

Appendix

A National Single Window Case Study⁵⁵

1. Introduction

This report briefly discusses the progress and status of an e-Logistics initiative, or so-called national Single Window (NSW) in Thailand. The establishment of a national Single Window is recognized as an important national strategy to improve the efficiency in documentary procedures required to expedite the movement of goods in and out of Thailand. It allows Thailand to pursue its agenda on Trade Facilitation Enhancement within the National Logistics Development Strategy (2007-2011) and its associated national long-term vision to become the world-class logistics hub for Indochina as firstly identified in Thailand Logistics Master Plan (2005-2009) with an aim to achieve:

- A reduction in average trade transaction cycle time from 24 (World Bank's Trading Across Border Report, 2004) to 14 days by 2011.
- A reduction in trade logistics costs from 19% of GDP in 2005 to 16% by 2011.

In addition to the responses toward national policy directives, the NSW implementation in Thailand also reflects the need to foster regional integration and realization of an ASEAN Economic Community by 2015. In this regard, the Thai government together with governments of ASEAN member economies signed the "Agreement to Establish and Implement the ASEAN Single Window". According to the Agreement, Thailand is obligated to develop the system as well as make necessary procedural changes and regulatory reforms to enable the operation of National Single Window by the year 2008.

The collaborative effort of Thai Customs Department, Ministry of Information and Communication Technology, Ministry of Commerce, Ministry of Agriculture and many other government agencies and business stakeholders in simplifying procedural and documentary requirements as well as automating all import/export-related process as part of National Single Window initiative since 2004 yields remarkable outcomes, including an annual cost saving of about 1,600 million USD⁵⁶. Table A.1 summarizes Thailand's achievement in its attempt to increase efficiency and compliance in the facilitation of cross-border trade comparing between 2007 and 2009.

⁵⁵ **Disclaimer** - This case study on Thailand's Single-Window initiative was prepared by an independent author. The discussion of this case does not represent an official message of any organizations, administration or government agencies. It is based on the author experience and involvement as a consultant with several NSW stakeholders.

⁵⁶ The calculation is discussed in Section 5.3.

Table A.1 - Thailand on Trading across Border (World Bank, Doing Business Report 2007 and 2009)

Year	Ranking (among 183 economies)	Export			Import		
		Document*	Time**	Cost***	Document*	Time**	Cost****
2007	103	9	24	848	12	22	1,042
2009	12	4	14	625	3	13	795

* Number of official documents involved in exporting (and importing) a standardized shipment of goods (this statistics does not cover other special control goods, e.g. agriculture products, or dangerous goods in which more documents, more time and costs will be needed.)

** Number of days needed starting from the final contractual agreement between the two parties, and ending with the delivery of the goods

*** US\$ per Container

The implementation of National Single Window nevertheless faced a number of challenges that lied in:

- The seeking of cooperation and support from all relevant stakeholders
- The establishment of common understanding in all aspects of the initiative among all stakeholders
- The simplification and standardization of procedural requirements as they often require the changes in existing laws and regulations;
- The selection of standards for the harmonization of documentary requirements and approaches for electronic exchange of information; and
- The harmonization of documentary requirements especially when the approved standard is not readily available.

2. Key components of national Single Window

Consistent with the ASEAN's view of National Single Windows, Thailand's NSW is designed to support a single entry of identical data; a single synchronous processing of data; a decision-making for the clearance and release of cargoes at a single point; and a compilation of statistics for economic analysis and management. According to a study report commissioned by Ministry of ICT (2008), Thailand's NSW consists of ten key components outlined below. Figure A.1 demonstrates how these components fit together.

- NSW exchange system that mainly serves as the national hub for electronic documents sharing and exchange, especially for G2G, G2B, and B2B interconnectivity. Its key features

include an interface for sending and receiving e-documents/messages in different protocols with the features of authentication, non-repudiation, semantic translator, syntax validation, and ebXML Messaging Service (ebMS)⁵⁷.

- About 40 import/export-relate permit/license/certificate systems issuing by many government and regulatory agencies with additional modules that facilitate back-end integration and service arrangements with the NSW central exchange hub. The Paperless Customs system is included.
- Information systems that serve as communication interface between domestic traders, trade/transport intermediaries, and government agencies
- Information system that facilitates the application and issuance of permit/license/certificate for controlling government agencies who do not have permit/license/certificate issuing systems, trade/transport intermediaries
- Modules that facilitate the interconnectivity between domestic permit/license/certificate issuing systems and those overseas NSW systems, e.g. ASEAN member economies
- Modules that facilitate the interconnectivity between members of domestic trade/transport community and their counterparts
- National Standard Data Set
- Message Implementation Guides
- Governance mechanism and criteria for the determination of transaction fee and quality of service
- IT physical infrastructure, Thailand's e-Government Interoperability Framework (TH e-GIF)⁵⁸, and the legal framework

The development of National Single Window in Thailand has been carried out in three phases.

- Phase 1 focuses on 1) the establishment of mutual understanding between Thai Customs Department and other participating 35 controlling agencies; 2) the simplification of procedural and documentary requirements; 3) the development of Paperless Customs or e-Customs system⁵⁹ that also facilitates the electronic payment of duty and fee; and 4) the development of system that facilitates secured integration of electronic information.
- Phase 2 aims at offering full services for Paperless Trade where local traders can 1) use the information that they prepare in one single form to acquire any permit/license/certificate needed as well as to seek approval for expediting the movement of goods across border;

⁵⁷ ISO/TS 15000-2:2004. Electronic business eXtensible Markup Language (ebXML) -- Part 2: Message service specification (*ebMS*).

⁵⁸ TH e-GIF is the national interoperability policy framework including the methodology and a recommended set of standards and protocols for developing any collaborative e-government platforms in Thailand.

⁵⁹ Thai Customs Department developed Paperless Customs using ebXML technology to replace its traditional EDI system which had been used since 1998.

and 2) track the status of documents and the movement of goods via internet. The secured integration of electronic information among domestic stakeholders and their counterparts in the region is achieved⁶⁰. In this phase, it is also expected that National Standard Data Set is incorporated by all domestic stakeholders.

- Phase 3 enables the compilation of statistics for economic analysis and management.

3. Critical Success Factors for NSW Development

3.1 Stakeholder management and interagency collaboration

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

3.1.1 National and regional collaboration

In year 2004, the National Competitiveness Development Committee (NCDC)⁶¹ 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 NSW implementation in Thailand 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 and strengthened the justification for budget allocation.

⁶⁰ The interconnectivity between Paperless Customs and information systems of permit/license/ certificate agencies is the first target. The implementation timeline depends on the readiness of each individual agency, but now 35 agencies have already signed the official memorandum of commitments for this endeavour.

⁶¹ The National Competitiveness Development Committee (NCDC) is a high-level committee chaired by Thailand's Prime Minister. NCDC comprises all economic-related Ministers as well as representatives from key industry sectors.

3.1.2 Common architecture vision and who doing what

After the need was perceived, most stakeholders of the NSW were identified. The Cabinet appointed a National Committee on Logistics Development (NCLD). NCLD consists of permanent secretaries from economic-related Ministries and representatives from trade-related associations. While the engagement of NCDC in the project reinforced strategic integration and thus mutual commitment among high-level decision-makers, the appointment of NCLD brought together the high-level management to plan and monitor Single Window implementation. The commitment at this level made stakeholders accountable to the project and obligated them to render collaboration.

The 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 was another actor who played an important role in fostering interagency collaboration and sponsorship. It appointed two government agencies, based on their organizational role, responsibility, and capability, to lead and manage cross-agency issues as well as project implementation.

- Recognizing that Thai Customs Department possesses in-depth knowledge of the business domain and relevant technologies, the Cabinet designated Thai Customs Department as a lead agency to coordinate and lead NSW implementation and drive the information exchange between Thailand's NSW and NSWs of other ASEAN economies.
- Given that Ministry of Information and Communication Technology (MICT) has a mandate to promote the development and uptake of e-government, the Cabinet designated it as an agency responsible for managing several related projects, handling initial budget allocation, providing necessary nation-wide government network infrastructure⁶², interoperability standards⁶³ and legal infrastructure, and identifying the best appropriate business model⁶⁴ options in order to ensure a smooth operation of NSW.

As a lead agency, Thai 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. Two sub-working groups were formed. One worked on streamlining business processes and aligning data requirements. The other dealt with technical communication protocols and related security issues. With close communication

⁶² GIN, the Government Infrastructure Network project for high-speed G2G interconnected networks sponsored by Ministry of ICT.

⁶³ TH e-GIF, the national e-government interoperability framework is one such attempt.

⁶⁴ Business model defines the services that NSW offers to targeted customers, resources required to provide those services, how the provision of those services is financed, pricing strategies, and revenue stream.

among stakeholders, interests and expectations on the system were regularly addressed, managed and aligned by the lead agency.

The appropriate appointment of lead agencies and the formation of sub-working groups provided the foundation for operational integration. However, there was also confusion on how independent agencies could function as a single entity with authorities for problem-solving. The high-level architecture of Thailand's NSW in Figure A.1 was developed and used as means to clarify different project components, their scopes and roles of each stakeholder. It provided a clear overall picture and common vocabularies, promoted common understanding among stakeholders both business sectors and responsible government agencies particularly the budgeting bureau, and strengthened integration at the operational level.

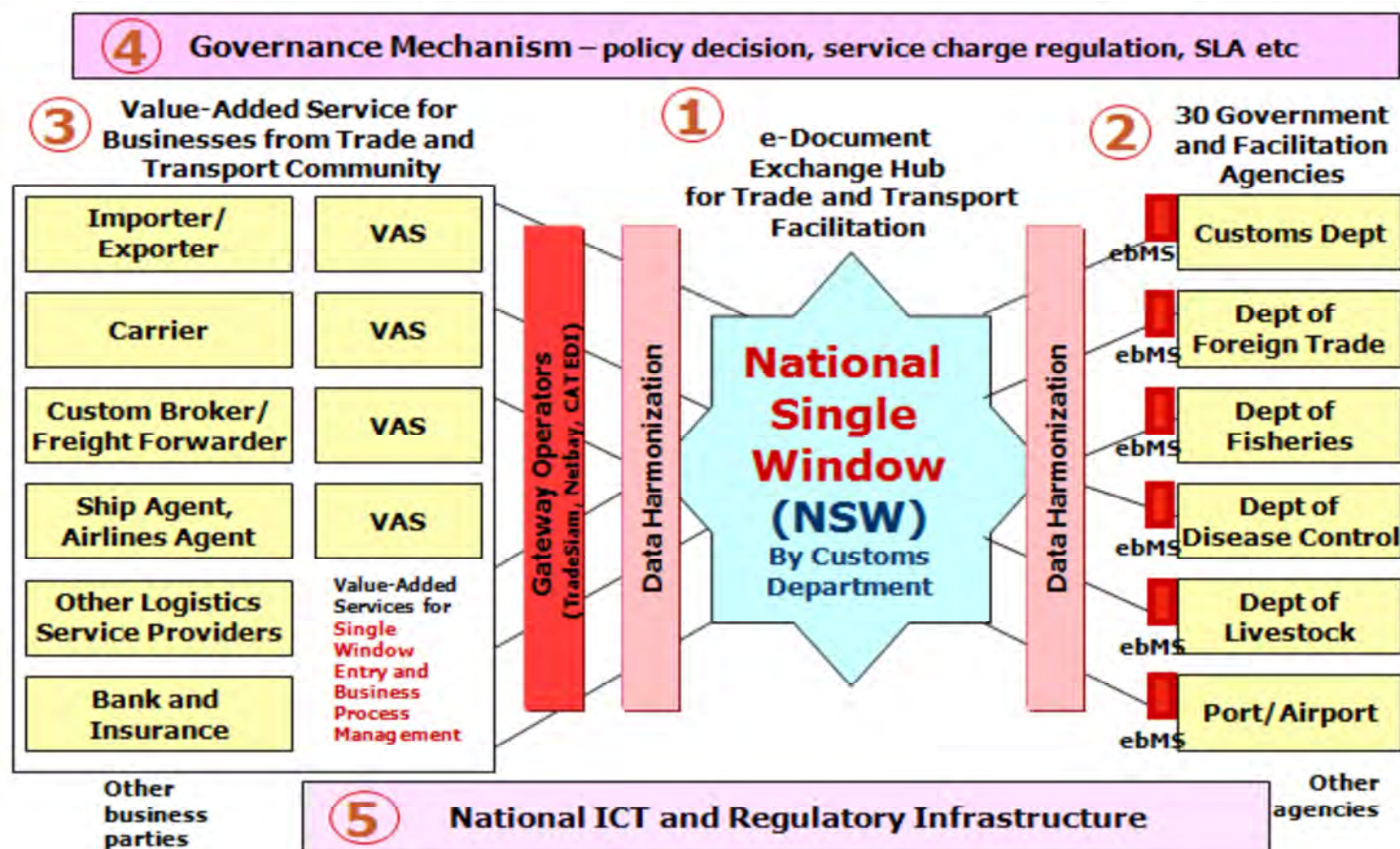
Having one agency in charge of system implementation and another in charge of cross agency issues and project management, on one hand, is advantageous as the roles and areas of work of two lead agencies are complimentary. MICT pushed the development of artifacts necessary for cross-agency cooperation, such as an initial National Standard Data Set and Thailand e-Government Interoperability Framework (TH e-GIF), that Thai Customs Department was not ready to take early on in the project. Several findings from the studies related to the simplification of business processes as well as the development of NSW business models and governance mechanisms conducted by MICT provided information that served as crucial inputs for decision-making processes participated by Thai Customs Department and other stakeholders.

Having two lead agencies, on the other hand, has a disadvantage. The ministerial bureaucracy in MICT held back budget allocation. It led to project implementation delay.

The roles and areas of work of two lead agencies were somehow changed later on in the project implementation. Thai Customs Department expressed an intent to lead the revision and refinement in the following areas of work. The action plan was therefore adjusted accordingly.

- The development of guidelines for system implementation and integration
- The harmonization of data requirements
- The development of the National Standard Data Set for all related documents
- The development of governance mechanisms and the identification of criteria for the determination of transaction fee and quality of service

Figure A.1 - Thailand's NSW High-Level Architecture (MICT Report, and Keretho, 2009)



3.2 Business process analysis and simplification

Business process analysis has been conducted as one of key activities in various projects under the NSW initiative. Several studies and implementation projects have been conducted. For example, one study focused on processes that are common to all traders using four modes of transport (trains, trucks, ships, and airplane), and also the export and import of national strategic products. The outputs of business process serve as input for several activities including:

- The derivation of possible investment and revenue models
- The harmonization of data requirements and the development of guidelines for electronic messages
- The design for the architecture of the future information systems
- The development of recommendations for business process simplification

The automation of business processes is one form of business process simplification. It allows electronic declaration of goods, electronic application for permit/license/certificate, and receipt of approval online. The electronic approval of permit and the electronic integration of permit information and goods declaration information not only fasten the clearance process but also eliminate the need for traders to travel to collect a permit at an office of a permit issuing authority and to physically submit the permit at a corresponding office of Thai Customs Department. It thus abolishes some travel costs and time that traders have to spend to obtain documents required to expedite the movement of goods across borders. With electronic integration of such information, integrity and accuracy of trade information can also be improved.

It should be noted that recommendations to remove redundant and non-value added business processes cannot always be implemented as they often require the changes in certain laws and legislation. In fact, business processes that are burdensome in traders' perspective may be seen as critical and necessary in controlling government agencies' point of view. Close consultation with all relevant stakeholders are therefore crucial prior to implementing the simplification of business process.

3.3 Data harmonization

The data harmonization efforts contributing to the development of Thailand's NSW have been carried out in three phases (as commissioned by Ministry of Transport and Ministry of ICT).

- Phase 1: Transport-related data requirements from 58 documents
- Phase 2: Data requirements from 189 documents used in business processes associated with the issuance of permits, licenses, and certificates carried out by 21 government agencies.

- Phase 3: Data requirements from other government agencies and trade community including bank and insurance.

The harmonization of data requirements in Thailand was conducted at the time where only a few standards that provide generic semantic rules and that serve as a building block for aligning the definition, representation, as well as the cardinality and location in the electronic message of each data element were available. A selected guideline, so called Buy-Ship-Pay UN/CEFACT Business Subset for International Trade which is previously known as UNeDocs, for data harmonization in Thailand was generic yet sufficiently contextualized to cover documentary requirements of all stakeholders in the international supply chain. It was also based on dictionary entry names from UN/CEFACT Core Component Library (CCL) and complied with UN/CEFACT Core Component Technical Specification (CCTS: ISO 15000- 5/ebXML). As UNeDocs project of the UN/CEFACT working party has been discontinued, Thai Customs Department has now conducted the harmonization of those data requirements using WCO Data Model version 3.0 as a reference.

3.4 The use of open and international standards for interoperability

Thailand's e-Government Interoperability Framework (TH e-GIF) was developed to provide a policy framework that promotes the integration and exchange of electronic information among government agencies using information systems that are operated on different ICT platforms. It also recommends the Enterprise Architecture concept (similar to the SWIF as discussed in Section 3) as a methodology that guides the initiation and management of inter-organization systems implementation. It provides a set of guidelines that forms a basis of interoperability among applications in respect to process, data, and technical communication protocols.

TH e-GIF comprises two major parts. The first part deals with managerial aspect of applications integration and development. The second part provides a set of common rules that guides different phases of application development from the elicitation business requirements in terms of process and information to the derivation of XML Schema from the information model. The common rules are based on internationally-accepted standards. They include:

- UN/CEFACT's Modeling Methodology for an analysis and modeling of process and information requirements
- UN/CEFACT Core Components Technical Specification (ISO 15000-5) for the construction of information model
- UN/CEFACT Core Components Library (CCL) as a basis for harmonizing the definition and representation format of data requirements
- UN/CEFACT XML Naming and Design Rules for transforming CCTS-based information model to XML schema

- Technical specifications including communication protocols and security measures required to ensure secure and interoperable exchange of information are also provided in the second part of TH e-GIF, including the *ISO/TS 15000-2:2004-Electronic business eXtensible Markup Language (ebXML) -- Part 2: Message service specification (ebMS)* as the messaging protocol for paperless document exchange currently used in Paperless Customs and Paperless e-Permits and e-Licenses and now used to enable automatic interoperability among different ICT platforms of the 36 government agencies.

3.5 Legal framework

There has been a remarkable progress in the development of legal framework necessary to support the uptake of e-business and e-government transactions in Thailand. Following the effective enactment of Electronic Transaction Bill with an incorporation of Electronic Signature on April 3, 2002, Electronic Transaction Commission chaired by Minister of Information and Communication Technology was founded according to Article 102 of the Bill with below mandate:

- To make sound policy recommendations to the Cabinet regarding the promotion and development of e-business as well as resolutions for any hindrance occurred.
- To monitor the operation of e-commerce
- To propose the development of necessary royal decrees to support the enforcement of Electronic Transaction Bill
- To issue regulations relevant to the implementation of electronic signature
- To handle all other matters as indicated in Electronic Transaction Bill

Under Electronic Transaction Commission, several initiatives that provide critical foundation for the development of e-commerce have been carried out by the Sub-committee on Legal Infrastructure. Key initiatives include:

- The Royal Decree on Regulatory Practices in e-Government Implementation;
- The Royal Decree on Electronic Fund Transfer;
- The Royal Decree and Supplementary Regulation on Services Related to Electronic Certification; and
- Computer Crime Act.

4. Conclusion

During 2010-2011, Thailand is in the second phase of NSW implementation and deployment in which the Thai Customs Department is currently in the process of gathering, developing and reconciling, and implementing the next phase national action plan with the close collaboration of more than 36 government and regulatory agencies, and other business and transport-related stakeholders.

Figure A.2 provides a snapshot of achievement up to the year 2010 and some of the key ongoing works. Participating government agencies are however in different stages of development. Some agencies have already had the back office systems that are capable of interconnecting with e-Customs in place but still incapable of supporting the use of fully automate e-Signature at the user levels. Some are in the process of developing back office systems. Some are in the process of testing the interconnectivity with e-Customs. Some are now working with Thai Customs Department on identifying a set of data to be exchanged. Some expressed the need to use NSW as a channel to issue permit/license/certificate.

Value-added service providers (VAS) have developed software that supports the preparation of documents and the management of export and import procedures. The available services are unfortunately limited and do not respond fully to business needs, e.g. the single window entry services are still in the conceptualization and development phase.

The current development of Thailand's NSW as coordinated and lead by Customs Department can be closely classified as the regulatory SW (the SW Level 2 as discussed in the Five Evolutionary Development Levels of Section 2.2) involving the interconnectivity and information exchange among 36 regulatory agencies.

In an another initiative, the Port Authority of Thailand has completely implemented its e-Port system that resembles the concept of the Port SW (described as the SW Level 3) fully at the Bangkok Port and partially at the Leamchabang Sea Port. This e-Port system is in the deployment and user adoption phase during the first quarter of 2012. The users involve those stakeholders at the port like customs brokers, shipping agents, freight forwarders, and terminal operators. The features and functions of e-Port include electronic data submission and transactions for container management and terminal operations, warehouse management, and port security checking. The next logical level of development for the future is to interconnect and exchange electronic data between the regulatory NSW which already includes Paperless Customs system, with this e-Port community system to further improve and streamline the services for port operations and clearance.

Several software assisted tools for traders and logistics service providers should be further developed and promoted for wider usage. For example, among many ideas, government budgets should be allocated to develop open-source software including back-office and front-office IT systems with NSW connectivity for traders and freight forwarders to speed up the complicated documentary procedures between traders, between importers/exporters and freight forwarders, and between freight forwarders and other logistics providers like carries and port operators.

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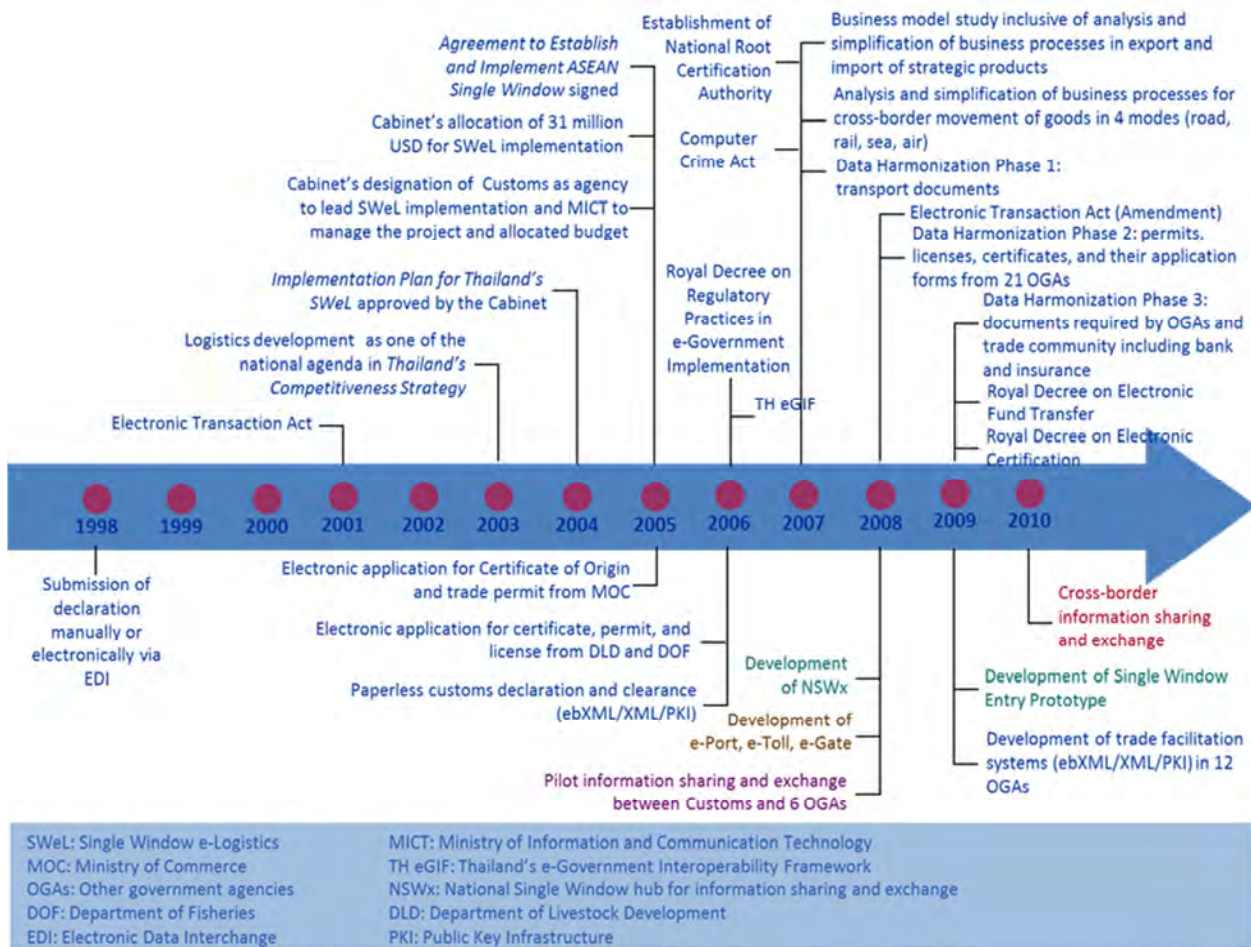


Figure A.2 Thailand's NSW Roadmap