Comparative analysis of four advanced single windows in Asia

Hong Kong, China; Japan; Republic of Korea and Singapore

Jonathan Koh

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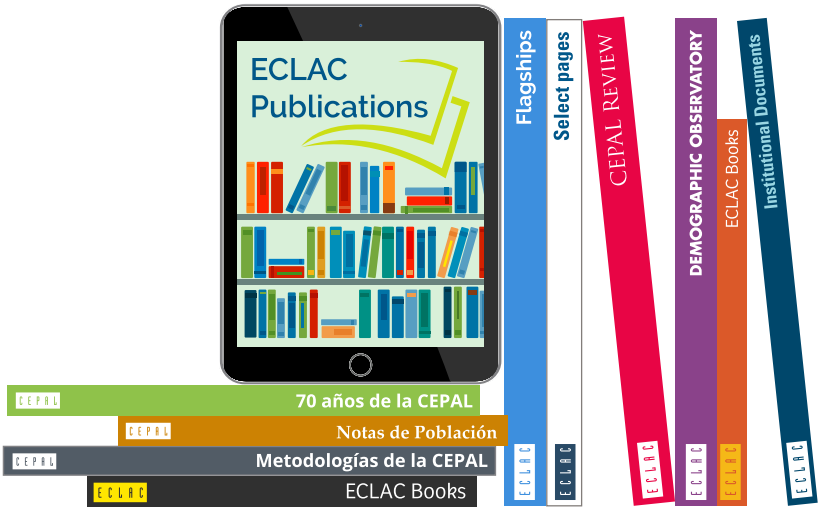

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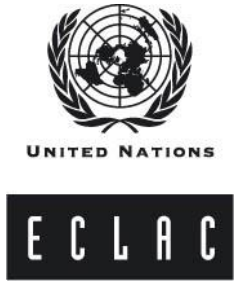

This document was prepared by Jonathan Koh, a consultant with the International Trade and Integration Division of the Economic Commission for Latin America and the Caribbean (ECLAC), within the framework of the cooperation programme between ECLAC and the Republic of Korea, as part of the project "Promoting digital and inclusive trade in Latin America and the Caribbean: learning from single windows in the Republic of Korea and other Asian countries".

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United Nations publication
LC/TS.2024/85
Distribution: L
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Printed at United Nations, Santiago
S.2400613[E]

This publication should be cited as: J. Koh, "Comparative analysis of four advanced single windows in Asia: Hong Kong, China; Japan; Republic of Korea and Singapore", *Project Documents* (LC/TS.2024/85), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2024.

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Contents

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Diagrams

Acrónimos

ACCS	Air Cargo Clearance System
ACI	Advance Cargo Information
AI	Artificial intelligence
AMS	ASEAN Member States
ASEAN	Association of Southeast Asian Nations
ASW	ASEAN Single Window
ATIGA	ASEAN Trade in Goods Agreement
B/L	Bill of Lading
B2B	Business-to-Business
B2G	Business-to-Government
C&ED	Customs and Excise Department
C&SD	Census and Statistics Department
CA	Competent Authorities
CCM	Cargo Clearance Module
CCP	Cargo Clearance Permit
CEDB	Commerce and Economic Development Bureau
CETS	Community Electronic Trading Service
CNM	Certificate of Non-Manipulation
CO	Certificate of Origin
DCP	Dutiable Commodities Permit
e-B/L	Electronic Bill of Lading
EDI	Electronic Data Interchange
e-L/C	Electronic Letter of Credit
EMAN	Electronic Service on Manifests
EODES	Electronic Origin Data Exchange System
FTA	Free trade agreement
G2G	Government-to-Government
GETS	Government Electronic Trading Services
HS	Harmonized System
IRM	Integrated Risk Management
IT	Information Technology
KCNET	Korea Customs Network
KCS	Korea Customs Service
KITA	Korea International Trade Association
KTNET	Korea Trade Network Co. Ltd.
L/C	Letter of Credit
MSME	Micro, Small, and Medium Enterprises (MSMEs)
N2N	Nation-to-Nation
NACCS	Nippon Automated Cargo Clearance System
NTP	Networked Trade Platform
OGA	Other Government Agencies
PCO	Preferential Certificate of Origin

PCS	Port Community Systems
PGA	Participating Government Agency
PPP	Public-Private Partnership
ROCARS	Road Cargo System
SAR	Special Administration Region
SNS	Singapore Network Services Pte Ltd
SP	Service Provider
SW	Single Window
TFA	Trade Facilitation Agreement
TID	Trade and Industry Department
TSW	Trade Single Window
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UNCITRAL	United Nations Commission on International Trade Law
UNECE	United Nations Economic Commission for Europe
VAN	Value-Added Network
VASP	Value-Added Service Providers
WCO	World Customs Organization
WoG	Whole-of-Government
WTO	World Trade Organization

Introduction

In the last two decades, the concept of the Single Window for Foreign Trade (SW) has acquired increasing importance in the global trade facilitation agenda. The main goal of the SW is to enhance trade facilitation, reduce administrative burdens, and promote efficient and secure trade processes. The United Nations Economic Commission for Europe (UNECE) UN/CEFACT Recommendation No.33 - "Recommendation and Guidelines on Establishing a Single Window - To Enhance the Efficient Exchange of International Trade Information Between Trade and Government" was first published in 2005 and updated in 2020, to factor the various developments —including technological ones— that took place in the intervening period. This latest version (UN/CEFACT, 2020) defines a Single Window as:

> "a facility providing trade facilitation that allows parties involved in trade and transport to lodge standardized information and documents with a single-entry point to fulfil all import, export, and transit-related regulatory requirements. Individual data elements should only be submitted once electronically".

The establishment of a Single Window plays a crucial role in the move towards paperless trade, generating significant savings in time and money for both companies and the different public bodies involved in foreign trade operations. The Trade Facilitation Agreement of the World Trade Organization (WTO), which entered into force in 2017, establishes the commitment of all its members to maintain or establish a Single Window.

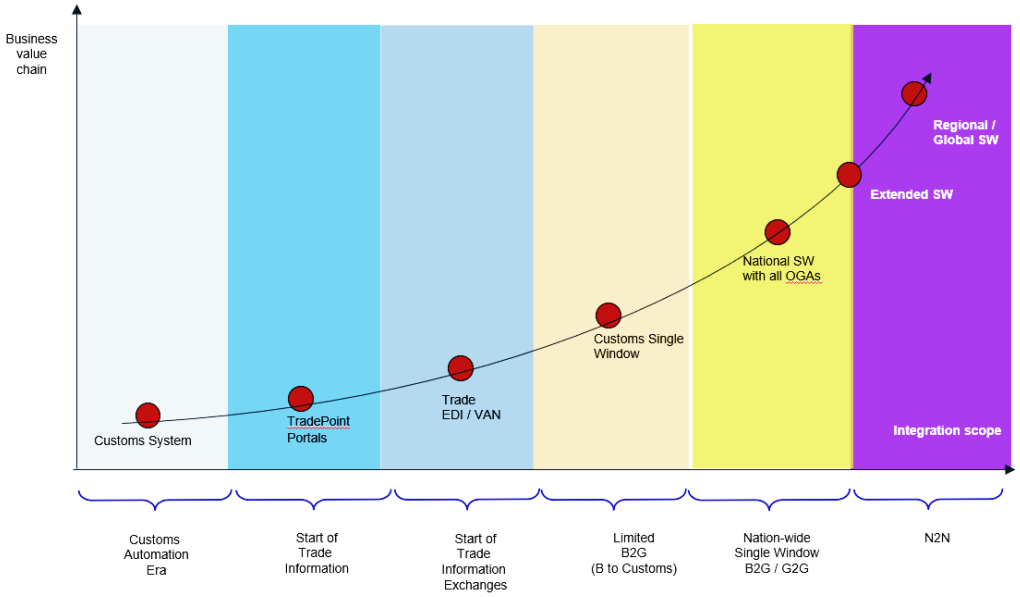
Asia is home to some of the world's largest trading economies and also to several of the most advanced Single Windows. This report analyses and compares the main functionalities of four of them: those of Hong Kong (Special Administrative Region of China), Japan, the Republic of Korea and Singapore. The experience of these economies offers important insights to policymakers in Latin America and the Caribbean, where Single Windows are generally at a much earlier stage of development. Of particular interest is the inclusion in advanced Asian Single Windows of several functionalities aimed at promoting the internationalization of micro, small and medium-sized enterprises (MSMEs), including by facilitating their participation in e-commerce.

This document is structured as follows. After this introduction, section I provides a framework for the characterization of Single Windows according to their stage of maturity. section II presents a brief historical account of the four economies' efforts in developing their respective Single Windows. section III provides an overview of the four Single Windows according to the five key elements outlined in Recommendation No. 33: the parties involved in trade and transport, standardized information and documents, a single entry point, the fulfilment of regulatory requirements, and the single submission of individual data elements. section IV focuses on the main functionalities of each Single Window and on their legal, institutional, and financial arrangements, while section V looks at some of their technological characteristics. Finally, section VI characterizes each of the four Single Windows according to their stage of maturity, using the framework presented in section I.

I. Framework to characterize single windows according to their maturity level

Diagram 1 provides a useful and simplified way to characterise the different stages in the development of a trade Single Window, based on the taxonomy proposed by Koh (2011).

Diagram 1
Stages in the development of a single window



Source: Author, adapted from J. Koh, "Ten Years of Single Window Implementation: Lessons Learned for the Future", Discussion Paper, UN Global Trade Facilitation Conference (2011) [online] https://unece.org/fileadmin/DAM/trade/Trade_Facilitation_Forum/BkgrdDocs/TenYearsSingleWindow.pdf.

A. Stage 1: customs automation

The pre-Single Window evolution's first step in advancing electronic trade facilitation is the development of a paperless customs declaration system, transitioning from manual or traditional Electronic Data Interchange (EDI) systems to electronic customs declaration systems. An electronic automated customs system is the foundational step towards establishing a national Single Window, and typically should include features like electronic customs declarations, e-payment, automated risk assessment, and risk-based inspections.

B. Stage 2: trade point portals

Following this was the era of the development of national Trade Points. These serve as an information source for trade-related information, providing traders with data about business and market opportunities. They also function as trade-facilitation centres, where players in trade transactions (e.g. Customs, banks, chambers of commerce, freight forwarders, transport and insurance companies) are grouped together under a single physical roof or linked virtually to the Trade Point to provide all the services required for trade transactions. Trade Points were originally conceptualized to serve as gateways to global electronic networks, with all national Trade Points interconnected in a worldwide electronic network.

C. Stage 3: trade electronic data interchange/value added network

In paperless customs environments, secure electronic data interchange (edi) and value-added Networks (VANs) facilitate electronic customs document exchange, eliminating the need for physical visits or paper submissions. These systems often expand to cover other customs-related tasks like online duty payment, electronic risk assessment, container loading documentation, and information exchange between customs and terminal operators to expedite customs clearance at ports or borders. One evolutionary development is the use of value-added network (VAN) providers as intermediaries in electronic data exchanges. A Value-Added Network (VAN) provider facilitates secure and efficient electronic data exchanges between businesses. They handle data transmission across different communication protocols, offer translation services for varying data formats, and ensure robust data security. VANs also enable interoperability between disparate systems, provide data storage and archiving, and offer additional services like integration with enterprise systems. They ensure network reliability and provide support for technical issues, often using a mailbox approach for receiving, storing, and forwarding electronic data, thus simplifying and streamlining business communications.

D. Stage 4: customs single window/port community systems

Stage 4 involves the concepts of Customs Single Window and Port Community Systems. Typically, the development and implementation of a Single Window in some countries have to be gradual and depend on agency collaboration, willingness, and cost-benefit justification. To address challenges resulting from the involvement of multiple other government agencies (OGAs),[1] a variation known as the "Customs Single Window" has emerged. It focuses primarily on customs-related interactions but does not cover all regulatory processes outlined in UN/CEFACT Recommendation 33.

[1] In the context of a Single Window system for trade facilitation, the expression "Other Government Agencies" (OGAs) refers to various government entities or authorities that have regulatory responsibilities and are involved in the import, export, or transit of goods. These agencies play a role in ensuring that imported or exported goods comply with specific regulations, standards, and requirements related to health, safety, security, environment, and other aspects. The term Participating Government Agencies (PGAs) is also synonymously used.

Other authorities with significant roles in trade, such as Port Authorities, have established limited, port-centric "Single Windows" referred to as either "Port Single Windows" or "Port Community Systems" (PCS). Port Single Windows provide local-level vessel information to port authorities, while PCS facilitates data exchange in the port environment with a Business-to-Business (B2B) character. A Port Community System serves as a centrally operated system for data transfer, enabling parties interested in sea-borne transport information to avoid bilateral data transfers.

These limited forms of Single Window systems, whether Customs-centric or port-centric, serve as valuable learning experiences for many countries as they work towards achieving the full vision of a "National Single Window" for trade facilitation.

E. Stage 5: national single window

At this stage, the focus is on integrating the automated customs system with all other government agencies (OGAs) responsible for issuing trade-related permits, certificates, and documents. This integration streamlines interactions between traders and multiple government agencies involved in trade, import, export, and transit regulations. A full national SW allows for the electronic application and issuance of permits and certificates, facilitating their exchange among government agencies. This eliminates the need for traders to visit multiple regulatory offices physically. In the beginning, priority is often given to the involvement of agencies handling high transaction volumes, numerous documents, and those impacting national development agendas, like agencies issuing certificates of origin and export permits for strategic products.

A full SW is achieved when all OGAs and all their permits are included. It needs to be able to interface or integrate the various OGAs' needs and requirements in the SW to facilitate trade. The challenge is that government agencies are traditionally organized in siloed departmental fashion, which creates limited connection with each other either technologically or in the way their services are delivered. Therefore, project teams implementing national single windows often found themselves to be pioneers in establishing a "whole of Government" framework. Few, if any, other electronic government initiatives have as wide a scope and breadth as a national SW project that necessitates the interfacing or integration of many government backend systems. This makes national SW projects even more challenging. Only countries that already have a strong electronic government foundation are able to build upon it towards the "whole of Government" connected government structure.

F. Stage 6: extended national single windows with business-to-business services

A national SW, by definition, caters for Business-to-Government (B2G) and Government-to-Government (G2G) connectivity. An interesting extended variant of NSW provides for the extension of the services to offer Business-to-Business (B2B) services as well, such as trade-financing instruments (letter of credit, letter of guarantee, bill of ladings), commercial documents (purchase/sales order, order confirmation, packing list, advanced shipment notice, commercial invoices), etc. These services hinge on the concept of a national "paperless trade" ecosystem. Examples of such extended paperless trade ecosystems include the Republic of Korea's u-TradeHub, Singapore's Networked Trade Platform, and Indonesia's National Logistics Ecosystem.

G. Stage 7: regional single windows

As more national Single Windows are created, there is considerable impetus in regional and international fora for greater connectivity between countries, regions and across continents. The model currently being contemplated foresees supra-national Nation-to-Nation (N2N) exchange of trade information between National Single Windows.

The ASEAN Single Window (ASW) is the first regional initiative that seeks to enhance regional connectivity. It is defined as: "The secured environment where National Single Windows (NSWs) integrate and operate". Other regions and groupings have also instituted regional SW projects including the Pacific Alliance initiative connecting the national SWs of Chile, Peru, Mexico, and Colombia; the European Union SW Environment for Customs which connects the limited Customs SWs between EU states; and the East African Community (EAC) regional electronic SW.

II. Historical background of the four Asian single windows

As trade is of great importance to the four Asian economies examined here, the development of paperless trade in these economies preceded the conceptualisation of the term Single Window as popularised in the first version of Recommendation 33. All of them started the computerisation or digitalisation of their trade processes during the era of Electronic Data Interchange (EDI) (see table 1). Electronic Data Interchange was first used for international trade processes primarily in industrialized countries during the late 1960s and early 1970s. The adoption of EDI for international trade was driven by the need to streamline and automate trade-related documentation and processes. It emerged as a technology that allowed businesses to exchange structured data electronically in a standardized format, replacing paper-based documents such as purchase orders, invoices, and shipping notices.

Table 1
Historical antecedents of the four Asian single windows

Economy	Name of SW and Extended SW	Year launched/number of years in operation	Start of electronic/paperless trade
Singapore	TradeNet/Networked Trade Platform (NTP)	1989/35	Launched the "TradeNet" SW in 1989, connecting the Singapore trade community via a single point of entry.
Hong Kong (S.A.R. of China)	GETS/Trade Single Window	1997/27	First platform - Government Electronic Trading Services (GETS) started in January 1997 but with limited trade permits until Trade SW (TSW) started in 2018.
Republic of Korea	UNIPASS/uTradeHub	1994/30	Implementation of EDI-based trade and customs automation systems and services in 1994. Launched UNIPASS SW in 2006.
Japan	Nippon Automated Cargo Clearance System (NACCS)	1978/46	First introduced a paperless trade system in 1978 with Air - Nippon Automated Cargo Clearance System (Air-NACCS). Launched the NACCS SW in 2003.

Source: Author's own elaboration.

All four economies present a nation-wide facility which allows parties involved in trade and transport to lodge standardized information and documents with a single-entry point to fulfil all import, export, and transit-related regulatory requirements. All of them established a centralized electronic platform where traders can submit and access the necessary trade-related information and documents.

Singapore SW: Launched in January 1989, Singapore pioneered what could be considered the world's first Single Window system, known as TradeNet. TradeNet serves as a Business-to-Government (B2G) platform, connecting businesses with the government and also enabling Government-to-Government (G2G) interactions. Through TradeNet, traders can submit a single declaration (trade permit) to multiple regulatory agencies, reducing time and costs associated with trade documentation. The system has continually evolved, aligning with international standards and integrating various government requirements. TradeNet's success lies in its "single platform and single submission" approach, resulting in streamlined and integrated processing. As this connected the Singapore trade community through a single-entry point with 35 government agencies, Singapore's SW experience provided valuable insights into the need for a "whole-of-government" (WOG) approach to deliver efficient services to the trading community. In 2007, Singapore introduced TradeXchange, a neutral integrated IT platform for both Business-to-Business (B2B) and B2G information exchange. It marked Singapore's first Public-Private Partnership (PPP) IT project and facilitated the flow of goods by connecting commercial and regulatory systems. The Networked Trade Platform (NTP), launched in 2018, replaced TradeXchange as a one-stop B2B trade and logistics ecosystem, connecting industry players across the trade value chain globally. The blending of B2B and B2G services, along with third-party involvement, stimulates innovative business models and value creation.

Hong Kong SW: Hong Kong started with the Community Electronic Trading Service (CETS), later renamed Government Electronic Trading Services (GETS), which began in January 1997. This evolution culminated in the Trade Single Window (TSW), which is still in the midst of implementation in three phases. GETS, presently operated by three Service Providers (SPs), serves as a front-end electronic service platform for the trading community. Traders use GETS to electronically submit various trade documents, including Trade Declarations, Electronic Manifests, Dutiable Commodities Permits, and Certificates of Origin. In 2018, the Hong Kong government launched Phase 1 of the Trade Single Window (TSW) which shall eventually replace GETS. TSW is a next generation SW platform for lodging import and export trade documents with all OGAs involved. Phase 1 (2018) covered 14 types of trade documents for specific controlled goods. Phase 2 (May 2023) expanded to include 28 additional trade documents and introduced new user-friendly features. Phase 3, to be implemented by 2027, is the most complex one. It will cover various trade documents and replace existing cargo clearance systems. It aims to fully implement the TSW, streamlining cargo clearance processes and integrating multiple systems. The estimated annual transaction volume of TSW is expected to reach 93 million dollars, offering efficiency and data sharing among users while maintaining customs clearance effectiveness.

Japan SW: Japan's paperless trade began in 1978 with the introduction of the Air-Nippon Automated Cargo Clearance System (Air-NACCS) to process air cargo import/export at Narita Airport, followed by the Sea-Nippon Automated Cargo Clearance System (Sea-NACCS) for sea cargo import/export in 1991. The Japan SW began in 2003, when early versions of NACCS SW served as an interface between various government systems, allowing users to conduct procedures required by different authorities with a single data transmission. The second generation, known as the NACCS Common Portal, integrated additional government systems and provided a unified interface for customs declarations and other trade procedures. The third generation NACCS SW saw the integration of the various backend systems operated by participant Government agencies, achieving a truly integrated SW for import/export processing. The latest sixth generation NACCS, operational since 2017, offers paperless trade procedures and integrates with the Cyber Port, a logistics platform, to provide one-stop logistics and customs clearance services and interoperability with international service providers.

Republic of Korea SW: The Korean SW journey started with EDI-based trade and customs automation systems and services, introduced between 1994 and 1998. Later, they transitioned from EDI to Internet-based paperless trade systems, including web-based customs declaration portals. The Korea Customs Service (KCS) introduced a Customs-centric SW called UNIPASS in 2006, providing online customs declaration services free of charge. In the same year, the Korea Public-Private e-Trade Facilitation Centre developed the National Paperless Trade Platform (uTradeHub) to operate value-added services related to customs clearance, manifest submissions, and customs duty drawback. Thus, Korea now has two Single Windows, UNI-PASS for customs clearance and uTradeHub for exportation processes, creating a comprehensive paperless trade environment covering all trade procedures.

III. Integrative analysis of main functionalities of the four Asian single windows

A. Parties involved in trade and transport

In the context of the SW, all parties involved in trade and transport can lodge information with a single-entry point. In practical terms, it is found that the four SWs generally serve the entire trading community i.e., trade and transport parties involved in import, export, and transit-related activities.

Singapore: Singapore TradeNet and the NTP fully cater for the entire trade community. TradeNet operates under a "whole-of-government" (WoG) approach, with Singapore Customs as the lead agency responsible for trade facilitation. There is a total of 16 participating government authorities, which in turn include 32 permit-issuing competent authorities (known as CAs in Singapore) including Building and Construction Authority, Central Narcotics Bureau, and Health Sciences Authority, that issue permits and regulate various aspects of trade.

Hong Kong: Hong Kong's Trade Single Window (TSW) involves nine Participating Government Agencies (PGAs) under the policy steer of six policy bureaux. These PGAs oversee 51 trade documents and submissions, including the Agriculture, Fisheries and Conservation Department, Customs and Excise Department, and Trade and Industry Department.

Japan: Japan's NACCS SW includes the entire trading and transport community, spanning six ministries, local government bodies, port and airport authorities, and the private sector. Private sector participants range from airlines and shipping companies to customs brokers and banks. Public sector involvement includes ministries like Finance, Agriculture, Forestry and Fisheries, and Health, Labour, and Welfare.

Republic of Korea: Korea's UNIPASS SW integrates 44 organizations and connects 430,000 entities involved in trade, including trading companies, customs brokers, shipping companies, and more. An interagency coordination platform was established to facilitate information sharing among regulatory

agencies, Customs, and other stakeholders. The uTradeHub, operated by KTNET, interfaces with various trade-related public and private entities, including the Korea Chamber of Commerce and Industry, financial institutions, and logistics companies.

B. Standardised information and documents

SW systems standardize data sets by utilizing established data models and standards to ensure consistency and interoperability among the various parties involved in trade. It was found that the common established data model adopted by all four Asian SWs studied is the World Customs Organization (WCO)'s Data Model. This is the international common standard often used to harmonise and standardise trade-related information in the SW context. The WCO Data Model is also aligned with other international standards and conventions, such as those established by the United Nations (UN/CEFACT; UN/LOCODE) and the International Organization for Standardization (ISO).

Adopting the WCO Data Model framework enables the national SWs to interoperate with each other via a standardized set of data elements and information related to customs and international trade. One of the most common documents with which countries start SW-to-SW exchange is the Certificate of Origin (CO). Its dataset is based on the UN/CEFACT Certificate of Origin Data Set, which makes it very amenable to mutual exchange and recognition.

C. Trade process integration

1. Electronic data submission

Businesses, importers, exporters, and other trade participants submit their trade-related data to the SW system. This data can include information about goods, customs declarations, certificates of origin, permits, licenses, and more. Typically, data submission by traders to the SW is governed by relevant legal frameworks governing the SW operation and use of such restricted information.

In Singapore, the legal basis for traders' submission to the SW is primarily governed by the Customs Act and the Regulation of Imports and Exports Act, which govern the submission of trade-related information and documents electronically to TradeNet. In Hong Kong, traders are required to submit trade-related information and documents electronically through GETS and TSW under the Electronic Transactions Ordinance (Cap. 553) (ETO), together with the Evidence Ordinance (EO) which regulate the submission of trade data and documents through the GETS/TSW. Japan has a specific "Law for processing of import/export and port related procedures through the Electronic Data Processing System" as the legal basis for traders' submission to the NACCS system. Likewise, the Republic of Korea's legal basis for traders' submission to the SW is established under the government-enacted "Digital Signature Act" and the "Framework Act on Electronic Transactions".

2. Interconnectivity

The SW is needed to inter-connect a host of various systems, e.g., the backend systems of participating Government agencies, other relevant parties (banks, financial institutions, ports) as well as in some cases, the systems of large traders, enabling them to share information and coordinate activities seamlessly.

It was found that the common data exchange formats and protocols used by the four SWs include:

- EDI (Electronic Data Interchange): EDI is a well-established protocol for the electronic exchange of structured data. It has been used in earlier versions of the four Asian SW systems, adopting UN/EDIFACT standards to facilitate the exchange of documents such as declaration and manifest.

- AS2 (Applicability Statement 2): AS2 is a secure messaging protocol commonly used for EDI data exchange. It provides encryption, digital signatures, and data compression to enhance data security in SW implementations.
- XML (eXtensible Markup Language): XML is a widely used data exchange format in SW systems. It provides a structured way to represent and transport data, making it highly suitable for exchanging standardized trade-related information.
- FTP (File Transfer Protocol)/SFTP (Secure File Transfer Protocol): FTP is a standard network protocol used for transferring files between computers over a network. SFTP is a secure version of FTP that adds encryption and authentication to the file transfer process. It is commonly used in SW systems to ensure secure and reliable transfer of data files.
- HTTP/HTTPS (Hypertext Transfer Protocol/Secure Hypertext Transfer Protocol): HTTP and its secure counterpart, HTTPS, are widely used for web-based data exchange. SW systems may offer web services that allow stakeholders to access and exchange trade-related data using these protocols.
- MQ (Message Queuing): Message queuing systems, such as IBM MQ or Apache Kafka, can be used in the four Asian SW implementations to facilitate asynchronous and reliable messaging between different components of the system. They help ensure the timely and orderly exchange of data.
- JSON (JavaScript Object Notation): JSON is another structured data format commonly used for data exchange in Asian SW systems, especially in web-based applications. It is known for its simplicity and human-readability.
- Web Services (SOAP and REST): The latest versions of the Asian SW systems have been updated to offer web services using protocols like SOAP (Simple Object Access Protocol) or REST (Representational State Transfer) to allow stakeholders to access and exchange data over the internet using standardized methods.

D. Fulfilling regulatory requirements

The element of fulfilling regulatory requirements implies that the SW fulfils a government function and as such, it has received a relevant mandate from the Government to perform these actions. In this regard, all the four Asian SWs have been mandated by their respective governments to serve as the single-entry point for the trading community to lodge their submissions.

Singapore: Singapore's TradeNet is the single platform for submitting trade declarations and obtaining the necessary permits and approvals, thus ensuring compliance with regulatory requirements. Singapore Customs as the lead agency oversees the entire trade process, including the regulatory aspects. All imports, exports, and transshipments must obtain permits from competent authorities based on their requirements for controlled items. The permits are streamlined through TradeNet.

Hong Kong: The regulatory regime under the TSW brings together all the import and export regulatory documentation requirements under one single electronic platform and align and reconcile the entrenched laws, rules and practices. The TSW serves as a centralized platform for traders to submit trade-related documents to nine Participating Government Agencies (PGAs) responsible for regulating trade documents and submissions.

Japan: NACCS is a comprehensive SW that fulfils regulatory requirements related to import and export declarations, customs clearance, and other port-related processes. It is now covering trade and port related services involving many governmental agencies as well as port authorities, as a SW for international logistics and cross-border trade.

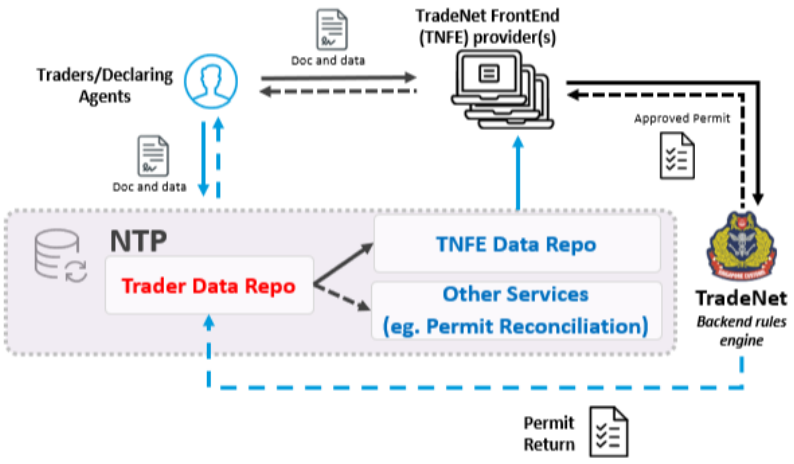
Korea: Korea's UNIPASS SW enables the electronic processing of permits and approvals for various trade-related activities and serves as a platform for regulatory agencies to share information and streamline regulatory processes. It currently integrates 44 organizations involved in trade and connects numerous trade entities. The collaborative effort between regulatory agencies, Customs, and the private sector ensures that regulatory requirements are met effectively and transparently.

E. Single submission of individual data elements

Single submission of individual data elements means that once these have been submitted, they should not need to be submitted again. Data reuse and information sharing are important tenets in the four Asian SWs. Once the data is validated and standardized, it can be shared with various government agencies and entities responsible for trade regulation, customs clearance, inspections, and other related processes. Traders can access and reuse the data as needed for their specific functions. The data in the SW also allows for the efficient and effective sharing of data across multiple government agencies and stakeholders. Traders, customs brokers, and logistics service providers benefit from reduced data entry requirements because they only need to submit data once to the SW system, thus reducing administrative burdens and data entry errors as well as saving costs.

An example is shown in the case of Singapore's TradeNet, which serves as a single point of entry for single submission to multiple regulatory agencies. Singapore traders submit a single trade permit application to TradeNet. Upon approval by Singapore Customs, TradeNet relays the approved permit in structured data format to the trader's data repository (a service within Networked Trade Platform (NTP) for data reuse for other service transactions) (see diagram 2).

Diagram 2
Example of data reuse in singapore tradeNet/NTP



Approved Permit is directly returned in structured data format to Trader's data repository in NTP for reuse for other service transactions.

Source: Singapore Customs website. https://www.customs.gov.sg/businesses/national-single-window/overview/.

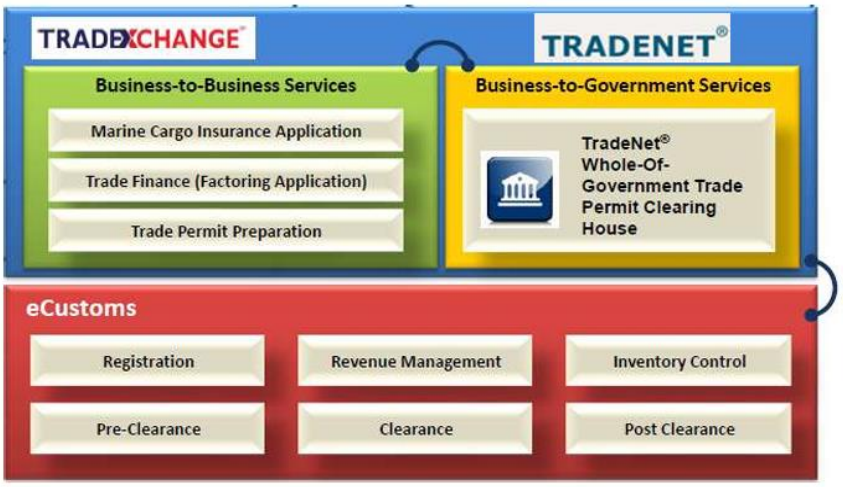
IV. Main features of selected Asian single windows

A. General characteristics

Singapore: After more than 30 years of continuous upgrades, and integrated with over 30 government agencies, TradeNet 4.1, introduced in 2012, remains the key pillar of Singapore's trade facilitation efforts and an enabler of its external trade. With TradeNet, about 99% of all permit applications are processed electronically within 10 minutes. The sharp reduction in the time taken to process permit applications resulted in about 9 to 10 million permits being issued annually. The tremendous success of Singapore's TradeNet lies in the concept of a "single platform and single submission" approach, resulting in extremely fast permit processing time.

In 2007, TradeXchange was introduced as a neutral IT platform, enabling B2B and B2G interactions and enhancing trade competitiveness. This Public-Private Partnership (PPP) IT project was developed and administered by CrimsonLogic Pte Ltd, with government support. Since 2018, the Networked Trade Platform (NTP) has been in place, replacing TradeXchange. It serves as a one-stop trade and logistics ecosystem platform, facilitating data exchanges across global supply chains. NTP aims to establish Singapore as a leading trade, supply chain, and trade financing hub. It offers a wide range of trade-related services, fosters open innovation, and digitizes data at its source, cutting costs and streamlining processes. Both TradeNet and NTP currently exist in parallel. The idea of blending B2B and B2G services and the inclusion of third-party service providers on the NTP platform seek to encourage innovative business models and value creation and contribute to Singapore's status as a global trade hub.

Diagram 3
TradeNet, tradexchange and ecustoms systems (prior to networked trade platform)



Source: J. Koh, Presentation at Workshop on Advancing Interoperability of Single Windows, 31 May – 1 June 2017, Cholpon Ata, Kyrgyzstan.

Hong Kong: To maintain Hong Kong's trade competitiveness and logistics hub status, the government has embarked on transitioning from its first-generation Government Electronic Trading Services (GETS) to the next generation Trade Single Window (TSW), now in its third and final phase of implementation due in 2027 (see diagram 4). The key elements of TSW include:

- Enhancing trade operational efficiency: TSW allows round-the-clock electronic submission of trade documents through a central platform, reducing the need to approach multiple government agencies individually. Data can be easily reused, minimizing errors and effort. Traders can track their applications and submitted information.
- Enhancing government operational efficiency: TSW supports government agencies in processing applications and issuing licenses/permits electronically. It reduces manual work, streamlines processes, and enables cross-departmental online services.
- Enhancing cargo clearance efficiency: TSW minimizes cargo hold-ups by providing sufficient cargo information, ensuring smoother cargo clearance and overall cargo flow.
- When fully implemented, TSW will have a central portal for user access, a front-end platform for cargo information submission, a highly automated cargo risk assessment engine, and support for post-clearance audit checks. It will also utilize cloud infrastructure, artificial intelligence, and big data analytics for efficient and accurate trade facilitation and risk assessment.

Diagram 4
Hong Kong SAR trade single window

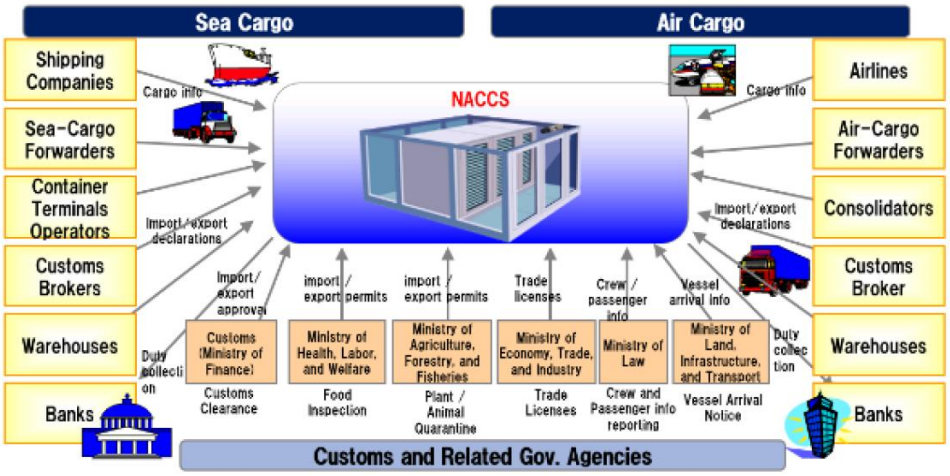
Source: Hong Kong Customs and Excise Department, "Customs News", Issue 65, April 2021, p 18 [online] https://www.customs.gov.hk/hcms/filemanager/en/content_112/issue65_e.pdf.

Japan: The main features of the NACCS system include a comprehensive coverage of services for customs import/export procedures, for cargo quarantine procedures and vessel/aircraft clearance management and linking immigration, port authorities for one-stop service (see diagram 5). It caters for both B2G and B2B services where Customs and the trading community can share information and reuse the manifest information that the carrier submitted to Customs. NACCS is therefore a multi-faceted SW system fulfilling various roles including:

- Joint Use by Public and Private Sectors: It integrates sea and air systems, consolidates government ministries' systems, and enhances single window services. It manages and secures information appropriately, ensuring backup functions for large-scale disasters with automatic switching.
- Public Infrastructure: NACCS enhances administrative system functions, adapting to new national measures. It strengthens system processes for specific procedures, enhances functions related to administrative procedures, and improves procedures of related ministries and agencies. It optimizes services based on needs.
- Comprehensive Logistics Information Platform: NACCS tailors services to industry and customer needs. It advances paperless processing of trade-related procedures, enhances international system connections and links with private-sector systems, and expands the scope of WebNACCS.

NACCS has significantly reduced customs clearance times while processing a growing number of declarations. The number of declarations increased over 5-fold; on the other hand, the time taken for the customs clearance of import goods was reduced to less than a third during this period. Around 99.9% of import/export declarations are now processed electronically through NACCS, doubling since 1989 when it was 40% to 50%. In 2022, total import and export transactions reached 112.9 million and 30.1 million, respectively.

Diagram 5
Nippon Automated Cargo Clearance System (NACCS) single window

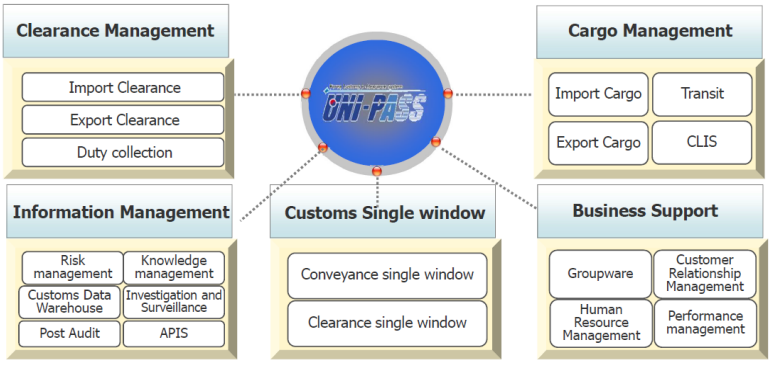


Source: NTT Data Presentation, "Problems and Solutions of Trade/ Customs in Asian countries", March 2016 [online] https://events.development.asia/materials/20160301/problems-and-solutions-tradecustoms-asian-countries.

Republic of Korea: The UNIPASS SW serves as a one-stop service for all Customs clearance procedures such as imports, exports, and other customs clearance transactions (see diagram 6). It includes a comprehensive risk management system which targets higher-risk companies and goods, resulting in a great improvement in clearance performance. Other features include a streamlined business process, with convenient user-centric interfaces, employment of new mobile technology and big data analysis, and an early warning and control system for system and service monitoring. KCS launched its fourth generation UNIPASS in April 2016, with a cost of about 150 million dollars.

UNIPASS processes 430 million declarations and 50 million travellers per year. It integrates 44 domestic organisations for processing of regulatory permits, enabling the sharing of information between regulatory agencies, KCS and other stakeholders (including private organization mandated by the government to conduct verification), as well as providing access to over 430,000 trading entities, such as trading companies, customs brokers, shipping companies, airlines, delivery companies, and warehouses (Cho and Nam, 2016).

Diagram 6
UNIPASS single window



Source: Sung Heun Ha, "Comprehensive view on Korean Single Window". Presentation at UNESCAP, June 2019 [online] https://www.unescap.org/sites/default/files/2%20Korea%20SW_Session%207.pdf.

B. Legal framework

The legal basis for the SW in Singapore, Hong Kong, Japan, and Korea is rooted in various legislative provisions. While there are some unique aspects to each country's legal framework, there are commonalities among them in terms of promoting and facilitating electronic trade and customs processes.

Singapore: The legal basis for Singapore's TradeNet SW is primarily found in the Electronic Transactions Act (ETA), which allows government agencies to accept filings, permits, licenses, and approvals electronically. The ETA gives legal status to electronic equivalents of paper documents and signatures. Other legal bases include the Customs Act, the Regulation of Imports and Exports Act, and the Goods and Services Tax Act, which allow for the establishment and operation of computer services for managing trade-related documents electronically.

Hong Kong: Hong Kong's legal framework that enables electronic trade and customs processes is the Electronic Transactions Ordinance (ETO) and other relevant legislation facilitate and legalize electronic filing through the SW system. Amendments to various ordinances, including the Import and Export Ordinance, Dutiable Commodities Ordinance, Reserved Commodities Ordinance, and Protection of Non-Government Certificates of Origin Ordinance, were made to enable the submission of trade documents through the Trade Single Window (TSW) platform.

Japan: Japan's legal foundation for electronic trade and customs processes includes the "Special Act of Customs Procedure through the Electronic Data Processing System" (NACCS Special Rules Act). This special law was enacted in 1977, providing legal assurance for electronic procedures in customs. Subsequent amendments and legislation, such as the "Act on Processing of Business Related to Import and Export by Means of Electronic Data Processing System," further facilitated electronic customs processes. In addition, the "Act on Electronic Signatures and Certification Business" was enacted to promote the use of electronic signatures and secure electronic services.

Korea: Korea's legal basis for electronic trade is rooted in the "Act on Promotion of Trade Business Automation," enacted in 1991. This act enables the environment for Electronic Data Interchange (EDI)-based Paperless Trade. In 2006, the act was revised into the "Electronic Trade Facilitation Act," making it the underlying legislation for internet-based paperless trading. Additional legal foundations include the "Digital Signature Act," the "Framework Act on Electronic Transactions," and the "Act on Promotion of Information and Communications Network Utilization and Information Protection."

It is noted that all four economies have enacted specific laws and regulations to facilitate legal recognition of electronic transactions, provisions for electronic signatures, and enabled the use of electronic means in international trade. Their SW systems also prioritize data privacy and security. Access to sensitive trade data is controlled, and encryption and authentication mechanisms are in place to protect the confidentiality and integrity of the data. Safeguards have been built in to protect data confidentiality and information security. Information submitted by traders to the SW are shared between relevant Government agencies on a strictly need-to-know basis for processing, clearance, enforcement, and statistical purposes.

In Singapore's TradeNet SW, data privacy safeguards are governed by the Personal Data Protection Act (PDPA). While the PDPA primarily focuses on personal data protection, it has implications for data privacy in TradeNet as it employs stringent data protection measures including encryption of data in transit and at rest, access controls to safeguard personal data. In Hong Kong, data privacy safeguards are mainly regulated by the Personal Data (Privacy) Ordinance (PDPO). Hong Kong Customs and Excise Department (C&ED), which manages the Trade Single Window (TSW), follows PDPO guidelines to ensure the privacy of trade-related data. Access to data is restricted to authorized personnel, and data encryption and secure protocols are employed during data transmission. Traders' data privacy rights, including consent and access, are respected. Japan and the Republic of Korea have similar safeguards.

C. Institutional arrangements

The institutional arrangements for the SW can vary depending on the specific context and needs of each country. Commonalities among these institutional arrangements include the involvement of government agencies, the private sector, and industry associations in the development and operation of SW systems, as well as extensive stakeholder engagement to gather input and ensure the success of the platforms.

Singapore: The TradeNet project was announced in December 1986, with a target to bring the system online within two years. A high level TradeNet Steering Committee comprising representatives from government agencies and the private sector was formed to conceptualize the nationwide SW system. The project was jointly developed by the Trade Development Board (TDB) and the National Computer Board (NCB), with TDB mobilizing the trade community. Singapore Network Services (SNS), later renamed Crimson Logic, was established in March 1988 to own and operate TradeNet.

Hong Kong: The drive for the SW is led by the CEDB, aided by C&ED which is designated as the operator of the Trade Single Window (TSW). The Office of TSW Operation (OSWO) was established in June 2018 under the C&ED to oversee TSW operations and provide support to users. Extensive engagement with the trade community through public consultations, briefings, meetings, and User Consultation Groups (UCG) ensured stakeholder input in TSW development.

Japan: The Ministry of Finance played a crucial role in coordinating the efforts of Customs and among the ministries. The Nippon Automated Cargo Clearance System (NACCS) Center as a special purpose entity was established to develop and maintain the NACCS SW since its establishment. Working groups, comprising experts in related industries, were formed to plan and upgrade NACCS, and a Liaison Conference on NACCS among Ministries was launched.

Republic of Korea: The Customs-centric SW is led internally by the Korea Customs Service (KCS) with a taskforce comprising customs officers, business consultants, and software engineers. The Public-Private e-Trade Facilitation Centre, consisting of various entities including government ministries, KCS, industry associations, and financial institutions, established the uTradeHub as a model of public-private collaboration. However, the absence of a strong institutional arrangement for harmonization and coordination between UNIPASS and uTradeHub poses challenges and potential conflicts between the two platforms.

Below are some general principles and best practices that can guide the development and operation of SW systems based on the experiences of Singapore, Hong Kong, Japan, and the Republic of Korea:

- Clear Governance Structure: It is necessary to establish a clear governance structure that defines the roles and responsibilities of government agencies, private sector stakeholders, and relevant industry associations, as well as to designate a lead agency or organization responsible for overseeing the development, operation, and maintenance of the SW system.
- Public-Private Collaboration: Strong collaboration between the public and private sectors is required to ensure that the SW meets the needs of both government and industry stakeholders. This involves the establishment of formalized frameworks for regular communication, consultation, and the solicitation of feedback from industry participants. These structured channels are imperative for the continuous improvement and refinement of the SW system.
- Stakeholder Engagement: Every start and continual operation of the SW requires extensive stakeholder engagement, including public consultations, industry forums, and user consultation groups, to gather input on system design, functionality, and user requirements. It is recommended to involve a wide range of stakeholders, including traders, carriers, forwarders, logistics practitioners, trade associations, and chambers of commerce.

- Special-Purpose Agency: Of note especially in the Singapore, Japan and Korean cases is the establishment of a special-purpose agency or organization responsible for owning and/or operating the SW system. This entity should have a dedicated focus on the continual sustainment of the SW and should be furnished with necessary technical expertise and resources to develop and maintain the system effectively.
- Coordination Mechanisms: It is also important for a high-level committee to be established to enable coordination mechanisms among Customs, government ministries and other agencies involved in trade facilitation to ensure harmonization and avoid duplication of efforts.

These recommendations emphasize the importance of collaboration, stakeholder engagement, legal frameworks, phased implementation, and effective governance to ensure the successful development and operation of SW systems in Singapore, Hong Kong, Japan, and Korea, or any other country considering the adoption of such systems. Tailoring these principles to the specific context and needs of each nation is crucial for achieving the desired outcomes in trade facilitation.

D. Financial sustainability and operational continuity

Maintaining a large scale, national facility like a SW and keeping it regularly updated requires robust revenue models, efficient cost management, and strategic partnerships. It is crucial to regularly review and adjust these models to remain competitive and responsive to market changes. As observed in the four Asian SWs, ensuring financial sustainability involves the respective governments providing the capital expenses and taking ownership of the SWs, while operational continuity typically requires a dedicated SW operating entity. The SW operating entities are allowed to generate a diversified revenue stream which includes service fees, subscription charges and government subsidies, to ensure a steady flow of income to operate and maintain the SW.

Singapore: The initial cost of establishing TradeNet was borne by the Government, who has also continued to control and ensure its financial sustainability. To ensure the operational continuity of the TradeNet system and its services, it was decided to establish a Special Purpose Vehicle to operate TradeNet on behalf of the government. By setting up this company (Singapore Network Services Pte Ltd (SNS), later renamed as CrimsonLogic Pte Ltd) as a separate profit-making entity, the Government could avoid the expenses of managing and operating a nationwide network. To ensure the financial sustainability of TradeNet, CrimsonLogic collects from traders a one-time registration fee, a monthly fee for each user, and recurrent fees for each declaration which comprises messaging, processing, and statutory fees. The messaging and processing fees go to CrimsonLogic, while the statutory fees are transferred to the Government.

Hong Kong: The Hong Kong S.A.R. Government completely funded the establishment of the TSW and assigned C&ED as the operating agency to look after its day-to-day maintenance and operation. Hence, the Office of Trade Single Window Operation, a unit under the C&ED, was established to oversee the operation of the TSW system. It also provides support to TSW users through training, helpdesk, and hotline services. Traders may make submissions to the system directly or via accredited commercial players who may serve as value-added service providers (VASPs). The Government's policy is that fees charged for the SW services should in general be set at levels adequate to recover their full cost. The Government agencies will review the existing fees for their services as well as justifications for those currently free-of-charge services and identify possible cost savings with a view to achieving full-cost recovery as far as possible in the new TSW environment. The change in the submission mode to be brought by the SW itself is neutral and should not attract a new fee.

Japan: The costs involved in setting up, maintaining, integrating, and upgrading the NACCS system were met by the relevant Ministries, with the majority being borne by the Ministry of Finance since the allocation is based on the ratio of transaction volume. The NACCS system is operated and

steered by the NACCS Centre, which is now under public-private ownership, with the Ministry of Finance as the largest shareholder. The NACCS Centre is supervised by the Ministry of Finance, which oversees Japan Customs. The Japanese Government (Japan Customs and other agencies) pays a fixed price for NACCS support and operations, while the trading community users pay NACCS a subscription fee as well as for every transaction – import/export declaration; port entry; manifest (per one bill at lading); shipping instructions. Some services, such as the Advance Filing Rule, are provided free of charge.

Republic of Korea: KCS, as a Government agency, allocates public funds from its own budget to support the development, operation, and maintenance of the UNIPASS system. KCS' funding ensures the UNIPASS system's availability and sustainability. However, it maintained the UNIPASS customs declaration service free for traders and customs brokers. KCS also designated 2 service providers - KTNET and KCNET - to operate charged value-added services including customs clearance, manifest submissions, and consolidation and customs duty drawback alongside UNIPASS. This has been the main policy of KCS regarding the value-added services over the customs network. In contrast, in the case of uTradeHub, KTNET has been operating and enhancing the system, and all the services are charged.

All four SWs, in addition to their respective SW operating entities, also have a tier of Value-Added Service Providers or front-end solution providers (in the case of Singapore and Hong Kong), which offer a range of services that complement and enhance the functionality of the SW. VASPs can play a crucial role in complementing the functionality of a SW operating entity. They extend the core services of the SW by offering specialized functionalities that are not typically provided by the basic framework. They are key to expanding the capabilities of a Single Window, making it a more comprehensive, efficient, and user-friendly platform for international trade.

Value added services can include advanced trade finance solutions, compliance and certification services, logistics and supply chain management tools, and even data analytics capabilities. VASPs enhance the overall efficiency of the trade process by integrating additional layers of service that cater to the specific needs of various users. For example, they might offer tailored solutions for different industries, thus enabling businesses to streamline their operations more effectively. This specialization can lead to faster processing times, reduced costs, and improved accuracy in trade transactions. Additionally, the presence of VASPs can stimulate competition and innovation within the trade services sector. As these providers strive to offer more effective and advanced solutions, the Single Window system benefits from continuous improvements and updates, thereby staying relevant and efficient in a rapidly changing global trade environment.

E .Services provided to the trade community

Singapore: TradeNet offers a range of services to the trading community which includes user and company registration, receipt and intelligent routing of trade permit and certificate of origin applications. Furthermore, traders can access support for permit amendments, cancellations, and refunds, as well as self-print certified true copies of permits and perform web-based status inquiries for permit applications. Additionally, services extend to downloads, automated billing, and direct bank account debits for fees, with round-the-clock Call Centre support.

The Networked Trade Platform (NTP) complements TradeNet offering diverse services including Government Services for customs and trade regulations, Trade-Related Value-Added Services (VAS) for trade finance compliance and certificate verification, and Digital Trade Services for B2B trade, supply chain management, and more. It also provides utility services like secure file sharing using the national single sign-on authentication system. These services collectively improve trade efficiency, ensure regulatory compliance, and facilitate the exchange of trade information between businesses and government agencies. Many of these services are offered by value-added service providers to complement those offered by CrimsonLogic, the TradeNet operating entity.

Hong Kong: Until its eventual replacement by TSW when Phase 3 is completed in 2027, the GETS services are still operating through the three Service Providers (SPs). Within this system, traders electronically submit four types of essential trade documents: Trade Declaration (TDEC), Electronic Manifest (EMAN), Dutiable Commodities Permit (DCP), and Certificate of Origin (CO), to fulfil the legal requirements for importing, exporting, or re-exporting goods to or from Hong Kong. The SPs receive these electronic trade submissions from traders and carriers, verifying their identities, validating the data, charging relevant fees, and transmitting the information to the Government's back-end computer systems which process the data for customs clearance, trade statistics compilation, import and export licensing control, and origin certification, among others.

Phase 1 of the TSW, first rolled-out in December 2018 covering 14 types of trade permits, is now in full service. In 2022, around 11,650 licences/permits were issued under Phase 1 services. Phase 2 of the TSW was launched in May 2023 and covers a further 28 types of trade permits for specific controlled articles which may be submitted through the TSW on a voluntary basis. Phase 2 has incorporated new functions for better user experience including advanced account management functions, seamless interface with the information systems of relevant government departments, provision of notification service, and functions to allow submissions in bulk. The transaction volume in Phase 2 for these trade documents was around 1.8 million annually.

Japan: NACCS currently provides many functions to process all import/export related procedures and can be joined by all related parties from both the private and public sectors, enabling to build up a "Comprehensive Logistics Information Platform". The main features of the NACCS system include a comprehensive coverage of services for customs import/export procedures, for cargo quarantine procedures and vessel/aircraft clearance management and linking immigration and port authorities for a one-stop service.

Approximately 99% of import/export cargo are currently processed through the NACCS system, with the main services covering import and export declarations; customs procedures; trade control; vessel clearance; landing permission; animal/plant/food quarantine. NACCS handles all procedures in real-time in line with the flow of movement of cargo for import and export. It caters for both G2B and B2B services where Customs and the trading community can share information and reuse the manifest information that the carrier submitted to Customs.

Republic of Korea: UNIPASS, functioning as a Customs Single Window (Customs-SW), encompasses a comprehensive array of customs-related B2G services. These services cover import, export, and express cargo clearance, cargo management, duty payment, draw-back, preferential Certificate of Origin issuance, permit application through interfaces with other regulatory agencies, Authorized Economic Operator (AEO) services, simplified and expedited clearance for E-commerce cargo, the Advanced Passenger Information System, and Harmonized System (HS) code analysis.

Additionally, the uTradeHub platform offers a range of B2G and B2B trade-related procedures, some of which overlap with UNIPASS services. These services include trader directory services, licensing, certification, issuance of preferential and non-preferential Certificates of Origin, trade financing and insurance services like electronic letters of credit, electronic bills of lading, and trade settlement. Furthermore, it provides trade and customs logistics support, including manifest and bonded transportation, import, export, and express cargo clearance, accredited National Certificate Electronic Document Authority services, relay services such as cargo insurance and export insurance policy applications, and Free Trade Agreement origin management services, encompassing origin determination, issuance, distribution, and storage of certificates, among others.

F. Facilities for Micro, Small, and Medium Enterprises (MSMEs)

Micro, Small, and Medium Enterprises (MSMEs) face numerous challenges in international trade, primarily stemming from their limited resources compared to larger corporations. Firstly, they often struggle with complex and varied regulatory environments across different countries, which can be overwhelming in terms of understanding and compliance. Access to financing is another significant hurdle, as MSMEs typically have lesser collateral and credit history, making it difficult to secure the necessary funds for expansion into new markets. Furthermore, logistical challenges, including the high cost and complexity of shipping and customs procedures, disproportionately affect MSMEs. These enterprises also frequently lack the necessary market information and networks to effectively navigate foreign markets. Lastly, limited capacity in terms of manpower and expertise hinders their ability to manage the intricacies of international trade, from negotiating deals to handling legal and cultural differences in business practices. These challenges collectively impede the ability of MSMEs to effectively conduct and expand their international trade operations.

Generally, the four Asian SWs aid MSMEs in overcoming their international trade challenges via an easy to access centralized platform for all trade-related processes, thus simplifying the complex regulatory landscape and making compliance more manageable for MSMEs with limited resources. This reduces the administrative burden and lowers the cost of processing trade documentation. Furthermore, the SWs provide access to essential market information and networks, helping MSMEs to navigate export markets more effectively. The streamlined processes and consolidated information also enable quicker and more efficient customs clearances, alleviating logistical challenges. Overall, SWs offer MSMEs a more accessible and less resource-intensive pathway to participate in global trade.

Singapore: TradeNet is open to all users, large and small. To aid MSMEs, the TradeNet operator CrimsonLogic operates "Customer Service Bureaus", which are in a centrally accessible location, to offer a comprehensive range of over-the-counter services at nominal fees. MSMEs can use these counter service agents at these bureaus, to help file the trade permits and certificates of origin application on their behalf.

Besides Customer Service Bureaus offered by the operator, Singapore Customs also designates several third party service providers as "TradeNet Front-end Solution Providers" (also referred to as Value-Added Service Providers, VASPs). Essentially, they act as intermediaries between the trader and TradeNet. These Front-end Solution Providers offer the interface software solutions that allow MSMEs to connect and submit electronic trade documents to TradeNet as well as other varied services catering to different needs of the MSMEs. Their easy-to-use software solutions often come with user-friendly interfaces, pre-filled forms, and other tools to streamline and automate the declaration process.

Hong Kong: To cater for MSMEs, a paper-to-electronic conversion service is provided via specified agents. This service for the import/export declarations is provided by SPs through a network of service agents in Hong Kong. Importers/exporters have to complete a specified paper authorisation form. The service agents will convert the information on paper into electronic messages and send them to the SPs for onward transmission to the Government. The processing time for such conversion service required by individual service agents is different and an extra service charge will be incurred. The Hong Kong Post is collaborating with one of the three service providers by the Government, to provide paper-to-electronic conversion service at 26 conveniently located post offices in order to facilitate MSMEs to submit paper trade declaration forms to the Government in electronic form.

Japan: There are no specific facilities provided by NACCS SW for MSMEs. However, MSMEs can have access to valued-added service providers of NACCS to utilise the SW services for import and export. Japan Customs also introduced simplified customs clearance for imported goods valued at 200,000 yen (approximately 1,360 dollars) or less by applying a simplified procedure instead of the general procedure applied to general freight. This can be very useful for MSME traders.

Republic of Korea: The country's export promotion agencies provide several digital service platforms that support the exports and internationalization of MSMEs. KTNET has a Free Trade Agreement (FTA) information website (fta.utradehub.or.kr) to encourage SMEs to exploit the benefits offered by FTAs. KCS also operates portals that provide information on the status of various FTAs, custom tariffs by countries and certificates of origin, among others.

G. How do the asian single windows handle e-commerce?

Several distinctive elements shape the dynamics of cross-border e-commerce. Firstly, "parcelization" is a prevalent feature, whereby trade predominantly occurs through a high volume of small parcels instead of traditional bulk shipments. This shift to smaller, more frequent shipments often involves low-value goods, diverging from the conventional focus on high-value commercial items. Accompanying this trend is an increased volume of customs declarations, posing a significant challenge in terms of processing efficiency. Additionally, the e-commerce sector demands speedy customs clearance to meet customer expectations for quick delivery.

A SW platform plays a pivotal role in streamlining these complex processes. By integrating various customs and trade processes into a single digital platform, it effectively manages the high volume of transactions characteristic of e-commerce. The platform can automate and expedite the assessment and clearance of low-value goods, ensuring a faster turnaround. Furthermore, it consolidates all necessary documentation and compliance requirements, simplifying the administrative burden for traders and customs authorities alike. This integration not only accelerates the overall trade process but also enhances the accuracy and efficiency of customs operations, crucial in meeting the fast-paced demands of cross-border e-commerce.

Singapore: Singapore Customs provides the Consolidated Declaration scheme for qualified air express companies to consolidate multiple time-sensitive imports, transhipments, or exports of e-commerce shipments, for submission through TradeNet. The scheme allows for a Consolidated Import Declaration for Bulk Clearance (CIDBC) and Consolidated Outward Declaration for Bulk Clearance (CODBC). The CIDBC/CODBC consolidated permit only covers the import/export of non-dutiable and non-controlled goods. A TradeNet permit is still required to cover the import/export of any dutiable or controlled goods, which are subjected to the approval of the relevant competent authorities.

Hong Kong: The existing GETS does not have any specific features to support cross-border e-commerce. However, the use of advance cargo information (pre-arrival) allows Hong Kong Customs to carry out effective risk profiling. At present, road cargo and sea cargo information are submitted electronically prior to the arrival of the cargo. To support e-commerce, the Hong Kong Government has put in various funding schemes to support local trading companies to explore and develop new markets and adopt technologies to improve their e-commerce operations. The major funding schemes include: (a) the Technology Voucher Programme (TVP), launched in November 2016 to subsidize local enterprises in using technological services and solutions such as e-commerce platform and logistics management system; and (b) the Dedicated Fund on Branding, Upgrading and Domestic Sales (BUD Fund) launched in June 2012 to support MSMEs to develop business in China. The BUD Fund covers support to enterprises in developing e-commerce and integrating online and offline modes of sales and marketing. The Hong Kong Productivity Council has also assisted local SMEs to embark on digital transformation through organizing training sessions and activities relating to e-commerce.

Japan: Japan Customs facilitates cross border e-commerce through a swift, simplified customs clearance process designed for low value imported goods. Instead of the general freight procedure, importers can opt for this "simplified customs clearance procedure for low-value goods" on their import declaration form. It applies to goods valued at 200,000 yen or less per article, excluding those needing

an import license, goods receiving tax relief, and certain goods under the temporary tariff Measures Law. Japan Customs also require specific data for cross-border e-commerce cargo imports (such as name of the e-commerce platform, addresses and names of the importer, domestic delivery destination of the goods) to be specifically indicated in the import declaration form for specific clearance purposes. This provides the legal basis for making importing these goods under a false name a criminal offense.

Republic of Korea: In 2018, the KCS established an "Express Customs Clearance System" which helped simplify the customs clearance process further. This plan should reduce the number of required documents to submit to the administrative authorities. Another objective was to establish a "Common Logistics System" that amasses small volumes of SME export products for their delivery in bulk to reduce shipping costs. uTradeHub established an "e-Commerce Cluster" in 2022 for e-traders to simplify the all-online export-related declaration process, and to create a special simplified declaration form and system to provide a simple and convenient online trading environment. The services by cross-border e-commerce traders include integrated delivery request management; automated creation of documents for proof of foreign exchange transaction; automated Simplified Export Declaration; and automated creation of Purchase Certificate.

V. Specific technology characteristics of the four Asian single windows

A. Authentication mechanisms

Singapore: Individuals access TradeNet and NTP online through SingPass, a single login system offering secure digital transactions. SingPass allows convenient and secure login via the app, using fingerprint, facial recognition, or a 6-digit passcode, and includes two-factor authentication methods like Face Verification and Multi-User SMS 2FA for enhanced security. Business entities use CorpPass, a digital identity system for secure access to government e-services. It replaces multiple accounts with a single login for businesses, enabling authorized representatives to perform online transactions and access services. CorpPass ensures stringent security through unique IDs, entity registration, and authorization, along with digital certificates and encryption.

Hong Kong: The electronic authentication methods to access government electronic services, including TSW, are primarily through the use of digital certificates. These certificates serve as online identity verification and can encrypt sensitive information in online transactions. The process of electronic authentication involves establishing confidence in user identities presented electronically to an information system. Digital certificates, which are a form of electronic record, can be integrated into Hong Kong ID Cards or installed on PCs and other storage devices. They are protected by passwords and are issued by certification authorities like the Hong Kong Post Certification Authority and Digi-Sign Certification Services Limited (operated by TradeLink, one of the GETS service providers). The Hong Kong Post Certification Authority issues "e-Cert" digital certificates for personal and organizational use, which are accepted for a range of government e-services, online banking services, and for exchanging encrypted electronic documents. Similarly, Digi-Sign Certification Services Limited issues "ID-Cert" digital certificates for both individuals and organizations, which can also be used for government e-services, online banking, online trading, and other electronic document exchanges.

Japan: The authentication methods used to access NACCS are: the NACCS network through leased line (dedicated line), BIA (Broadband Internet Access), PSTN (Public Switch Telephone Network), and Internet through service providers.

Republic of Korea: The UNIPASS system offers two main methods for authentication:

(i) Cell Phone Authentication: Users must ensure their cell phone number, either postpaid or prepaid, is registered using their Registration Card ID. The authentication process involves selecting the network company, entering personal information and a security number, and then inputting the authentication number received.

(ii) Public Certificate Authentication: Users enter the authentication number received and input their public certificate password for verification.

B. Digital signature

Singapore: The necessity for digital signature certificates varies based on the context and type of transaction or service. SingPass, the nation's digital identity platform, offers a digital signing functionality, including a Signing Certificate for digitally signing documents. This is crucial for legal and official transactions where verified signatures are essential. In the corporate sector, digital signature certificates might be required for certain interactions, especially when dealing with government agencies or for legally binding documents, a role facilitated by CorpPass, the digital identity system for businesses. Legally, digital signatures hold the same validity as handwritten signatures under the Electronic Transactions Act in Singapore, provided they meet certain criteria. Besides SingPass/CorpPass, TradeNet do not need users to subscribe to a third party Certification Authority's digital certificate to authenticate and validate one's identity in submitting to TradeNet.

Hong Kong: Currently, digital certificates are used in GETS and ROCARS, which accepts two kinds of digital certificate: (a) E-certificate issued by the Hong Kong Post; and (b) ID-Cert issued by the Digi-Sign Certification Services Limited. Both personal and organizational certificates issued by the two organizations are accepted.

Japan: The digital signature methods used in NACCS are aligned with Japan's broader digital signature standards, including:

(i) Certificate-based signatures are primarily used for e-filing documents, including those related to customs and import/export activities. This requires authentication either by the Japanese Public Key Infrastructure (JPKI) or by an authorized service provider.

(ii) A proprietary digital verification seal, known as "e-seal". Its use is mandatory for government contracts, emphasizing its importance in the legal validity of digital documents and contracts.

Republic of Korea: KTNet provides a Joint Certification Service (formerly known as Public Certification Service), which provides digital signature services such as: Issuance of an online ID card and e-seal as an e-signature certification service provider in accordance with the Digital Signature Act; identification of e-commerce counterparties and the provision of e-signature, and verification of forgery and falsification of e-documents. The Joint Certification Service accredited certificates can be used conveniently for all e-transactions. They can also be used from various types of storage methods, including mobile, desktop, USB memory stick, hardware security module, etc. KTNet is the only accredited certificate authority in the trade sector that issues accredited certificates for e-trade. They also provide specialized secure certification for e-documents (such as PDF, etc) as well.

C. Electronic payment

Singapore: The electronic payment for both taxation and fees is facilitated by TradeNet through direct debit from the users' bank accounts with Singapore Customs known as General Interbank Recurring Order (GIRO). Payment is deducted directly from the Declaring Agent's account.

Hong Kong: E-payment is collected by the GETS services providers. For example, TradeLink collects e-payment via (a) Autopay, where the payer can perform a direct debit authorization to pay Tradelink, Tradelink will collect the statement amount automatically through autopay from the nominated bank account two working days after the statement date, (b) Faster Payment System (FPS) where the payer can use a mobile banking application or e-Wallet to scan the QR code to make some specific payments to Tradelink via FPS, or (c) Bank Transfer to pay the charges.

Japan: The NACCS SW incorporates automated tax calculation and electronic payment which enables prompt payment operations and accurate revenue collection, with minimal leakage in customs revenue.

Republic of Korea: Both UNIPASS and uTradeHub facilitate the e-Payment of customs duties and fees for electronic submission of cargo manifests, as well as for inspection fees incurred. UNIPASS features Integrated Payment which enables issuance of integrated payment receipt and record book.

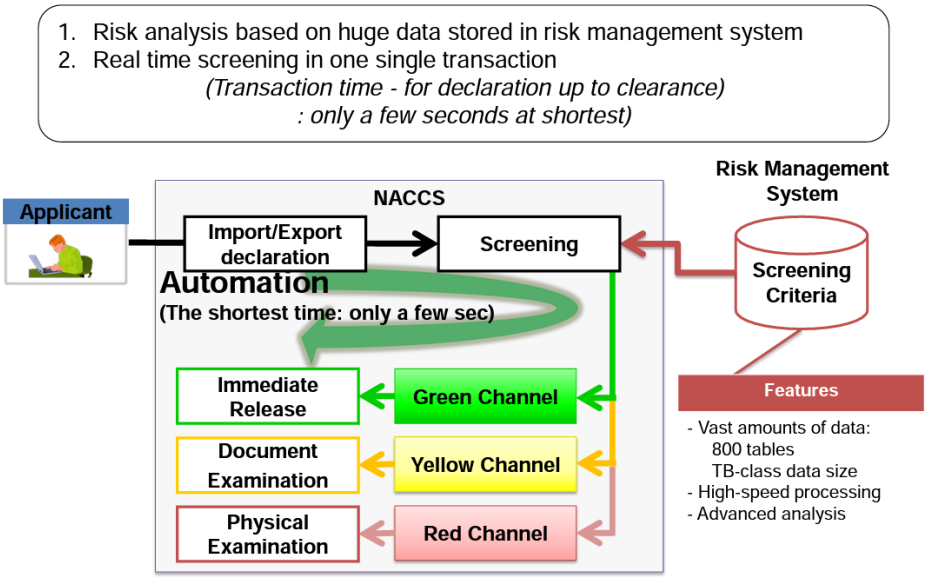
D. Risk management

Singapore: Singapore's early experience in developing TradeNet provided it with insight into better coordinated border management (CBM). Both the SW and the CBM mindsets are complementary elements of Singapore's 'whole-of-government' (WoG) approach to providing efficient services to the trading community. Data submitted to TradeNet is essential for effective risk management, and TradeNet incorporates an "integrated risk engine" which processes the submitted data for selectivity and tactical decision-making. Singapore Customs works closely with the other regulatory agencies, in particular the Immigration and Checkpoint Authority (ICA), using an integrated risk-based approach, to identify shipments posing security risks, and take steps to mitigate such risks through actions on the ground. The two agencies cooperate on joint risk profiling and targeting efforts, rendering operational assistance to each other when suspicious shipments are detected, and consult each other on decisions to inspect or interdict shipments when necessary. Through TradeNet, all government regulatory agencies can process their risk management requirements in an integrated WoG manner.

Hong Kong: The TSW incorporates a Cargo Clearance Module (CCM). This module will include a powerful and highly automated risk engine that shall serve as a centralized risk assessment system for C&ED. It shall enable C&ED to screen cargo information more efficiently, to perform risk assessment of cargo data, and to conduct cargo selection and examination. The streamlined submission workflow, the ability of data re-use, and the submission of more detailed cargo information by traders will help C&ED enhance its risk profiling work and focus enforcement efforts on targeted suspicious consignments, thus expediting the cargo clearance process, reducing unnecessary cargo hold-ups, and as a result improving cargo flow. The new highly automated cargo risk assessment engine will also enhance C&ED's ability to detect contraband and other illegal activities more effectively, thus safeguarding the security and public safety of Hong Kong.

Japan: A risk management system is incorporated which conducts risk analysis based on the large volume of data stored in the NACCS system. This enables real-time risk screening to be performed very fast. The risk management system of NACCS works in conjunction with Japan Custom's Customs Intelligence Database System (CIS). This is an integrated information system in which all customs clearance records for imports and exports and information on importers and exporters are compiled and used for customs screening (see diagram 7).

Diagram 7
Risk management in the Nippon Automated Cargo Clearance System (NACCS)



Source: NTT Data Presentation, "Problems and Solutions of Trade/ Customs in Asian countries" (2016) [online] https://events.development.asia/materials/20160301/problems-and-solutions-tradecustoms-asian-countries.

Republic of Korea: UNIPASS includes an Integrated Risk Management (IRM) module which incorporates a multi-point, intelligent risk management engine with self-learning. The IRM facilitates automatic clearance of low-risk cargo. The Integrated Risk Management system analyses not only Customs data, but also data provided by other entities to create risk profiles and targeting criteria on cargo, as well as on the trading entities and passengers. The system analyses their behaviour and risk patterns for predictive analysis. Such analysis is made available to Customs officers during various stages of the audit and inspection procedures to aid them in their decision-making.

E. Use of emerging technologies

Singapore: The Singapore Government has introduced the blockchain-based "TradeTrust" framework that comprises globally accepted standards that connect governments and businesses to a public blockchain to enable trusted interoperability of electronic trade documents across digital platforms. TradeTrust allows end users to endorse, exchange and verify documents and effect title transfer across different digital platforms seamlessly. TradeTrust can be utilised to digitalise two categories of documents used in cross-border trade: verifiable documents such as the Certificate of Origin, where the provenance and authenticity of the e-document can be verified by any party, and transferable documents such as Bill of Lading, where the e-document's title ownership can be transferred from one party to another.

TradeTrust was created to align with the UNCITRAL Model Law on Electronic Transferable Records (MLETR), which became part of Singapore's Electronic Transactions Act (ETA) in 2021. It empowers users to easily implement Electronic Transferable Records (ETRs), such as electronic Bills of Lading, that meet the requirements set forth in the MLETR, Singapore's ETA, the United Kingdom's Electronic Trade Documents Act (ETDA), and United States laws (New York and Delaware). These ETRs are legally valid and recognized across various platforms and systems. The Singapore Government has made TradeTrust's open-source code freely available for businesses and solution providers to integrate it to their systems, enabling the creation and verification of documents that support practical use cases. Through collaboration with various local and international agencies and industry partners, Singapore is

actively working to establish a "TradeTrust interoperability framework" for the exchange of digital trade documentation. This initiative aims to facilitate a more seamless and efficient flow of goods among digitally interconnected trading partners.

Hong Kong: C&ED has established a Customs Crime Analytics System (CCAS) using advanced data analytics tools to analyse and correlate a huge amount of information from both internal systems and external sources (e.g., data from external counterparts) to conduct their enforcement work every day, such as case investigation, cross-border risk assessment, etc. The system is an all-in-one smart analytics platform to consolidate and mine voluminous data from disparate sources in various formats (both structured and unstructured) and builds a customs' crime knowledge base to facilitate Customs' enforcement works. Artificial intelligence (AI) and predictive models are used to unveil hidden trends, predict patterns, relations and anomalies for proactive risk management. The system significantly enhances C&ED officers' enforcement capability in crime detection, case investigation, cargo profiling, intelligence processing, etc. The analytics results produced by the platform can be shared with other government departments to facilitate their enforcement work, such as enhancing food safety check for FEHD (Food and Environmental Hygiene Department), enhancing environmental protection for EPD (Environmental Protection Department), etc. It helps Hong Kong government to achieve its long-term mission as an essential part of a Smart Customs Blueprint.

In addition, C&ED has also established an Information Systems Strategy Plan (ISSP) which shall make the best use of innovative technologies to achieve digital transformation and ultimately evolve to become a data-driven corporation realised by a broad application of various forms of technology, like cloud computing, big data analytics, artificial intelligence and blockchain.

Japan: Japan Customs, NACCS and their technology partner NTT Data have embarked on the use of artificial intelligence (AI) to enhance risk management to transform how decisions are made, allowing risk managers innovative ways to analyse data, identify trends, and create predictions through scenario planning. AI is leveraged to automatically assess and select the flow of inspection of imported and exported goods and entry and exit passengers, using identification systems and big data processing algorithms. New features include identifying key transport vehicles and containers to be inspected by connecting number plate recognition cameras with a risk management system; automatically recommending a list of declarations with risk signs of the customs value, freight classification and intellectual property infringement. NACCS SW is currently collaborating with TradeWaltz, a Japanese private sector-led blockchain business trading platform. TradeWaltz, founded by NTT Data and backed by 11 other Japanese companies, is a blockchain platform for digitization of international trade processes. It is working with NACCS on system linkage leveraging on blockchain to improve the convenience for the trading community involved in international logistics and cross border trade.

Republic of Korea: To counter limited quality of available data for effective risk management of e-commerce transactions, KCS has explored the application of blockchain technology to enhance transparency in information exchange and trust among individual data creators, as well as to automate data entry, which was previously a partly manual process. The pilot yielded success as each participant in a transaction shared their information directly with Customs through the blockchain. This success was attributed, in part, to the simplicity and computerization of e-commerce transactions, with each participant holding specific data at distinct points in the transaction timeline. In the blockchain approach, all transaction participants (sellers, express carriers, and Customs brokers) transmitted their information, or "blocks," directly to Customs in real time. Throughout the pilot, KCS oversaw all transactions recorded on the blockchain and verified the accuracy of the received information. Another usage of blockchain is the Electronic Origin Data Exchange System (EODES). This is a blockchain-based service platform for cross-border e-CO exchange involving issuing, exchanging, and reviewing the Certificate of Origin electronically.

F. Connectivity with other single windows

Singapore: Singapore TradeNet conducts electronic exchange of data via the ASEAN Single Window (ASW), which is a regional initiative connecting the National Single Windows (NSWs) of ASEAN Member States (AMS). Singapore, Indonesia, Malaysia, Thailand, and Vietnam were the first five AMS to go "live" in January 2018 under the ASW with the digital exchange of the ASEAN Trade in Goods Agreement (ATIGA) Electronic Certificate of Origin form, known as ATIGA e-Form D. For imports into an ASW-ready AMS, an e-ATIGA Form D is acceptable to claim preferential tariff treatment under ATIGA. TradeNet also facilitates the exchange via the ASW of the ASEAN Customs Declaration Document (ACDD). This document contains an ASEAN-defined specific set of export data, sent to the importing AMS' SW for the purpose of supplementing risk management. Traders can opt to send their export ACDD information via TradeNet and ASW to the importing AMS. The benefits for participating traders include potential reduction in Customs clearance time for consignments which are supported by the ACDD and imported into exchange-ready AMS.

TradeNet also conducts electronic exchange with China via the Electronic Origin Data Exchange System (EODES). The EODES arrangement with China enables the electronic submission of the Preferential Certificate of Origin (PCO) and the Certificate of Non-Manipulation (CNM) between Singapore and Chinese Customs, eliminating the need for hard copy PCO or CNM to be dispatched overseas. EODES shortens the transmission lead time and assures the PCO authenticity, thus reducing the goods' time-to-market through faster Customs clearance.

Hong Kong: Hong Kong GETS currently does not exchange data with other countries' SWs. However, one of their service providers (TradeLink) is active as a founding member of the Pan Asian e-commerce Alliance (PAA). The PAA is formed by SW operators in Asia and facilitates the exchange of trade data between SWs and trade service providers.

Japan: NACCS, along with TradeWaltz, piloted interfacing with Singapore's Networked Trade Platform in 2021. In November 2022, under the Economic Partnership Agreement between Japan and the Republic of Indonesia (JIEPA), a pilot to exchange certificates of origin (COs) was initiated to simplify operational procedures and facilitate bilateral trade. This is the first time that Japan has piloted a CO data exchange. Once the CO data exchange is in full operation, importers will be able to submit an electronic CO from the Indonesia SW to NACCS at the time of importing goods under JIEPA preferential duty rates.

Republic of Korea: The country has already implemented cross-border data exchange between its SW and other countries' SWs. For example, through the Electronic Origin Data Exchange System (EODES) arrangement with China, the electronic certificates of origin are exchanged between the Customs authorities of Korea and China. Korea's SW also implemented an EODES arrangement with Indonesia's SW in March 2020, and has reached technical agreements with Vietnam and India to implement the same. The EODES systems interact with UNIPASS database and web application server (WAS) for data management.

VI. Characterizing the four Asian single windows according to their stage of development

Singapore: Based on the seven stages of SW development presented in section 1, the Singapore TradeNet SW, which currently operates in conjunction with the Networked Trade Platform (NTP), can be considered as an **advanced NSW development**, with external exchange with other SWs as well. Specifically, the following milestones have been achieved:

- **Stage 5 (National Single Window):** TradeNet has integrated with over 30 Government agencies under a "whole-of-government" approach, hence it is a fully integrated national SW.
- **Stage 6 (Extended National Single Window with Business-to-Business Services):** Networked Trade Platform (NTP) is an extended form of SW, providing a host of B2B trade and trade finance services.
- **Stage 7 (Regional Single Windows):** Singapore has already conducted trade connectivity with various SWs via the regional ASEAN SW, as well as bilaterally with other countries (China). In the continuing phases of the SW development, the NTP continues to pursue enhancing cross-border digital connectivity through direct G2G exchange of regulatory documents and data with overseas regulators of Singapore's key trading partners.

Hong Kong (S.A.R. of China): Based on the evolution of its SW, Hong Kong can be deemed to have **a full SW environment**. With the advent of the TSW expected to be fully deployed by 2027, Hong Kong shall have an advanced NSW allowing external exchange with other SWs by then. Currently the Hong Kong SW has achieved the following milestones:

- **Stage 3 (Trade Electronic Data Interchange/Value Added Network):** The current GETS system was established originally as an Electronic Data Interchange (EDI) network, to facilitate submission of the trade declaration and three other trade documents. The Hong Government also allowed three service providers to serve as Value-Added Network (VAN) providers.

- **Stage 4 (Partial Single Window):** With Phase 1 and 2 of the TSW completed and in operation, there are 44 trade permits and 9 Government agencies covered. Therefore, with a combination of the older GETS and a partially completed TSW covering trade permits, Hong Kong essentially has a partial NSW environment in place.
- **Stage 5 (National Single Window):** When the TSW Phase 3 is fully deployed by 2027, Hong Kong shall have a next generation, sophisticated full NSW in place.

Japan: Based on the evolution of its SW, Japan has an **advanced NSW**. The NACCS SW plays a pivot role providing not only the classical SW B2G services but covering comprehensive customs clearance as well as airport and seaport community services. The Japanese SW has evolved over time to achieve the following milestones:

- **Stage 3 (Trade Electronic Data Interchange/Value Added Network**): The early generation initiated in the 1970s (Air-NACCS and Sea-NACCS) were the start of Japan's SW journey.
- **Stage 5 (National Single Window) and Stage 6 (Extended National Single Window with Business-to-Business Services):** With the third generation of NACCS launched in 2013, NACCS became a comprehensive NSW catering to the entire trade, customs clearance, import/export permits and licencing, cargo and transport as well as sea and airport services, fulfilling the vision for a "Comprehensive Logistics Information Platform". A unique feature of the NACCS SW is that all the other government agencies' systems have been incorporated into NACCS.
- **Stage 7 (Regional Single Windows):** Together with other Japanese platforms like TradeWaltz, NACCS SW is also extended as a regionally, globally connected SW. NACCS was instrumental in the development and implementation of the Vietnam and Myanmar single windows, dubbed V-NACCS and M-NACCS respectively, which were funded by Japan Government. Hence, there is a linking up of the Japan NACCS SW with these two countries.

Republic of Korea: Based on the evolution of the SW development, the dual Korea SWs can be deemed as an **advanced NSW development**, with external exchange with other SWs as well. Specifically, the following has been achieved:

- **Stage 5 (National Single Window):** UNIPASS has integrated with 44 organisations, including most of the trade regulatory agencies. Hence, it is a fully national SW.
- **Stage 6 (Extended National Single Window with Business-to-Business Services):** uTradeHub is an extended form of SW, providing B2B services such as trade finance.
- **Stage 7 (Regional Single Windows):** The Republic of Korea has made great efforts to extend its SW to be a regionally and globally connected SW, including the EODES arrangement with China and similar arrangements with other Asian countries.

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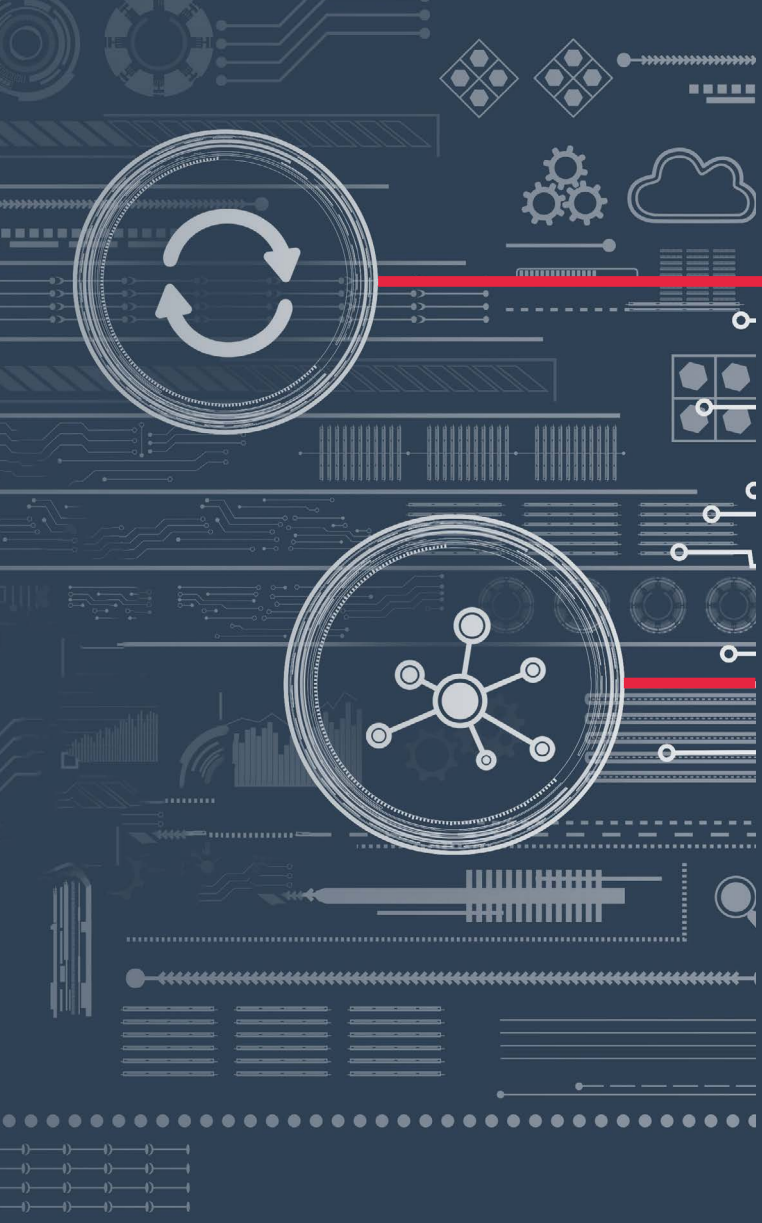

The establishment of a single window is a crucial step in the move towards paperless trade, generating significant savings in time and money for companies as well as the different public bodies involved in foreign trade. Under the Trade Facilitation Agreement of the World Trade Organization, which entered into force in 2017, all the Organization's members committed to maintaining or establishing a single window. Asia is home to some of the world's largest trading economies and to several of the most advanced single windows. This report analyses and compares the main functionalities of four: those of Hong Kong, China; Japan; the Republic of Korea and Singapore. The experience of these economies offers important insights for policymakers in Latin America and the Caribbean, where single windows are generally at a much earlier stage of development. Of particular interest is the inclusion in advanced single windows in Asia of several functionalities aimed at internationalizing micro-, small and medium-sized enterprises, including by facilitating their participation in e-commerce.

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