation around open, and offers a variety of professional and technical services) & inter-relation between e-government and open government</p>	x				x	x	Experiences & lessons learnt from concepts of open government; public participation & social involvement methodologies; & aspects of communication management <i>to be applied for development of open government & implementation of open data initiatives in Thailand to foster citizen inclusion or e-participation in development of government services</i>
<p><i>Government Cloud/e-services</i> platform for public administration</p>		x	x	x	x	x	Experiences & lessons learnt from Government Cloud and e-services development <i>to be applied for e-government services development based on cloud computing technology to reduce costs & maximize resources</i>
<p><i>Pan-European e-government</i></p>		x					Experiences & lessons learnt on pan-European

Target Study Topics	International Study Visit						Expected Results
	Policy-Level Visit			Middle-Management Visit			
	Switzerland	Austria	Poland	Korea	Singapore	U.S.A.	
<i>initiative</i>							e-government initiative <i>to be applied for Thailand's e-government development in an ASEAN regional context & in alignment with directions of ASEAN Roadmap</i>
<i>e-government policy issues</i>		X					Experiences & lessons learnt from e-government policy issues <i>to be applied for effective policy formulation & integration; soft & hard measures for e-government implementation, including risk management</i>
<i>e-government security issues</i>			X		X	X	Experiences & lessons learnt from e-government security issues <i>to be applied for planning & updating any system/program to enforce security & data protections</i>
<i>e-communication system for public administration</i>			X				Learning from this Poland's initiative of e-communication system for public administration (considered as an example of innovative regional solution to e-government) could <i>be applied for development of e-government services in Thailand</i>
<i>Smart / Mobile e-government</i>				X	X	X	Experience & lesson learnt from mobile government <i>to be applied for development of smart government to provide smart e-services/G-mobile platform service in Thailand</i>
<i>Broadband policy</i>				X			Experience & lesson learnt from broadband policy <i>to be applied for development of</i>

Target Study Topics	International Study Visit						Expected Results
	Policy-Level Visit			Middle-Management Visit			
	Switzerland	Austria	Poland	Korea	Singapore	U.S.A.	
							<i>broadband infrastructure to support development of web services/content & promotion of digital literacy among citizens</i>
<i>Single sign-on integrated services</i>				x			Experience & lesson learnt from single sign-on integrated services <i>to be applied for e-services development (by identifying & improving governance processes & mechanisms across several departments in order to transform organizationally public service delivery with increase in functional productivity in government), which will lead to greater efficiency and effectiveness of services along with needed cost savings</i>
<i>uTradeHub/NSW for e-trade services</i>				x		x	Experiences & lessons learnt from NSW <i>to be applied for development of e-trade network & service beneficial to streamline trade process</i>
<i>e-participation/e-inclusion</i>		x			x	x	Experiences & lessons learnt from concepts /activities of e-participation/e-inclusion <i>to be applied for e-service development that will enhance participation of citizen in design & development of government services for their needs</i>
<i>e-government architecture</i>	x				x	x	Experiences & lessons learnt from e-government architecture <i>to be applied for design enterprise architecture of e-government</i>

Target Study Topics	International Study Visit						Expected Results
	Policy-Level Visit			Middle-Management Visit			
	Switzerland	Austria	Poland	Korea	Singapore	U.S.A.	
							<i>to ensure interoperability for connected government</i>

6.3. Progress of Workshop Arrangement

Upon consultation with MICT, the workshop arrangements for this project are required to be achieved in two events, which are a workshop to present the final project results to the high-level Executives of MICT and a workshop to present the final project deliverables to MICT and other government officials.

Furthermore, in order to verify and validate the project results prior to the final report delivery, the KU-INOVA consultant team has planned to organize a focus group meeting to call for experts from public and private sectors to provide comments on the project deliverables and express their opinions, in particular on the recommendation part. These consultation activities will be conducted so that the e-government development in Thailand will respond properly to actual needs of all concerned parties for the maximal benefits of the country.

The plan for arrangement of those workshops and focus group meeting are as follows:

1. Focus group meeting

Proposed Date: tentatively in mid July 2013 (12 July 2013)

Proposed Targets: 25 representatives from ministries, independent public agencies, academia, IT companies and application solution providers, ICT innovation-related institutions, citizen/civic sector (e.g. Foundation for Consumer)

Proposed Venue: MICT

Expected Outcomes: Recommendations on e-government development (in especially the related issues of interoperability, institutional structure and governance, innovation in public services, and radical re-engineering/reform for “doing more for less for more”) in Thailand to be consolidated in the Final Report.

2. Workshop to present the final project results to the high-level Executives of MICT

Proposed Date: tentatively in late July 2013 (31 July 2013)

Proposed Targets: 20 high-level Executives from the Office of Permanent Secretary, and selected Departments of MICT, Advisors, Experts

Proposed Venue: MICT

Expected Outcomes: High-level Executives of MICT acknowledge/adopt the project results.

3. Workshop to present the project deliverables to MICT and other government officials

Proposed Date: tentatively in early August (2 August 2013) - in consultation with MICT and the World Bank

Proposed Targets: Government officials of MICT and other Ministries

Proposed Venue: to be further discussed

Proposed Venue: to be further discussed

Expected Outcomes: Government officials of MICT and other Ministries acknowledge the project results.

6.4. Progress on Proposal of Recommendations on Thailand's direction for the development of e-government to align with related directions of the Roadmap for an ASEAN Community (2009-2015)

To conceptualize the direction of Thailand's e-government development in an ASEAN regional context to align with related directions of the Roadmap for an ASEAN Community (2009-2015), it is necessary to learn where and how e-government development plays the role in ASEAN community and its Roadmap. Several ASEAN ICT and e-government-related documents (e.g. Roadmap, Master Plan, Blueprint, Framework) are, therefore, explored and studied. Some background briefings are presented in this part of the Draft Final Report to illustrate existing status of e-government development in ASEAN. They will be the good groundworks for formulating the recommendations on Thailand's direction for the development of e-government to align with related directions of the Roadmap for an ASEAN Community (2009-2015) to be proposed in the next Final Report.

In addition, the European Interoperability Framework (EIF) for the delivery of public services across European countries is selected for study particularly due to its concept and characteristics of cross-border interoperability, which will broaden the perspectives of e-government development in an aspect of interconnection and interoperability of national e-governments in a regional environment.

6.4.1. Background Information from ASEAN ICT and E-Government-Related Documents

The Roadmap for an ASEAN Community (2009-2015)

In bringing the ASEAN Vision 2020 into reality, ASEAN member countries set the goal of building an ASEAN Community by 2020 comprising three pillars, namely political-security community, economic community and socio-cultural community, all of which are closely intertwined and mutually reinforcing for the purpose of ensuring durable peace, stability and shared prosperity in the region. They have mutually agreed that *the ASEAN Political-Security Community Blueprint, the ASEAN Economic Community Blueprint, the ASEAN Socio-Cultural Community Blueprint and the IAI Work Plan 2 (2009-2015), as annexed, shall constitute the Roadmap for an ASEAN Community (2009-2015)*, and each ASEAN member country shall ensure its timely implementation. All the three pillars are expected to work in tandem in establishing the ASEAN Community in 2020.

ASEAN Economic Community Blueprint

ASEAN Leaders declared that the ASEAN Economic Community (AEC) shall be the goal of regional economic integration and agreed to hasten the establishment of the AEC by 2015 to transform ASEAN into a region with free movement of goods, services, investment, skilled labour, and freer flow of capital. ASEAN member countries signed the Declaration on the ASEAN Economic Community Blueprint and adopted, as part of the Roadmap for an ASEAN Community (2009-2015), *the ASEAN Economic Community Blueprint* in 2007. This is upon realizing that the rapidly changing globalized world continues to present both opportunities and challenges to which ASEAN must proactively utilize and respond, keeping itself always relevant, while maintaining ASEAN's centrality and role as the primary driving force in charting the evolving regional architecture.

Taking into consideration the importance of external trade to ASEAN and the need for the ASEAN Community as a whole to remain outward looking, the AEC envisages the following key characteristics: (a) a single market and production base; (b) a highly competitive economic region; (c) a region of equitable economic development; and (d) a region fully integrated into the global economy. These characteristics are inter-related and mutually reinforcing.

Among all strategic approaches for implementation, one related to '*ICT infrastructure development*' calls for the priority actions of *developing a general framework or guidelines for coordinated ASEAN e-government programs for efficient delivery of public services, and to facilitate regional trade, investment and other business activities; activating the ASEAN e-Government Forum to identify key public services for ICT applications, including capacity building activities; and enabling the interoperability of products/services, information systems and networks, in a convergence environment.*

ASEAN ICT Masterplan 2015

Vision: ICT will be a key enabler for ASEAN's social and economic integration. By developing next generation ICT infrastructure and skilled human capital, promoting content and innovative industries, as well as establishing an enabling policy and regulatory environment, ICT will help ASEAN to transform into a single market. In doing so, ASEAN will empower its communities and advance its status as an inclusive and vibrant ICT hub, making ASEAN an ideal region for economic activities.

The Vision will yield four key outcomes which reflect how ASEAN will develop and transform economically and culturally: 1) ICT as an engine of growth for ASEAN countries; 2) Recognition for ASEAN as a global ICT hub (a region of high quality ICT infrastructure, skilled manpower and technological innovation); 3) Enhanced quality of life for peoples of ASEAN; 4) Contribution towards ASEAN integration (having ICT to foster greater collaboration between ASEAN businesses and citizens, leading to integration of ASEAN).

In achievement of those key outcomes, the six strategic thrusts were established: 1) Economic transformation; 2) People empowerment and engagement; 3) Innovation; 4) Infrastructure development; 5) Human capital development; and 6) Bridging the digital divide.

ASEAN-TAFEGI (Technical Architecture Framework for e-Government Interoperability)⁶⁹

E-government services will be the foundation system driving services and operations of the ASEAN member countries in 2015. AEC will affect all ASEAN member countries to interoperate e-Government applications to provide seamlessly services to all ASEAN Governments, businesses and citizens. ASEAN member countries need the common technical architecture framework for their e-government interoperability.

The objectives of ASEAN-TAFEGI are:

- To propose the draft blueprints for the common ASEAN Technological Architecture Framework for E-Government Interoperability (ASEAN-TAFEGI) and a Technical Architecture for connecting e-government systems related to people movement facilitation
- To recommend the interaction type/e-government workflows in common for general e-government services
- To recommend the interaction type/e-government workflows for the people movement facilitation
- To propose the recommended data model, security model and network model for the general e-government services and the people movements
- To raise the concerning laws and regulations for the general e-government services and the people movements

Scopes of ASEAN-TAFEGI include the followings:

1. Common Technological Architecture Framework for ASEAN e-Government Interoperability

- 1) Standards for defining e-government workflow, data model, electronic document model for interoperability among different e-government systems
- 2) Standards and protocols for network and computer system interoperability
- 3) Security model(s) including authentication, integrity and confidentiality
- 4) Concerns regarding related laws and regulations of ASEAN member countries

⁶⁹ This part of ASEAN-TAFEGI is extracted from the web site of <http://prezi.com/ykk9674oua0s/asean-tafegi/>. The content (including recommendation part) is still in the drafting and reviewing process by ASEAN and not finalized yet.

Data & Work Processes	Network and Computer System Protocol	Security	Legal
e-Government Workflow	Network	Authentication	Law
Data Modeling	Computer System	Integrity	Regulation
Interoperability e-Document	Information Interchange	Confidentiality	Policy
		Privacy	Rights

Figure 6-1: Common Technological Architecture Framework for ASEAN e-Government Interoperability (ASEAN-TAFEGI)

- Recommended interaction type related e-Government workflow
- Recommended common e-government services
 - (i) Service for Citizens of Business Enterprises
 - (ii) Service for Enterprises other state member
- Recommended data interoperability
- Recommend network and computer systems
- Recommended security model(s) for interoperability
- Recommended regarding related laws and regulations of ASEAN member states
 - (i) Development of regulatory models
 - (ii) Reference framework for legal infrastructure
 - (iii) Challenges to a common legal framework development

2. Technical Architecture for Connecting e-Government Systems related to People Movement Facilitation.

- 1) e-Government interoperability workflow with respect to the movement of people such as business people, skilled workers, etc, among ASEAN member countries
- 2) Data/electronic document model(s) relevant e-government services related to Immigration, visa and work permit processing.
- 3) Standards and protocols for network and computer system interoperability, security model(s) including authentication, integrity and confidentiality for the movement of people
- 4) Concerns regarding related laws and regulations for the movement of people among the ASEAN member countries

Interoperability Workflow	Data & eDocument	Security	Legal	Network and Computer System Protocol
Business People	Immigration	Authentication	Law	Network
Skilled Workers	VISA	Integrity	Regulation	Computer System
	Workpermit	Confidentiality	Policy	Information Interchange
		Privacy	Rights	

Figure 6-2: Technical Architecture for Connecting e-Government Systems related to People Movement Facilitation

- Recommended workflow and data/electronic document model(s) relevant e-government services for
 - (i) work permit processing
 - (ii) visa
 - (iii) immigration
- Recommended e-government services for the movement of people
 - (i) Work permit service: e-service for business employers and employment agencies to perform work permit transactions
 - (ii) Visa service: e-service for government employee, job seekers, business, visitors, families, citizens and residents to perform visa transactions
 - (iii) Immigration service: e-service for citizen to perform cross border movement
- Recommended data interoperability
 - (i) Data/ information standard
 - (ii) Common middleware
 - (iii) Common interconnection services
 - (iv) Communication methods
- Recommended standards and protocols for network and computer system interoperability for the movement of people
- Recommended security model support people movement
- Recommended laws and regulations for people movement among the ASEAN member states
 - (i) Reference legal framework for people movement
 - (ii) Challenges to a legal framework for people movement

6.4.2. European Interoperability Framework (EIF) for Public Services⁷⁰

The European Interoperability Framework (EIF) is one of a series of interoperability initiatives that aim to support the establishment of European public services. To implement European public services, the public sector must address many challenges. Cross-border and cross-sectoral interoperability is seen as a key factor in overcoming these challenges. Achieving cross-border interoperability is a political priority in European public service initiatives. The provision of seamless cross-border public services (for which interoperability is a prerequisite) has the potential to have a high impact on businesses and citizens.

The purpose of EIF is to promote and support the delivery of European public services by fostering cross-border and cross-sectoral (a policy area, e.g. customs, police, health, environment, agriculture, etc.) interoperability; to guide public administrations in their work to provide European public services to businesses (including non-governmental organizations, not-for-profit organizations, etc.) and citizens; and to complement and tie together the various National Interoperability Frameworks (NIFs) at European level.

The needs and benefits of interoperability

Interoperability is both a prerequisite for and a facilitator of efficient delivery of European public services. Interoperability addresses the need for:

- **cooperation** among public administrations with the aim to establish public services;
- **exchanging information** among public administrations to fulfill legal requirements or political commitments;
- **sharing and reusing information** among public administrations to increase administrative efficiency and cut red tape for citizens and businesses.

The result is:

- **improved public service delivery** to citizens and businesses by facilitating the one-stop-shop delivery of public services;
- **lower costs** for public administrations, businesses and citizens due to the efficient delivery of public services.

The key concepts of the conceptual model

A conceptual model for public services is essentially proposed to suggest ways to organize the creation and operation of public services. The aim of the model is to bring practical benefits to establishing European public services. As a blueprint for future implementations of European public services, the model helps develop a common vocabulary and understanding across European Member States about the main elements

⁷⁰ This part is based on *Draft for Public Comments – As Basis For EIF 2.0* (2008) and *Annex 2 - European Interoperability Framework (EIF) for European public services* (2010), European Commission.

of a public service and how they come together. The model emphasizes a building-block approach to setting up European public services, allowing for the interconnection and reusability of service components when building new services. The model promotes the reuse of information, concepts, patterns, solutions, and specifications in Member States and at European level, recognizing that European public services:

- are based on information from various sources located at different levels of administration, in different Member States, and
- combine basic public services constructed independently by public administrations in different Member States.

Therefore, the model highlights the need for modular, loosely coupled service components interconnected through infrastructure and for working together to deliver European public services. It explicitly calls for EU-wide adoption of a service orientation to designing and developing systems, and an ICT ecosystem comprising consistent, and in some cases jointly developed, service components. Its particular service orientation is a specific way of creating and using business processes, packaged as services, throughout their lifecycle. What makes the model powerful is its flexibility in allowing different aggregate services to be created by combining basic public services from multiple providers. The model unlocks the potential for further aggregating and combining the different services available. In the EU context, the application of conceptual model should be for cross-border application; cross-sectoral application; and cross-administrative boundary application.

Interoperability Levels and Interoperability Agreements

The practical implementation of the conceptual model for cross-border/cross-sectoral services requires each of the four levels of interoperability to be taken into account, which are legal interoperability; organizational interoperability; semantic interoperability; and technical interoperability. Providing European public services requires cooperation among different public administrations at the different interoperability levels. For each level, the organizations involved should formalize cooperation arrangements in *interoperability agreements*.

Agreements should be drafted with sufficient detail to achieve their aim --- to provide a European public service --- while leaving each organization maximum internal autonomy.

- *At legal level*, interoperability agreements are rendered specific and binding via legislation, including European directives and their transposition into national legislation, or bilateral and multilateral agreements, which are outside the scope of the EIF.
- *At organizational level*, interoperability agreements can, for example, take the form of MoUs or SLAs that specify the obligations of each party participating in cross-border business processes. Interoperability agreements at organizational

level will define expected levels of service, support/escalation procedures, contact details, etc., referring, when necessary, to underlying agreements at semantic and technical levels.

- *At semantic level*, interoperability agreements can take the form of reference taxonomies, schemes, code lists, data dictionaries, sector-based libraries and so forth.
- *At technical level*, interoperability agreements include interface specifications, communication protocols, messaging specifications, data formats, security specifications or dynamic registration and service discovery specifications.

Interoperability Governance

Due to their cross-border and cross-sectoral characteristics, European public services operate in a complex and changing environment. Ensuring interoperability between legal instruments, organization business processes, information exchanges, services and components that support the delivery of a European public service is a continuous task, as interoperability is disrupted by changes to the environment, i.e. to legislation, the needs of businesses or citizens, the organization of public administrations, business processes or technologies. Moreover, as the common components and interoperability agreements are the results of work carried out by public administrations at different levels (local, regional, national, EU), coordination and monitoring this work requires a holistic approach. Public administrations should also establish a framework for the governance of their interoperability activities across administrative levels.

6.4.3. Conclusion

E-government services will be the foundation system driving services and operations of the ASEAN member countries in 2015. ASEAN Economic Community (AEC) will affect all ASEAN member countries to interoperate e-government applications to provide seamlessly services to all ASEAN Governments, businesses and citizens. ASEAN member countries need the common architectural model and framework for their e-government interoperability.

In achieving e-government interoperability, many member countries may face similar challenges, relating to not only the technical aspect but also the organizational, inter-organizational, managerial, political, legal, national and international settings.

Dealing with these challenges, it needs a holistic e-government interoperability model/framework as an approach to systematically address them and support the delivery of ASEAN public services by fostering cross-border and cross-sectoral interoperability and to tie together the various national e-government interoperability frameworks at ASEAN level.

Thailand e-Government Interoperability Framework (TH e-GIF) has been developed since 2006 for promotion of automatic interoperability between different public agencies

and to achieve the target of a one-stop service electronic business process between e-government information systems. It suggests ways to develop integrated e-government systems for effective online services to consequently achieve SMART Collaborative e-Government. Based on those international e-GIF models and whole-of-government approaches of many countries including EU e-GIF and ASEAN TAFEGI, the TH e-GIF contains all elements (i.e. Political Will; Inter-Agency Collaboration & Social/Cultural Change; Legal Power; Process Agreement; Meaning Exchange Agreement; and Technical Development) necessary for effective development and implementation of e-government interoperability to drive an integrated unified whole-of-government model aimed at centralizing the entry point of service delivery to single portal where citizens can access all government-supplied services, regardless of which government authority provides them. However, the TH e-GIF still needs continual improvement.

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Appendix A: A Survey of Thailand e-Government Services

This appendix reports a survey result about online services provided by Thai government ministries and departments. During January to March 2013, the KU-INOVA research team surveyed the websites of 303 government ministries and agencies with more than 1,000 electronic services. It was found that many government websites still provide information with one-way communication and not much interaction. They only provide basic information. Nevertheless, there are many government agencies that start to offer two-way communications with interaction with users and citizens. However, less than 50% of government agencies have started to provide "online transactions" by allowing citizens to submit electronic application forms for sending their requests to the government agency. Advanced online transaction services with electronic data exchange and interoperability between government agencies are still rare and slowly emerging.

The table below lists the names of government agencies and some of their online services. It should be mentioned that there were some limitations on the survey that have been conducted. The accessibility of surveyed services faced with some difficulties, e.g. certain functions and online services may be unreachable by external users. Therefore, this survey could not provide the exhausted list of all public online services. However, main electronic services in each government agency below could be further analyzed, and improvement suggestions could be further provided to drive Thai e-government services and interoperability development in the future.

Names of Public Agencies	services	Uniform Resource Locator (URL)
1. Office of the Prime Minister		
<p>1.1 Office of the Permanent Secretary, The Prime Minister's Office</p>	<p>Hot line 1111 and The Complaints Management System linked with the other government agency as following:</p> <ul style="list-style-type: none"> -Ministry of Natural Resources and Environment -Royal Thai Police -Office of the Civil Service Commission -Office of the Consumer Protection Board -Office of the National Broadcasting and Telecommunications Commission <p>Public consultation website</p> <p>Follow-up and evaluation system</p> <p>Evaluation standard of public self-service system</p> <p>Distance education system</p> <p>Local innovation system</p> <p>National Identity Information system</p> <p>Public agency database, Office of the Official Informatin Commission (O.I.C.)</p>	<p>http://www.1111.go.th</p> <p>http://www.publicconsultation.opm.go.th</p> <p>http://me.dloc.opm.go.th</p> <p>http://203.170.239.248/sar2010/sar/authentication</p> <p>http://elearn.dloc.opm.go.th</p> <p>http://Http://203.170.239.248/innovation/index.php</p> <p>http://www.identity.opm.go.th</p> <p>http://www.oic.go.th/ginfo</p>
<p>1.2 The Public Relations Department</p>	<p>Whistle-blowing system for the graft or corruption, misconduct, corruption of government officials.</p> <p>Thai Government Organizational Directory</p>	<p>http://center.prd.go.th/clean/govclean.html</p> <p>http://www.prd.go.th/main.php?filename=Glossary</p>
<p>1.3 Office of the Consumer Protection Board</p>	<p>The Total Consumer Protection</p>	<p>http://complain.ocpb.go.th/ocpbcomplain/login/login.aspx</p>
<p>1.4 The Secretariat of the Cabinet</p>	<p>The Cabinet Resolution Delve</p> <p>Information the water situation. (Mobile Application for Water4Thai) such as:</p> <ol style="list-style-type: none"> 1. Weather – data of Thai Meteorological Department. 2. Rainfall - data of Thai Meteorological Department. 3. Volume of water in the river - 	<p>http://www.cabinet.soc.go.th/soc/Program2-1.jsp?menu=1</p> <p>https://play.google.com/store/apps/details?id=com.piesoft.water4thai&feature=search_result#?t=W251bGwsMSwxLDEsImNvbS5waWVzb2Z0LndhdGVyNHRoYWkiXQ..</p>

Names of Public Agencies		services	Uniform Resource Locator (URL)
		from the Royal Irrigation Department. 4. Volume of water in the dam - data of Electricity Generating Authority of Thailand (EGAT) 5. Waters backing up daily - data of Hydrographic Department.	
1.5	The Secretariat of the Prime Minister	Information Retrieval Cabinet Resolved Services	http://www.cabinet.soc.go.th/soc/Program2-1.jsp?menu=1
1.6	National Intelligence Agency	Report information and comments about the security of the country, including the security of the country.	http://www.nia.go.th/niaweb/webbrd/
1.7	The Bureau of the Budget	Information system for follow-up and evaluation	http://203.155.122.36/ev2009/SignIn.aspx
		e-Budgeting	https://164.115.5.34/bis50/login/login_2.aspx
		Analysis Risk as Good Governance of plan/Project	http://203.155.122.39/riskeval54/
		Recover and remedy person who suffered from flood crisis	-
1.8	Office of the National Security Council	Information website	http://www.nsc.go.th/
1.9	Office of the Council of State	Law information	http://www.krisdika.go.th
1.10	Office of the Civil Service Commission	Website of public service information, the recruitment exams (Section A) from Office of the Civil Service Commission	http://job.ocsc.go.th/
		Examination by Computer (Sample of test general ability) (Section A)	http://job.ocsc.go.th/OCSC_Test_Example_46/Default.aspx?Username=&SessionID=
1.11	Office of the Public Sector Development Commission	Information website	http://www.opdc.go.th
1.12	Office of the National Economic and Social Development Board	Information website	http://www.nesdb.go.th
1.13	The Thailand Research Fund	Searching research data of The Thailand Research Fund	http://elibrary.trf.or.th
		Thai National Research Repository linked with the other government agency as following 1. National Research Council of	-

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Thailand 2. Health Systems Research Institute 3. National Science and Technology Development Agency	
1.14	Internal Security Operations Command	Information website	http://www.isocthai.go.th/indexs.html
1.15	The National Health Commission office	Information website	http://www.nationalhealth.or.th/
1.16	Office for National Education Standards and Quality Assessment (Public Organization)	Information website	http://www.onesqa.or.th/onesqa/th/home/index.php
		e-library	http://www.qlearningcenter.in.th/elib/cgi-bin/opacexe.exe?op=gsf&frm=kwdsch&db=Main&skin=u&lang=1
		e-journal	http://www.onesqa.or.th/e-journal/journal/index.php
1.17	National Village and Urban Community Fund Office	Information website	http://www.villagefund.or.th/index.aspx https://www.facebook.com/villagefundPage
1.18	Designated Areas for Sustainable Tourism Administration (Public Organization)	Information website	http://www.dasta.or.th/th/home/index.php
1.19	Thailand Convention & Exhibition Bureau (Public Organization)	Document download service systems	http://www.tceb.or.th/about-us-th/e-community-th/download-center-th.html
		Information website of Meetings & Incentives, Conventions and Exhibitions (MICE)	http://www.tceb.or.th
1.20	Office of Knowledge Management and Development (Public Organization)	Information website	http://www.okmd.or.th/
1.21	The Land Bank Administration Institute (Public Organization)	Information website	http://po.opdc.go.th/org_view.php?org_id=33
1.21	MCOT Public Company Limited	Information website	http://WWW.MCOT.NET
2. Ministry of Defence			

Names of Public Agencies		services	Uniform Resource Locator (URL)
2.1	Office of the Permanent Secretary for Defence	Comment system	http://www.mod.go.th/think.html
		MOD: e-Court System, The Judge Advocate General's Department	http://www.prospersof.com/portal/popup/p_mod_e-crt.html
2.2	Royal Aide-De-Camp Department	Knowledge Management	http://www.radc.go.th/km.html
2.3	Royal Thai Armed Forces Headquarters	Delving regulation about soldier	http://edoc.rtarf.mi.th/edoc_internet/edoc.php
		Geo-Informatics Project due to Royal Idea for worship 84 years old	http://84th.rtsd.mi.th/
		RTSD Coordinate Transformation Service for Mobile Device	http://www.rtsd.mi.th/mobile/rtsdnavi/
		Aerial Photograph Purchase Order	https://asd1.rtsd.mi.th/RTSD/
2.4	Royal Thai Army	Information website	http://www.rta.mi.th
		Verify register number of military automotive	http://www.matulee.com/carcheck/
		Complaint, clean coordinate of Royal Thai Army	http://dop.rta.mi.th/petition/list_dep.php
		performance reports system (RTA Online)	http://rtaol.rta.mi.th/
2.5	Royal Thai Navy Headquarters	Knowledge service and alarm system such as earthquake report, conditions in the Chao Phraya River, water level in the Chao Phraya River, knowledge to cope with disasters through electronically Service and hotline 1696 of Navy Disaster Relief Center.	http://ndrc.navy.mi.th/
		Complaint service	http://www.navy.mi.th/rongtook/
		Guidance of Royal Thai Navy Headquarters	http://www.unseenedu.com/
		Information website of The Bangkok Dock Company (1957) Limited	http://www.bangkokdock.co.th
2.6	Royal Thai Air Force	Complaint/informed dishonest clue, misconduct system	http://www.comm.rtaf.mi.th/Newcomplaint/
2.7	The War Veterans Organization of Thailand Under Royal Patronage of His Majesty the King	Information website	http://www.thaiveterans.mod.go.th/index_th.html
2.8	Defence	Information website	http://www.dti.or.th

Names of Public Agencies	services	Uniform Resource Locator (URL)
Technology Institute (Public Organization)		
3. Ministry of Finance		
3.1 Office of the Permanent Secretary for Finance	Public Finance Information	http://dwfoc.mof.go.th
3.2 The Treasury Department	Information website for coin service	http://ecatalog.treasury.go.th/home/index.php
	Searching cost estimate for each plot	http://landprice.treasury.go.th/
3.3 The Comptroller General's Department	Public Procurement	http://www.gprocurement.go.th/wps/portal/index_EGP
	e-pension and others linked with the other government agency as following	http://pws.cgd.go.th/cgd/
	<ul style="list-style-type: none"> - Public debt management office to check the registration of advisers Thailand. - Department of the Interior to determine the life / death of government pensions. 	
3.4 The Customs Department	Government Financial Management Information System (GFMIS)	http://www.gfmis.go.th/
	Data of release import product, invoice of relocate export product	-
	Linked to a central application system support licenses and certificates through the Department of Fisheries. (Fisheries Single Windows)	-
	Link data between public sector and private sector for Import – Export process (Thailand National Single Window)	-
	(Postal Manifest system)	-
	Linked Postal Manifest system with Thailand Post Company Limited	-
	Information System for consideration and information as section 70 of Petroleum Act, 1971	-
	Custom Tariff Database	http://igtfcustoms.go.th
	Import-Export Statistical Data	http://www.customs.go.th/Statistic/Index.jsp http://internet1.customs.go.th/ext/Statistic/StatisticIndex2550.jsp
	Tracking system to Customs electronically. (e-tracking)	http://e-tracking.customs.go.th

Names of Public Agencies	services	Uniform Resource Locator (URL)
	Reporting system for ships and cargo ships account electronically. (e-report)	http://www.tiffaedi.com/e-manifest.asp
	e-formality	-
	e-payment	http://www2.customs.go.th/DutyPayment/DutyPayment.jsp#3
3.5 The Excise Department	Suggestion for information and application via internet	http://www.excise.go.th/index.php?id=471
	Answer question about exercise law	http://legal.excise.go.th/elcs_u/
	Information of exercise law	http://law.excise.go.th/exciselaw
	New first car as government policy	http://firstcar.excise.go.th/
	NSW Link license of import-export liquor, tobacco with Department of Customs	-
	Information website of Liquor Distillery Organization Excies Department	http://www.liquor.or.th/main/#
	Information website of Playingcard Factory	http://www.playingcard.or.th/home.php
3.6 The Revenue Department	Information through the Web service system of the Revenue Department. (RD Web Services)	http://www.rd.go.th/publish/42531.0.html
	Link data between Department of Revenue and Department of Business Development	-
	(RD Data Warehouse)	-
	(statXchange)	-
	Inquiry, suggestion and complain	http://rdsrv2.rd.go.th/contactus/index.html
	Simply disseminate	http://www.rd.go.th/publish/41592.0.html
	VAT Report name list of VAT free Jewelry operator	http://www.rd.go.th/publish/21524.0.html
	Application for all of taxpayer identification	http://tinreg.rd.go.th/tinnet/info/
	Application for right of register VAT P.P. 01.1 via internet	http://vsreg.rd.go.th/
	Name lists of gold operator	http://vsreg.rd.go.th/vreg013
	Data of register VAT operator has exist running business	http://www.rd.go.th/publish/313.0.html

Names of Public Agencies		services	Uniform Resource Locator (URL)
		E-FILING	http://rdserver.rd.go.th
		e-Tax Invoice / e-Receipt	http://rdetax.rd.go.th/BOETAX/jsp/eTaxInvoice/index.jsp
		VAT Refund for Tourists	http://vrt.rd.go.th/INETVRT/jsp/VRTI0010.jsp
		Tracking for refund VAT	http://vatstat.rd.go.th/VatStatus/
		Tax Calculation related with sale real estate	http://rdsrv2.rd.go.th/landwht/landwht06.asp
		Delivery/verify document of refund natural person income tax	https://rdserver.rd.go.th/cgi-bin/main/pit/send_doc.pl
3.7	State Enterprise Policy Office	Information website	http://www.sepo.go.th
3.8	Public Debt Management Office	Register Thai consultant service, Thai consultant information center	http://www.thaiconsult.pdmo.go.th
3.9	The Fiscal Policy Office	disseminate via website	http://www.fpo.go.th
		Disseminate research via internet	http://www.fpo.go.th/e_research/index.html
		Disseminate economics via internet	http://www.fpochannel.com
3.10	Deposit Protection Agency	Deposit Protection Agency Website	http://www.dpa.or.th
3.11	Government Pension Fund	GPF WEB Service	https://gpfservices.gpf.or.th/gpfservices/tas/gpfweblogin.aspx
3.12	Student Loans Fund (SLF)	Service for students (e-Studentloan)	https://www2.studentloan.or.th/SLFSTUDENT/html/index.html
3.13	Office of Insurance Commission	Verify agent license/broker	http://www.oic.or.th/th/eServicePage/inner05.php
		Policy of life insurance company	http://eservice.oic.or.th/eService/InsurePlan/i_Search/SearchPlan.aspx
		casualty insurance	http://www.oic.or.th/th/search/search.php
		Information website	http://www.oic.or.th/th/home/index.php
		Online service e.g. broker candidate, broker renew license/online broker (e-licensing)	-
3.14	Neighboring Countries Economic Development Cooperation Agency (Public Organization)	Information website	http://www.neda.or.th

Names of Public Agencies	services	Uniform Resource Locator (URL)
3.15 The Government Lottery Office	Check lottery online	http://www.glo.or.th
3.16 Thailand Tobacco Monopoly	E-Commerce and e-Payment of UOB Bank	http://www.thai-tobacco.com/
	Complaint with the product quality and safety.	http://www.thaitobacco.or.th/thai/complaint/5-7-0
	Virtual Private Network (VPN)	http://www.thaitobacco.or.th/thai/service_information/service_information-5-6-5221.html
3.17 Government Savings Bank	GSB Internet Banking	http://www.gsb.or.th/products/personal/services/internet-banking.php
	Judgment record with Legal Execution Department, Ministry of Justice	-
	e-certificate with Department of Business Development, Ministry of Commerce	-
	GSB Internet Banking	https://ib.gsb.or.th/retail/security/commonLogin.jsp
3.18 The Government Housing Bank	JusticePetition	http://www.ghbhomecenter.com/webcrm_form.php?crmID=01
	Information website of first home stretching program	http://www.ghbank.co.th/product/FirstHabitat/03/03.html http://pralestates.blogspot.com/2012/09/ghbank-first-home-stretching-program.html#.UbGoFtIW3jI
3.19 Krung Thai Bank Public Company Limited	KTB Online	http://www.ktb.co.th/ktb/th/
3.20 Bank of Agriculture and Agricultural	Information website	http://www.baac.or.th
3.21 Export-Import Bank of Thailand	Information website	http://www.exim.go.th
3.22 Small and Medium Enterprise Development Bank of Thailand	Postpone Assets Data	http://www.smebank.co.th/property/
3.23 Islamic Bank of Thailand	Procurement News	http://www.ibank.co.th/2010/th/eprocurement/Default.aspx?ID=1
	Information website	http://www.ibank.co.th/2010/th/main/
3.24 Thai Credit Guarantee Corporation	Information website	http://www.tcg.or.th/main/

Names of Public Agencies		services	Uniform Resource Locator (URL)
3.25	Secondary Mortgage Corporation	e-studentloan	http://www2.studentloan.or.th
3.26	The Stock Exchange of Thailand	Share Investment and Online Derivative	http://www.set.or.th
3.27	The Syndicate of Thai Hotels and Tourists Enterprises Limited	Information website	http://www.sahathaihotel.com
3.28	Thai Asset Management Corporation	Information website	http://tamc.or.th/index.php
4. Ministry of Foreign Affairs			
4.1	Office of the Permanent Secretary for Foreign Affairs	Multimedias Center	http://www.mfa.go.th/web/2705.php
		Enlist Thai people in abroad via internet	http://www.consular.go.th/main/th/register-help
4.2	Department of Consular Affairs	Abroad natural disaster	http://www.consular.go.th/modules.php?name=Content&pa=showpage&pid=320
		E-Passport Thailand	-
4.3	Department of Protocol	Information website	http://www.mfa.go.th/main/th/organize/107/15339-กรมพิธีการทูต.html
4.4	Department of European Affairs	Information website	http://www.europetouch.in.th
4.5	Department of International Economic Affairs	Information website	http://www.villagefund.or.th
4.6	Department of Treaties and Legal Affairs	Searching Treaties and Law	http://122.0.0.22/treaty/cgi-bin/SearchSeparate/SearchBi/Search_Document.asp
4.7	Department of Information	Vocabulary-abbreviation of Diplomatic	http://www.mfa.go.th/web/838.php
4.8	Department of International Organizations	Information website	http://www.mfa.go.th/main/th/organize/107/15334-กรมองค์การระหว่างประเทศ.html
4.9	Department of American and South Pacific Affairs	Information website	http://www.mfa.go.th/main/th/organize/107/15333-กรมอเมริกาและแปซิฟิกใต้.html
4.10	Department of ASEAN Affairs	Information website and Asiam Document online	http://www.mfa.go.th/asean/

Names of Public Agencies		services	Uniform Resource Locator (URL)
4.11	Department of East Asian Affairs	Public Relation	http://www.eastasiawatch.in.th/index.php
4.12	Department of South Asian, Middle East and African Affairs	Information website	http://sameaf.mfa.go.th/th/
4.13	Thailand International Development Cooperation Agency	Information website	http://www.tica.thaigov.net/main/
		Website of thai embassy and consulates	http://www.thaiembassy.org/main/
5. Ministry of Tourism and Sports			
5.1	Office of the Permanent Secretary for Tourism and Sports	Geo-Informatics for tourism	http://gis.mots.go.th/opsgis/index/
		Information website	http://secretary.mots.go.th/main.php?file_name=index
5.2	department of physical education	Training of coach, Referee	http://gms.dpe.go.th/osrdWebGame/index2.jsp
5.3	Institute of Physical Education	Information website	http://www.ipe.ac.th/main/
5.4	Department of Tourism	Application for register tourism place and tourism register data via internet	http://123.242.133.66/th
5.5	Sports Authority of Thailand	Information website	http://www.sat.or.th/th/main/Default.aspx
5.6	Tourism Authority of Thailand	Tourism Authority of Thailand Portal Website	http://www.tourismthailand.org
		Mobile Application (thailandMedTourism)	https://itunes.apple.com/th/app/thailand-medical-tourism/id475644561?mt=8
6. Ministry of Social Development and Human Security			
6.1	Office of the Permanent Secretary for Social Development and Human Security	Information website of Social Development and Human Security service center	http://www.m-society.go.th/service/
		One Stop Crisis Center or OSCC 1300 Hotline	-
6.2	Department of Social Development and Welfare	Reservation of low income traveller	http://www.ict.dsdw.in.th/hostel/
		Assistant and protection violate actor in family	http://61.19.50.51/
		Declare for searching parents of abandoned child	http://www.dsdw.go.th/dsdw2011/module.php?module=babies&pg=index
6.3	Office of Women's Affairs	Family Information Center Database	http://www.thaifamily.in.th/

Names of Public Agencies	services	Uniform Resource Locator (URL)
	and Family Development	
6.4	Office of Welfare Promotion, Protection and Empowerment of Vulnerable Groups	Supporting juvenile is volunteer for age 13-15 years old has participate in setting activity as benefits to themself and social (e-children) http://opptgg.opp.go.th/opp/index_childnet.php
	Aging Wise (Maintain local intellectual along with classical culture)	http://opptgg.opp.go.th/wisdom/homepage/manual/intro-menu.html
	Older fund (Form e.g. supporting project)	http://www.olderfund.opp.go.th/home
	Data of The Disadbantaged (Form e.g. survey form for the disadvantaged.)	http://www.oppd.opp.go.th/
	Central target group Database	http://opptgg.opp.go.th/opp/index.php
6.5	National Office for Empowerment of Persons with Disabilities	Identification systems to the disabled.(e-card) http://ecard.nep.go.th/nep_card/nep_home/index.php Disabled Organization Certificate Standard http://www.nep.go.th/sdo/index.php
6.6	Community Organizations Development Institute (Public Organization)	Natutal Resource Management and Stability Agriculture of People - Geo-Informatics http://www.codi.or.th/webcodi/gis/
	(RCP/ProMAps) Promotion Program of Community such as 1. Community Data for certify status 2. Community Welfare for provincial 3. Stability house operating 4. Community Council Database 5. Promotion Program for Development (RCP/ProMAps)	http://www.codi.or.th/index.php?option=com_flexicontent&view=item&id=2001&Itemid=228
	Local Council Data (Codi_Sapa)	http://www.codi.or.th/CODI_sapa/pages/Login.aspx
	Project of supporting community welfare	http://www.codi.or.th/welfare/index.php
6.7	National Housing Authority	Geo-Informatics of resident; register for social problem and poverty http://dhds.nha.co.th
	Housing request systems for low income (All occupations)	http://dhds.nha.co.th/nhawl/
6.8	Office of the Government Pawnshop	Information website http://www.pawn.co.th/
7. Ministry of Agriculture and Cooperatives		

Names of Public Agencies		services	Uniform Resource Locator (URL)
7.1	Office of the Permanent Secretary for Agriculture and Cooperatives	Service Link	http://service.moac.go.th/main.php?filename=index
		Royal Rain Mobile Application (Fonluang)	https://itunes.apple.com/th/app/fonluang/id460397128?mt=8
		Database of agriculture and co-operative of provincial	http://www.moac-info.net/
		Complaint service	http://www.moac.go.th/ewt_login.php?fn=complain
		Website of Office of the Permanent Secretary for Agriculture and Cooperatives	http://www.moac.go.th
		Silk investigate	http://www.gisilklamphun.go.th/src/web/Default.aspx
		Agriculture Disaster Relief Information System (Aggie DRIS)	
		Complaint service	http://globaltrace1.acfs.go.th/
7.2	Royal Irrigation Department	Procurement of Royal Irrigation Department	http://http://procurement.rid.go.th/
		Complaint	http://113.53.240.218/complain/
		Water Crisis	http://203.154.183.2/Service/index.php
		Link public statistics; StatXchange (max.-min. water level at main meter station)	-
7.3	Cooperative Auditing Department	Financial Information Service	http://203.154.183.2/Service/index.php
		Web Services	http://203.154.183.2/index.php?pid=016
		Cooperative Geo-informatics	http://intranet.cad.go.th/cad2005/cad_ewm/
7.4	Department of Fisheries	Certificate of quality standard and aquatic animal product	http://172.16.7.200/dofcer/login/login.asp
		Certificate of quality standard and aquatic animal product	http://172.16.7.200/dofcer/login/login.asp
		Fisheries Single Window	-
		Culturist and fishery	http://regisfarm.fisheries.go.th/
		Application for certificate live aquatic animal	http://www.aahri.in.th/fish/
7.5	Department of Livestock Development	Inform and give knowledge to people about animal epidemic	http://www.adreport.dld.go.th
		Livestock Standard	http://www.dld.go.th/ict/eservice/
		Traceability, Department of Livestock Development	http://www.dld.go.th/traceability/

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Information for monitoring bird flu	http://164.115.5.225/dcontrol/site/index.php
		Agriculturist register list and reserve seed and feed	https://req1.dld.go.th/aff/
		Dairy Cattle Management Program (DHI for Windows)	http://www.dld.go.th/breeding/dairy/dhi/
		Fresh milk management	http://milk.dld.go.th/
		Marking and registered animal	https://nid.dld.go.th/
7.6	Land Development Department	People service program	http://serve.ldd.go.th/service/
		Result report of analysis soil, water and fertilizer	http://lddmapserver.ldd.go.th/soilanaly2/
		Caution Information	http://www.ldd.go.th/web_irw/index.htm
		E-Library	http://e-library.ldd.go.th/
		Organics Database Prpgram	http://o-agriculture.ldd.go.th/ldd/default.aspx
		Geo-Informatics	http://www.ldd.go.th/gisweb/main.html
		Database Program of Land Development Report	http://serve.ldd.go.th/landdev/
		Certificate standard of product, factor of agriculture production	http://qcenter.ldd.go.th/qupdate/home/
		Application for receive Vertiver grass Online	http://sql.ldd.go.th/service/v-inputID.aspx
		Soil and fertilizer Management	http://oss101.ldd.go.th/web_soil_clinic/care/care2-3-fert.htm
7.7	Department of Agriculture	Research Database, Department of Agriculture	http://it.doa.go.th/refs/
		E-Library	http://lib.doa.go.th/elib/cgi-bin/um2.exe?op=login&lang=1&db=Main&pat=&cat=&skin=u&lpp=20&catop=&scid=zzz
		Transport Single Window e-Logistics Transport Single Window e-Logistics	-
		Certified Organic Crops Standard	http://210.246.186.198/~organic/home/index.php
		GAP DOA Online GAP DOA Online	http://122.155.190.187/gap/
		Resource database	http://gis.doa.go.th/doanew/indexmap.php
7.8	Department of Agricultural Extension	Information of agricultural Extension	http://agriinfo.doae.go.th
		Agriculturist Register Database	http://www.survey.doae.go.th

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Soil Examination Service	http://www.soil.doae.go.th/soil/
		Agriculture Knowledge Management Center	http://www.k-center.doae.go.th
		Community Enterprise Information	http://smce.doae.go.th
		Information of Agricultural Institute	http://farmgroup.doae.go.th
		Link Service Center of Department of Agricultural Extension	http://www.servicelink.doae.go.th/index021.html
		Village Volunteer	http://asakaset.doae.go.th/index.html
7.9	The Cooperative Promotion Department	Co-operative Reservation	http://www.cpd.go.th/web_cpd/cpd_regisOnline.html
		E-Library	http://it2.cpd.go.th/cpd_book/
		Co-operative Information Searching	http://www.thaicooperative.org/search/page_select.html
		Packaging Design	http://it4.cpd.go.th/product/index.aspx
		Agriculture Disaster Relief Information System – Aggie DRIS	-
7.10	Agricultural Land Reform Office	Searching Land Register and verify Sor.Por.Kor. 4-01	http://202.183.194.17/raja/
7.11	National Bureau of Agricultural Commodity and Food Standards	ISO/IEC17025 Register laboratory was certified ISO/IEC 17025	http://cssa.acfs.go.th/
		Thailand's Health Certificate Check List Thailand's Health Certificate Check List	http://www.thaichertlist.net/thaichertlist/
7.12	Office of Agricultural Economics)	Complaints Management System	http://www.oae.go.th/ewtadmin/ewt/oae_web/download/complain.pdf
		Agriculture Economics Data	http://www.oae.go.th/ewt_news.php?nid=4542
		Web Services for quantity of import-export as monthly	http://www.oae.go.th/oae_report/export_import/wsImEx.php
		Fruits Information Center	http://www.oae.go.th/fruit/
7.13	กรมการข้าว (Rice Department)	Database of Natural Disaster Warning, epidemic of rice enemy	http://www.ndarpe.ricethailand.ku.ac.th/
7.14	The Queen Sirikit Department of Sericulture	e-learning of local intellectual	http://www.qsds.go.th/monmai/
		THAI SILK Shop Directory THAI SILK Shop Directory	http://qsds.go.th/silkshop.th/
7.15	Agricultural Research Development	e-Office	http://e-office.arda.or.th/
		In-depth silk Data warehouse.	http://www.arda.or.th/kasetinfo/silk/

Names of Public Agencies	services	Uniform Resource Locator (URL)
Agency (Public Organization)	In depth rice data warehouse.	http://kasetinfo.arda.or.th/rice/
7.16 Highland Research and Development Institute (Public Organization)	Information for Management	http://mis.hrdi.or.th/highlandi/Source/Login/Default.aspx
	Geo-Informatics	http://gis.hrdi.or.th/
	Project of disseminate biological Resurce and high land local intellectual	http://eherb.hrdi.or.th/
7.17 The Golden jubilee Museum of Agriculture Office (Public Organization)	Information website	http://www.wisdomking.or.th/
7.18 Rubber Estate Organization	Productivity on produce umbrella and rubber tree	http://www.reothai.co.th/Para6.htm
7.19 Fish Marketing Organization	Information website Website	http://www.fishmarket.co.th
7.20 Dairy Farming Promotion Organization of Thailand	Dairy Cattle Information	http://www.thaidanskimilk.com/index.php?lay=show&ac=article&Id=47974
7.21 Office of the Rubber Replanting Aid Fund	Information website	http://www.rubber.co.th
7.22 The Marketing Organization for Farmers	Information and complaint	http://www.mof.or.th/web/complain.php
	The Marketing Organization for Farmers Delivery	http://www.mof.or.th/web/home.php
8. Ministry of Transport		
8.1 Office of the Permanent Secretary for Transport	Compensation appeal	http://km.mot.go.th/KM/appeal/searchappeal.jsp
	Withdraw nursing welfare, pension officer of Ministry of Transport	http://vigportal.mot.go.th/RegisterWeb/Link/pension.jsp
	Map Online	http://vigportal.mot.go.th/RegisterWeb/Link/gisportal.html
	GIS portal (Transport FDGS)	http://gisportal.mot.go.th/
	E-service	http://vigportal.mot.go.th/portal/site/PortalMOT/Eletronic_SC/
	Travelling service	http://vigportal.mot.go.th/portal/site/PortalMOT/Citizen_SC/
	Transport service, e.g. e-logistics, EDI, e-gate	http://vigportal.mot.go.th/portal/site/PortalMOT/Transport_SC/
Driving license/Personal License	http://vigportal.mot.go.th/portal/site/Portal	

Names of Public Agencies		services	Uniform Resource Locator (URL)
			MOT/Licence_SC/
		Tax register/Vehicle license	http://vigportal.mot.go.th/portal/site/PortalMOT/Register_SC/
		Joint permit/Construction way/waterway	http://vigportal.mot.go.th/portal/site/PortalMOT/Build_SC/
		Personal development of communication and transport	http://vigportal.mot.go.th/portal/site/PortalMOT/DevHuman_SC/
8.2	The Department of Land Transport	Tax payment online	https://www.dlte-serv.in.th/dltWeb/
		Verify tax and outstanding tax	http://apps.dlt.go.th/carpending/
		Transport statistics	http://apps.dlt.go.th/statistics_web/statistics.html
		Complaint service	http://apps.dlt.go.th/1584complain/frmComplainCar-User.php?CarType=1
		Route information on Geo-Informatics	http://gis3d.mot.go.th/dltroute/default.aspx
		TH e-GIF linkage	-
		DXC linkage	-
		Public bus information exchange	-
8.3	Marine Department	e-service of development project	-
		e-service of development project	-
		Transport Single Window e-Logistics	-
8.4	The Department of Highways	Traffic Situation and inform accident	http://bhs.doh.go.th/gis
		Permission for any action in highway	http://e-services.doh.go.th/dohweb/user/index.html?c_id=6773&sc_id=
		Complaint Center	http://map-server.doh.go.th/complainboard_doh/topicpeople.asp
		GIS for tourism	http://gisweb.doh.go.th/doh/distance_m.php
8.5	Department of Rural Roads	Route Map Service	http://gis1.drr.go.th/
		Safety on the road	http://sms.drr.go.th/sms/
		Floods Management	http://fms.drr.go.th/fms/
		Local Highway Maintenance	http://lmms.drr.go.th/lmms/
8.6	Office of Transport and Traffic Policy and Planning	Real Time Real Time Traffic Condition	http://www.itsotp.net/

Names of Public Agencies		services	Uniform Resource Locator (URL)
8.7	The Department of Civil Aviation	Permission, register and any requests	http://www.aviation.go.th/Service/reglicense.htm
		Linked to the system of Transport Single Window e-Logistics	-
8.8	Port Authority of Thailand	CitiBank (e-pay) CitiOnline Payment from CitiBank (e-pay)	https://www.citiconnect.asia.citibank.com/payment/PAT/index.jsp
		e-gate	https://egate.port.co.th/egatereg/
		e-Port	http://eport.port.co.th/
		Estimate Charge program	http://www.bkp.port.co.th/bkp/service/thai/cal.asp
		Banned release import product, export invoice	-
8.9	The State Railway of Thailand	Information website	http://www.railway.co.th/
8.10	Bangkok Mass Transit Authority	Information website	http://www.bmta.co.th
8.11	Thai Airways International Public Company Limited	Booking service	http://www.thaiairways.co.th/index.html
		linked System to use of a central registration database. (Information Kernel Network Operations) or IKNO with Department of Provincial Administration	-
8.12	Airports of Thailand Public Company Limited (AOT)	Daily flight and seasonal check	http://www.airportthai.co.th/
8.13	Aeronautical Radio of Thailand Company Limited	Airline Information Service	http://www.aerothai.co.th/shareholder
		Airline Information Service to user	http://aim.aerothai.co.th
		Bengal Traffic Management	http://www.bobcat.aero
		Monitoring Agency for Asia Region (MAAR)	http://www.aerothai.co.th/maar
8.14	The Transport Company Limited	Searching travel information	http://home.transport.co.th/th/component/content/section/3.html
		Searching car trip	http://58.181.228.8:8080/transport/index.php
		Reservation and distribution ticket	http://www.newwavemanage.com/index.php?page=content&id=4
		Public bus information exchange	-

Names of Public Agencies	services	Uniform Resource Locator (URL)
8.15 Thai Maritime Navigation Company Limited	Information website	http://vigportal.mot.go.th/portal/site/PortalMOT/about/tmn/ http://gphone.prd.go.th/dp.php?MID=19&DID=148
8.16 Expressway and Rapid Transit Authority of Thailand	Apply job	http://www.exat.co.th/job/
	Sticker for Hazard material on express way	http://e-services.exat.co.th/stk
	Application for rental special region	http://e-services.exat.co.th/rentarea/
	Easy Pass	http://vigportal.mot.go.th/RegisterWeb/Link/easypass.html
	Genius traffic data exchange center (green, yellow, red, slide from CCTV)	-
8.17 Mass Rapid Transit Authority of Thailand	Information website	http://www.mrta.co.th
8.18 Civil Aviation Training Center	Civil Aviation Training Center Library Library online	http://library.catc.or.th/
8.19 Suvarnabhumi Airport Hotel Company Limited	Information website	http://www.novotelairportbkk.com/
8.20 THAI-Amadeus Southeast Asia Company Limited	Information website	http://www.thaiamadeus.com/
9. Ministry of Natural Resources and Environment		
9.1 Office of the Permanent Secretary for Natural Resources and Environment	Complaint service	http://www.mnre.go.th
	Knowledge	http://cado.mnre.go.th/kmteam/
	Complaint Management of Ministry of Natural Resource and Environment	http://www.mnre.go.th
	e-petition	http://petition.mnre.go.th/MONRE_PETITION/download_form_main.php
9.2 Pollution Control Department	Project Database and Research of Pollution Control Department	http://ptech.pcd.go.th/pcd/
	Service Center of Pollution Control Department	http://www.pcd.go.th/callcenter/
9.3 Department of Marine and Coastal Resources	Marine Resource and Coast Database	http://www.dmcg.go.th/marinecenter
9.4 Department of Mineral Resources	Fossil Information	http://www.dmr.go.th
	Soil Disaster Complaint	http://www.dmr.go.th

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Statisticals of Public Sector, Possibility Mineral Resourc Estimation	-
9.5	Department of Environment Quality Promotion	Environmental article	http://www.deqp.go.th/index.php?option=com_content&view=category&id=12&Itemid=50
		Associate Platform about environmental forums	http://www.thaieforum.com/deqp/home.php
		e-learning	http://e-learning.deqp.go.th/
		Thai green hotel website	http://thaigreenhotel.com
9.6	National Park, Wildlife and Plant Conservation Department	Reservation and National Park Service, internet online	http://www.dnp.go.th/parkreserve/reservation.asp?lg=1
		Link Central Application and license and certificate via internet	http://cites.dnp.go.th
		Information website	http://www.dnp.go.th/
		Media and disseminate document	http://www.dnp.go.th/watershed/
9.7	Office of Natural Resources and Environmental Policy and Planning	Policy Database, plan and measure of natural resource and environment	http://envipolicy.onep.go.th/Search.aspx
		Complaint	http://e-petition.onep.go.th/
9.8	Royal Forest Department	Geo-Informatics	http://58.181.150.61/index.asp
		Tracking trespass forestry and control wildfire	http://protection.forest.go.th/mainmenu.html
		NSW Linkage	http://nsw.forest.go.th/ForestNSW/login/auth
		Information Website of Forestry Certificate Department	http://www.forest.go.th/check_wood/
9.9	Department of Water Resources	Floods-Meteorology Information Service	http://ishydro.dwr.go.th/
		Water Crisis	http://www.dwr.go.th/report
		Floods-landslide Alarm	http://202.129.59.76/website/ews_all/index.php
9.10	Department of Groundwater Resources	Aetesian Well Information	http://www.dgr.go.th/well_web/WellWEB/Well_web.html
		e-Map of Ground Water Resurce	http://conjgis.dgr.go.th/conjcenter/GIS/default.aspx
		Geo-Informatics	http://map3d.dgr.go.th/#
		Downloading Form of groundwater	http://www.dgr.go.th/service/download.php

Names of Public Agencies	services	Uniform Resource Locator (URL)
	operation	
9.11 Thailand Greenhouse Gas Management Organization (Public Organization)	Carbon label and Carbon Footprint of Organization	http://thaicarbonlabel.tgo.or.th/carbonfootprint/
	Web-based Thai Carbon Footprint Calculator	http://thaicfcalculator.tgo.or.th/
9.12 Biodiversity-Based Economy Development Office (Public Organization)	Information website	www.bedo.or.th
9.13 The Zoological Park Organization under The Royal Patronage of H.M. The King	E-Learning	http://www.zoothailand.org/elearning/index.html
	Information website	http://www.zoothailand.org/index.php
9.14 The Botanical Garden Organization	Plants Information Searching Service	http://www.qsbg.org/qsbgdatabase_n.htm
9.15 Wastewater Management Authority	Information Technology of Wastewater Management Authority Website	http://www.wma.or.th
	Model Scheme of wastewater management and development database for decision making	http://ct02.wma.or.th
	Automatic Water Quality Examination	http://ct01.wma.or.th/main.php
9.16 Thai Plywood Company Limited	Information website	http://www.thaiplywood.com/thai/nhome.php
9.17 Forest Industry Organization	Information for performance evaluation	http://www.fio.co.th/evaluate/
	Teak Products store online	http://www.fio.co.th/store/
10. Ministry of Information and Communication Technology		
10.1 Office of the Permanent Secretary for Information and Communication Technology	National Knowledge Center	http://www.tkc.go.th/
	Space Information Center	http://www.space.mict.go.th
	Improper website	http://www.mict.go.th/main.php?filename=complaint
	Voice over IP (VoIP)	http://voice.mict.go.th/
	Complaint for dishonest trace	http://www.mict.go.th/clean/
	Web Portal for disabled	http://www.pwdsthai.com

Names of Public Agencies		services	Uniform Resource Locator (URL)
		ICT Genius9	http://www.ictgenius9.com/home/
10.2	The Meteorological Department	Weather Information Service	http://www.tmd.go.th/cis
		Storm Route	http://www.tmd.go.th/storm_tracking.php
		Earthquake Report	http://www.tmd.go.th/earthquake_report.php
		Warning	http://www.tmd.go.th/list_warning.php
10.3	National Statistical Office	Searching Information from Statistics Report	http://service.nso.go.th/nso/search/index.jsp
		Integration of public statistics via Web Service (StatXchange)	-
10.4	Software Industry Promotion Agency (Public Organization)	National Software Industrial Information Service	http://www.nsim.sipa.or.th
		Intranet	http://eservice.sipa.or.th/index.php?action=logout&ref=1
		One Stop Service	http://board.sipa.or.th/index.php
10.5	Electronic Government Agency (Public Organization)	Thai Floods Information Center	http://flood.egov.go.th
		e-Government Portal	http://www.egov.go.th , http://m.egov.go.th/
		e-central for public communication (Mailgothai)	https://login.mail.go.th/Li/index.php?redirecthost=thai veterans.mail.go.th
		Electronic Correspondence Management System (e-CMS)	-
10.6	Electronic Transactions Development Agency (Public Organization)	Incident report and statistics of Thailand Computer Emergency Response Team (ThaiCERT)	http://www.thaicert.or.th/
10.7	CAT Telecom Public Company Limited	CAT Contact Center	http://www.contactcenter.cattелеcom.com
		Certificate Authority (CAT CA)	http://www.contactcenter.cattелеcom.com/thai/Application_service/CAT_CA_info.asp
		CAT e-business - CAT e-auction - CAT conference - CAT e-office - CAT webhard - CAT e-mail - CAT e-Smartfarm - CAT-eExhibition	http://www.catcommerce.com/index.php?option=com_content&view=article&id=2&Itemid=1
		Application for IP Address	http://www.cat.net.th/ip/index.php

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Telecommunication payment	http://www.contactcenter.cattelcom.com/th/ai/home/payment.asp
10.8	Thailand Post Company Limited	Post e-Mart	http://www.postemart.com/
		Linked Postal Manifest with Thailand Post Company Limited	-
10.9	TOT Public Company Limited	Digital Signature Service	-
		e-Service, e.g. e-Invoice, e-Pay, e-Code	https://www.toteservice.com/
11. Ministry of Energy			
11.1	Office of the Permanent Secretary for Energy	Information website	http://www.energy.go.th/
		E-Library	http://elibrary.energy.go.th/energy_ebook/th/index.php
11.2	Department of Alternative Energy Development and Efficiency	E-Form of Energy Management	http://eform.dede.go.th/forms/frmservlet?cnfig=eform
11.3	Department of Mineral Fuels	Information website	http://www.dmf.go.th/index.php http://ray.dmf.go.th/
		Information for consider and informed as section 70 of Petroleum Act, 1971 with Customs Department	-
11.4	Department of Energy Business	Fuel Balance Linkage	http://reserve.doeb.go.th/
		e-Law	http://elaw.doeb.go.th/
		Oil trader registration	http://eservice.doeb.go.th
		Information of fuel trade service center	http://portal.doeb.go.th
		Linkage of Public sector and Private sector (NSW)	-
11.5	Energy Policy and Planning Office	Information website	http://www.eppo.go.th/index-T.html
11.6	Office of the Energy Regulatory Commission	Application form of produce power of any kinds	http://www.erc.or.th/ERCWeb/Front/Permit.aspx?p=17&tag=แบบคำขออนุญาตผลิตไฟฟ้า
		e-Service for any user, e.g. volume of production via fee payment, form record	http://www.erc.or.th/ERCWeb2/Front/StaticPage/OnlineService.aspx?p=105&muid=14&prid=15
		Check index of capacity on primary energy saving: PES	http://www.erc.or.th/ERCWeb/Front/News/NewsDetail.aspx?Type=1&CatId=2&rid=163
		spp/vspp database	http://www.erc.or.th/ERCSP/

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Regional User Committee	http://recc.erc.or.th/
		Electric Development Fund	http://portal.erc.or.th/PDFPortal/Login.aspx
		People Portal	http://www.erc.or.th
		e-Learning of Office of the Energy Regulatory Commission	http://www.erc.or.th/ERCWeb2/Front/StaticPage/OnlineService.aspx?p=105&muid=14&prid=15
11.7	The Energy Fund Administration Institute (Public Organization)	Fuel Fund Information	http://www.efai.or.th
11.8	The Electricity Generating Authority of Thailand	Information website	http://www.egat.co.th/index.php?option=com_content&view=category&id=152&Itemid=773
		Water Crisis Follow-up	http://water.egat.co.th/waternew/
11.9	PTT Public Company Limited	Automatic Telephone	http://www.pttplc.com/TH/business-opportunity-customer-relations.aspx
		eBilling & Payment	https://ebpp.pttplc.com/login.html?windowId=dad&csrf_token_HMdjbjS71HROIKdK6Pdy:jsessionId=c0aeb901df05cba05073aa68ba4f=qH9HYLK2ja6AOzB9Kqri;jsessionId=c0aeb901df05cba05073aa68ba4f
		PTT Marine e-Order	https://pttweb.pttplc.com/B2BBunker/systemlogin.aspx
		PTT Oil e-Service/m-Service	https://pttweb.pttplc.com/weboil/cover.aspx
12. Ministry of Commerce			
12.1	Office of the Permanent Secretary for Commerce	International Trade Information of Thailand	http://www2.ops3.moc.go.th/
		Trade Index	http://www.price.moc.go.th/Default5.aspx
		International Trade Statistics of Thailand	http://www2.ops3.moc.go.th/
		Trade Index	http://www.price.moc.go.th/Default5.aspx
		OneStop Export Service Center	http://onestopservice.ditp.go.th/index.php
12.2	Department of Foreign Trade	OneStop Export Service Center	http://www.dft.go.th/e_trade.htm
		Domicile Certificate Service	http://edi.dft.go.th/
		Permission and import-export certificate service	http://edi2.dft.go.th/
		Operator Registration	http://reg-users.dft.go.th/
		e-standard product	http://ocs.dft.go.th/

Names of Public Agencies	services	Uniform Resource Locator (URL)
	Standard Export Report	https://csi.dft.go.th/
	Domicile Certificate Service	https://rovers.dft.go.th/
	Information for more efficiency of import-export uncutted diamond	http://kpcs.dft.go.th/
	Domicile Self-Certification of ASIAN	http://110.164.176.107/self-cert/home/readme.aspx
	Two-Way Product Database	http://www.dft.go.th/Default.aspx?alias=www.dft.go.th/exportcontrol
	Information standard deal with originate of product and agreement of Customs Tariff; FTAS of Asian and others trading business	http://fta.dft.go.th/พจนานุกรม.aspx
12.3 Department of Internal Trade	Report of Rice Trader	http://ict.dit.go.th/mill/Forms/Logonoff/f_login.aspx
	Linkage and statistics exchange with National Statistics Office	-
	Controlled Product Relocate	http://transport.dit.go.th/transport/Login.aspx
	Geo-Informatics	http://gis.dit.go.th/
	Measure Examine	http://cbwm.dit.go.th/service/
	Marketing Database and Marketing Instrument	http://mwsc.dit.go.th/
12.4 Department of Trade Negotiations	Tax Benefits Information	http://www.thaifta.com/thaifta/Home/TariffSaving/tabid/175/Default.aspx
12.5 Department of Intellectual Property	Trademark	http://122.154.29.221/tm-system/
	Copyright system	http://122.154.29.221/cr-system/
	ePatent	http://110.164.177.233/ePatent/Login.aspx?ReturnUrl=%2fePatent%2fToDoList.aspx
	Worldwide Patents Searching	http://110.164.177.243/DIPSearch/PatentSearch/SearchSimple.aspx
	Searching Decision-Trademark Order	http://110.164.177.234/eappealdoc/trademark_search.ceo
	Trade Secret system	http://110.164.177.222/trs/
	Thai Local Intellectual	http://110.164.177.222/loc/
	Geographical Indications	http://110.164.177.222/GEO/
	Intellectual Property Exchange	http://www.thaiipmart.com/
	Experts Directory on Design and	http://www.ipthailand.go.th/designdb/

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Development Product for Thai Creative Industrial	
12.6	Department of Business Development	Searching and reserve juristic person register	http://eregist.dbd.go.th/Member/faces/memb er/login.jsp
		Juristic Person Register	http://eregist.dbd.go.th/Member/faces/memb er/login.jsp
		Certificate of Juristic Person and Certificate Document via Alliance Bank (e-Certificate)	https://eservice.dbd.go.th/e-service/login.jsf
		Filing and Commerce Registration Information Service	http://regcom.dbd.go.th/mainweb/
		Thai Logistics Linkage	http://www.dbdlogistics.com/
		B2C E-Marketplace Thailand	http://www.dbdmart.com/
		Linkage information between The Revenue Department and Department of Business Development	-
12.7	Department of International Trade Promotion	Exporter Lists Name	http://application.ditp.go.th/Center_Public/t hailand_export_directory.html
		Mobile Application (Thailand Golden Trade Opportunities)	https://play.google.com/store/apps/details?id=ThailandGoldenTrade.noahnetwork https://itunes.apple.com/us/app/thailand-golden-trade-opportunities/id533362786?ls=1&mt=8
		SMEs Community/SMEs Products	http://smes.ditp.go.th/%E0%B8%AA%E0%B8%87%E0%B8%84%E0%B8%A1SMEs/%E0%B8%AA%E0%B8%99%E0%B8%84%E0%B8%B2SMEs.aspx
12.8	The SUPPORT Arts and Crafts International centre of Thailand (Public Organization)	featured products	http://www.sacictarts.net/scripts/default.asp
12.9	The Gem and Jewelry Institute of Thailand (Public Organization)	Information website	http://www.git.or.th
12.10	The Office of the Agricultural Futures Trading Commission	Information website	http://www.aftc.or.th
12.11	The Agricultural Futures Exchange of Thailand	The Agriculture Future Exchange via Internet	http://www.afetdirect.com/thai/

Names of Public Agencies		services	Uniform Resource Locator (URL)
12.12	Public Warehouse Organization	Information website	http://www.pwo.co.th/main.php?filename=index
13. Ministry of Interior			
13.1	Office of the Permanent Secretary for Interior	Searching law information of Ministry of Interior	http://103.28.101.10/divs0208/keyword_search.php
		Searching information of border medal and freeman medal	http://103.28.101.10/hrsearch/
		Joint Service Center of Ministry of Interior	http://103.28.100.60/coservices/webnew/main_coservices.php
		Searching telephone number of Ministry of Interior	http://103.28.101.10/wannapa/telephone/search_index.asp
		Information system	http://www.moi.go.th/portal/page?_pageid=814,1036627,814_1036673&_dad=portal&_schema=PORTAL
		Sustain Doctrine, Ministry of Interior	http://115.31.173.60/html/complaint.html
13.2	Department of Provincial Administration	Statistical Data Service	http://www.dopa.go.th/newweb/?name=service&file=statservice
		e-Services as mission of 6 copies law of Department of Provincial Administration	http://www.dopaservice.com/
		Check Elector Lists	http://www.khonthai.com/Election/
		File Criminal Case Report	http://www.dopa.go.th/
		Linkage DB for e-Service, Web Service for External with National Saving Fund, National Health Security Office and Social Security Office	-
		Civil Registration Database	http://www.dopa.go.th/web/index.php/2012-06-16-12-35-04/people-service1
13.3	The Community Development Department	Community Development Information Center	http://www.rdic.info/
		Central Information for Management and Utilization	http://cddcenter.cdd.go.th/cddcenter/login.php
		OTOP product online (OTOP today)	http://www.otoptoday.com/
13.4	Department of Lands	Geo-Informatics for inquiry about plot of land via google map on internet	http://dolwms.dol.go.th/dolwms/
		Data Exchange System Through Internet & Intranet (being developing)	-
13.5	Department of	Warning Public Danger for People	http://1784.go.th

Names of Public Agencies		services	Uniform Resource Locator (URL)
	Disaster Prevention and Mitigation	Geo-Informatics	http://61.19.54.137/gdoc/gis/gis.htm
		Flood Crisis Report	http://www.disaster.go.th/dpm/flood/flood.html
		e-Report for accident on the road	http://61.19.100.90/unroad/
13.6	Department of Public Works and Town & Country Planning	Public Service of Department of Public Works and Town & Country Planning	http://www.dpt.go.th/GtoP/
13.7	Department of Local Administration	Central Information of Department of Local Administration	http://info.dla.go.th/
		electronic form	http://eform.dla.go.th/
		Link Information of Local Administration Organization with Protection and Mitigation and Bureau of the Budget	http://eservice.dla.go.th
13.8	The Metropolitan Waterworks Authority	Water bill payments via Internet/Mobile Banking	http://www.mwa.co.th/ewt_news.php?nid=1512
		Clean Water Clinic	http://cwc.mwa.co.th/
		E-Service	http://www.mwa.co.th/more_news.php?cid=4
13.9	Provincial Waterworks Authority	Information for water consumer	-
		Information Management for PWA. Laboratory	-
		Information Service via Telephone	-
		Information website	http://www.pwa.co.th/
		Customer Service From GIS with Department of Provincial Administration	-
13.10	Metropolitan Electricity Authority	Public Agency Database	http://www.oic.go.th/ginfo/
		Mapping Service	http://www.meamap.com/gisnet/
		MEA e-Services	https://eservice.mea.or.th/new_eservice/
		internet/Mobile Banking Electricity bill payments via Internet/Mobile Banking	http://www.mea.or.th/profile/index.php?l=th&tid=4&mid=275&pid=115
13.11	Provincial Electricity Authority	Channel of consume electric	http://epay.pea.co.th
13.12	The Market Organization	Smile shop Distribute agriculture and community product (Smile shop)	http://www.chumchonyim.com/tag/article/ร้านชุมชนยิ้ม

Names of Public Agencies		services	Uniform Resource Locator (URL)
14. Ministry of Justice			
14.1	Office of the Permanent Secretary for Justice	Justice Volunteer Database	http://vjp.moj.go.th
		Application for register and publicize law for psychologist or social worker	http://welfare.moj.go.th
		Knowledge Management	http://www.km.moj.go.th
		e-Learning of Ministry of Justice	http://e-learning.moj.go.th
		Provincial Justice Office Website	http://www.servicelink.moj.go.th/
14.2	Department of Probation	Linkage Civil Registration, The Bureau of Registration Administration, Department of Local Administration	-
		Linkage Drug case registration with Office of the Narcotics Control Board	-
		Linkage criminal case registratin with Royal Thai Office	-
		Information website	http://www.probation.go.th/
14.3	Rights and Liberties Protection Department	Chat via website of Rights and Liberties Protection Department	http://e-justice.moj.go.th
		Chat board about law question, Justice Clinic	http://www.rlpd.moj.go.th
		Database for publicize to people via website	http://edoc.rlpd.moj.go.th/rlpdweb/
		Public Relation of Protection Witness	http://www.rlpd.moj.go.th/rlpd/witness/Protection_index2.html
14.4	Legal Execution Department	Bankrupt Information Examine	http://www.led.go.th
		Bankrupt Register	http://test.led.go.th/lom/register.asp
		Information website	http://www.led.go.th
		Linkage information record as judgment with Government Saving Bank	-
14.5	Department of Juvenile Observation and Protection	Information website	http://www2.djop.moj.go.th/main/index.php
		Linkage Civil Registration and offender database with The Bureau of Registration Administration, Department of Provincial Administrsration, Office of Justice Affairs	-
14.6	Department of Corrections	Statistics of prisoner nationwide	http://www.correct.go.th/correct2009/stat.html

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Linkage system of Data Exchange Center (DXC)	-
		Interesting criminal case statistics	http://www.correct.go.th/crime/report5.php
14.7	Department of Special Investigation	DSI	http://www.dsi.go.th/index.php?option=com_complain&Itemid=46
		Linkage system of Data Exchange Center (DXC)	-
14.8	Office of Justice Affairs	Information website	http://www.oja.go.th
14.9	Central Institute of Forensic Science	Complaint service	http://www.cifs.moj.go.th/main/index.php?option=com_contact&view=contact&id=2&Itemid=106
		Searching lost person and no name corpse	http://www.cifs.moj.go.th/main/index.php?option=com_content&task=view&id=70&Itemid=45
		Mortality Information	http://www.cifs.moj.go.th/cifsm/
14.10	Thailand institute of Justice (Public Organization)	Information website	http://tij.moj.go.th
14.11	Office of the Narcotics Control Board	Drug Case Registration with Department of Probation	-
		Vehicle Information System with Customs Department	-
14.12	Office of Public Sector Anti-Corruption Commission	Information website	http://www.pacc.go.th/pacc_website/index.php/home
15. Ministry of Labour			
15.1	Office of the Permanent Secretary for Labour	website of MOL Counter Service	http://counterservice.mol.go.th/
		Publics Service (e-labour)	http://lb.mol.go.th/main.php?filename=index
15.2	Department of Employment	Employment for applicant and employer	http://ejob.doe.go.th/
15.3	Department of Labour Protection and Welfare	Safety report via e-medias	http://eservice.labour.go.th/eformweb/
		Report of Employment condition and work	http://eservice.labour.go.th/eformweb/
		Training via internet	http://elearning.labour.go.th
		Welfare and Protection labour Information	http://www.labour.go.th/th/
		Linkage information with Department of Business Development	-

Names of Public Agencies		services	Uniform Resource Locator (URL)
15.4	Department of Skill Development	Promotion and coordinate skilled development	http://e-service.dsd.go.th/eservice
		Application for certificate course and expenditure of e-training	http://115.31.139.90/asdeservice/
		Searching course of training	http://115.31.139.90/asdeservice/TRN01000.aspx
		Searching occupation	http://e-service.dsd.go.th/eservice/tr03000.aspx
		e-Services	http://e-service.dsd.go.th/eservice
		e-Training	http://dsd.bizpotential.com/#help
15.5	Social Security Office	E-Service	http://www.sso.go.th/eservices/home.do?webId=0
		Linkage DB for e-Service, Web Service for External with National Saving Fund, National Health Security Office and Bureau of Registration Administration, Department of Local Administration	-
		Chat Online	http://www.sso.go.th
		Complaint	http://www.sso.go.th
16. Ministry of Culture			
16.1	Office of the Permanent Secretary for Culture	Equality Coordinate Center	http://www.m-culture.go.th/gender/
		National Safety Media and Creative	http://www.c-me.go.th
		Cultural Information Center	http://mocc.xplog.org/
		Cultural Website creation into Creative Economy	http://www.creativeculturethailand.com
		The World Heritage Information Center	http://www.thaiwhic.go.th
16.2	Religious Affairs Department	Hajj Registration in part of Operator	http://www.hajthailand.net/agency/index.php
		Promotion merit and publicize religion information	http://e-service.dra.go.th
		Dhamma Retreat Database	http://e-service.dra.go.th
		Learning Center of Religion	http://www.dra.go.th/learning/
		Kathin Database	http://www.dra.go.th/
		e-library of religion database	http://www.dra.go.th/elibrary/
		Printing media Database	http://www.dra.go.th/emedial/

Names of Public Agencies	services	Uniform Resource Locator (URL)
	Sunday Buddhism Database	http://www.dra.go.th/
	Good Thai people Website	http://www.khondee.net
	Hajj Information Center of Thailand	http://www.hajjthailand.net/html/home/index.php
	Publisher of electronic certificates (e-cert)	http://www.dra.go.th/ecert/
16.3 The Fine Arts Department	Information website	http://www.finearts.go.th/
	e-Service, printing ISSN ISBN and CIP of National Library	http://www.e-service.nlt.go.th/home/index.php
16.4 Office of the National Culture Commission	Complaint, movie and Video Service	http://www.culture.go.th/subculture10/
	Cultural Center of Thailand	http://www.culture.go.th/subculture7/
	National Artist Directory	http://art.culture.go.th
	Community Relation Thai Culture program	http://saiyai.culture.go.th/
	Project on Development cultural knowledge (Oral)	http://folklore.culture.go.th/
	project on culture media interaction network of Kanchanapisek	http://kanchanapisek.culture.go.th/
	76 Provinces Culture Information	http://kanchanapisek.culture.go.th/
	National Artist Fund	http://www.culture.go.th/subculture3/
	Website of The superme artist hall)	http://www.culture.go.th/subculture8/
	Cultural Information via Social Network	http://www.facebook.com/CulturalZone
	Thai Folk Musical Instruments	http://www.culture.go.th/research/musical/html/th.htm
	Website of Bureau of Consideration Movie and VIDEO	http://www.culture.go.th/moviehtml/form.html
	Website of National Artist	http://art.culture.go.th/index.php
	Website of Culture Center of Thailand	http://www.culture.go.th/subculture7/
	Cultural products; e-Market	http://e-market.kapook.com/
16.5 Office of Contemporary Art and Culture	e-Book and document online	http://www.ocac.go.th/book.html
	Information website	http://www.ocac.go.th/
	e-card	http://www.ocac.go.th/ecard.html
16.6 Bunditpatanasilpa Institute, Ministry of	Information website	http://www.bpi.ac.th

Names of Public Agencies		services	Uniform Resource Locator (URL)
Culture			
16.7	Princess Maha Chakri Sirindhorn Anthropology Centre (Public Organization)	Thailand Local Museum Database	http://www.sac.or.th/databases/museumdatabase/
		Ethnic Broups Research in Thailand	http://www.sac.or.th/databases/ethnicredb/
		The Inscriptions In Thailand Database	http://www.sac.or.th/databases/inscriptions/
		Anthropological Archives in Thailand	http://www.sac.or.th/databases/anthropological_archive/
		Thailand Physical Anthropology Database	http://www.sac.or.th/databases/physanth/app/home.php
16.8	Film Archive (Public Organization)	Information website	http://www.fapot.org
16.9	Moral Promotion Center (Public Organization)	Virtue Assembly Database	http://www.moralcenter.or.th/main.php?filename=index http://61.47.60.173/ewtadmin/ewt/moral_assembly/main.php?filename=index
		Moral Center Library	http://dl.moralcenter.or.th/main.php?filename=index
17. Ministry of Science and Technology			
17.1	Office of the Permanent Secretary for Science and Technology	Science and Technology Knowledge Center (STKC)	http://www.stkc.go.th/?q=user/register
		Service Link	http://www.most.go.th/eservice/
17.2	Department of Science Service	Information website on Research and Development and Technology Transfer Services	http://www.dss.go.th/dssweb/rd-tt/index.html
		Application Online, Laboratory Accreditation	http://www.dss.go.th/accreditation/
17.3	Office of Atoms for Peace	Dosimeter Online (SSDL online)	http://www.oaep.go.th/ssdlonline/
17.4	National Institute of Metrology (Thailand)	Calibration Database	http://www.nimt.or.th/nimt/Service/index.php?menuName=lab_nimt_result&start=0&page=1
		Calibration Laboratory Directory	-
		Inform/Complaint/Recommend	http://www.nimt.or.th/nimt/FAQ/index.php?menuName=request
		Metrology Knowledge	http://PublishingImages/Services/17005000/no_image.gif
		Registration training online	http://www.nimt.or.th/nimt/OnlineRegister/
17.5	National Science	Thai World Repository	http://www.thaiglossary.org/

Names of Public Agencies	services	Uniform Resource Locator (URL)
and Technology Development Agency	LEXiTRON e-dictionary; Thai-English; LEXiTRON	http://lexitron.nectec.or.th/2009_1/
	Evaluation Development and Traffic Report Project (Traffy)	http://www.traffy.in.th/traffy/
	Thai Thesis Database	http://www.thaitheis.org/
	Materials Science & Technology Dictionary	http://www2.mtec.or.th/th/research/mstdict/MstDict.asp
	Germplasm Database	http://www.biotech.or.th/germplasm/Pages/find_des.asp
	Researcher data in biological technology	http://www.biotech.or.th/expert/rpt_main.asp?report=1
	International Academics Seminar Training	http://www2.mtec.or.th/eventnstda/Event/index.aspx
	Informaiton of Technical Service (MTEC)	http://www.mtec.or.th/index.php?option=com_frontpage&Itemid=1
	Informaiton of Research and Development (MTEC)	http://www.mtec.or.th/index.php?option=com_content&task=view&id=266&Itemid=156
	BIOTEC Culture Collection	http://www.biotech.or.th/bcc/
	The Consolidation of BIOTEC Genome Databases	http://www4a.biotech.or.th/cogdb/
	Linkage Thai National Research Respository with data from Office of Promotion Research Fund	-
	Request permission to use the intellectual property rights of NSTDA.	http://nstda.or.th/tlo/inside.php?option=content&id=17
	Information Website of National Center for Genetic Engineering and Biotechnology (BIOTEC)	http://www.biotech.or.th/
	Information Website of National Metal and Materials Technology Center (MTEC)	http://www.mtec.or.th/
	Information Website of National Electronics and Computer Technology Center (NECTEC)	http://www.nectec.or.th/
	Mobile Application (Traffic Voice Information Service ,TVIS)	https://play.google.com/store/apps/details?id=com.tsadvanced.mobile.android.traffroid&feature=also_installed
Information Website of National Nanotechnology Center (NANOTEC)	http://www.nanotec.or.th	
Information Website of Technology Management Center (TMC)	http://www.tmc.nstda.or.th/	
17.6 National Science	Workforce Information Center of	http://164.115.5.161/th/index.php?option=c

Names of Public Agencies		services	Uniform Resource Locator (URL)
	Technology and Innovation Policy Office	Science and Technology of Nation	om_content&view=article&id=135&Itemid=140
		Survey and Development Database of Research and Development, innovation of Industry in Thailand of 2009	http://203.185.131.38/rdsurvey2551/Default.aspx?onpage=first.
		Science and Technology Index of Thailand	http://164.115.5.161/th/index.php?option=com_content&view=article&id=121&Itemid=142
17.7	National Innovation Agency (Public Organization)	Innovation Register	http://www.nia.or.th/newsregister/
		Innovation Form	http://www.nia.or.th/onlineSubmission/index.php
17.8	Geo Informatics and Space Technology Development Agency (Public Organization)	Linkage Thai SDI with network agencies	http://mvos.gistda.or.th
		Geo-Informatics	http://thaisdi.gistda.or.th/
		Geo-Informatics via Internet	http://nsdiportal.gistda.or.th/geonetwork/srv/th/main.home
		Model of Landscape (Internal Zone Chaophraya)	http://digitalthailand.gistda.or.th/
		Foundation Geo-Informatics	https://sites.google.com/site/lidardemservice/home?previewAsViewer=1
		Geo-Informatics Standard	https://sites.google.com/site/fgdsservice/home/fgds
		Linkage Thai SDI with network agencies	https://sites.google.com/site/standardization-service/home?previewAsViewer=1
17.9	National Astronomical Research Institute (Public Organization)	Information website	http://www.narit.or.th
17.10	Synchrotron Light Research Institute (Public Organization)	Application for utilize Light	http://www.slri.or.th/th/index.php?option=com_content&view=article&id=29&Itemid=48
17.11	Thailand Institute of Nuclear Technology (Public Organization)	Nuclear Dictionary	http://www.tint.or.th/tint-dict/dict01a.html
		e-Form of Nuclear Technology	http://www.tint.or.th/?q=th/main
17.12	Hydro and Agro Informatics Institute (Public Organization)	Information website	http://www.haii.or.th
		Thailand Intregatied Water Resource Management	http://www.thaiwater.net
		Thailand Weather Information	http://www.thaiwater.net/web/index.php/we

Names of Public Agencies		services	Uniform Resource Locator (URL)
			atherinfo.html
		Website of Cooperative among agencies on emergency flood crisis	http://www.thaifloodwatch.net
17.13	Thailand Centre of Excellence for Life Sciences (Public Organization)	Information website	http://www.tcels.or.th/
17.14	National Science Museum THAILAND	Information website	http://www.nsm.or.th/
17.15	Thailand Institute of Scientific and Technological Research	Library/Research Report	http://opac.tistr.or.th/cgi-bin/gw/chameleon?skin=TISTR
		Application for Examination and Metrology	http://www.tistr.or.th/mtc1/
		Application for Service of Development and Analysis materials properties Center	http://www.tistr.or.th/mpad1/
		Website of Thai Packaging Center	http://www.tistr.or.th/tpc/
		Office of Certification Body (TISTR-OCB)	http://www.tistr.or.th/tistr/indexn.php?pages=serv_ocb
18. Ministry of Education			
18.1	Office of the Permanent Secretary for Education	Education Information and Subsidy Management	http://psis.opec.go.th
		e-office	http://www.sueksa.go.th/
		Information Standard for Integration of Education Information	-
		Competency Management Supporting System	http://www.cmss-otcsc.com/
18.2	Office of the Basic Education Commission	Medias Center	http://mediacenter.obec.go.th/moe/
		Integration Education Information of 5 Main Organization TH e-GIF with following agencies 1.Information Technology and Communication Center 2.Office of the Private Education Commission 3. Office of the Non-Formal and Informal Education 4. Office of The Basic Education Commission 5. Office of the Higher Education	-

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Commission	
18.3	Office of the Vocational Education Commission	Information website	http://www.vec.go.th/
		Integrated Education Information of 5 Organizations	-
18.4	Office of the Education Council	Education Research	http://www.thaiedresearch.org/thaied/
		Thaigifted Website	http://www.thaigifted.org/bank/main/main_t_haigif.php
18.5	Office of the Higher Education Commission	Planning for further study in higher education via OHEC Fund	http://www.gotouni.mua.go.th/
		Employment Condition of Graduate	http://www.job.mua.go.th/codes/index.php
		Individual Database of student, course of Higher Education Institute	http://www.data3.mua.go.th/dataS/
		Integrated Education Information of 5 Organizations	-
18.6	Business Organization of the Office of the welfare Promotion Commission for Teachers and Educational	Teachers Life Quality Development Center	http://www.tdc.go.th/
18.7	Secretariat Office of the Teachers Council of Thailand	Renew Work Permit Information	http://upload.ksp.or.th/
18.8	Office of the Non-Formal and Informal Education	Integrated Education Information of 5 Organizations	-
		Information website	http://www.nfe.go.th
18.9	The Institute for the Promotion of Teaching Science and Technology	Distance Teacher Training (IPST)	http://smttube.ipst.ac.th/ipst
		Automatic Office	http://203.146.15.34/moe_dretlow
		Searching certified qualification	http://203.146.206.27/quality52_v1/
		Searching teacher profession	http://203.146.206.27/quality52_v2/
		Personal Tax Income Calculation	http://203.146.15.32/tax/
		Conference room reservation	http://203.146.206.25/j_room
18.10	International Institute for Trade and Development (Public Organization)	Information website	http://www.itd.or.th

Names of Public Agencies	services	Uniform Resource Locator (URL)
18.11 National Institute of Educational Testing Service (Public Organization)	Information website	http://www.niets.or.th/
19. Ministry of Public Health		
19.1 Office of the Permanent Secretary for Public Health	Report, follow-up and monitoring drug problem	http://antidrug.moph.go.th/beta2/
	Report performance as public policy and strategy of Ministry of Public Health	http://ict4.moph.go.th/reportm/
	Information for Management and follow-up, Ministry of Public Health	http://moc.moph.go.th/index.php
	House Officer Application	http://imd.moph.go.th/resident
	Allocate Medical Personal on Geo-Informatics	http://203.157.240.14/gis/main/
	Circular Physician	http://imd.moph.go.th/
19.2 Department of Medical Services	Information for Decease Statistics	http://203.157.32.40/statreport/index.html
	Information website	http://203.157.32.40/dmsstat/index.html
	Complaint System of Department of Medical Services	http://www.dms.moph.go.th/request/inputform.html
	Website of Sirinthorn National Medical Rehabilitation Center (SNMRC)	http://www.snmrc.go.th/
	Postpone check-up via e-mail	http://www.snmrc.go.th/
	Institute of Dentistry Website	http://www.dentistry.go.th/
	Prasat Neurological Institute Website	http://www.pni.go.th
	Institute of Pathology Website	http://www.iop.or.th/
	Natal Cancer Institute Website	http://www.nci.go.th/
	Central Chest Institute of Thailand Website	http://www.cdi.thaigov.net/cdi/index.html
	Institute of Dermatology Website	http://www.inderm.go.th/
Institute of Aging Medicine Website	http://www.agingthai.org/	
QSNICH Refer Online, Queen Sirikit National Institute of Child Health	http://www.childrenhospital.go.th/refer/stagers.php	
19.3 Department of Disease Control	Information Center of Department of Disease Control	http://esv.ddc.moph.go.th/DDC2/
	Complaint for cigarette and liquor Center	http://complain.thaiantialcohol.com/

Names of Public Agencies	services	Uniform Resource Locator (URL)
	e-library DDC, Department of Disease Control	http://e-lib.ddc.moph.go.th/
	Bamrasnaradura Infectious Diseases Institute website	http://www.bamras.org/th/index.php
	Leprosy Information, Rajprachasamasia Institute website	http://www.thaileprosy.org/
	Geo-Informatics of Leprosy Control (GIS UCHA)	http://122.154.17.181:8010/lep_gis/index.php#
	Risk Communication and Health Behavior Development Office website	http://pr.ddc.moph.go.th/
	Office of Tobacco Control Website	http://btc.ddc.moph.go.th/cms/
	Bureau of Knowledge Management Website	http://kmddc.go.th/default.aspx
	Bureau of Epidemiology Website	http://www.boe.moph.go.th/
	Bureau of Occupational and Environmental Diseases Website	http://www.envocc.org/html/
	Bureau of General Communicable Diseases Website	http://thaigcd.ddc.moph.go.th/
	Travel Place And Vector Borne Disease Situation Website	http://www.thaivbd.org/drugtravel/
	Bureau of Emerging Infectious Disease Website	http://beid.ddc.moph.go.th/th_2011/index.php
	Bureau of Non Communicable Disease Website	http://www.thaincd.com/news/hot-news-view.php?id=7307
	Bureau of AIDS, TB and STIs	http://www.aidsstithai.org/index.php
	E-library; Bureau of AIDS, TB and STIs	http://27.254.33.65/ilovelib/home.php
19.4	Department for Development of Thai Traditional and Alternative Medicine	http://www.dtam.moph.go.th/
	Library of The Institute of thai Traditional Medicine	http://203.157.81.28/library
	Information System of Thai Traditional Medicine	http://203.157.81.28/ittm
	Website of Southeast Asian Institute of Thai-Chinese Medicine	http://tcm.dtam.moph.go.th/
	Website of Bureau of Protection Intellectual of Thai Traditional Medicine and Herb	http://ptmk.dtam.moph.go.th/home.php
	Website of Office of The Traditional Medical Knowledge Fund	http://fund.dtam.moph.go.th/home.php

Names of Public Agencies	services	Uniform Resource Locator (URL)
	Website of Thai Traditional Medicine Research Institute	http://tmri.dtam.moph.go.th/
19.5 Department of Medical Sciences	One stop service center	http://www.dmsc.moph.go.th/oss/
	Electronic Data Interchange of Laboratory Analysis Report System	
	Caution Database of Quality, Safety of health product	http://www.tumdee.org/alert/
	Cosmetic Information Center, Hazard Material Information Center	http://www.dmsc.moph.go.th/webroot/cosmetics/main_index.htm
	Website of Biological Products	http://www.dmsc.moph.go.th/webroot/Biology/biop/
	Radiation and Medical Device Information Center	http://webdb.dmsc.moph.go.th/radiation/drmdindex.asp
	Website of National Institute of Health of Thailand	http://nih.dmsc.moph.go.th/index.php
	Infectious Disease and Disease Vectors Information Center	http://webdb.dmsc.moph.go.th/ifc_nih/ez_mm_main.asp
	Toxicology Information Center	http://webdb.dmsc.moph.go.th/ifc_toxic/ez_mm_main.asp
	Transfusion-Transmitted Pathogens Section	http://ttp.dmsc.moph.go.th/ttp/th/main_th.php
	Website of Medicine Plant Research Institute	http://www.dmsc.moph.go.th/webroot/Plant/MPRI/
	Website of Bureau of Quality and Safety of Food	http://www.dmsc.moph.go.th/webroot/BQSF/IndexMain.htm
	Website of Bureau of Laboratory Quality Standards	http://www.dmsc.moph.go.th/webroot/qa/webblqs/default.asp?iId=JFLFJ
	Website of Bureau of Drug and Narcotic	http://www.dmsc.moph.go.th/webroot/drug/index.stm
19.6 Department of Health Service Support	Emergency Retort Center	http://203.157.7.46/GetHealthOfficeLocation
	Website of Bureau of Sanatorium and Art of Healing	http://mrd-hss.moph.go.th/mrd/ http://203.157.6.204/home/
	E-Service; Bureau of Sanatorium and Art of Healing	https://esv.mrd.go.th/index/index
	Information System for Protection Consumer on Private Sector Health (One Stop Service)	http://bo.mrd.go.th/helpsupport/index http://bo.mrd.go.th/auth/login
	Website of Division of Medical Engineering	http://medi.moph.go.th/index1.php
	Website of Primary Health Care Division	http://phc.moph.go.th/www_hss/frontend/theme/index.php
	Website of Office of Health Business	http://www.thaispa.go.th/

Names of Public Agencies	services	Uniform Resource Locator (URL)
	Promotion	
19.7 Department of Mental Health	CALL CENTER; Mental Health Problem of Children and Teenage	http://www.dmh.go.th/child/
	Mental Health Test was certified by Department of Mental Health	http://www.dmh.go.th/test/
	Website of Kullaya Ratchanakarin Institute	http://www.galyainstitute.com/home2/
	Information System, Assistant and Recover Mental to Disaster Victim	http://www.mcc-galya.com/reporter/
	Website of Ratchanakarin Child Development Institute	http://www.thaichilddevelopment.com/
	Website of Rajanukul Institute	http://www.rajanukul.com/
	Website of Bureau of Mental Health Development	http://mhtech.dmh.moph.go.th/ver6/index.php
19.8 Department of Health	Information Service Center Department of Health	http://203.157.68.251/elib/cgi-bin/opacexe.exe?op=gsf&frm=simsch&db=popin&skin=u&lang=1
	e-learning	http://www.anamai.moph.go.th/ewt_news.php?nid=1239
	Body Mass Index Calculation	dopah.anamai.moph.go.th/bmi.php
	Physical Potential Assessment	http://dopah.anamai.moph.go.th/test-form/fitness/background.html
	Report of Laboratory Experiment	http://rldc.anamai.moph.go.th/index.php?option=com_content&view=section&id=19&Itemid=82
	Purchase testing kit	http://rldc.anamai.moph.go.th/index.php?option=com_content&view=article&id=126&Itemid=54
	Self-assessment of 5th primary education to 6th Secondary education	http://sha.anamai.moph.go.th/
	Self-assessment health for student	http://sha.anamai.moph.go.th/
	Website of Bureau of Dental Health	http://www.anamai.ecgates.com/
	Website of Bureau of Nutrition	http://nutrition.anamai.moph.go.th/temp/main/index.php
	Website of Bureau of Food and Water Sanitation	http://foodsana.anamai.moph.go.th/main.php?filename=index_foodsan
	Website of Bureau of Reproductive Health	http://rh.anamai.moph.go.th/home.html
	Website of Exercise for Health	http://dopah.anamai.moph.go.th/
	Website of Bureau of Health Promotion	http://hp.anamai.moph.go.th/main.php?filename=index

Names of Public Agencies	services	Uniform Resource Locator (URL)
	Website of Bureau of Environmental Health	http://env.anamai.moph.go.th/
19.9 Food and Drug Administration	Information website	http://www.fda.moph.go.th/
	e-Inspection	http://narcotic.fda.moph.go.th/fdainspect/
	Website of One stop product service	http://newsser.fda.moph.go.th/oss/tha/frontend/index.php
	e-Submission	http://wwwapp1.fda.moph.go.th/esub/ http://iodinethailand.fda.moph.go.th/esub/index.php
	Inquiry for consideration of submission via Internet	http://wwwapp1.fda.moph.go.th/webvoice1/
	License Report must payment fee	http://wwwapp1.fda.moph.go.th/webfee/index.asp
	Searching drug patent	http://wwwapp1.fda.moph.go.th/patent/
	Searching Phamaceutical was revoked register	http://newsser.fda.moph.go.th/banned_pharmaceutical/
	Cosmetic Registration	-
	e-Certificate	-
	e-banking	-
	Website of Learning Resource Center	http://elib.fda.moph.go.th/library/
	FDA. single window. Health Products e-Logistics and Lodgment Organizer.	http://nctapp.fda.moph.go.th/LgtUpdate/updatopath.jsp
	Searching export product	http://wwwapp1.fda.moph.go.th/exporters/
	Searching Warning Food Organization	http://newsser.fda.moph.go.th/safetyalert/frontend/theme_1/fe_contact.php?Submit=Clear
	Website of	http://newsser.fda.moph.go.th/fda_mdc/frontend/theme_1/index.php
	Provide drug code standard	http://wwwapp1.fda.moph.go.th/drug/
Website of control hazard material	http://narcotic.fda.moph.go.th/welcome/	
Website of Food Bureau	http://iodinethailand.fda.moph.go.th/food_54/ http://newsser.fda.moph.go.th/food/index_1.php	
Website of Food and Drug Post Office	http://logistics.fda.moph.go.th:8080/fooddrug/home.php	
Website of cosmetics control, Bureau of Cosmetic Control and Hazard Material	http://e-cosmetic.fda.moph.go.th/frontend/theme_4/index.php?Submit=Clear&Lang=0	

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Website of Hazard Material Control, Bureau of Cosmetic Control and Hazard Material	http://www.fda.moph.go.th/psiond/index.htm
		Website of International Cooperative	http://newsser.fda.moph.go.th/IAHCP/main.php
		Website for caution and complaint about health product	http://newsser.fda.moph.go.th/hpsc/frontend/theme/index.php
19.10	Health Systems Research Institute	Health Systems Research Institute Website	http://www.hsri.or.th/
		Data bank and health knowledge	http://kb.hsri.or.th/dspace/
		Link National Research Respository and Data from Office of Research Supporting Fund	-
19.11	National Health Security Office (NHSO)	Withdraw drug, inquire reserve source, Antidote program	http://drug.nhso.go.th/Antidotes/
		EMERGENCY CLAIM ONLINE	http://emco.nhso.go.th/nhso/index.php
		Basic service information	http://dc.nhso.go.th/HPPWEB/search/SearchAction_init.do
		Security information center, health for management	http://eis.nhso.go.th/FrontEnd/home.aspx
		Linkage DB for e-Service, Web Service for External with Social Security Office	-
19.12	National Institute for Emergency Medicine	Emergency Medical Information (ITEMS)	http://ws.emit.go.th/items_front/index.aspx
		Medical volunteer	http://items2.emit.go.th/volunteer/VolunteerHeart.aspx
19.13	The Healthcare Accreditation Institute (Public Organization)	Information website	http://www.ha.or.th/ha2010/th/home/index.php
19.14	National Vaccine Institute (Public Organization)	Information website	http://www.nvco.go.th
19.15	The Government Pharmaceutical Organization	Verify right of nursing for Project of Knee Prosthesis in Health Security System	http://knee.gpo.or.th/KneeApplication/KneeLogOn/tabid/58/language/th-TH/Default.aspx
		Distribution System of The Government Pharmaceutical Organization on website	http://www.gpoproduct.com/ http://www.intergpomed.com/
		Antidote	http://202.129.59.203/antidote/antidote.php
		Medical Supplies Management	http://pharmahub.gpo.or.th:8080/ http://scm.gpo.or.th/vmi/

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Vendor management inventory Supplier management inventory	http://scm.gpo.or.th/vmi/
20. Ministry of Industry			
20.1	Office of the Permanent Secretary for Industry	Information Center for operator and SME	http://www.industry.go.th/page/sme.aspx
		Web Portal of Ministry of Industry	http://www.industry.go.th
		Model of verify environment in river basin	http://monitoring.industry.go.th/
20.2	Department of Industrial Works	Searching Factory Information	http://www.diw.go.th/diw/query.asp
		Complaints	http://reg.diw.go.th/claim/form_user.asp
		e-learning e-learning	http://csic.diw.go.th:82/login/index.php
		e-permission	http://www2.diw.go.th/e-license/login.asp
		Data Interchange with external factory; Web service, Factory information, Hazardous substance Import/Export	-
		Machinery Market	-
		CSR-DIW	http://www.csrdiwnetwork.com/thai/index.aspx
		Industrial Park	http://www.diw.go.th/diw/liz/index.html
		Harmony Project between community and Industries	http://www.diw-3samakee.com/
		Database of verify quality soil and groundwater in factory, data service for soil pollution	http://watertech.diw.go.th/soil2/Login.aspx?ReturnUrl=%2fsoil2%2fmain.aspx
	Machinery Registration Office	http://www2.diw.go.th/mac/	
20.3	Department of Industrial Promotion	Project of Development Capacity of Competition in Thai Industry by Technology	http://www.ecitthai.net/
		e-consulting	http://boc.dip.go.th/
		e-marketplace portal network for Thai Entrepreneur	http://www.industry.in.th/
		Database of trade-off waste in Thai Industrial Network	http://www.greenindustry.in.th/
20.4	Department of Primary Industries and Mines	Application for mining report via internet	http://sso.dpim.go.th/josso/signon/login.do?josso_back_to=http://dses.dpim.go.th/cms/josso_security_check/
		Checking fee payment on utilize area concessin and special compensation	http://www1.dpim.go.th/mnp/mnpay.php

Names of Public Agencies		services	Uniform Resource Locator (URL)
		to public	
20.5	Office of the Cane and Sugar Board	Permission Online	http://export.ocsb.go.th/
		Geo-Informatics for Sugar Cane and Sugar Industrial	http://gimis.ocsb.go.th/user_chk.jsp
		Licence and certificate of import and export product	http://export.ocsb.go.th/
		Searching information of transport sugar	http://ias.ocsb.go.th/ccs/sugarzone.startup
20.6	Thai Industrial Standards Institute	Industrial Standards Lists	http://203.154.78.161:8080/public_standard/Servlet/SearchTisServlet?action=Q
		Community Products Standard	http://app.tisi.go.th/otop/otop.html#topic4
		Expenditure rate in checking industrial product	http://app.tisi.go.th/ib_product_cert/cost_ib.html
		Expenditure rate in checking industrial product	http://app.tisi.go.th/cgi-bin/labfee/cost.pl
		Agency and period of examine	http://app.tisi.go.th/cgi-bin/labfee/list.pl
		Laboratory Lists	http://www.tisi.go.th/index.php?option=com_content&view=article&id=2137&Itemid=31
		Certificate System of Thailand	http://www.tisi.go.th/index.php?option=com_content&view=article&id=2011&Itemid=29
		Buyer manual	http://buyguide.tisi.go.th/buyguide
		Library of Thai Industrial Standards Institute	http://library.tisi.go.th
		Community Products Standard	http://tcps.tisi.go.th/public
20.7	Office of Industrial Economics	Filing, follow-up, check and record monthly industrial data (Form Ror.Ngor.8)	http://factory.oie.go.th/oieOnline/
		Link import-export tax data as tariff of Customs Department; XML WEB SERVICE with Thailand Automotive Institute	-
		Link import-export data by HS CODE (Monthly) (XML System) with Electrical and Electronics Institute	-
20.8	Thailand Board of Investment	Information about investment and promotion investment	http://www.boi.go.th
		Check document status via internet	http://doctracking.boi.go.th/
		Application of Turnover (Tor.Sor.)	http://https://boieservice.boi.go.th/PM

Names of Public Agencies		services	Uniform Resource Locator (URL)
		310) via Internet	
		Application for Online Investment Promotion	http://https://boieservice.boi.go.th/IPS
		Co-Investor Form	http://www.boi.go.th/thai/services/matchmaking.asp
20.9	Office of Small and Medium Enterprises Promotion	Shop Online	http://www.sme.go.th/pages/SMEs@Click.aspx
20.10	Industrial Estate Authority of Thailand	Searching Factory Information	http://www.ieat.go.th/main/default/factory
		E-Privilege & Permission: EPP	http://e-pp.ieat.go.th/
20.11	Thai-German Institute	Information website	http://www.tgi.or.th/
20.12	Thailand Productivity Institute	Knowledge Shopping Online	http://shopping.ftpi.or.th/store/comersus_dynamicIndex.asp
		Knowledge Center	http://www.ftpi.or.th/kc/kc.html
		Competitive Benchmarking database	http://sas.ftpi.or.th/cbench/index.html
20.13	National Food Institute	Food Intelligence Center Thailand	http://fic.nfi.or.th/
20.14	Thailand Textile Institute	In depth Texture Information Center	http://www.thaitextile.org/th/textile_intel/
20.15	Management System Certification Institute (Thailand)	Information website	http://www.masci.or.th/index.php
20.16	Thailand Automotive Institute	Automotive Information Center	http://data.thaiauto.or.th/iu3/
		Link import-export tax data as tariff of Customs Department; XML WEB SERVICE with The Office of Industrial Economics	-
20.17	Electrical and Electronics Institute	In depth Information for Electrical and Electronics Industrial	http://www.thaieei.com/eei2009/th/iu.aspx
		Import-Export Data by HS CODE (Monthly) with The Office of Industrial Economics	-
20.18	Iron and Steel Institute of Thailand	Statistical Report	http://www.isit.or.th/modules.php?mod=Home&file=statistics&core_id=27&core_id=109
20.19	Institute for Small and Medium Enterprises	Information website	http://www.ismed.or.th/SME2/src/bin/controller.php?view=first.First

Names of Public Agencies	services	Uniform Resource Locator (URL)
Development		
21. Independent Public Agencies		
21.1 The Office of His Majesty's Principal Private Secretary	Information website	http://www.ohm.go.th/th/office-of-his-majesty-principal-private-secretary
21.2 Bureau of the Royal Household	Information website	http://www.brh.thaigov.net/new-site/index.php
21.3 National Office of Buddhism	Searching database of Buddhism	http://search.debgo-10.com/SearchTemple.php
	Learning interchange for self-development and organization	http://www.debgo-10.com/
	Information website	http://www.onab.go.th/
21.4 Office of the Royal Development Projects Board	Information website	http://www.rdpb.go.th
21.5 National Research Council of Thailand	National Research Management System (NRPM).	http://nrpm.nrct.go.th/
	Register to receive research funding for research.	http://rpcd.nrct-research.com
	Thai National Research Repository linked	http://www.vijai.net/
21.6 The Royal Institute	National Research Management	http://www.royin.go.th/akara/home/index.php
21.7 Royal Thai Police	Register research for supporting research	http://www.royalthaipolice.go.th/stat.html
	Thai National Research Respository with data from the Thailand Research Fund	-
	Searching Thai gazetteer	http://www.jaray.org/help_page/help3.php
	Statisticals Information	-
	Informed Information Technology Criminal	http://ephone.police.go.th/
	Squeal	http://www.royalthaipolice.go.th/sms/sms.html
	Informed commit lese majesty website	http://webmonitor.police.go.th/
	DXC Linkage	-
Information Kernel Network Operations, IKNO:Department of Local Administration	-	

Names of Public Agencies		services	Uniform Resource Locator (URL)
		Tourist Police Division Website	http://www.thailandtouristpolice.com/index.php
21.8	Anti-Money Laundering Office	Database Information for investigate basis violate/Laundering violate and bribe information database/premium of carry out with assets (AMCIS) and Central Information Database and data interchange (AMCES)	http://www.amcis.amlo.go.th/AMLO/web/General/index.jsp
		e-report transaction	-
21.9	Office of the Attorney General	Inquiry law service via internet, Special public prosecutor office, Protection Internatinal Right Division	http://www.humanrights.ago.go.th/
		Information website	http://www.e-learning.ago.go.th/
		e-learning of Office of the Attorney General	http://www.e-learning.ago.go.th/
		Protection international rights	http://www.humanrights.ago.go.th
		Law Consulting to people	http://www.lawaid.ago.go.th/
		e-directory	http://www.ago.go.th/link_IS.php
21.10	Thai National Assembly	Archieves interchange between public agency	-
		Application for public information service	http://www.senate.go.th/information
		Public Information Center	http://www.parliament.go.th/gennews
		Legislation Information Center	http://www.parliament.go.th
		Law Information Service	http://www.parliament.go.th/elaw
21.11	King Prajadhipok's Institute	Information website	http://www.kpi.ac.th/
21.12	Office of the Election Commission of Thailand	Office of the Election Commission of Thailand	http://www.ect.go.th
		Participation Activities	http://www2.ect.go.th/home.php?Province=ppb
		Informed clue of violate election law	http://www.ect.go.th/newweb/th/regis/index.php
21.13	Office of the Constitutional Court	Information website	http://office.constitutionalcourt.or.th/
21.14	Office of the Ombudsman Thailand	e-Complaint	http://www.ombudsman.go.th/popup.asp
		Check Civil Registration of Department of Local Administration	-

Names of Public Agencies		services	Uniform Resource Locator (URL)
21.15	Office of the Administrative Court	Trial Parties case	http://court.admncourt.go.th/casePlanP/
		Searching Judgment	http://court.admncourt.go.th/ordered/
		Inquiry, testify at hearing, pronounce a judgment/Order	http://www.admncourt.go.th/admncourt/se arch_appointment1.aspx
		Searching Case Information	http://court.admncourt.go.th/ORDERED/ac cuse_new.aspx
21.16	Office of the National Anti-Corruption Commission	Information website	http://www.nacc.go.th/
21.17	Office of the Auditor General of Thailand	Parcel Supply and Public Sector Service	http://www.oag.go.th
		Information Kernel Network Operations, IKNO:Department of Local Administration	-
		Web Site OAG	http://www.oag.go.th
21.18	Office of the National Human Rights Commission of Thailand	Information website	www.nhrc.or.th
21.19	Office of the Court of Justice	Searching Case Information	http://dbcase.coj.go.th/
		Searching Case Information Service	http://dbcase.coj.go.th/
		e-library of Justice Court	http://www.library.coj.go.th/
		e-court	https://vpn.coj.go.th/dana-na/auth/url_default/welcome.cgi
		Government Financial Management Information System, GFMIS	-
21.20	The Thai Red Cross Society	Information website	http://www.redcross.or.th/home/indexthai.php4
21.21	The Crown Property Bureau	Information website	http://www.crownproperty.or.th/
21.22	The Bank of Thailand	The Revenue Department Data Warehouse Linked	-
21.23	Securities and Exchange Commission Thailand	Online Service	-
		Thailand Financial Instrument Information Center	-
21.24	The Court of Appeal	Information website	http://www.coj.go.th/appealc/
21.25	Civil Court of Thailand	Information website	http://www.civil.coj.go.th

Names of Public Agencies		services	Uniform Resource Locator (URL)
21.26	Criminal Court	Information website	http://www.crimc.coj.go.th
		Criminal Court Information	http://www.crimc.coj.go.th
21.27	Office of the National Broadcasting and Telecommunications Commission	Service Link	http://www.nbtc.go.th/wps/portal/NTC/Home2
21.28	Southern Border Provinces Administration Centre	Visitation Database from Restless of Southern Region	http://164.115.9.55/southernvisit
21.29	National Health System Reform Office	Information website	http://www.nationalhealth.or.th/
21.30	Bangkok Metropolitan Administration	Bangkok Commercial Registration Online	http://tp.bangkok.go.th/
		Bangkok Local Museum	http://office.bangkok.go.th/localmuseum/
		Web map service of BMA GIS Center	http://www.bangkokgis.com/
		BMA Data Center	http://www.bangkok.go.th/info/

Appendix B: List of Reference Models of e-Government Interoperability Framework

No.	Reference Models	E - GIF Development
1	Thailand: Six Critical Success Components of TH e-GIF	Based on EA and Interoperability Framework
2	America: Federal Enterprise Architecture Framework (FEAF) http://www.whitehouse.gov/omb/e-gov/fea	Based on EA
3	Malaysia: 1GovEA http://www.enterpriseitnews.com.my/biz-performance/item/2586-mampu-announces-1govea-at-bitas-conference-2013.html	Based on EA (Beginning Process: 2013)
4	Hong Kong: HKSARG Interoperability Framework http://www.ogcio.gov.hk/en/infrastructure/e_government/if/interoperability_framework.htm	Based on Interoperability Framework HKSARG: Hong Kong Administrative Region
5	Singapore: Singapore Government Enterprise Architecture (SGEA) http://www.egov.gov.sg/egov-programmes/programmes-by-government/singapore-government-enterprise-architecture-sgea	Based on EA
6	Greek: Greek e - GIF http://www.e-gif.gov.gr/portal/page/portal/egif/	http://www.e-gif.gov.gr/portal/pls/portal/cs/211041.PDF
7	Germany: SAGA (Standards and Architectures for e-government Applications) http://www.cio.bund.de/SharedDocs/Publikationen/DE/Architekturen-und-Standards/SAGA/archiv_saga_2_0_englisch_download.pdf?__blob=publicationFile	Based on Interoperability Framework
8	UK: UK e – GIF (Interoperability Framework) http://collections.europarchive.org/tna/20050301192910/ http://www.govtalk.gov.uk/	Based on EA and Interoperability Framework

No.	Reference Models	E - GIF Development
	<p>(EA): The cross-Government Enterprise Architecture (xGEA) and The cross-Government Enterprise Architecture Reference Model (xGEARM)</p> <p>http://webarchive.nationalarchives.gov.uk/20100304104621/http://www.cabinetoffice.gov.uk/media/317444/ict_strategy4.pdf</p> <p>http://tna.europarchive.org/20080727001118/http://www.cio.gov.uk/documents/cto/pdf/enterprise_architecture_uk.pdf</p>	
9	<p>New Zealand: New Zealand E – Government Interoperability Framework (NZ e – GIF) (Interoperability Framework)</p> <p>http://ict.govt.nz/library/e-gif-v-3-3-complete.pdf</p> <p>(EA)FEA</p> <p>http://archive.ict.govt.nz/plone/archive/about-egovt/strategy/nov-2006/strat11.html</p>	<p>Based on EA and Interoperability Framework</p> <ul style="list-style-type: none"> - New Zealand EA developed from FEA - Same name as Model FEA of USA, however, different in some detail
10	<p>Australia: Australian Government Architecture Framework (AGA)</p> <p>http://agimo.gov.au/files/2012/04/AGA_RM_v3_0.pdf</p> <p>http://agimo.gov.au/files/2012/04/Information_Interoperability_Framework1.pdf</p>	<p>Based on EA and Interoperability Framework</p> <p>** AGA adapted an established and proven framework based on the FEAF**</p>
11	<p>Korea: Interoperability Map for e-Government</p> <p>http://www.gobiernofacil.go.cr/e-gob/gobiernodigital/Foro_Ddigital/presentaciones/e_Government_Interoperability_in_Korea.pdf</p>	<p>Based on EA</p>
12	<p>Estonia: Estonian IT Interoperability Framework</p> <p>http://www.riso.ee/en/files/framework_2005.pdf</p>	<p>Based on Interoperability Framework</p>