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THE ROLE OF CUSTOMS-PORT COOPERATION IN IMPLEMENTING A PCS

Executive Summary

Key Takeaways

- *Cooperation between Customs and port authorities is critical to the success of a PCS.*
- *Safe, secure, sustainable, and digitalized maritime trade is underpinned by international instruments. These instruments provide a framework to support the operations of a PCS.*
- *Customs and port authorities are kingpins of digitalization and must ensure interoperability of their systems.*
- *Customs take stewardship among cross-border regulatory agencies. Port authorities lead the effort amongst maritime agencies.*
- *Port authorities and Customs must agree on standard policies, procedures, and guidelines that encourage data collaboration and support a matrix of services.*
- *A port authority's responsibility for safety, security, efficiency, and compliance must be matched with and supported by Customs' role in enforcement and trade facilitation.*
- *Customs and port authorities must work harmoniously to achieving a common goal: smooth trade across borders while ensuring compliance with global trade laws.*

The success of a PCS hinges on successful cooperation between Customs authorities and port authorities. They are the kingpins of port and maritime digitalization, determining the policies, processes and procedures that turn a port's digital transformation from vision into reality. Together they ensure safety, security, efficiency and compliance with domestic and international rules, regulations, and laws. A harmonious relationship between Customs authorities and the port authorities is the bedrock on which a strong, secure, and stable PCS is built.

Cooperation between Customs and port authorities is also crucial for accelerating the digitalization and sustainability of maritime supply chains. Close collaboration between Customs and port authorities is vital for the successful implementation and operations of a PCS. Ports and Customs share operational space and facilities and work in a coherent regulatory environment. Their business processes are intertwined, and data requirements are alike. The two authorities share a mutual goal of ensuring safe, secure, and efficient operations.

While port and maritime authorities typically champion the development of PCSs, Customs have a crucial and determining role. There is hardly a PCS that succeeded without the active backing and stewardship of Customs authorities. The involvement, trust, and full participation of Customs in a PCS is vital for its success.

This chapter covers the four pillars of cooperation between ports and Customs: (i) Legal and regulatory. (ii) Institutional and governance. (iii) Business processes and data. (iv) ICT systems and interoperability.

Several international instruments underpin the regulatory environment to support the design and operation of a safe, secure, sustainable, and digitalized maritime trade environment. Countries have adopted these instruments and integrated the commitments made into their national legislation to harmonize the implementation of their respective ICT systems for Customs, trade, port, and logistics. Governments are also collaborating with their trade partners at a regional level to promote and implement regional harmonization.

The institutionalization of cooperation between port authorities and Customs is foundational to building trust between them and other port community members. While the National Trade Facilitation Committees focus on the broader issues of cooperation at the national level, the port community needs a dedicated consultation and collaboration platform to work together on issues affecting its members. Local institutional arrangements at each port may involve discussing tactical and operational concerns. At the central level, it may mean dealing with strategic and policy issues. Increasingly, PCSs are being developed for a cluster of ports, or nationally for all ports in a country. Likewise, countries come together to deal in regional groupings to set-up harmonized regulatory requirements and establish and institutionalize regional cooperation.

Port authorities and Customs (along with other border control authorities) must collaborate on the business processes for the clearance formalities of vessels and cargo. Ports and Customs must synchronize their regulatory procedures and clearance formalities, while also ensuring that the operations are optimized and remain efficient. A PCS helps ports and Customs 'to be on the same page' and implement joined-up procedures based on shared data.

Finally, ICT systems of ports and Customs must interoperate to cover the complement of port operations. Several entities are situated at the port in their capacity as contractors (tugboat operators, bunker fuel suppliers, ship chandlers) and concessionaires (e.g., terminal operators). The automated systems operated by these entities also link in the handling of vessel, cargo and passenger operations. Likewise, apart from Customs, there are several other regulatory authorities such as immigration, health, security and environment that must work closely to support automated handling.

1. Introduction

1.1. The context

Customs and port authorities share the infrastructure of trade facilitation. Ports provide the backdrop in which customs and other cross-border regulatory agencies implement their regulations. Those regulations cover a wide range of topics including taxation, health, safety, security, and the environment. Legislation drives the oversight of the regulatory agencies. Ports and airports host and support the physical and operational infrastructure for the movement of goods, passengers and means of transport (vessels/barges/trains/trucks) and crew. Building a strong collaboration between the port authorities and Customs is vital.

1.2. Outline and boundaries of the chapter

In this chapter we briefly examine the relationship between port authorities and Customs and the rationale for collaboration for the development of a PCS. The chapter does not discuss the detailed technical, legal, and business model aspects of the PCS. We look at the main motivations for the port and Customs to collaborate in implementing a PCS, namely: (i) To ensure that a port remains safe, secure, efficient, and economically competitive. (ii) To facilitate trade by simplifying and streamlining the bureaucratic procedures at ports.

2. PCS and the complementary roles of port authorities and Customs

Ports constitute critical infrastructure for trade. They are often the beating heart of their region's economy. Ports serve at the national frontiers. Therefore, protecting the ports and their operations constitutes vital national security interest. The port authority provides infrastructure and facilities port operations and supports regulatory inspections for cargo control. They also provide digital systems for processing and communicating information about cargo and transportation. The port authority assists with regulatory inspections that are conducted in designated control areas for veterinary, waste, or dangerous goods controls. Port operators must comply with measures related to plant protection, phytosanitary controls, animal and veterinary controls, food and feed safety, and sanitary measures. The port authority ensures that regulatory inspections are coordinated and conducted in a simultaneous manner.

Discontinuities or disruptions to port operations will have major ramifications for the associated supply chains and in the case of major ports, can seriously impair economic activity. Customs are the gatekeepers at the port, as they nearly always take the final decision on the release of the goods from the port, with a responsibility to protect the economic frontiers of the country. They must exercise control over the flow of all means of transport (vessels/barges/trains and trucks) and goods entering or leaving the port to ensure that they conform to regulations and do so without impacting the efficiency of port operations. Port authorities also have some regulatory responsibilities. The following table briefly compares the responsibilities of the two organizations:

To implement the respective mandates, it is necessary to have close and trustworthy co-operation between ports authorities

and Customs. Under the principles of border agency co-operation, Customs liaise with other government regulatory agencies (OGA's), such as immigration, sanitary, veterinary, phytosanitary, health authorities to ensure that vessel and cargo clearance formalities are followed. Usually, Customs coordinate the final notifications of release or hold on behalf of various border control authorities. Typically, Customs authorities ensure that if the cargo or vessels are to be inspected or controlled, they are carried out synchronously and in a coordinated manner.

Customs operations take place in the infrastructure and facilities provided by port authorities either directly or through their contractors or concessionaires. A port authority works with and through terminal operators, storage yards, warehouses, tank firms, and cargo inspection facilities. On the regulatory side, port authorities must work with the harbor master, port and flag state control authorities, port safety, fire protection services and marine security and other government agencies. Port and/or maritime authorities or their concessionaires manage ICT facilities to handle vessel and cargo related information for the movement to the foreland or the hinterland.

Terminal operators are entities appointed by the port authority (often operating under a long-term lease agreement) and are the most important stakeholders in the context of collaboration between Customs and ports. They are responsible for holding cargo securely in temporary storage, protecting against unauthorized access, tampering, or pilferage until Customs decides to inspect cargo or permits its release. Terminal operators manage cargo flows into, out of and through the terminal's premises that are located inside the port. Terminal operators are Customs

Table 1. The collaborative complementary role of Ports Authorities & Customs

Objective	Port Authorities	Customs
Cargo Clearance	Through the port & cargo terminals: Verifying the identity of goods and entities bringing and taking out those goods; Responsibility for the inventory of goods in bonded areas;	Verifying the accuracy and completeness of import, export and storage; documentation, including bills of lading, commercial invoices, and packing lists; Calling port terminals to account for goods, passengers; Customs and port authorities work together to facilitate the movement of goods across borders, by ensuring that import, storage, export and exit procedures are clear and streamlined, and that customs inspections are conducted efficiently.
Safety & Security	The implementation of the SOLAS convention and the International Ship and Port Security (ISPS) Codes; Customs, OGA's and port authorities collaborate to assess the risk associated with different shipments, including the likelihood of smuggling or the presence of prohibited items.	Security and safety measures before the entering or exiting of the goods Customs and port authorities work together to ensure the security of the port and its surrounding areas, by screening visitors and monitoring the movement of goods and people. Customs may also take action against money laundering and terrorist financing; Customs processing of General Declarations, Passenger manifests, Vessel Security Reports.
Health & Safety	Inspecting ships for food safety and infectious disease control; public and environmental health checks; Implementation of Occupational Safety & Health (OSH) Standards for all Personnel at ports including customs officers.	Regulatory restrictions and prohibitions, phytosanitary and veterinary requirements, goods compliance with the safety and health standards intellectual property rights preservation; Drugs, precursors, weapons, marshal goods controls implemented in close cooperation with OGA's.
Taxation & Revenue	Port authorities collect port dues, other fees for the use of port facilities and services.	Customs authorities are responsible for collecting customs duties and other taxes on imported goods
Environmental protection	Intervention of environmental restrictions, waste management services and controls; MARPOL Convention; Port reception facilities; control and safe handling of dangerous goods; For dangerous goods, customs and port authorities work together to inspect cargo to ensure that it complies with relevant regulations.	Enforcement of regulations to control the transboundary movement of waste; protection of trade in endangered wildlife products; control of nuclear and other hazardous material; Customs, OGA's and port authorities collaborate to ensure that shipments comply with environmental regulations, and that the port and its operations do not negatively impact the environment.

temporary storage (bonded) facilities and can be called to properly account for the cargo they handle. They are required to assist Customs and port authorities in the event of an inspection. Implementing a PCS requires terminal operators to be users of and linked to the PCS and to collaborate very closely with Customs and ports. The Customs and port authorities by virtue of their legal powers must effectively persuade terminal operators to collaborate with port community members.

Port Authorities play a facilitating role in the performance of controls assigned to cross-border regulatory agencies (often referred to as OGA's) such as sanitary, veterinary, hazardous waste, dangerous goods etc. Port authorities provide areas designated for the control of such goods. In coordination with Customs, port authorities seek to facilitate joint and simultaneous regulatory inspections in the interest of cost savings and efficiency.

Customs and port authorities need to cooperate closely for effective supervision and law enforcement at ports. Mutual recognition of supervision and coordination of law enforcement can reduce repetition and operating costs for enterprises, as well as reduce input of resources and administrative costs for

both agencies. Coordinated law enforcement can integrate the strengths of both agencies and form a stronger law enforcement force to avoid the negative consequences of disjointed and random law enforcement actions.

Port and Customs authorities highlight the importance of information in the risk-based model for secure international supply chains. Digitalization of maritime cargo information is seen as a common goal for law enforcement agencies, port service providers, and economic operators. Digitalization requires solid relationships and mutual understanding between port and Customs authorities. Pivotal investments into digitalization, such as the PCS and MSW projects, are costly and require long-term planning, and port and Customs authorities must ensure the compatibility and interoperability of various digital systems and conformity with governmental policies. Legislative requirements and restrictions may pose challenges. Factors such as organizational, technical, and financial resources need to be assessed for successful implementation. Data confidentiality and privacy protection policies also need to be considered. Achieving alignment in cybersecurity requirements and standards among various authorities and economic operators is a complex and long-lasting effort.

3. Complementary legal & regulatory powers

Maritime and Customs laws require Customs and port authorities to collaborate closely right at the beginning of a port's inception. That collaboration must continue throughout the port's existence. Customs law typically defines the territorial boundaries of a country for Customs purposes and allows Customs to authorize ports and cargo reception facilities and which locations and facilities can handle cargo under international trade procedures. This principle is defined under Standard 6.1 of the Revised Kyoto Convention, which requires that: "All goods, including means of transport, which enter or leave the Customs territory, regardless of whether they are liable to duties and taxes, shall be subject to Customs control." To maintain physical control on the flow of goods, Customs authorities establish the port facilities as 'bonded' premises that can securely hold imported and export goods that are under Customs control. Customs authorities also specify reporting formalities (including declarations) that ships must submit to facilitate controls.

The time-bound implementation of the IMO FAL Convention provides a unique opportunity to foster Customs port collaboration. The IMO FAL Convention combines the reporting formalities that a visiting ship must comply with and covers all data required by all government agencies situated on shore. The Convention requires contracting parties to provide facilities to receive the regulatory data needed from a calling vessel under various laws to be delivered at a single point of entry ("Maritime Single Window") using a standardized electronic format. By January 2024, the Contracting Parties to the convention must implement the digitalization of the IMO FAL reporting formalities, including the concept of a "Maritime Single Window". At a global level, the WCO and the IMO have partnered to harmonize the IMO FAL Compendium ("The IMO Compendium on Facilitation and Electronic Business") with the WCO Data Model. The updated Compendium has established the global standard on the submission of maritime data. In line with this 'apex-level' collaboration, Customs and port authorities must coordinate locally at the country and port levels to align the legal requirements under their respective Maritime and Trade Single Windows. In a PCS context, a dialogue on the mechanism to implement the FAL requirements provides the ideal framework to cement collaboration between a port and Customs.

To implement a PCS, Customs and port authorities must closely collaborate in providing the enabling legal framework. The two organizations have a common cause in promoting the foundational e-transaction laws that digital logistics platforms, PCSs and trade single windows share with one another. The critical elements of the enabling legal framework for electronic commerce and digital logistics platforms include: (i) Data privacy and security and measures to ensure that personal data is protected, and data breaches are minimized. (ii) The legal framework should recognize electronic signatures as valid and legally binding. (iii) The law should recognize electronic records and transactions, and the courts must ensure their enforceability. (iv)

Box 1. Customs Trade Partnership Against Terrorism (C-TPAT)

The Customs-Trade Partnership Against Terrorism (C-TPAT) is a voluntary program that relies on collaboration between the public and private sectors. It acknowledges that the most effective way for the US Customs & Border Protection can ensure cargo security is through close partnerships with key players in the global supply chain, including the port authorities, importers, carriers, consolidators, licensed customs brokers, and manufacturers. The Security and Accountability for Every Port Act of 2006 established a legal framework for the C-TPAT program and mandated rigorous oversight.

The legal framework should protect intellectual property rights in the digital environment. (v) Contracts entered electronically should be valid and enforceable. (vi) The affected parties should be able to resolve their liability issues and disputes (including the use of arbitration). (vii) There should be adequate consumer protection for PCS users.

Laws enabling the use of private sector data for Customs control are an important aspect of Customs port cooperation in the context of a PCS. PCSs offer the opportunity for Customs to use private sector data to manage Customs controls. PCSs can be an effective platform for cooperation, and regular and systematic consultation between Customs authorities and the port authorities, and by implication, with the members of the private sector that are a part of the port community. The World Customs Organization's SAFE Framework of Standards (FoS) recognizes and recommends the possibility of Customs authorities accessing and using economic operators' commercial systems and to audit them to satisfy customs' requirements. Under the SAFE FoS, customs have online access to the commercial systems of the parties involved. Once the issues of confidentiality are resolved, the arrangement should provide enhanced access to authentic information and offer the possibility for far-reaching simplified procedures.

By aligning with Customs norms under the WCO SAFE FoS, ports can contribute positively to the integrity, safety, and security of the international supply chain. Customs laws and regulations require port authorities and terminal operators to play their part, and PCSs can provide crucial information for achieving those objectives. When a port's facilities fulfil the standards set out by Customs under its Authorized Economic Operators (AEO) regulations, they can become a part of the 'Authorized Supply Chain'. The concept of Authorized Supply Chains refers to the



PHOTO BY: PCS OPERATORS | PORTNET, MOROCCO

possibility that all participants in an international trade transaction are approved and trusted by Customs as observing specified standards in the secure handling of goods and compliant with the relevant regulatory norms. Transactions under an authorized supply chain receive guaranteed and reliable facilitation in cargo clearance with no or far reduced regulatory hold-ups or Customs inspections. The WCO SAFE FoS also mentions Cargo Community Systems (CCS) as a facility wherein ports or airports, and all other parties involved in the transport chain, agree to establish, and operate, an electronic system by which they exchange all relevant cargo and transport related data. “Provided that these systems contain the necessary particulars for Customs purposes, Customs shall consider participating in such systems and extracting the data required for their purposes.” The port authority and terminal operator are important in the trade chain and should consider accrediting themselves under their respective national AEO programs.

The PCS can help to improve the efficiency and effectiveness of the Advance Cargo Information (ACI) process by providing a single platform for the exchange of information and coordination of activities among the various stakeholders involved. ACI is a Customs requirement under the WCO SAFE FoS that requires the submission of detailed information about cargo and related entities (such as shippers, consignees, and carriers) to a country’s Customs authority before the arrival of the cargo. This information includes the description, value, and quantity of the goods and information about the parties involved in the shipment. ACI aims to enhance border security and facilitate trade by allowing Customs authorities to identify high-risk shipments and conduct risk assessments before the cargo arrives. ACI enables Customs officials to

identify and prevent the entry of goods that may threaten public safety or security, such as illegal drugs, weapons, or hazardous materials. ACI requirements vary by country, but generally, they apply to all goods shipped into a country. Failure to comply with ACI requirements can result in penalties and delays.

The breach of maritime security poses severe challenges to the resilience and business continuity of port operations, and to meet these challenges effectively, the ISPS Code offers a structure for collaboration between ships and government agencies. The Code helps identify and prevent activities that endanger maritime security. It enables Customs and ports authorities to come together as partners to meet the challenge by facilitating the recognition and prevention of security risks globally. Under the Code, governments are responsible for disseminating security-related information to ships and port facilities. The Code mandates governments to collect and evaluate data regarding security threats and share this information with internal agencies and partner countries. The IMO has harmonized the data requirements under the vessel security report covered by the ISPS code by including them as part of the FAL Compendium. Customs and port/maritime authorities are the main recipients of these reports, and a PCS could facilitate the receipt and dissemination of the security-related reports to all concerned agencies. Individuals working on ships and port facilities must know about security risks and report such concerns to relevant authorities for evaluation. If those individuals are PCS users, they can process the information in a timely manner. Implementing the Code necessitates the creation of an entirely new culture among those engaged in the routine operations of the shipping and port sector.

4. Shared institutional & governance space

Customs and ports must join hands to underpin the governance and institutional framework for implementing a PCS. The institutional basis for Customs-port collaboration must exist at the national, and regional/port levels, because each level must address a different set of problems. To prioritize actions leading to a PCS implementation, port authorities and Customs should work together at the National Trade Facilitation Committee (NTFC) that governments have formed in compliance with the WTO TFA.

Considering the need for a sharp focus on Customs-port collaboration in PCSs, the World Bank and the IAPH recommend the creation of a body that will eventually be subordinate to the NTFC called the National Port Community Council (NPCC) (please refer to chapter 3).

The NPCC can help establish trust between port community members and facilitate trade while securing the supply chain.

The NPCC should have a two-tiered governance framework consisting of steering and business process committees. The steering committee should comprise heads of governmental agencies and trade association presidents, whereas the business process committee should include business process and legal and ICT experts from all members. The steering committee should be responsible for initiating and launching any digitalization initiatives and driving the evolution of the legal framework. The business process committee should review and reengineer business processes, digitize manual processes, implement standardization and cybersecurity, and foster best practices and innovation. The national port or maritime authority and Customs may co-chair the NPCC to signal collaboration and joint leadership on trade facilitation and supply chain security. The patterns of institutional collaboration between Customs and port authorities can be best understood through country examples, some of which are illustrated below:

Box 2. Example 1. United States – Collaboration between FMC and CBP

The Federal Maritime Commission (FMC) and Customs & Border Protection (CBP) are the two federal agencies that share the responsibility to ensure secure and facilitated international trade in the maritime sector. The two agencies enjoy a close working relationship and collaborate extensively toward ensuring greater security, compliance, and facilitation of cargo in the maritime environment. CBP and FM have a complementary mission and objectives. While CBP's mission is to protect and safeguard the country's borders, and to enhance the country's economic prosperity through secure and efficient trade and travel, FMC's mission is "to foster a fair, efficient and reliable ocean transportation system and protect the public from unfair and deceptive practices in the maritime sector." There is a longstanding collaboration between the two organizations to ensure port security and compliance with the Safe Port Act and assist the FMC in fulfilling its regulatory responsibilities under the Shipping Act. FMC and CBP have entered into an MOU to transfer data from CBP's Automated Commercial Environment (ACE) and other systems directly to the FMC to help the latter fulfil its statutory and regulatory duties and responsibilities.

The digital collaboration of customs and ports is reflected in the digital collaboration between CBP's ACE and port terminals at the US's ports. ACE provides a centralized platform for importers, exporters, carriers, port terminals and other trade partners to submit documentation and receive real-time updates on the status of their shipments. ACE is the U.S. government Trade Single Window for processing trade-related import and export data required by government agencies. Through ACE's digital interfaces with ocean carriers and MTOs, CBP helps streamline port logistics while ensuring border security at US ports. ACE ensures that any government agency hold, or release is transmitted as digital messages to inform the carriers and the nominated marine terminal operator (MTO) about movement authorizations, including the physical release of cargo from the marine terminal and to implement holds on cargo movements. The FMC has anchored other collaborative initiatives that require close collaboration with CBP. The most important ones are:

1. [Maritime Transportation Data Initiative](#)
2. [Ocean Shipping Reform Act of 2022 \(OSRA\) Implementation](#)
3. [Supply Chain Innovation Initiative.](#)

Source: CBP and FMC Websites.

Box 3. Example 2: China's E PORT System as the platform for Customs Port Collaboration

China's digitalization of port processes reached the take-off stage in 1998 with the introduction of the E-Port platform, which provides a unified information system for "one-stop clearance, one-stop logistics, one-stop foreign trade". The platform works at two layers the China E-Port at the national level and the local E-Port serving at the port level. The facility covers the twin functions – the regulatory function of clearance and enforcement at ports, and the window to offer and consume local logistical services. In some respects, E-Port can be considered as a hybrid between a TSW an MSW and a PCS. The institutional framework governing E-Port is similar to the National Port Community Council (NPCC) described above. At the apex level, China's E-Port implementation is driven by the State Council's Inter-ministerial Joint Conference on port Administration, with the Vice Premier of the State Council as the convenor of the joint conference, and the specific tasks are carried out by the General Administration of China Customs (GACC) as the leading department of single window program, with the relevant units jointly to form the Single Window Implementation Working Group with 25 ministries and commissions participating in it.



Chinese government has established the National E-Port Coordinating and Steering Committee, coordinate the resolution of major issues during the building of E-Port. Administrative office under this committee to be responsible for its day-to-day affairs. Dedicated body to build the E-Port Systems. It is responsible for the design, development daily operation, maintenance and management of the E-Port systems and networks.

Source: Presentation on "Development & Application of E-Port in China —Workshop on Single Electronic Window Development for CAREC"

5. Collaboration in business process & data

Customs and port authorities collaborate to manage an array of business processes covering cargo and passenger clearances. Lack of coordination between the port authority, the terminal operator and Customs can potentially delay cargo operations. The following are a couple of examples:

I. *Permission to unload*: A time gap may arise between the berthing of a vessel and the commencement of vessel operations if Customs boarding formalities are not completed, and permits are not granted on time. In some countries, the permission to unload is linked to the completion of boarding formalities, which includes an officer physically

boarding the vessel and reviewing documentation received from the vessel's master, and the inspection of the vessel's stores.

II. *Sharing the results of risk assessment*: Customs' risk assessment based on advance cargo information helps generate the list of containers to be released on arrival, sent for inspection or to the x-ray station for scanning. The terminal operator, which develops a tentative unloading plan prior to a vessel's arrival, needs to know about these details sufficiently in advance to finalize the offloading sequence, yard storage plans and delivery plans.

Box 4. Example 3: India- EDI/eTrade provides the platform for Customs-Port collaboration

India's PCS implementation is the product of close collaboration between the port authorities and customs. As the PCS operator, the Indian Ports Association (IPA) front ends the views of the port sector. The 'major ports' of the public sector and other large private ports are IPA members. PCS began its initial implementation in 2008. Before that, customs and port authorities collaborated at the port level, with an installation of the Indian Customs EDI System (ICES) functioning at each port. ICES exchanged electronic messages with the port authorities' systems through local Message Exchange Servers (MES). The message set was developed in the early 2000s. In 2008, Indian customs centralized its ICT platform to cover all ports. ICEGATE, the customs' central EDI Gateway, became the single interface with all external partners and began exchanging electronic messages with the PCS, which acted as the single point interface for all Indian ports.

For nearly two decades, customs and port authorities (led by IPA) worked on the data interoperability framework developed under the government's umbrella "mission-mode projects" (MMP) called Electronic Data Interchange (EDI) For Trade (eTrade). The Cabinet Secretary's office monitored MMPs to ensure high-level stakeholder coordination, focusing on promoting collaboration in the port, aviation, banking and regulatory sectors. In the port sector, the significant effort involved the implementation of the definition and implementation of standard electronic messages between customs, port authorities, terminal operators, NVOCCs, shipping lines (mainline operators) and ship's agents. High-level monitoring of customs-port authority collaboration continues to date and extends to implementing Advance Cargo Information, Direct Port Delivery, and the tracking port dwell time. The National Committee on Trade Facilitation, also headed by the Cabinet Secretary, closely monitors the implementation of the National Trade Facilitation Action Plan 2020-23. The Action Plan includes 66 action items and about a fifth of the action items involve close cooperation between customs and the port sector led by the Ministry of Shipping.

The above examples illustrate the need for mutual understanding between the main stakeholders at a port. The responsibility to resolve such issues rests jointly with Customs and port authorities.

The integration between Customs, the PCS, and the Terminal Operator Systems (TOS) is crucial for the port's cargo entry and evacuation. The PCS is a comprehensive system of information sharing between stakeholders covering: (a) The ocean-going vessel's entry to exit cycle. (b) Cargo import and export cycle. (c) The management of hinterland transport by rail, road, and inland waterways. (d) Payment management for services provided and consumed in the port and terminal process. Customs needs to obtain the most upstream data directly from the commercial and transport sources to be subsequently passed on to the PCS, or alternatively submitted by the information source directly to the PCS where Customs can access it online. Customs has the legal powers to demand and receive advance data on vessels, cargo, crew, passengers, dangerous goods, and ship stores. A port's operations depend on these data streams, which serve as the lifeblood of its operation. In theory, exchanging agreed information and messages between Customs, port authorities, and terminal operators should be automatic and seamless. In practice, this goal takes a lot of work to accomplish and requires a collective appreciation of the interlinkages in a port's business process. The collaborative business processes shared by port authorities, terminal operators, and Customs is briefly illustrated below:

5.1. Vessel-related operations

- I. Vessel operations begin with the shipping line, or the ship's agent registering a vessel by submitting a detailed vessel profile to the PCS. Port authorities and terminal operators need this data for navigation and vessel docking. The PCS may share a subset of the vessel profile data with Customs because customs must use it to validate the conveyance level data it receives in a conveyance or cargo report.
- II. The shipping line or the ship's agent registers scheduled vessel voyages at ports, announcing them on the PCS to inform the entire port community, including ports and customs, who can prepare for the port call's regulatory and commercial aspects and plan the whole port call process.
- III. One of the foundational functions of a PCS is the assignment of the stay reference number. The stay reference number is the link that ties up all data and processes surrounding a vessel's call. Upon the request of a ship's agent or shipping line, the port typically assigns a stay reference number to a ship when it arrives at a port. The port authorities, Customs, terminal operators, port services and the rest of the port community use this number to track the vessel's life cycle of operations for the port call. Unless Customs and port authorities agree to share this number as the common identifier, efficient port operations are impossible. By tracking vessels through a unique identifier, like a stay reference number, port authorities can better manage

Table 2. Truck Appointment System via PCS – based on the India PCS Case study

1	Transport Booking – The Customs Broker/ Freight forwarder/Container Freight Station/Importer/ Exporter books Trucking company based on the manifest line numbers (in case of imports) and Stay Reference Number (VCN) (in case of an export).	<i>Action performed on the PCS's web portal</i>
2	Transport Booking Acknowledgement – The Transporter views the Transport Booking Request and approves or rejects the booking request. Once the Transporter approves the booking and allocates truck and driver against that booking.	<i>Electronic messages exchanged via PCS: TPRORD- Transport Order and PRGMSG- Pre gate information</i>
3	Delivery Gate Schedule – The Terminal Operator/ Port Authority via the PCS shares the Delivery Gate Schedule with all the Transporters who have accepted the booking (for import).	<i>Electronic messages exchanged via PCS: DGTSCH- Delivery Gate Schedule</i>
4	Gate Open Report – Terminal Operator/ Port Authority share the Gate Open Report to all the Transporters who have accepted the booking (for export).	<i>Electronic messages exchanged via PCS: GOCOFR- Gate Open cut off Report</i>
5	Gate Appointment Booking – Once the Transporter receives the Delivery Gate Schedule or Gate Open Report, the Transporter completes the Gate Appointment Booking. Transporter allots the time slot to the Port/Terminal.	<i>Electronic messages exchanged via PCS: GTINAP- Gate In appointment Booking</i>
6	Gate Activity – The driver shares the URN (Unique Reference Number) with the Port gate person. Port gate person verifies the URN. If the verification is successful, the vehicle is allowed to Gate- in or Gate- out from the Port.	<i>Action performed on the PCS's web portal</i>
7	Equipment Interchange Report – The Terminal Operator shares the Equipment Interchange Report with the Customs Broker/ CFS.	<i>Electronic messages exchanged via PCS: EIRMSG- Equipment Interchange Report</i>

the flow of ships in and out of the port, coordinate the use of resources, like berths and cranes, and ensure that all vessels are complying with local laws and regulations. Through stay reference numbers, customs ensures that all vessel calls (and, through them, the cargo they carry) are accounted for. Vessels calling at a port may carry out multiple operations at one or more terminals. To track a ship's schedule and movements, port authorities and Customs may assign rotation numbers to uniquely identify and track the vessels' activities. Port and Customs may also use these identifiers to remain on the same page on the vessel's operations, shared via the PCS.

5.2. Cargo operations

I. The implementation of Advance Cargo Information (ACI) is an important area for Customs-port collaboration. Customs administrations worldwide are implementing the ACI process to receive, risk assess and process cargo clearance before the cargo's arrival. ACI enables Customs to identify high-risk cargo and perform targeted inspections, reducing the risk of security breaches. When Customs introduce ACI as prescribed under the SAFE FoS, it helps streamline customs workflows, support pre-clearance, and conclude compliance verification almost as soon as the consignments leave the last port of call. A port terminal can also benefit in several ways from ACI mandates

of Customs. With ACI, port terminals can better plan for the arrival and handling of cargo. ACI allows Customs to pre-notify shipments that require inspection before release, allowing terminal operators to plan their operations, helping reduce the overall processing time and improving the terminal's productivity. Customs prenotification on a PCS also enhances the ability of the shipping lines, freight forwarders, trucking companies, and Customs brokers to plan the uplift and delivery of cargo from port terminals.

II. It is not possible to automate cargo delivery through the gates of port terminals without close collaboration between Customs and port authorities. Terminal gate automation,¹ which is one of the most important modules implemented under a PCS, requires the two organizations to be on the same page and act in unison to ensure that all other members of the port community fall in line with the requirements.

- The terminal operator must provide the infrastructure and technology to automate truck movements at the terminal gates. Gate automation requires a complex array of hardware and software systems, and includes automated boom barriers, RFID readers, automated numberplate recognition systems, smart card solutions, self-service consoles, CCTV systems and integrated vehicle inspection facilities. Customs and port authorities need to agree, preferably at a national level, to set the standards for all terminal operators so that all

¹ Terminal Gate automation is part of the Terminal Operating System (TOS). Port Gate automation is part of the PCS. Closed ports will have 2 sets of gates: at terminal and port level. Open ports (e.g. Marseille-Fos and Antwerp) have only Gates at Terminal level.

terminal operators provide the necessary data and interfaces to support the automated truck movement system.

- PCSs register truckers, trucks and crew that operate across terminals in a port, and across multiple ports. PCSs can help Customs and port authorities implement the agreed technical and security standards that truck fleet operators and crew must follow. All participants must adhere to standards that enable automated gate operations. For example, Customs and port authorities may require truckers to fix an RFID tag on the truck's windscreens, drivers to undergo security clearance and hold identity cards of a particular technical specification. Together, they must ensure that members of the port community are trained to implement the solutions. Customs and port authorities can create a framework to register trucks that visit the port.

- It is now a global norm in Customs to implement advance cargo information. EU-driven procedures, such as the Import Control System and Export Control System, ensure that authorities have the required advanced information for all activities, including truck appointment systems. Customs and ports can collaborate and develop priority services for AEO clients via the PCS. In consultation with Customs, ports can introduce concepts such as fast lanes, dedicated AEO Gates, separate cargo holding areas and priority pathways for AEO clients. Gate automation accompanies a series of exchange of messages between Customs, shipping lines, terminal operators, trucking company, and freight forwarder. The following table captures examples depicting business processes and accompanying exchange of messages:

6. Interoperable ICT framework

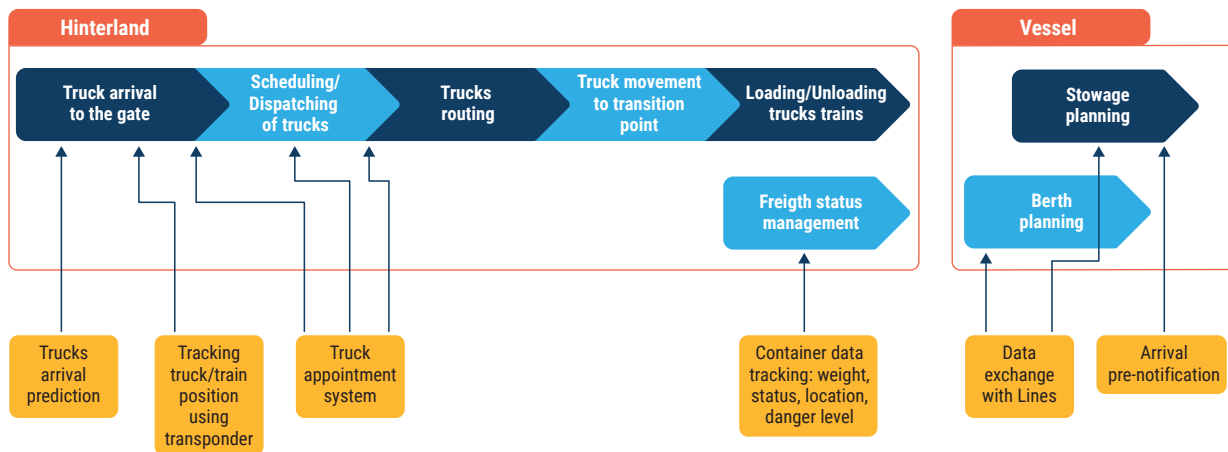
Port authorities and Customs spend significant money on ICT and must co-ordinate their investments in the interest of interoperability, economy, synergy, and efficiency. A pattern of longstanding and close collaboration to promote interoperability between port/maritime authorities and Customs is behind every PCS's success story. As kingpins in the digitalization space, Customs and port authorities together provide a large tent to cover the PCS community members, and a partnership between them is vital in establishing and managing interoperability among them. Customs takes the stewardship among cross-border regulatory agencies whereas port authorities lead the effort amongst maritime agencies.

Customs and port authorities may refer to the European Interoperability Framework (EIF), which provides comprehensive guidelines for public authorities implementing collaborative digital platforms. EIF recommends the adoption of a common architectural framework, which may include a set of technical specifications, standards, and guidelines for developing interoperable solutions. For ports and Customs to promote interoperability in a PCS environment, they must adopt EIF's principles of using open standards, reusable solutions, aligned business processes and harmonized data standards across different public authorities and private sector operators. The EIF promotes a governance framework that supports the development and implementation of interoperable solutions. Port authorities and Customs must agree on standard policies, procedures, and guidelines that encourage data collaboration and support a matrix of services. For PCS to promote interoperable solutions, the EIF fosters developing and adopting standard vocabularies, data models, and application programming interfaces (APIs). A community metadata registry and conceptual data model are vital artifacts that support semantic interoperability in PCS implementation.

Customs and port authorities emphasize the need to provide quality data in line with regulatory obligations. Stakeholders submitting the regulatory reports are not owners of the data and therefore only pass on data received from others. This has a double negative effect: first of all, for the competent authorities (Customs, OGA's and port authorities) the low data quality has an effect on the use they can make of it (risk analysis, decisions on actions to undertake, reporting and statistics, etc.) and secondly on the side of trade it could be the source of delays and even penalties or legal liability. A PCS can connect to the relevant stakeholders to receive the data directly. Quality data leads to better risk management, improved controls, and efficient operations.

To enhance and maintain interoperability, Customs and port authorities may develop models using facilities ranging from groupware to sophisticated modelling tools. The various elements of interoperability require working with and through the interoperability of different models (business process models, data models, and architectural models). Models are vital for managing the process of PCS development. Models are vital for managing the process of developing (and sharing the results of). Models promote efficient communication, information sharing, coordination, and collaboration. Tools that enable teams to work in real-time or asynchronously via a centralized platform (groupware) can assist with communication and cooperation to keep track of goals of interoperability. While models can be represented as text or spreadsheets, the complexity of the transport and international trade environment shows that the usage of modelling standards such as Business Process Modelling Notation (BPMN) or Unified Modelling language (UML) in combination with a dedicated charting tool (open source or proprietary) has many advantages in terms of efficiency, maintenance of models and quality assurance. For instance, to support an interoperable architecture, experts may use TOGAF (the Open Group Architecture Framework) standards and the ArchiMate modelling language for

Figure 1. The linkage between business processes (in yellow) and IT services (in blue)



Enterprise Architecture. The following is an illustration of a diagram describing Vessel-related processes - berth planning and stowage planning and how these processes can be supported by IT-services, covering data-exchange with ocean liners.

It is also commonplace to use diagramming to share interoperability artifacts for business processes. UNESCAP developed the Business Process Analysis Guide² that captures a simple methodology to elicit, document, and analyse the existing “as-is” business processes involved in international trade, as well as aid in developing recommendations for further improvement. Likewise, to depict shared data models, PCS participants may collaborate on data models that show the structure and relationships of the standard data elements.

7. Conclusions

Port authorities and Customs have an important relationship regarding the movement of goods and people across international borders. Port authorities are responsible for managing ports, providing infrastructure, and overseeing the movement of ships, cargo, and passengers while ensuring compliance with relevant regulations. Customs is responsible for regulating imports and exports and collecting taxes on the government’s behalf. They also enforce trade regulations to protect countries from illicit goods or harmful substances entering their borders.

PCSs are the living examples of close collaboration between port authorities and Customs. PCSs can contribute to ensuring that all goods and people moving into or out of a port are properly documented and declared legally according to established

rules by both parties involved. Regular dialogue between the two organizations helps ensure a steady flow of trade without any disruption due to miscommunication or misunderstanding on either side. This efficient coordination helps ensure that all processes related to shipping run smoothly without hindrance from unexpected delays caused by improper paperwork handling. This could lead to costly consequences in terms of time wasted waiting at ports. A port authority’s responsibility for safety, security, efficiency, and compliance must be matched with and supported by Customs’ role in regulation enforcement. This means they can work together harmoniously to achieve a common goal: a smooth transition through international boundaries while maintaining strict adherence with laws governing global trade.

² <https://www.unescap.org/resources/business-process-analysis-guide-simplify-trade-procedures>

