ความก้าวหน้าในการพัฒนาระบบหน้าต่างเดียวของประเทศไทย สถานะปัจจุบันและการพัฒนา

DEVELOPMENT OF THAILAND'S NATIONAL SINGLE WINDOW CURRENT STATUS AND IMPROVEMENTS

สกุณนิษฐ์ โพธิพันธุ์[1] และมนตรี โสคติยานุรักษ์[2]
Sakhunnishta Bodhibandhu[1] and Montree Socatiyanuruk[2]

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาการดำเนินงานของระบบหน้าต่างเดียว (National Single Window) ของประเทศไทยในปัจจุบัน เพื่อนำไปสู่แนวการพัฒนาอีกระดับ โดยมีวัตถุประสงค์ดังนี้ 1) การประเมินระบบหน้าต่างเดียวของประเทศไทย ทั้งในส่วนของโครงสร้าง การดำเนินการ และการมีส่วนร่วมของผู้ให้บริการและผู้ใช้บริการ 2) การระบุปัญหาเกี่ยวกับการดำเนินการและกระบวนการของระบบหน้าต่างเดียว และ 3) การระบุแนวทางแก้ไขที่เป็นไปได้เพื่อปรับปรุงประสิทธิภาพของศุลกากร ประสิทธิภาพของท่าเรือ และประสิทธิภาพในการทำการค้าโดยรวมผ่านระบบหน้าต่างเดียวของประเทศไทย การนำนโยบายระบบหน้าต่างเดียวซึ่งได้เริ่มวางแผนขึ้นในช่วงประมาณปี 2548 ไปสู่การปฏิบัตินั้น ได้มีการพัฒนาไปมากแล้ว และยังคงมีการพัฒนาปรับปรุงอย่างต่อเนื่อง ในการศึกษานี้ดำเนินระเบียบวิธีวิจัยแบบผสมผสานโดยใช้ข้อมูลเชิงปริมาณสนับสนุนข้อมูลเชิงคุณภาพ และศึกษาหลายปัจจัยพร้อมกัน เพื่อตรวจสอบการดำเนินการของระบบหน้าต่างเดียวจากมุมมองของกลุ่มผู้มีส่วนได้ส่วนเสียหลายกลุ่ม ในการเก็บรวบรวมข้อมูล ได้ดำเนินการโดย ระยะที่ 1 การทบทวนนโยบาย ระยะที่ 2 การแจกแบบสอบถาม (n = 400) และระยะที่ 3 การแจกแบบสอบถามปลายเปิด (n= 38) จากนั้น ทำการวิเคราะห์ข้อมูลระยะที่ 1 และระยะที่ 3 โดยใช้การวิเคราะห์เนื้อหา สำหรับข้อมูลระยะที่ 2 ทำการวิเคราะห์โดยใช้สถิติเชิงพรรณนา ผลการวิจัยแสดงให้เห็นว่าขณะนี้ได้มีการใช้งานระบบหน้าต่างเดียว และการดำเนินการตามกระบวนการนำเข้าและการส่งออกสินค้านั้น ส่วนใหญ่ใกล้เสร็จสมบูรณ์แล้ว ซึ่งส่งผลดีผู้ใช้งานและหน่วยงานผู้ให้บริการ โดยเฉพาะอย่างยิ่งการลดต้นทุนและเวลา รวมถึงการปรับปรุงประสิทธิภาพ อย่างไรก็ดี ยังมีบางจุดที่จำเป็นต้องได้รับการปรับปรุงโดยเฉพาะอย่างยิ่งการประสานงานระหว่างหน่วยงานที่ต้องมีการแบ่งปันกระบวนการและข้อมูล และการปรับปรุงความเสถียรของระบบการศึกษานี้มีข้อเสนอแนะในการพัฒนาอย่างต่อเนื่องระบบของหน้าต่างเดียวโดยอิงจากผลการศึกษา

คำสำคัญ: ระบบหน้าต่างเดียว การอำนวยความสะดวกทางการค้า การนำเข้า การส่งออก

[1,2] คณะรัฐประศาสนศาสตร์ สถาบันบัณฑิตพัฒนบริหารศาสตร์
Graduate School of Public Administration, National Institute of Development Administration
Corresponding author email: s.bodhibandhu@gmail.com

Abstract

The aim of this research was to investigate the current implementation of Thailand's National Single Window and identify opportunities for improvement. Objectives included 1) assessing Thailand's existing National Single Window, including its structure and function and agency and customer participation; 2) identifying problems with function and process of the National Single Window; and 3) identifying potential solutions to improve customs efficiency, port efficiency, and overall trade efficiency through Thailand's National Single Window. Implementation of the National Single Window, which began to be considered in policy around 2005, is now substantially complete, but development activities and improvement are still ongoing. This study used a nested sequential qualitative-led mixed methods research design to investigate implementation of the National Single Window from the perspectives of multiple stakeholder groups. Data collection was conducted using a policy review (Phase 1), a questionnaire (n = 400) (Phase 2), and an open-ended questionnaire (n= 38) (Phase 3). The Phase 1 and Phase 3 data was analysed using content analysis, while Phase 2 data was analysed using descriptive statistics. The analysis showed that the National Single Window is currently being used and some aspects, such as implementation of import and export processes, is largely complete. This has provided benefits to users and agencies, especially reduced cost and time and improved efficiency. However, there are still some areas where improvements are needed, particularly interagency coordination of processes and information sharing and improvement of system stability. The study provides recommendations for continued development of the National Single Window based on these findings.

Keywords: National Single Window (NSW), Trade Facilitation, Import, Export

Introduction and Objectives

The central issue of this research is how Thailand's international trade can be improved through implementation of a National Single Window for customs. Since the mid-1960s, Thailand's economy has thrived under a series of export-oriented growth policies (Brown, 2004). Such policies, which have included manufacturing export promotion and other export incentives and promotion of foreign direct investment (FDI) activities, have led to Thailand's now highly competitive position in the global manufacturing value chain (Warr & Kohpaiboon, 2018), as well as its increasingly competitive position in the global digital economy (Kharas & Doodley, 2021). Regionally, the ASEAN Economic Community (AEC) agreement has positioned Thailand as a regional multimodal transport and logistics hub, increasing its importance in global trade networks as a route to neighbouring countries (Pongpreecha & Wasusri, 2019). At the same time, this repositioning has made it increasingly apparent that Thailand's continued growth requires a reduction in regulatory barriers in order to facilitate trade (Shrestha & Thanh Doan, 2021).

A national Single Window (NSW) is a shift in regulatory strategy for Thailand. The single window (SW) is a streamlined regulatory and administrative tool, which facilitates trade by reducing regulatory barriers (Sourdin & Pomfret, 2012a). SWs offers importers and exporters a "one-stop shop" for regulation, reducing the amount of paperwork required and facilitating fee payments and other requirements. Thailand began implementing an NSW in the early 2000s, with the 2005-2009 Thailand Logistics Master Plan (Walsh, 2015). The earliest implementation of the NSW harmonised import and export procedures across 30 different agencies, and provided additional value-added services (UN ECE, 2013). This implementation of Thailand's NSW had significant effects on trade efficiency by reducing export time and cost and turnaround times (Suksri, Sermcheep, & Srisangnam, 2015). Ultimately, it has reduced regional trade friction (Cheewatrakoolpong & Rujanakanoknad, 2011; Das, 2017). Improving the NSW even further to increase integration and reduce trade efficiency even further could have positive effects on Thailand's import and export efficiency, which is increasingly important in its outward-looking and innovation-oriented economy (Thawesaengskulthai, Hyde, & Gill, 2020). Thus, improving Thailand's NSW is a matter of economic significance.

There has as yet been little academic research devoted to the problem of Thailand's NSW. In fact, only a few studies were identified that have addressed its existence or efficiency, and none have considered this question recently despite the rapid changes in Thailand's economy that have occurred post-COVID (Virakul, Na Chiangmai, & Senasu, 2022). This research aims to address the gap in academic research by examining the current implementation of Thailand's NSW and seeking opportunities for improvement. The central objectives included 1) assessing Thailand's existing NSW, including its structure and function and agency and customer participation; 2) identifying problems with function and process of the NSW; and 3) identifying potential solutions to improve customs efficiency, port efficiency, and overall trade efficiency through Thailand's NSW.

Literature Review

Barriers to trade, transaction costs, and trade costs

A trade barrier is a government restriction on international trade flows, including tariff barriers and non-tariff barriers (Ma & Lu, 2011). Such restrictions can be outright barriers (for example, barring imports from specific countries or of specific types of goods), but they can also be financial or non-financial barriers, such as import duties and fees, other transaction costs, and time costs (Poon & Rigby, 2017). One particular type of trade barrier is the administrative trade barrier, which stem from the cost of regulatory compliance for trade (Ching, Wong, & Chang, 2004). Such administrative barriers can include for example complicated import/export regulations, lengthy waits for inspections and customs clearance, and/or large amounts of paperwork (Maggi, Mrázová, & Neary, 2022). Unlike other types of trade barriers, such as tariffs or licensing requirements, administrative trade barriers are not

usually erected intentionally (Nitsch & Wolf, 2009). Instead, administrative barriers stem from inefficient bureaucracy within a generally open economy (Laajaj, Eslava, & Kinda, 2023). Whether intentional or not, administrative trade barriers still increase the cost of trade. For example, Hornok and Koren (2015) found that reducing administrative trade barriers in Spain by 50% was equivalent to reducing ad valorem tariffs by 9%. In the United States, it was found that high administrative barriers actually reduced import volume and value (Hornok & Koren, 2010). Thus, reducing administrative barriers to trade in a trade-oriented economy could have a significant impact on trade flows and costs.

From the perspective of the individual firm, transaction costs, or the financial and non-financial costs involved in engaging in business, determine the extent of participation in international trade (Rindfleisch, 2020). International trade is associated with high information asymmetry (Hennart, 2015) and behavioural uncertainty (Cuypers, Hennart, & Silverman, 2021), which create high transaction costs. These uncertainties and the associated transaction costs do influence international market selection and the export decision in general (He, Tian, & Wang, 2019). Additionally, trade costs, or the costs associated with international trade, also affect the export decision (Deardorff, 2014). Trade costs include shipping, customs clearance, currency exchange costs, and costs associated with legal and regulatory compliance (Sourdin & Pomfret, 2012a). Essentially, the trade costs are those associated with getting goods to the border, direct and indirect costs of crossing the border, and those involved with distributing goods beyond the border (Moïsé & Florian Le, 2013). Reducing transaction costs and trade costs underlies the principle of trade facilitation and the SW concept.

Trade facilitation and the single window (SW) concept

Trade facilitation measures are policies and systems that are designed to reduce trade costs, including direct costs and indirect costs (Grainger, 2011). Trade facilitation can take a number of different forms, including regulation changes, process changes, and changes to documentation and regulatory compliance systems such as implementation of information technology (IT) based systems (Sourdin & Pomfret, 2012b). Trade facilitation can target different areas that impose policy costs, such as customs and regulatory environment, e-business usage, and port efficiency (Wilson, Mann, & Otsuki, 2003). Wilson et al.'s (2003) research indicated that in the Asia Pacific region, port efficiency and regulatory barriers were the most significant areas where trade facilitation could be effective at reducing trade costs. More recent research has suggested that lowering non-tariff barriers, particularly for outbound trade from developing countries, is a bigger concern for trade facilitation policies (Hoekman & Nicita, 2011). Issues of trade facilitation, particularly reducing non-tariff barriers for developing countries, are the focus of the World Trade Organization (WTO) Trade Facilitation Agreement, also known as the Bali Package (Hoekman, 2016). The Bali Package is intended to address questions like efficiency of ports and customs procedures and modernization of customs

procedures (Kanyimbo, 2013). Thus, there have been movements toward increasing trade efficiency.

Although there is no single approach to trade facilitation, the SW has proved to be one of the most popular choices in improving efficiency (Choi, 2011). While the SW concept has been defined in different ways, in general the concept refers to "A 'cross-border', intelligent' facility that allows parties involved in trade and transport to lodge standardized information, mainly electronic, with a single-entry point to fulfil all import, export and transit related regulatory requirements (World Customs Organization, 2013, p. 20)." The SW can be conceptualised as a central environment, which coordinates communications between traders and government agencies, such as customs, agriculture, health, and transport agencies (Choi, 2011). SW designs can be conceptualised as either single window, single submission portal, and single environment (World Customs Organization, 2013). Table 1 summarizes the key differences between these three designs. As this shows, the SW concept is the most restrictive, while the single environment is most permissive. However, exactly what any SW includes depends on the jurisdiction, as there are variations in rules and regulations as well as stage of implementation (Niculescu & Minea, 2016). Furthermore, SW systems are typically implemented in a stated fashion, beginning with relatively simple one-stop shops or smaller (such as port-level) SW systems (Tsen, 2011). Thus, any particular NSW is likely to be the culmination of several stages of implementation.

Table 1 Typology of single window environments (Adapted from World Customs Organization, 2013)

Characteristic	Single Window	Single Submission Portal	Single Environment
Exclusive on the market	Must be	Can be	Can be
Standardized documents and information	Must use	Must use	Must use
Government mandate for single entry point	Must have	Can have	Can have
Regulatory processes	Must include	Can include	Must include
Single submission point	Must be	Should be	May be

Effective SW implementation

There are several guidelines for effective SW implementation available from standard documentation (World Customs Organization, 2013). First, the requirement to standardise and streamline information flows and documentation requires data formats and interfaces to be standardised in the back end. Furthermore, because it is expected that the standardisation of

the SW will drive standardisation of data formats, processes, and so on, they should be as strong as possible (World Customs Organization, 2013). These requirements may often be 'stepped' or trialled through smaller implementations, such as port-level implementations, to ensure they will be successful when applied at a larger scale (Tsen, 2011).

There are a number of known issues with SW implementation. One of the biggest known issues is the coordination of standardisation of forms and information, process flows, and back-end systems across multiple agencies (McLinden, Fanta, Widdowson, & Doyle, 2011). Such coordination of efforts requires a significant resource allocation for change management within the partner agencies, as well as development of the SW agency and systems, which is highly complex and prone to failure. Additionally, the regulations, policies, and procedures that are implemented within the SW need to be suited to the SW system, and if they are not they must be adapted (Tijan, Jardas, Aksentijević, & Hadžić, 2018). This can involve a significant amount of regulatory and procedural change within partner agencies, outside the effort required to align policies and procedures to the SW (Abeywickrama & Wickramaarachchi, 2015). Thus, the implementation of a SW system is highly complex, and requires significant dedication of resources to inter-agency coordination and change efforts as well as the technical design of the SW itself.

The question of what effect an effective SW implementation on trade is uncertain. In theory, NSW systems reduce the complexity of regulatory procedures, forms, and time, while reducing the amount of duplication, thus significantly reducing cost and time to import goods (Sourdin & Pomfret, 2012b). A global study of 72 countries has supported this effect, showing that NSW systems were a minor, though significant, positive predictor of trade flows (de Sá Porto, Canuto, & Morini, 2015). NSWs may also affect trade costs by removing opportunities for corruption, particularly by removing individual customs agents as the sole decision maker and creating oversight over paperwork (Ndonga, 2013). NSWs could also reduce the amount of time required for shipment, increasing transport sustainability and reducing waste (Tijan, Agatić, Jović, & Aksentijević, 2019). Thus, there are a variety of ways that NSW systems can benefit trade flows in general.

Thailand's National Single Window (NSW)

Trade costs are known to be a problem for Thailand's international trade. One study, which investigated trade between 1996 and 2012, found that bilateral trade costs for ASEAN-4 countries have fallen, but costs for Thailand's largest five trade partners did not (Saggu, Utoktham, & Stone, 2016). Their study, showed that the biggest trade costs were associated with regulatory compliance; for example, one sample category required 13 different procedures and 31 documents, costing USD298 and requiring 22 days to import (Saggu et al., 2016). Another study has also found that bureaucratic and regulatory compliance

costs are a significant and increasing part of trade costs (Wongpit, 2013). Thus, there is a clear case for NSW implementation in Thailand.

In Thailand, the first steps toward an NSW was the ASEAN Agreement to Establish and Implement the ASEAN Single Window (ASEAN, 2005). The initial goal was for the ASEAN Single Window (ASW) to be operational by 2018, but this has not yet occurred due to failure of several ASEAN governments to implement a NSW (Das, 2017). However, in Thailand the effort has been ongoing since 1998, with implementation of the Customs EDI Services (UNNext, 2012). By 2011-2015, it was planned that the ASW and other international single windows would be implemented (Koh & Mowerman, 2015). Implementation of the NSW has had significant benefits, reducing cargo clearance to two steps and turnaround to under five minutes for most shipments (UNNext, 2012). This has led to a significant improvement in trade efficiency, particularly for trade within ASEAN (Suksri et al., 2015). However, there may still be improvements to be made, which led to this study.

Research Methodology

Research Framework

The research framework is illustrated in Figure 1. The first aspect of the research framework is the stakeholders, who are involved in policy formation and whose interests are affected by the policies as implemented (Clemons & McBeth, 2015). Trade facilitation theory (Pomfret & Sourdin, 2010a; Sourdin & Pomfret, 2012b; Wilson et al., 2003) forms the basis for the second aspect of the framework, which is the implementation process. There are three process-related success factors included in the framework, which include successful interagency coordination (Kassim & Abu, 2015; Wang, 2018), implementation of technology that is suitable for the stakeholders (Kim & Kim, 2014) and choice of standardised technologies and models for data flows in order to facilitate integration into regional and global systems (World Customs Organization, 2013). Finally, lowered trade costs (including direct, indirect, and hidden trade costs) (Hoekman & Nicita, 2011; Moïsé, Orliac, & Minor, 2011; Sourdin & Pomfret, 2012a, 2012b), improved customs efficiency (Das, 2017; Saggu et al., 2016), and increased port efficiency (Wilson et al., 2003) are identified as outcome-based measures of successful implementation.

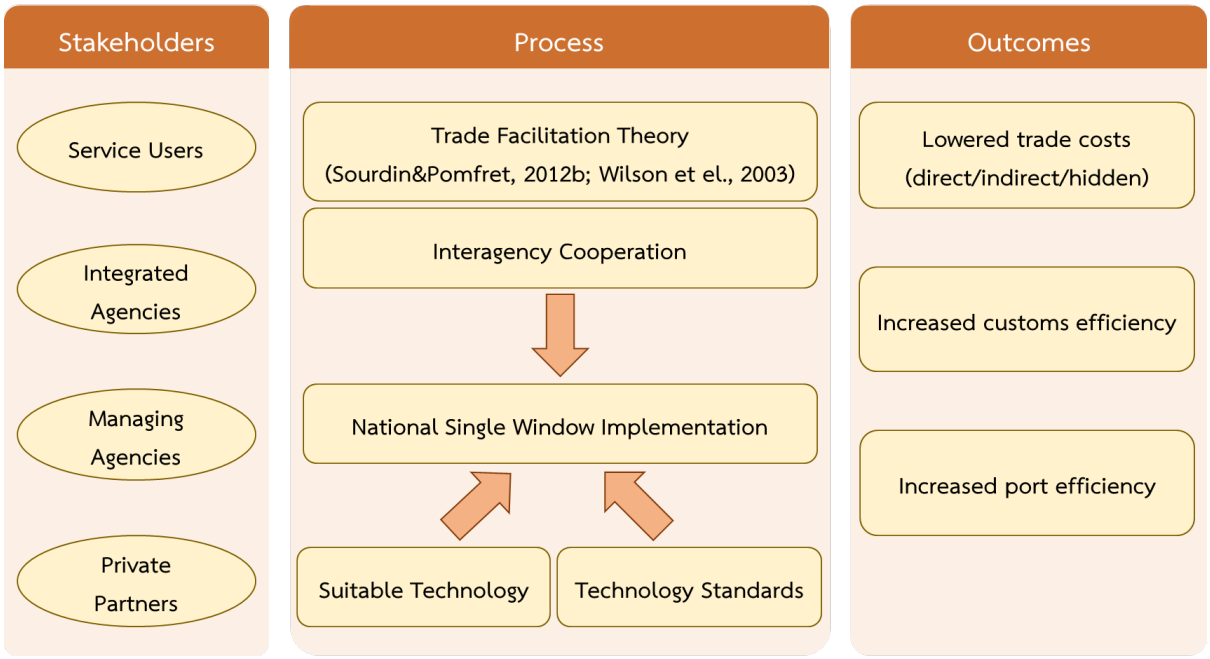

Figure 1 The research framework

Research design

The study used an embedded multi-strand QUAL(quan) sequential mixed methods research design, with a three-stage research process. An overview of these three stages is provided in Figure 2.

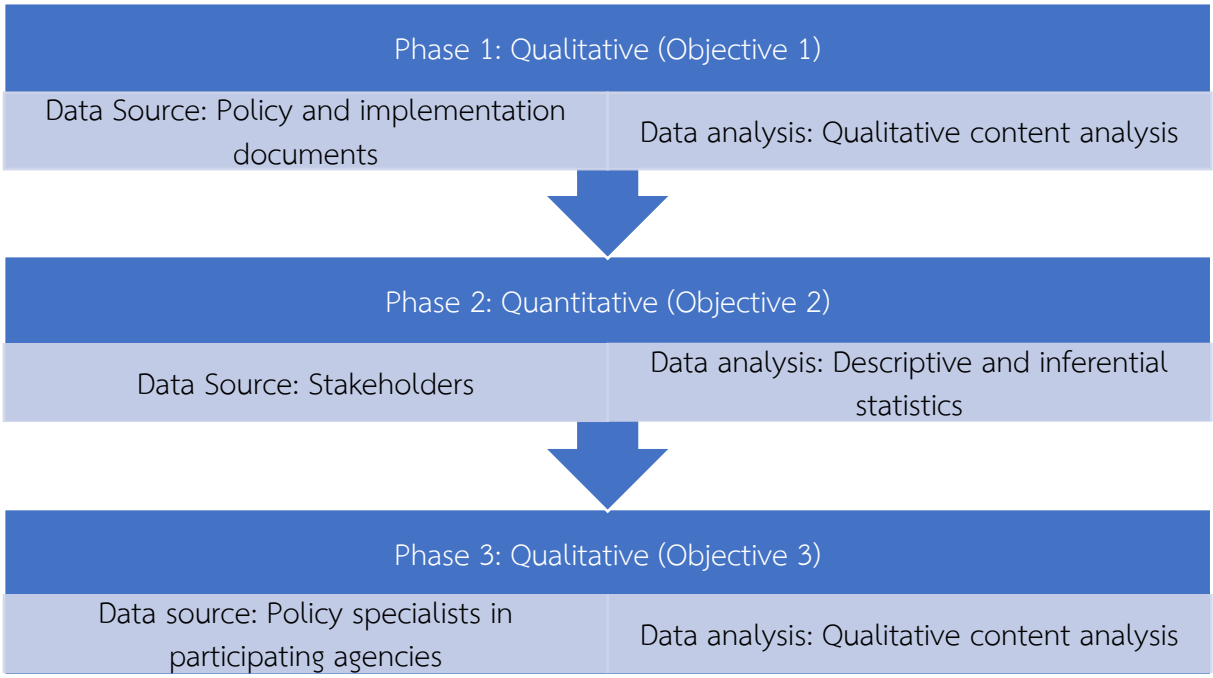

Figure 2 Overview of the three stages of the research

Data collection and analysis – Phase 1.

Data collection for Phase 1 used a document review of policy and implementation documents sourced from relevant agencies, which related to the prior implementation efforts for the NSW and ASW. The data was collected using a comprehensive document search of documents from news sources, agencies, customers, and independent observers. This document review was limited in that it only included data that was publicly available, as the researcher did not have access to confidential documents from stakeholders. Data analysis for this stage used a qualitative content analysis (QCA) approach, in which codes were rigorously applied to the textual data in order to reduce and interpret the findings (Kuckartz, 2014). A directed approach was used, with initial codes identified from the literature review (Hsieh & Shannon, 2005).

Data collection and analysis – Phase 2.

The population of interest in Phase 2 included stakeholders in the NSW, including policymakers, representatives of participating agencies and service users (e.g., end customers, logistics suppliers and exporters, and import/export agents). The final sample (n = 400) was above the target minimum sample size of 385 members for a large but unknown population size (Krejcie & Morgan, 1970). Snowball sampling was used to select participants, since this enabled the researcher to reach a relatively sparse population that does not have obvious access routes (Handcock & Gile, 2011). Data was collected using a questionnaire that was developed by the researcher following the literature review and analysis of Phase 1 findings. The questionnaire included open-ended and closed-ended questions that investigated NSW usage experience, problems, and opportunities. The questionnaire was tested using an item-objective congruence (IOC) index approach (Rovinelli & Hambleton, 1977), in which a panel of five experts was asked to review the questionnaire and assess the construct validity of each item. Items were adjusted based on the feedback prior to distribution. The questionnaire was distributed online to broaden participation (Toepoel, 2016). Analysis included descriptive statistics.

Data collection and analysis – Phase 3.

Data collection for Phase 3 used open-ended questionnaires, which were distributed to international trade policy experts, policymakers, and representatives of stakeholders including participating agencies, import and logistics companies, and others who use the service (n = 38). This sample was purposely selected to ensure reliability of information about stakeholder views (Hennink, Hutter, & Bailey, 2020). An open-ended questionnaire was used because data collection took place during the COVID pandemic, which precluded meeting face-to-face. There were other advantages as well, as questionnaires give participants time to think about questions, undertake research if needed, and provide more detailed answers than they may during interviews (Babbie, 2008). Therefore, while this was a compromise in terms

of data collection, it also had some advantages. Data analysis was conducted using QCA, with a similar approach as was used in Phase 1.

Research Findings

Phase 1: Document review

Phase 1's document review addressed the first objective of the research, which was to assess Thailand's existing NSW, including its structure and function and agency and customer participation. Document review began with the Action Plan on Thailand Logistics Development (2023-2027), which was published in January 2023. Guideline 3 of the Action Plan calls for improvement of customs clearance and international transport facilitation. It identifies five strategies to address this guideline, which are summarized in Table 2. As this shows, broadening usage and data linkages to the NSW is one of the key strategies that will achieve this guideline.

Table 2 Summary of key strategies for Guideline 3 of the Action Plan on Thailand Logistics Development (2023-2027)

Strategy	Objective
1	Develop data linkages and accelerate full usage of the National Single Window (NSW) system.
2	Develop electronic logistics processes.
3	Improve cross-border freight transport facilitation at major trade gateways.
4	Accelerate cooperation and remove barriers to international transport.
5	Amend laws and regulations regarding international transport and logistics.

The second key document that was reviewed was the Progress Report on implementation of the National Single Window (NSW) and ASEAN Single Window (ASW) as of September 2023. Key statistics on usage of the NSW are summarized in Table 3. There are currently 34 connected government agencies, five privately held ports and transportation terminals, and 17 connected e-payment and e-guarantee providers. This is a slight reduction from the previous year, as three units (Aeronautical Radio of Thailand, Airports of Thailand (AOT) and Civil Aviation Authority of Thailand (CAAT)) eliminated duplicate linkages through existing systems. Thus, this represents an increase in efficiency, even if it is a lower number of agencies overall.

There are some opportunities to continue to improve the NSW within this document. Currently, 464 out of 470 targeted import, export, and logistics processes have been developed, leaving six in progress. The development of the ASW is also substantially complete in areas such as the ATIGA e-Form D (all ASEAN trade partners) and ASEAN Customs Declaration Document (ACDD) (seven trade partners). However, the e-Phyto certificate has to

date only been linked to Indonesia, with testing beginning with Philippines. Thailand's NSW is also beginning the process of linkage outside ASEAN, with trade partners including Japan, China, and IPPC Hub country members (Argentina, Australia, Chile, Fiji, France, Morocco, New Zealand, South Korea, and the United States). Additionally, there are several data linkage projects for G2G and B2G in progress, including development of data linkages and processes. Additionally, central platform registration, as planned under the Royal Decree on Principles and Procedures for Good Government Administration (No. 2) B.E. 2019, has been targeted for near-future development. In summary, the development of the NSW is currently in progress, with some areas such as import, export, and logistics processes substantially complete, but other areas such as central platform registration remain to be implemented.

Table 3 Key statistics on usage of Thailand's NSW (September 2023)

Registered Users	15,595
Legal entities	13,390
Personal users	1,935
Average monthly documents (January-September 2023)	12,059,460
Year-on-year increase	7.7%
Connected agencies	34
Government-to-government (G2G) services	32
Business-to-government (B2G) services	27
Customs, tariffs, and other import-export agencies	23
Connected ports and terminals	5
Connected payment and guarantee providers	17

Phase 2: Stakeholder survey

The stakeholder survey conducted in Phase 2 of the study addressed the second objective of the research, which was to identify problems with function and process of the NSW. The survey investigated the experience of border compliance before implementation of the NSW, including time and cost, and the experience of the NSW. Only 184 of 400 firms (46%) tracked import-export performance measures prior to implementation of the NSW. Therefore, the first half of the survey was completed by fewer respondents.

Pre-NSW costs. A summary of estimated costs per shipment prior to the NSW is summarized in Table 4. Exports and imports had similar costs. 38.6% to 39.1% of firms typically had costs of under 2,500 Baht per shipment for ordinary imports and exports, with 28.3% to 29.3% having costs of 2,501 to 5,000 Baht and 8.2% to 12% having costs of over 5,000 Baht. Import and export licenses, permits and certificates were also similar, with 28.8% to 32.1% of firms having costs under 500 Baht per shipment, 29.3% to 35.3% of firms having costs of 501 to 1,000 Baht, and 16.3% to 21.2% of firms having costs over 1,000 baht.

Table 4 Summary of estimated pre-NSW costs per shipment

	Export/import Cost per Shipment			
	Don't know Didn't use	≤2,500 Baht	2,501 – 5,000 Baht	>5,000 Baht
Ordinary import	38 (20.6%)	72 (39.1%)	52 (28.3%)	22 (12%)
Ordinary export	44 (23.9%)	71 (38.6%)	54 (29.3%)	15 (8.2%)
	Don't know Didn't use	≤500 Baht	501 – 1,000 Baht	>1,000 Baht
Import license, permit or certificate	27 (14.7%)	53 (28.8%)	65 (35.3%)	39 (21.2%)
Export license, permit or certificate	41 (22.3%)	59 (32.1%)	54 (29.3%)	30 (16.3%)

Pre-NSW border compliance time. As shown in Table 5, even prior to the NSW implementation, most ordinary (unrestricted) imports and exports were processed within one to two days, with only 5.4% to 6.5% taking three days or longer. However, restricted imports and exports, which required a license or other documentation, could take much longer, with 19.6% of restricted imports and 14.2% of restricted exports taking three days or longer.

Table 5 Summary of estimated pre-NSW time per shipment

	Days to Complete Processing				
	Don't know	1	2	3	4+
Ordinary import	31 (16.8%)	95 (51.6%)	46 (25%)	11 (6%)	1 (0.5%)
Ordinary export	28 (15.2%)	123 (66.8%)	23 (12.5%)	9 (4.9%)	1 (0.5%)
Restricted import	33 (17.9%)	59 (32.1%)	56 (30.4%)	25 (13.6%)	11 (6%)
Restricted export	34 (18.5%)	64 (34.8%)	60 (32.6%)	15 (8.2%)	11 (6%)

NSW activities. Table 6 summarizes the activities that the NSW is used for by firms after implementation. This shows that submitting data for import and export and export/import license/certification applications are used by most of the respondents. However, e-tracking and information search are used much less.

Table 6 NSW tools and facilities used by survey participants

	Yes	**No**
Import data submission	342	58
	(85.5%)	(14.5%)
Export data submission	314	86
	(78.5%)	(21.5%)
License/certification applications	400	0
	(100%)	(0%)
E-tracking	72	328
	(18%)	(82%)
Information search	20	380
	(5%)	(95%)

NSW experience. Most of the participants were frequent users of the NSW, using it up to 10 times a month (36.5%), 11-30 times a month (48.3%) or more than 30 times a month (15.3%). Most transaction times were up to 30 minutes (70.3%), although a few were over 40 minutes (8%). A relatively small group (14.8%) had experienced a critical incident with an NSW transaction. However, a slightly larger group (20.3%) thought there were barriers to using NSW.

NSW attitudes and satisfaction. Table 7 summarizes attitudes and perceptions of the NSW among respondents. On this scale, 1 indicated strongly disagree, 3 indicated disagree, 5 indicated neutral, 7 indicated agree, and 10 indicated strongly agree. Therefore, responses between 1 and 3 can be viewed as disagreement, 4 to 6 as a neutral position, and 7 to 10 as agreement. Overall, most of the responses fell into the 'agreement' range in terms of mean, indicating that respondents agreed the NSW has streamlined paperwork, simplified trade documentation, brought convenience, allowed the firm to optimise human resources, and streamlined and brought transparency to border compliance processes. About 25.8% indicated a less than 10% time reduction, while 54.3% estimated a 10% to 20% time reduction. 19.3% indicated the time reduction was more than 20%. They also agreed that the NSW has reduced the cost of border compliance and duplication of trade documentation. When asked about cost reduction, 38.8% indicated a 10% or less cost reduction, while 46.3% indicated 10% to 20% cost reduction and 12.5% indicated higher reductions. Finally, the NSW was viewed as technologically suitable in general.

There were some areas that indicated a needed improvement. On average, respondents were neutral about whether the NSW implementation has led to procedural delays or increased repetitive document submission, or required more time for border compliance. They also were neutral about the NSW reaching all regulatory agencies and authorities the firm needed to deal with. Participants also felt that the NSW did not have full participation from regulatory agencies. Perhaps most importantly, there was a high level of agreement that there were still some improvements needed within the NSW. Thus, while

overall views were neutral to positive, there were still indications that there was a need to improve the NSW even further.

Table 7 Perceptions and satisfaction of the NSW

The Thailand's NSW point of view and level of satisfaction.	**Mean**	**Std. Deviation**	**Interpretation**
The introduction and implementation of the Thailand's NSW has streamlined paperwork for border compliance.	7.7	1.560	8
The introduction and the implementation of the Thailand's NSW has led to the simplification in lodging trade documents to the regulatory agencies or port/border handling agencies.	7.0	2.099	7
The introduction and implementation of the Thailand's NSW has brought you a convenience to lodge documents anywhere 24/7.	7.5	1.688	8
The introduction and implementation of the Thailand's NSW has streamlined paperwork for border compliance.	7.6	1.564	8
The introduction and implementation of the Thailand's NSW has led to the increase of transparency in border compliance.	7.2	1.681	7
The introduction and implementation of the Thailand's NSW has led the procedural delay cost to be incurred.	4.3	1.731	4
The introduction and implementation of the Thailand's NSW has enabled to optimize your organization's human resource.	7.0	1.459	7
The introduction and implementation of the Thailand's NSW has led to the increase of repetitive document submission.	4.8	1.928	5
The Thailand's NSW has technological suitability for your organization.	7.0	1.547	7
The Thailand's NSW requires a longer period of time for border compliance.	4.5	1.688	4
The current Thailand's NSW does not reach all the regulatory agencies or port /border handling agencies you deal with.	5.3	2.043	5

Table 8 Perceptions and satisfaction of the NSW (cont.)

The Thailand's NSW point of view and level of satisfaction.	**Mean**	**Std. Deviation**	**Interpretation**
The current Thailand's NSW does not reach all the regulatory agencies or port /border handling agencies you deal with.	5.3	2.043	5
The current Thailand's NSW is not user friendliness.	5.7	1.951	6
The current Thailand's NSW has not fully participation from the regulatory agencies.	7.3	1.558	8
The introduction and implementation of the Thailand's NSW has resulted in the reduction of border compliance cost.	6.2	1.903	6
The introduction and implementation of the Thailand's NSW has eliminated the duplication of trade documents lodging to the Customs Department and relevant agencies.	6.8	1.594	7
There are some requirements needed to improve Thailand's NSW.	8.1	1.485	8

Phase 3: Expert surveys

Phase 3's agency surveys addressed the third objective of the study, which was to identify potential solutions to improve customs efficiency, port efficiency, and overall trade efficiency. Of the 38 respondents, only seven had not linked information, licensing, or electronic certificates with the NSW. Of these agencies, two were currently in the process of testing NSW links. The others did not have a need to link to the NSW, either because they did not deal with import/export issues at all or because they were linked to the ICAO-compliant Flight Permit Online System (FPOS).

The respondents identified a range of benefits the agency has experienced from NSW linkage, which are summarized in Table 8. As this shows, there are some significant benefits, including reduced usage of paper and other resources and reduction of documents; reduced time; improved convenience; better interagency coordination; improved tracking and measurement of applications; reduced processing costs; and a reduction in fake documents, errors, and unlicensed imports. Overall, participants viewed the NSW as beneficial for these reasons.

There are also some problems in use of NSW, which are summarized in Table 8 as well. Ten of the respondents reported there were no problems with implementation. However, issues like system delays and instability, the system not checking data is correct and

responding badly to incorrect data, and failure to link and share data between agencies were reported relatively frequently. Thus, there are some technical issues that need to be addressed within the NSW, but perhaps most important, to improve efficiency it is necessary to enable linking information and certifications between agencies and improve the system stability and reduce delays.

Table 9 Benefits and barriers of NSW implementation

Benefits	**Responses**
Reduced paper usage/number of documents/other resources	17
Reduced time (agency and customer)	16
Improved convenience (less travel, etc.)	16
Better interagency coordination and consistency, less duplication	12
Improved tracking and measurement	12
Reduced cost (agency and customer)	11
Fewer fake documents, unlicensed imports, and errors	8
Barriers	**Responses**
System delays and instability	6
No checks that data is correct before entry, system responds poorly to incorrect data	6
No linking of information and certificates between agencies	5
Lack of scalability for high volume	4
Need better technical assistance and documentation	4
Need training for new users	3
Data transmission failures are not reported correctly	3
No capability for custom fields, some information not available	2
Problems cannot be resolved automatically	2
Still need to manually release shipments	1
Data should be encrypted	1
No issues encountered	*10*

Recommended improvements for the NSW are summarized in Table 9. The most common recommendations include improving interagency coordination of tasks like registration, documentation, and licensing and improving tracking and reporting of licenses and other documentation. These improvements are more commonly mentioned than system improvements for reliability and stability, communication channels, and error checking among others.

Table 10 Recommendations for improvement in NSW implementation

Improvements	Responses
Improve interagency coordination of registration, documentation and licensing	7
Improve tracking and reporting	5
Improve system reliability and efficiency	3
Improve communication channels	3
Improve error checking, catch and report incomplete applications	2
Improve design and functionality	2
Provide public information and training	1

Conclusion, Critiques and Recommendations

In summary, this research has shown that Thailand's NSW is under development, with many of the required processes and information flows already completed and many others under coordination. Many of the relevant agencies have already linked to their systems to the NSW, with only a few agencies not linking, typically due to lack of requirement or use of other systems. Furthermore, users of the NSW have perceived some significant benefits, including reductions in cost and time requirements for import and export. However, there are still some gaps in the NSW. While import/export licensing and paperwork completion is widely used, the NSW is not regularly used for tools like information search and e-tracking. From the agency perspective, there are some significant benefits to the NSW, such as reduced paper and resource use, time, and cost for both the agencies and customers. However, there are still some significant issues, particularly system delays and instability, no checks to ensure data is correct, and failure to link data and licenses between agencies. Respondents view the biggest improvement needs as being improved interagency coordination and tracking and reporting of data and licenses, along with various technical improvements. Some of these improvements will be necessary in order to facilitate the achievement of the Action Plan on Thailand Logistics Development (2023-2027), where the first strategy is improving data linkages and usages of the NSW.

These findings suggest that, as with many NSW implementations (Tsen, 2011), Thailand's NSW implementation is a work in progress, with gradual improvements and changes as the system grows. Thus, the development of the NSW does have a clear direction. Increasing integration between documents and information can transition the NSW more fully toward a single window system (World Customs Organization, 2013). Some improvements may prove to be a challenge, as it is known that interagency coordination of data and documentation is one of the potential ways in which the SW implementation can encounter trouble (McLinden et al., 2011). Sharing data may require changes to regulation or the processes and policies of some agencies, which may face resistance (Tijan et al., 2018). Thus, it is likely that further

interagency coordination may not be simple to achieve. However, since a stable system that is strongly integrated is essential to achieve efficiency, for example by reducing procedure and form duplications (Sourdin & Pomfret, 2012b) and reducing cost and time (Tijan et al., 2019), it is still worth doing.

There are some limitations to the study that should be considered. One of these limitations is that the study was based on responses from single representatives of the partner agencies. Thus, it is possible that respondents may not have been aware of all issues within the agency, and therefore there could be additional issues that are encountered in the agency. Furthermore, as there were limited documents available for review, the implementation process as a whole may be more limited at the agency level. These limitations are inherent in the research, since the researcher held an outside position and therefore could not access internal agency documentation. Finally, the research did not include a technical evaluation of the NSW system, and instead relied on user documentation and official statistics. Therefore, the study does not address the state of technical development of the NSW.

This research has identified several gaps in the literature, which should be addressed in later studies. One of these gaps is that there has been little international comparison of NSW implementations or outcomes between countries. While NSW implementations are acknowledged to be individual and responsive to regulatory environments, such international research could allow for the development of best practices for technical integration and interagency coordination. There is also room in the literature for more extensive research into the development of the ASEAN Single Window (ASW) in ASEAN countries. The ASW represents a regional and coordinated effort to develop NSWs on the part of nations with varying financial and technical resources, institutional strength, and export regulations and economic policies. Thus, its implementation offers an excellent opportunity to compare NSW implementation approaches within differing institutional and economic contexts.

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