INNOVATION IN BUSINESS PROCESSES & E-PAYMENTS IN SINGLE WINDOW

PART IV
VOL 2
The impact of the Single Window will be felt through changes to the business processes in cross-border transactions. How are business processes analysed? What are the potential areas for rethinking and redrawing business processes? What technologies can come into play? This Part of the Compendium throws light on areas where governments can innovate.
Contents
1. Introduction ................................................................................................................................. 3
   1.1 How is this Part Organized? ................................................................................................. 3
2. From Key Features to Business Processes .......................................................... 3
   2.1 What is a ‘Feature’? ............................................................................................................. 4
   2.2 From CBM to Features in a Single Window ....................................................................... 5
3. Approaches to Business Process Modelling ..................................................... 6
   3.1 UML and BPMN ................................................................................................................. 7
   3.2 Five Dimensions of Analysis ............................................................................................ 9
   3.3 Business Processes: Sources of Information .................................................................... 11
   3.4 The Context of Business Processes in a Single Window .................................................. 12
   3.5 WCO Data Model: Simple Business Process Diagram ..................................................... 13
   3.6 Trade, Transport and Regulatory Views of the Supply Chain ........................................ 14
   3.7 The Regulatory View of the Supply Chain ........................................................................ 15
4. Business Processes in a Single Window .......................................................... 18
   4.1 Group I: Identification, Registration and Authorization .................................................. 19
   4.2 Innovation and Re-engineering Opportunities ................................................................... 22
   4.3 Group II: Application for and Issuance of LPCO ............................................................... 25
   4.4 Group III: Advance Information and Cargo Release ......................................................... 27
   4.5 Group IV: Processing of Goods Declaration ...................................................................... 29
5. Electronic Payment ............................................................................................................. 30
   5.1 E-payment in WTO TFA ..................................................................................................... 31
   5.2 What is Electronic Payment? ............................................................................................ 32
   5.3 Types of Electronic Payment ............................................................................................. 32
   5.4 Automated Payments and Revenue Accounting ............................................................... 32
Annex: Business Innovation through Single Window Processes: ......................... 37
   A Perspective from Dubai Customs, UAE .............................................................................. 37
   I. Business Process Innovation in Dubai Customs, UAE ......................................................... 37
   II. Business Process Innovation – Opportunities and Challenges ........................................ 38
   III. WCO Instruments that Inspired Business Innovation in the Single Window ................... 40
1. Introduction

This Part explains how governments can reorganize business processes in the context of a Single Window to provide regulatory services that govern cross-border trade. Apart from listing the key business processes, this Part outlines the strategic areas for action, and describes the optimal ways of ensuring that trade submits information only once, instead of several times to different government agencies.

Policy managers, business architects, specialists on international trade law and regulations, and programme managers of Single Window projects would benefit from this work. Those with a background in government regulation of cross-border trade and electronic modes of service delivery would also find this document a useful reference.

High-level business processes are envisaged in international instruments such as the Revised Kyoto Convention and the SAFE Framework of Standards. These process models, published as part of the WCO Data Model Project, provide a high-level view of business processes but are not meant to be used as a specification for developing software applications.

1.1 How is this Part Organized?

Section 2 introduces the concept of the Single Window, and the implications for business process modelling. Section 3 describes the approach followed in identifying the business processes in a Single Window, and the source material for this documentation. Section 4 deals with the context within which Single Window business processes occur, the dimensions of business process analysis, data harmonization and submission of harmonized information. Lastly, Section 5 provides a detailed overview of the actors and processes in a Single Window environment.

2. From Key Features to Business Processes

The ‘Single Window’ is an approach to service delivery whereby all regulatory services for import, export and transit clearance are provided ‘under one roof’, making it convenient for businesses to access and consume these services. It involves a rearrangement of the location of service outlets, of delivery channels and of interactions with regulatory agencies from a user’s point of view. The Single Window approach helps reduce cost and effort, both to the service provider and to the consumer, leading to positive outcomes for both parties.

The operational concept of the Single Window in the context of cross-border trade involves regulatory agencies providing to the actors engaged in international trade and transport transactions a comprehensive set of services, through a common framework and an agreed set of business processes. A simple way to begin discussions on the solutions to bring all services under one roof is to identify and list the features of a system.
2.1 What is a ‘Feature’?

Features help provide a simple narrative of the real needs of users and stakeholders, without delving into a detailed description of systems and how they fulfil those needs. Features act as a shorthand for user expectations: what a Single Window does can be described by simply jotting down a high-level description of the expectations. Features are definitive versions of the loosely spelt-out demands of stakeholders or policy leaders. They are defined rigorously enough to form clear linkages to user requirements. Features can help outline business processes and define the contours or boundaries of the system. The rigorous definition of a ‘feature’ is provided under ‘Rational Unified Process’, a methodology based on Unified Modelling Language (UML):

*Simply put, a feature is a service that the system provides to fulfil one or more stakeholder needs. Features are easily represented in natural language, using terms familiar to the user.*

Features are of two kinds: Functional, and non-functional. Non-functional features have more to do with system requirements and expectations. **Functional features**, on the other hand, deal with the functional requirements of the system and are therefore **linked to business processes**.

As stated, non-functional features relate more to system characteristics, such as availability, speed, usability, response time, accessibility, maintainability, security, versatility and agility. The following table provides examples.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Centrally run application</td>
<td>The Single Window application will be hosted centrally, be run from a central data centre, and be supported by a disaster recovery site.</td>
</tr>
<tr>
<td>2. Availability and uptime</td>
<td>The Single Window application should be available on a 24x7x365 basis, with an uptime of 99.8%.</td>
</tr>
<tr>
<td>3. Accessibility and mobility</td>
<td>The Single Window application running on the system would be accessed from a variety of devices, including desktop and mobility devices.</td>
</tr>
<tr>
<td>4. Versatile database</td>
<td>The Single Window application should be able to capture textual, graphic, audio and video data on Customs processes.</td>
</tr>
</tbody>
</table>

Table 1: Examples of non-functional features.

While non-functional features are important, they provide no hint as to business processes, which can be found in business requirements. The business requirements are defined through the functional features of the Single Window.
The feature-set can help develop the requirements in the form of use cases, activity diagrams, data flow diagrams and other artefacts. Where a Customs automated system already exists, the list of features can be developed to reflect the incremental functionality that the system would provide. Below is the feature list for ‘SWIFT’ in Indian Customs. This helped communicate to all stakeholders what the Single Window would do once operational, and to describe the projects and tasks to the respective project teams.

### 2.2 From CBM to Features in a Single Window

The WCO concept of co-ordinated border management (CBM) helps the Customs community to

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**INDIAN CUSTOMS: SINGLE WINDOW INTERFACE FOR TRADE (SWIFT)**

**Foundational Features**

**Integrated Declaration:** Traders will submit integrated import and export declarations that will contain clearance-related information required by all participating government agencies (PGAs). Separate forms/declarations will be dispensed with.

**Integrated Risk Assessment:** All PGAs will use an automated system to apply the principles of risk-based selectivity for carrying out inspection and testing.

**Automated Routing:** The system will apply business rules to identify consignments based on the declaration, to automatically route them to the relevant PGAs.

**Online Release:** The system records and collates clearance-related decisions and approvals from all relevant PGAs and delivers the results to the trader at a single point.

**Paperless Processing:** A system that allows a trader to submit all regulatory information (including supporting documents) only electronically, and in a digitally-signed form, so that the trader does not have to approach PGAs. In addition, printouts generated by PGAs to record and convey regulatory assessments and decisions will be replaced with functionally equivalent electronic messages.

**Single Window: Enhancements**

**Compliance Information Portal:** A single web-based source for all clearance-related procedural steps, duties, fees and charges for import and export of any commodity, reflecting the logic that drives the Single Window.

**Automated Licence Verification:** A system that automatically verifies licences, permits, certificates and other authorizations received by a trader, provided the document issuer grants access to the corresponding electronic records or documents.

**E-payment of Duties, Taxes and Fees:** All regulatory payment (fees and charges) will be done electronically, based on approved procedures.

**Event Notification Service:** A facility that instantaneously updates trader/transporter systems with event-based status information drawn from systems operated by Customs, PGAs and logistics providers, including warehouse operators, so that the trader receives a single view of operations.

**Appointment Management System:** A system for managing field operations for cargo clearance activities requiring co-ordination of multiple agencies.
describe the features that a Single Window should have. The Single Window concept manifests co-ordinated border management by streamlining and simplifying border management systems and procedures, involving one or more of the following:

**Co-location and sharing of regulatory facilities:** When CBRAs decide to co-locate facilities, they have the opportunity to unify service outlets, fostering inter-agency co-operation, improving communication, and enabling unified operational controls by sharing operational information.

**Empowered frontline officials:** Administrative authority is delegated to officials handling the government-trade interface, either by delegating authority within an agency, or by cross-designation between agencies. Empowered frontline officials speed up decision making, leading to faster service delivery and expedited business.

**One-stop border posts (OSBPs):** Countries sharing a land border enter into international agreements that enable close co-operation between agencies on both sides of the border so that regulatory formalities associated with import, export or transit are not duplicated.

**Incremental submission of data:** Trade and transport actors submit data to CBRAs at different points in time in the course of an international trade transaction. A Single Window may require submission of only the incremental data to reflect a change or progression in the transaction. The Single Window should avoid re-submission of data that was part of an earlier submission. The ability to link up individual submissions of data by a trader is part of the ‘intelligence’ of a Single Window environment.

**Harmonized regulatory declarations:** Different CBRAs prescribe data requirements which often overlap. It is possible in a Single Window to prescribe a harmonized set of data requirements so that the actors concerned are not obliged to repeatedly submit the same data for a trade transaction or a transport movement to different agencies.

**Sharing of information amongst CBRAs:** Sharing of regulatory data is the logical consequence of harmonized regulatory declarations and enables the shared or separate application of controls by the respective CBRAs.

**Harmonized CBRA response:** The response to a declaration/report by a trade or transport actor is an important part of the business process. A CBRA response indicating release of goods signifies the fulfilment of a regulatory service. Each CBRA may process its responses independently, but the Single Window must provide a unique harmonized response to the trader.

### 3. Approaches to Business Process Modelling

A Single Window allowing traders to submit standard electronic data for import, export and transit only once can be achieved by examining individual activities and processes, and how they are logically connected with each other. Experts have recommended a step-by-step approach to Single Window development, beginning with business process analysis (UNESCAP, 2010). Business processes are driven by information, and the Single Window is premised on ensuring that the inputting of information is carefully arranged to eliminate redundant inflows.
3.1 UML and BPMN

The development of new business processes or re-engineering of existing ones begins with a vision of how things will work in a Single Window. They can be expressed in many ways, including as policy pronouncements, or as a brief description of key features. The vision and key features form the wish list for the developers of systems and solutions. Developers must comprehend this vision while undertaking analytical or re-engineering activities. They must, from the outset, explain how they can bridge the gap between the vision and their solution, continuing to do so throughout, until the solution is ready for implementation. The science and art of modelling can help manage this communication clearly and concisely for all stakeholders. The issue is addressed in the WCO Data Model, which discusses how to model, and which modelling standards to adopt. The Data Model Project Team observed the following:

The challenge is how to successfully capture the processes and to avoid taking up too much time and resources to produce colourful diagrams, lengthy explanatory notes and numerous documents that are completely ignored after having been produced.

The traditional approach would be to use a flow diagram and additional documents, but this is not always the best approach. The flow diagram will show a sequence of activities, but not much more, making it difficult to identify actors and roles.

To successfully capture business processes and information requirements it is necessary to establish a model that reflects concise and clear views and verifiably fulfils the requirements of a process description.

The ultimate accolade possible is to have someone look at a process model and find that it reflects the real-world business process.

There are several ways of analysing and documenting business processes, each with their own notations and conventions. Unified Modelling Language (UML) is a standardized general-purpose modelling language and is a method of modelling. Although UML has many applications in the software industry, it is also commonly used by business experts to logically describe and specify business requirements.

**Key UML Artefacts**

**Use Case diagram:** The purpose of a Use Case diagram is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies (such as inclusions or extension relationships) between those use cases. The stick figures represent actors that can have a role. The ovals represent actions/steps in the process, and the lines indicate a relationship between the actor and the process step.

**Use Case description:** This is a table describing actors, preconditions, post-conditions and the scenario. In the row ‘Actors’ are those parties that can play a role in the process. In the row ‘Scenario’, the process is described step by step (at a fairly high level).

**Activity diagram:** The labels on top of the diagram indicate the relevant actors. The diagram has to be read from the top left to the bottom right. This diagram shows the activities in a CBRA process in a logical order and, therefore, also in a certain sequence.

The reader is referred to the WCO Data Model where these UML Artefacts have been used for modelling business processes.
The Information Management Sub-Committee (IMSC) agreed to use Unified Modelling Language (UML) and UN/CEFACT Modelling Methodology (UMM) as the modelling standards. UML helps to specify, visualize and document: (i) business process models and information requirements; (ii) non-software systems (e.g. procedures of a process or UN/EDIFACT Data Maintenance Requests); and (iii) software systems modelling. A characteristic of UML, enabling its widespread support, is that it is methodology-independent: regardless of the methodology used to perform the analysis and design, UML can be used to express the results.

Business process models cover the ‘what’ processes of individual CBRAs, and their interactions with trade and among themselves. These models do not cover the question of ‘how’ the CBRA carries out those processes. For example, when an activity diagram states “CBRA conducts risk analysis” or “importer submits declaration,” the models do not consider how the risk analysis is done, or how the importer’s declaration is validated and processed.

UML helps to visualize business process models and specify information requirements. It uses several types of diagram. This approach is consistent with the way of describing business processes under the WCO Data Model project.

Business Process modelling is an essential part of the preparatory phase for the establishment of a Single Window, along with functional messages. Unified Modelling Language is associated with software development, but there are other internationally recognized modelling standards that need greater recognition. Business process modelling for a Single Window, especially for a business audience, needs simpler notations.

Business Process Model and Notation (BPMN) Version 2.0 has been used as the methodology for modelling in several organizations. BPMN is a standard developed and maintained by the Object Management Group (OMG).

### UML and BPMN - What is in common? What are the differences?

**Similarities:**

- Both are open standards maintained by the OMG;
- Both are rigorous methodologies and can have technical linkages based on the software programs developed;
- Both are standardized graphical notations for business process modeling;

**Differences**

- While BPMN is dedicated mainly for business processes modeling, there are 14 types of UML diagrams; One among these 14, the Activity Diagram reflects business process models.
- While UML is object-oriented, BPMN follows a process-oriented approach;
- While BPMN is de-facto standard in business process modeling, UML remains popular with object oriented software designers and architects.
EU experts have chosen BPMN to model the implementing provisions of the EU Modernized Customs Code (which subsequently became the Union Customs Code).

### 3.2 Five Dimensions of Analysis

Models are abstractions that help visualize the real world of the business. The abstractions simplify the real world to help analysts examine the only aspects relevant to the subject of analysis. While models help the developers of software and can act as a tool for communication among stakeholders, they can also build the background in which legal changes can be identified and put in place. As part of its work on Globally Networked Customs (GNC), the WCO identified five dimensions of business processes that can help better define legal underpinnings: Chronology, Geography, Entities, Procedures and Exchanges.

**Figure 1:** Five dimensions of business process analysis.

**Chronology** – This dimension projects the *events* in international trade in a chronological order. Events are discrete points in time that signify a moment in the course of an activity. There are different views of the same events, leading to different data concepts of the date and time of the event.

**Geography** – The events take place at locations. The occurrence of an *event* is always linked to location. Location has implications for legal jurisdiction.

**Parties (People)** – Players that take part in the events. Parties are entities that have rights and obligations under laws and regulations. The parties are actors in use cases. Actors can be generalized into abstract actors, based on their roles. For example, the Authority actor is a generalization derived from Customs Authority and Agriculture Authority.
**Regulatory Procedures** – These bind the actors to certain defined patterns of behaviour, thus giving some order and character to the business processes that take place in the course of cross-border transactions.

**Exchanges** – Exchanges signify movement of information between parties in the course of international trade. Figure 2 shows exchanges of business-to-government (B2G), government-to-government or CBRA-to-CBRA (G2G), government-to-business (G2B) and business-to-business (B2B). These information exchanges are defined in laws and regulations, or governed by mutual agreements.

The five dimensions of analysis mentioned above provide the framework for the end-to-end description of business processes.

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**Figure 2: Analysing cross-border exchanges.**

Figure 2 uses several terms, which are explained below.

‘NSW’ stands for the **national Single Window** and covers bi-directional information flows between business and governments (CBRAs), and between the CBRAs of one country/regulatory territory. ‘ISW’ stands for the **international Single Window**, which handles exchanges between national Single Windows and CBRAs located in different national jurisdictions/regulatory territories. The exchanges referred to in the ISW are linked to the WCO concept of Globally Networked Customs. They are also the subject of the UN/CEFACT project on Single Window Interoperability and UN Recommendation No. 36.
‘Community systems’ are systems that facilitate information exchange between businesses, both nationally and internationally. They are generally built as infrastructure to enable digital commerce to cater for a community of interest. **Port community systems** or cargo community systems are examples of community systems. These systems play a key part in the Single Window process as they often facilitate information integration and business process choreography. The processes that are covered by community systems are established on the basis of partnership amongst businesses. Sometimes, CBRAs also partner with community systems to facilitate the flow of regulator information. These community systems act as third-party intermediaries that submit data on behalf of the businesses and provide key workflows and controls to manage the progression of the international trade or transportation processes. Each system has a portfolio of services which can be classified according to a scheme or taxonomy. Using the taxonomy, it is possible to list services that belong to non-overlapping categories. Each category can be broken down into hierarchies. Service taxonomies help separate the scope between community systems and Single Window solutions.

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**The Data Pipeline: Placing Businesses in the Driving Seat**

The entire international supply chain exists to fulfil the needs of the buyer, who is interested in the value represented by goods supplied by the seller. Advancements in electronic business have enabled buyers to use facilities that help navigate the supply chain processes of finding, ordering, shipping and paying online. Just as the buyer seeks to receive goods, the seller is interested in securing payment for goods. Several online facilities have emerged which perform complex business transactions in an online platform to fulfil the business needs of buyers and sellers, giving them a ‘Single Window’ experience. Extending Single Window business processes to the domain of the seller and the buyer, and the shipper and the consignee, is the key challenge. Developments in cloud computing and e-commerce technologies has resulted in the concept of ‘data pipelines’ which help transport supply data of the right quality to the right party at the right time, and that includes regulatory agencies such as Customs. CASSANDRA, a research project funded by the European Union, involves a consortium of 26 innovative industry leaders in the fields of supply chain management, logistics, IT and Customs, and is attempting to do just that. The project aims to make container security more efficient and effective by addressing the visibility needs of both business and government in the international flow of containerized cargo, by developing a data sharing concept that allows an extended assessment of risks by both business and government.

*Source: [http://www.cassandra-project.eu/](http://www.cassandra-project.eu/)*

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### 3.3 Business Processes: Sources of Information

In developing Version 3.0 of the Data Model, the Project Team examined data requirements from a Single Window perspective and produced an analytical tool to document the functional requirements for a Single Window: the ‘WCO Single Window Initial Functional Assessment Guide’. The DMPT also produced the ‘WCO Single Window Data Harmonization Guidelines’ as a tool to help collect, analyse, reconcile and harmonize the data requirements in a Single Window.

WCO Data Model Version 3.0 included documentation based on the business processes described in the Revised Kyoto Convention, the IMO FAL Convention, the TIR Convention and other international conventions. The documentation already assumes that there will be flows between national cross-border regulatory agencies in a Single Window environment.
APEC produced surveys on the Single Window in 2007 and 2010, documenting the roles and functions of different government agencies involved in international trade. The WCO concluded a similar survey in 2011. These surveys provided detailed information on different types of government agencies involved in the regulation of international trade and transport, as well as their functional responsibilities. The surveys also included business processes covered by the respective national Single Windows of individual governments/economies.

Cross-border regulatory procedures are governed by national legislation. Such legislation is usually based on international conventions, standards and practices to simplify and harmonize trade procedures. This document relies on these international instruments as the basis for standardized representations of these business processes.

### 3.4 The Context of Business Processes in a Single Window

UN/CEFACT describes the international supply chain in its Buy-Ship-Pay model, as set out in UN Recommendation No. 18 (UN/CEFACT, 2001). This simple, high-level reference model consists of three groups of business processes: Buy, Ship and Pay. The main generic actors are Customer, Supplier, Intermediary and Authority.

![The simple Buy-Ship-Pay process](source: UN/CEFACT)

There are a number of ways of viewing business processes in the international supply chain. Each view serves a particular community of interest, with its own definition of a transaction in that chain. For the regulatory agencies, the transaction may end with the release and clearance of goods. For the traders (buyers and sellers), it will not end until goods are delivered and accounts receivable are settled. Similarly, the transporters will square up their records of the transaction when all payments and claims in respect of a transport contract are settled, possibly involving the carriage of multiple consignments. To manage these differing views, experts have produced different process and information models which describe apparently similar processes in the supply chain. These differing views may be classified as ‘trade’ ‘transport’ and ‘regulatory’.

In the Buy-Ship-Pay model, the Buy processes cover all commercial activities related to the ordering of goods; the Ship processes cover all of the activities involved in the physical transfer of the goods, including official controls; and the Pay processes cover all of the activities involved in payment for the goods. The UN/CEFACT Buy-Ship-Pay model was expanded in the ‘Reference Model of the International Supply Chain with special reference to Trade Facilitation and Trade Security’
Each of the Buy, Ship and Pay areas was divided further into ‘business areas’ and ‘process areas’. These serve as the basis for elaborating models broken down to the relevant level of detail. The UN/CEFACT Buy-Ship-Pay modelling guidelines have broadly assigned the business areas for different business processes.

Official controls, covering all processes involving cross-border regulatory agencies, have been grouped together under Ship processes. This is only for convenience, since activities related to official control go beyond the physical transfer of goods, and sometimes extend to the Buy business areas (international orders for purchase depend on licensing or certification of goods, manufacturers and premises). Regulatory processes also extend into Pay business areas, since paying for the goods includes payment of duties, taxes and fees, and details of payable or paid amounts for goods determine Customs valuation.

The full elaboration of Buy-Ship-Pay process models is still a work in progress and these do not provide complete guidance on Single Window business processes. The modelling work done as part of the WCO Data Model project, and the additional models produced by the WCO Data Model Project Team, will help provide the necessary high-level models.

The literature on the Single Window refers to international trade Single Windows, the logistics Single Window, and maritime Single Windows. To the extent that such ‘Single Windows’ provide services to actors in the international supply chain for the fulfilment of regulatory requirements, they fall within the scope of the modelling covered by this document. Services to business that are not covered by cross-border regulation fall outside its scope.

3.5 WCO Data Model: Simple Business Process Diagram

To overcome limitations posed by different views of the Buy-Ship-Pay supply chain, the Data Model Project Team developed the ‘Simple Business Process Model’ (see Figure 4 below). The terms ‘reports’ ‘declares’ and ‘produces’ have the meanings ascribed to them in the Revised Kyoto Convention: to ‘report’ a cargo declaration, to ‘declare’ a goods declaration, and to ‘produce’ the goods or a declaration of departure/arrival to Customs. The main area of interest will be the processes and data flows through/within the box entitled ‘C.B.R.A.’.
3.6 Trade, Transport and Regulatory Views of the Supply Chain

International trade procedures are very complex and involve multiple parties situated in different countries. It is useful to divide these procedures into trade, transport and regulatory processes. Figure 5 illustrates these three distinct views (trade, transport and regulatory processes) that take place simultaneously. Each of the views represents a related collection of business processes. This type of diagramming may include chronology, geography, parties, procedures and exchanges – the five dimensions of analysis listed earlier – in the same frame. Figure 5 also lists the different types of IT systems that are used to conduct business processes, further highlighting the complexities involved in executing business processes in a Single Window.

The *trade* view involves discovery of products by potential buyers, identification of business partners, the establishment of agreements for purchasing goods, and the activities dealing with the fulfilment of the purchase order. Supply chain events, such as order confirmation, despatch and delivery, are relevant to this view. The *trade* view reflects the services sought by trade actors, such as the buyers, sellers and manufacturers of goods.

The same set of events will be viewed by the transport actors in terms of supply chain logistics events. The *transport* view includes processes linked to the physical carriage of goods on a means of transport. These processes are linked to the booking of space, stuffing of transport equipment, loading and unloading of goods, and the delivery of goods to the ultimate consignee.

The *regulatory* view deals with regulatory reporting to authorities along the entire supply chain. In this view, actors are entities that fulfil regulatory formalities with authorities at import, export and
transit. The regulatory view maintains the focus on the exchanges between regulatory authorities and business entities. This view helps understand supply chain events in terms of events involving regulatory controls.

It may be of interest to note that certain physical events on the ground, such as stuffing of cargo into transport equipment or transport means, loading and unloading of transport means, and delivery of goods to the ultimate consignee, have identical meanings in all three views, making it possible to correlate information from the three different views. Such correlation may be necessary because data supplied by actors in the fulfilment of cross-border regulation has its origin in processes of trade and transport.

3.7 The Regulatory View of the Supply Chain

Figure 6 provides a high-level representation of the ‘regulatory’ view. It captures the actions of the key players in a Single Window in pursuance of regulatory compliance. This is elaborated in greater detail in Figures 8 to 11. These figures will serve as the reference diagrams for further elaboration of business processes in a Single Window environment.

The regulatory view is shown as comprising ‘pre-export’, ‘export’, ‘international transport’, ‘international transit’, ‘import’ and ‘post-clearance’ phases. Business processes that occur in the pre-import phase are not shown separately, but could be taken as processes preceding import processes.

These phases follow the logical flow of goods through a supply chain: goods leave the regulatory territory of export using a means of international transport in order to reach the regulatory territory of destination via one or more regulatory territories of transit. These phases provide the basis for projecting flows of regulatory information between the relevant actors in a sequential manner. Tracking the business processes underlying these flows is the objective of this document.

At the bottom of the diagram, the different regulatory territories are described. The events in the supply chain take place in these regulatory territories. To enable the analysis of the legal issues, the distinction between chronology, geography and procedures will be maintained.

On the left-hand side of Figure 6 are the names of the relevant actors. These are generic actors. For a detailed overview of all the actors in the WCO Data Model and the relationships, please refer to the business process diagrams in the relevant sections of the WCO Data Model. Exchanges take place between these generic actors, depicted in Figures 8 to 11. These actors, in their respective roles, participate in regulatory procedures in different phases, starting from the pre-export phase and ending with the post-clearance phase. Not every actor will have a role in every phase. Across the top of the figure are the identified processes.
Figure 5: Supply Chain events: Trade transport and regulatory perspective

The Regulatory View of Single Window Business Processes
Figures 8 to 11 show an end-to-end view of regulatory processes. These processes are described in general chronological order of occurrence. However, while that order broadly holds, there could be certain alternative or exceptional scenarios, introducing differences into the sequence. Figure 8 depicts the initial set of procedures that establish the CBRAs that offer registration services. Registering an entity may also involve regulatory approvals. For example, in the case of a hypothetical country X, a trader will not be registered for import and export operations without having a VAT number. In most countries, Customs brokers may be required to furnish minimum financial guarantees and provide proof that they have passed the qualifying criteria. Customs locations and Customs areas are required to satisfy regulatory criteria for approval.

Registration procedures involve submission of key data into the Single Window about parties (economic operators) involved in the supply chain process, regulated products, means of transport, regulatory locations, CBRAs and their services, and means of transport, etc. In addition to key business data, registration processes also establish technical information about Single Window users and Single Window services. Figure 7 provides the details of these processes (R1 to R9).
Figure 6: Strategies of regulatory control in the international supply chain

Registration processes establish the identifiers for the registered entities. A set of attributes for these registered entities may have been subject to regulatory verification, as described in the preceding paragraphs. In transactional reporting to Customs, the trader simply mentions the identifiers (not their underlying attributes) in his import/export goods declaration, thereby reducing duplicate data flows. These identifiers serve as the linking pins of information in the cross-border regulatory processes described in Figures 9 to 11.

The green lines pertain to partner CBRA procedures, such as application and issue of licences, certificates and permits, and declarations made to partner CBRAs for the clearance of cargo at import, export and transit (see Figure 7). The processes covering goods declarations, cargo reports, conveyance reports and post-clearance audit exchanges shown in Figures 9 to 11 subsume the transactional verification and post-verification processes carried out by all CBRAs, including Customs.
The vertical lines in Figures 8 to 11 with arrows representing information flows are called ‘declarations’. A declaration is a statement or action, in any form prescribed or accepted by the CBRA, giving information or particulars required by the CBRA. The CBRA response to these declarations represents the reverse flow of information. It is assumed that every declaration is matched with one or more responses from the regulatory agencies.

Data Simplification and Harmonization – The Regulatory Declaration

Generally, in the absence of data harmonization, separate procedures are followed by Customs and partner CBRA, leading to multiple declarations. For instance, if there is a Customs goods declaration at import, there may well be a regulatory declaration for a partner CBRA at import. After the harmonization of regulatory data, and standardization of data requirements, it is possible to combine these into a single cross-border regulatory declaration, as shown in Figure 7 below. Data simplification and harmonization make it possible to create a harmonized regulatory declaration which may help collect data for different regulatory agencies.

![Data Simplification & Harmonization]

Figure 7: Regulatory data harmonization.

4. Business Processes in a Single Window

A Single Window implies ‘one-time’ submission of data, and it is therefore necessary to keep track of the original source of data within the supply chain. Identification of the original source of data helps to establish the business process involved in the ‘first submission’, to obtain information first hand, and maintain quality. These business processes are often rooted in laws and regulations,
supported by administrative instructions. Therefore, along with the listing of groups of business processes, this Section points to the regulatory basis of the source for those business processes.

For convenience, business processes in a Single Window have been divided into the following groups:

<table>
<thead>
<tr>
<th>Business process group</th>
<th>Source material/legal basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Registration/authorization</td>
<td>SAFE Framework of Standards (AEO concept), national legislation/regulations/business practices</td>
</tr>
<tr>
<td>II Application/issue of licences, permits, certificates, other (LPCO)</td>
<td>Several international instruments/national regulations</td>
</tr>
<tr>
<td>III Advance information</td>
<td>SAFE Framework of Standards</td>
</tr>
<tr>
<td>IV Goods declaration/cargo reports</td>
<td>RKC business processes, IMO FAL Convention, TIR Convention, etc.</td>
</tr>
<tr>
<td>V Post-release verification</td>
<td>Revised Kyoto Convention and WCO PCA Guidelines</td>
</tr>
</tbody>
</table>

Table 2: Five major groups of Single Window business processes.

Post-release compliance verification processes involve periodic interaction between officials of CBRAs and businesses. They include confirmation of compliance, or raising of disputes by businesses or government. Therefore, business processes for post-release compliance verification (listed alongside ‘V’ in the above table) have not been covered in this document. Figure 8 below conveys briefly the broad groupings of business processes, which will be discussed in the rest of this Part.

4.1 Group I: Identification, Registration and Authorization

A typical piece of Customs legislation begins with a section on definitions for entities that will have legal obligations concerning international trade, including where, how and by whom goods should be entered for import, export and transit. There are similar regulations which support partner CBRAs, defining entities that have obligations regarding, for example, traded goods. These laws
and regulations cover all entities and objects involved in the flow of cargo, travellers, means of transport and crew.

Business entities can begin to transact in a Single Window only when they are ‘onboarded’. That is why this Part starts with the Group I processes of ‘identification’, ‘registration’ and ‘regulatory authorization’. These are the foundation of the Single Window, as data about parties, locations, transport means, etc. are first recognized by the national Single Window operator.

The registered entities have a legal existence in the legislation of the respective CBRAs. These registration processes may also be viewed in conjunction with regulatory pre-verification processes in which the respective regulatory authorities have the opportunity to verify information provided by users when registering. These pre-verification processes may be determined by a combination of regulatory and administrative imperatives.

Before access is granted to any of the Single Window services, certain administrative requirements of the national Single Window operator need to be met. These requirements are described in the registration processes whereby the national Single Window operator establishes a legal relationship with the various actors using the Single Window services. Typically, these would be the legal agreements to be entered into between the responsible official from the national Single Window operator and the responsible official acting on behalf of the registering entity. There could also be multiparty agreements – for instance, between the trade/transport actor (as subscribing party), Customs/the partner CBRA with authority to issue regulatory approvals (as relying party), and the national Single Window operator (service provider). The parties with whom Customs interacts are called ‘actors’ and are divided into the following broad groups:

**National Single Window operator:** It is assumed that a ‘Single Window operator’ (shown in the BPMN diagram on the swim lane ‘Authority Single Window Operator’) will be established as a legal entity, with the mandate to provide Single Window services. In describing the Single Window business processes, it is perhaps necessary to mention the existence of national Single Windows in different jurisdictions. There may be a national Single Window in the country of origin (NSW at departure), in the transit country (NSW at transit) and in the destination country (NSW at destination). The interaction between national Single Window operators provides the G2G dimension in a Single Window.

**Economic operators:** Economic operators are parties from trade and transport that play a role in a Single Window environment. They often use intermediaries called ‘agents’, who play certain roles on their behalf. These agency roles are defined in laws and regulations in cross-border legislation. Any compliance-related activity that is supposed to be performed by an economic operator can also be performed by its agent.

The Group I business processes shown in Figure 8, and the legal issues involved, are listed in Table 3 below:
Table 3: Registration/regulatory authorization (Group I processes).
The above processes are linked to registration and onboarding of the particulars of all actors, locations and facilities, etc. to operate a Single Window. This process provides the users of the Single Window with access credentials and authorization. It might be termed ‘master data management’, ‘user account administration’ or ‘customer relationship management’. The following BPMN diagrams illustrate two critical processes – R2 and R3 – from the above table, dealing with the registration of users and economic operators, respectively.

4.2 Innovation and Re-engineering Opportunities

Group I includes one-time processes for registration of users and economic operators, etc. in the Single Window. There are significant opportunities for simplification of Group I processes. The following are the re-engineering opportunities provided in business process R2, ‘Register users in the Single Window’:

RE 1- Single sign-on for Single Window users

One of the advantages of the Single Window is that the trader (a representative of the importer or exporter) and officers of regulatory authorities can access all the information in the Single Window by using a single login, instead of being asked to visit the websites of different participating government agencies. The following are the savings, benefits and types of simplification resulting from a single sign-on for Single Window users:

✓ Common user verification process saves time for the user, as well as government.
✓ Parallel registration of users can be done away with.
✓ A user does not have to log on to multiple sites.
✓ CBRAs will be compelled to share transactional information to ensure correctness.
✓ Client services and relations can be handled through a common platform.
Multiple facilities for supporting user management can be dispensed with.

**RE 2 - Electronic connectivity between all participating agencies**

In a Single Window, all participating agencies should be connected by electronic means. This allows instantaneous sharing of regulatory declarations and other information. There are three modes of connectivity:

(i) Incorporation of the agency’s functions into the same system (integrated model);

(ii) Interfaces built for sharing information in the form of electronic messages between agencies (interfaced model);

(iii) A combination of (i) and (ii) above (hybrid model).

The benefits of electronic connectivity relate to speed in sharing information and the results of processing. While one can still achieve Single Window functionality without a single sign-on, it would not be possible to build a Single Window without electronic connectivity with participating agencies.

**RE 3 - Electronic connectivity with logistics providers**

Logistics operators play an important part in the efficient handling of import and export cargo. Unloading and loading, stuffing and stripping, storage and delivery, gate in and gate out, are all critical operations during cross-border clearance of import, export and transit cargo. It is critical for the Single Window business processes to establish and exploit the links with logistics operators. The following diagram explains how logistics operators, such as shipping lines and terminal operators, play a critical role in the movement of cargo. The importer is not able to obtain delivery until completion of ‘line release’ (fulfilment of documentation with the shipping line), and this is conveyed to the terminal operator.

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**Registration & Authentication of Single Window Users**

All Single Window system users are to pre-register with the system owner, and each user should be authenticated when they are submitting information through the Single Window.

The registration process requires an applicant to submit his personal details, working details and contact information. He is to be made aware of, and agree to, the terms and conditions for using the Single Window system, and accept that all information submitted by him is true and accurate, and the consequences and penalties for violating the terms and conditions. Upon completion, the applicant is given a user ID and password to access the system. The user should be reminded that the user ID and password are confidential and for personal use only. In no circumstances should the user allow others to use his user ID or password to gain access to the system and submit a declaration.

To further improve security regarding the usage of the registered user ID, the system owner may consider having a secondary authentication process. One method is to issue all users with a token that generates a one-time PIN (OTP) each time they log in to the system. Alternatively, an OTP is generated by the system and sent to the registered mobile device of the registered user for authentication.

The registration and authentication process ensures that authorized users are the ones submitting data in the Single Window system and that they are fully aware of the terms and conditions for using the system. This prevents unauthorized users from trying to submit falsified or inaccurate information in the expectation that they will not face penalties for an incorrect declaration. In this way, the integrity and accuracy of the data is maintained.
Electronic connectivity should be established between the Single Window system and the systems of the carriers, as well as with the terminal operator systems (TOS) or the port community systems. In the absence of such linkages, the actual release of cargo will involve traders physically handling paperwork.

**RE 4- Updating the directories and profiles of users**
Replication and updating of user data services is required for the Single Window so that users can experience seamless access to different systems.

Just as important is the registration of economic operators. The Single Window operator can simplify the processes for businesses by enabling single-point registration for all activities which come under the umbrella of international trade and transport.

**RE 5- Common verification of ‘Know Your Customer’ details**
Various actors, such as carriers, brokers and warehouse operators, are often required by regulation to carry out ‘due diligence’ on the firms with which they deal and have formal business relationships. The Single Window can provide basic assurances in this regard by offering to be party to the KYC ecosystem. KYC norms ensure that fictitious, proscribed and dubious entities are barred from transacting business. It should be possible for Customs and other agencies to carry out KYC operations in a single place, which will benefit businesses at large.

The following diagram illustrates the business process of economic operator registration.
25

Figure 12: Process – Economic Operator Registration.

**RE 6- Register and manage common economic operator account**

The registration and day-to-day management of economic operators is time-consuming for regulatory agencies, as well as trade. If the accounts are managed separately by each agency, it will add to overheads. Registering at a single point (on the Single Window portal), and synchronizing it on an ongoing basis, provides a single view of the trader’s operations to the trader and to all participating agencies. Even the systems belonging to logistics operators (i.e. port/cargo community systems and terminal operators) can, with the consent of the economic operator, use data from the latter’s registration in the Single Window (including updates thereto).

**4.3 Group II: Application for and Issuance of LPCO**

All movements of goods across borders are subject to tariff and non-tariff regulatory regimes. With the liberalization of trade, most traded goods in the world are not subject to quantitative restrictions. However, there are still a variety of regulatory (non-tariff) restrictions imposed by national laws and international conventions. These restrictions impose conditions that must be met before regulatory authorities allow imports, exports and transit. The conditions are often documented and expressed in licences, permits, certificates and other documents (referred to in this Compendium as LPCO) which state that they have been met in the context of transactions. The variety of goods that are subject to trade restrictions and conditions notwithstanding, use cases to apply for and obtain LPCO from regulatory agencies are very similar. The process includes: (i) application for licences/permits/certificates/other; (ii) pre-issuance verifications; (iii) transactional compliance checks at import or export; and (iv) post-transactional compliance/analysis. The following BPMN diagram illustrates the process:
The process of application and issuance of licences, permits or certificates remains broadly the same, despite differences in regulations. It varies for different commodities, but has the same underlying pattern. The table below describes the business process.

<table>
<thead>
<tr>
<th>L1</th>
<th>Application for licence, permit, certificate or other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The economic operator applies to a cross-border regulatory agency for a licence, permit or certificate, and receives a response.</td>
</tr>
<tr>
<td></td>
<td>CBRAs may collect fees for application, registration, inspection, testing and processing, as well as licensing fees. These are termed ‘fees and charges’.</td>
</tr>
<tr>
<td></td>
<td>CBRAs may conduct verifications before issuing LPCO. The verification processes include pre-issue verifications, post-issue verifications and/or transactional verifications at the time of presentation of goods to the authority. These LPCO verifications may cover documentary or goods verifications. They are broadly classified as ‘verification’.</td>
</tr>
</tbody>
</table>

Table 4: Application for Licenses, Permits and Certificates (Group II processes)

Figure 13: Application for licenses, certificates, permits or other types of authorization.

**RE 7- Common application form (CAF) for LPCO**

One of the most challenging areas relates to the business processes when trade applies for different types of licence, permit, certificate or other authorization. Many different government agencies are involved in issuing these LPCO. They deal with different commodity groups and diverse regulatory mandates, they operate with controlled vocabularies unfamiliar to other domains, and they possess differing attitudes to risk. All this at first appears to be very daunting from the point of view of integration in a Single Window. However, with sufficiently detailed data harmonization and business process analysis, it becomes clear that a common application form (CAF) for LPCO is possible. A typical application form would involve a request to endorse, permit or approve a facility/product/entity in relation to international trade. A common application form ensures
RE 8- Standardized memo for referrals
Government agencies can sometimes refer LPCO applications to specialized bodies for expert opinion or advice. The referee can be a testing laboratory, an inspection agency, a quality certification agency or an expert body.

RE 9- Standardized referral results
Similarly, test results received from laboratories, or recommendations received from different agencies, can be standardized. When the results of tests and referrals are obtained in a standardized format, they can be used to generate compliance histories for tested products. If test results are received by the Single Window in a non-standard format, they cannot easily be used in a database, and will not facilitate risk-based selectivity, especially where PGA risks are concerned.

RE 10- Harmonized LPCO database
While different LPCO can have different formats, there is an underlying template which means that they can be said to belong to a document family. WCO Data Model Version 3.6 contains a description of a common template (a ‘Base Information Package’) for LPCO. The template has been used to model several LPCO, such as certificates of origin and CITES permits.

4.4 Group III: Advance Information and Cargo Release
The mandate for Customs under the SAFE Framework of Standards requires the collection of information on international supply chains in advance of the transaction: advance information must be supplied to regulatory agencies at export and import in the form of, respectively, pre-departure and pre-arrival goods and cargo declarations. Information may also have to be provided regarding the containers loaded on board the vessel, in the form of a vessel stow plan (VSP) and container status (CS) messages. Table 5 below provides details of the processes for advance information.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>SAFE goods declaration – pre-departure advance export declaration</td>
</tr>
<tr>
<td>A2 &amp; A3</td>
<td>SAFE cargo declaration at export &amp; import</td>
</tr>
<tr>
<td>A4</td>
<td>SAFE pre-arrival advance import declaration</td>
</tr>
</tbody>
</table>

Table 5: Advance information processes.
The above figure outlines pre-arrival processing, which is also a standard in the WTO Trade Facilitation Agreement (TFA). Having a pre-arrival processing system in the Single Window can be a significant step in the re-engineering of border cargo release mechanisms. It ensures release on arrival, thereby guaranteeing reduced clearance times and a predictable process flow. Customs authorities should typically allow traders to lodge electronically, in advance, clearance-related documents for advance processing and release of goods on arrival at the port, airport or land border. Pre-arrival processing is an optional service in many administrations. Some of them restrict commodities for pre-arrival release (e.g. precious cargo, newspapers, currency notes, perishable items, drugs and pharmaceuticals, diplomatic cargo, and urgent shipments under temporary importation).

Advance lodging of information (manifests and goods declarations) allows release upon arrival, without delay. Chapter 3 of the General Annex to the Revised Kyoto Convention refers to pre-lodgment and preregistration of goods (Standard 3.25 reads: “National legislation shall make provision for the lodging and registering or checking of the Goods declaration and supporting documents prior to the arrival of the goods.”).

**ARTICLE 7 OF THE WTO TFA: RELEASE AND CLEARANCE OF GOODS**

7.1 Pre-arrival Processing

1.1 Each Member shall adopt or maintain procedures allowing for the submission of import documentation and other required information, including manifests, in order to begin processing prior to the arrival of goods with a view to expediting the release of goods upon arrival.

1.2 Each Member shall, as appropriate, provide for advance lodging of documents in electronic format for pre-arrival processing of such documents.
Most pre-arrival declaration programmes are voluntary and require traders to use them to expedite release. Pre-arrival processing depends on risk assessment. The SAFE Framework of Standards provides for pre-arrival processing in Standard 1 (‘Integrated Supply Chain Management’), which sets out detailed procedures on the submission of data, including the import/export goods declaration, the cargo declaration, and associated time limits. The time limits for advance information mostly relate to security reporting. However, it is understood that, with advance information and security pre-clearance, admissibility is taken care of and release is rapid.

4.5 Group IV: Processing of Goods Declaration

Processes T1 to T8 in Table 6 below are based largely on the Revised Kyoto Convention. In addition to the above models, there is a response package model, which depicts the business processes associated with a CBRA’s response to a declaration.

It is assumed that, in a Single Window environment, there will be regulatory data harmonization, and that the data exchange points between the economic operator and Customs will coincide with the relevant exchanges with a partner CBRA. This implies that the standard regulatory reporting events for Customs will also be used as the reporting events for the partner CBRAs. This is the logical conclusion of the principle that one-time submission requires harmonized data and documentation.

<table>
<thead>
<tr>
<th>Process No.</th>
<th>Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Export goods declaration</td>
<td>The necessary arrangements are made to meet the authority’s requirements with regard to an export goods declaration.</td>
</tr>
<tr>
<td>T2</td>
<td>Conveyance report at exit</td>
<td>The necessary arrangements are made to meet the authority’s requirements to take the means of transport for commercial use and its crew, cargo, stores and passengers out of the Customs territory.</td>
</tr>
<tr>
<td>T3</td>
<td>Export manifest (cargo report at export)</td>
<td>The necessary arrangements are made to enable goods and the means of transport for commercial use to leave the Customs territory.</td>
</tr>
<tr>
<td>T4</td>
<td>Conveyance report at entry</td>
<td>The necessary arrangements are made to meet the authority’s requirements to bring the means of transport for commercial use and its crew, cargo, stores and passengers into the Customs territory.</td>
</tr>
<tr>
<td>T5</td>
<td>Import manifest (cargo report at import)</td>
<td>The necessary arrangements are made to meet the authority’s requirements to bring goods and the means of transport for commercial use into the Customs territory.</td>
</tr>
<tr>
<td>T6</td>
<td>Transit departure</td>
<td>The necessary arrangements are made to enable goods to be placed under the Customs transit procedure.</td>
</tr>
<tr>
<td>T7</td>
<td>Transit destination</td>
<td>The necessary arrangements are made to terminate the Customs transit operation.</td>
</tr>
<tr>
<td>T8</td>
<td>Import goods declaration</td>
<td>The necessary arrangements are made, and a declaration lodged with Customs, to bring goods under the Customs procedure; clearance for home use.</td>
</tr>
</tbody>
</table>

Table 6: Goods declaration/cargo report/conveyance report.
The BPMN diagram below provides an overview of the re-engineering opportunities.

Figure 15: Procedure – Outright Exportation

5. Electronic Payment

A high degree of trade facilitation is achieved through efficient payment systems. However, success depends on how the business rules linked to payments are optimized for trade facilitation. Multiple e-payment options are now available in a Single Window.

The use of modern technology in automating payment systems has revolutionized the speed and efficiency with which payments can be made. Payment of duties, taxes, fees and charges is a crucial business process in a Single Window environment. Apart from government dues, an importer has to make payments of different types along the international supply chain (remittances against commercial items, and payment against transport and logistics services). Therefore, e-payment not only helps in obtaining regulatory clearance rapidly, but is also critical in lubricating logistical and commercial processes.

Very often, the processing of documentation and the physical movement of goods are contingent upon payment. Depending upon the terms of payment for goods and freight, the trader has to make
necessary payments promptly. It is therefore in the interest of all participants to introduce electronic payments at every stage. The following schematic helps explain the entire process, and how payment becomes the most critical of processes holding up release. It is obvious that efficiencies achieved in payment processes will significantly improve the velocity of cargo flow. As explained later, while electronic means of payment are important in speeding up cargo release processes, the business rules governing payment, and the efficiency of the associated business processes, are just as vital.

Figure 16: Illustration of how prompt payment is necessary to obtain release. Logistics payments are just as important as regulatory payments.

5.1 E-payment in WTO TFA

In a Single Window, e-payments greatly help facilitate trade. Article 7.2 of the WTO Trade Facilitation Agreement deals specifically with e-payment in the form of a ‘best efforts’ provision.

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**WTO Trade Facilitation Agreement**

**Article 7.2 Electronic Payment**

Each Member shall, to the extent practicable, adopt or maintain procedures allowing the option of electronic payment for duties, taxes, fees, and charges collected by customs incurred upon importation and exportation.
While the Agreement provides for e-payment of duties, taxes, fees and charges collected by Customs incurred upon importation and exportation, the logic equally applies to charges collected by other cross-border regulatory agencies. As mentioned above, unless regulatory charges are paid in full, or properly guaranteed, release may be held up. Therefore, in a Single Window environment, it is necessary to examine all types of regulatory payments from a trade perspective.

5.2 What is Electronic Payment?

Electronic payment methods involve the transfer of information on payments made electronically, instead of the physical exchange of paper (cash, cheques, demand drafts, vouchers, etc.). Electronic payments can be effected directly from home or from the office, using computers (including mobile devices). Electronic payment methods help reduce transaction costs by dissolving distance and time factors in the payment process, and by enabling a high degree of automation for the trader, Customs and banks.

The acceptance of electronic means of payment of duties, taxes, and fees implies that Customs must install the necessary technology and services linking its systems to the banking system in order to validate payment details and ensure acceptance of amounts. Amounts received electronically by banks and reported by them have to be reconciled with the amounts reported to Customs as payment by electronic means. Amounts will also have to be reconciled periodically, both at the transactional and gross level.

5.3 Types of Electronic Payment

There are different types of electronic payment system. The type of system that can be used by a Single Window solution depends on the national payment systems architecture. The association of national banks and financial institutions establishes the ground rules for electronic payment and settlement infrastructure.

At the time of clearance, or at any time before clearance, duties, taxes, fees and charges can be collected by accepting cash, cheques, bank drafts, credit cards and debit cards from the declarant, and by using real-time electronic funds transfer (EFT) payment methods.

5.4 Automated Payments and Revenue Accounting

Payment systems are inter-related. For Customs authorities, duties, taxes fees and charges are a source of revenue. The management of revenue collection is part of the overall revenue accounting process. This process is an essential part of any integrated Customs IT system. A revenue accounting system must:

(a) Account for all duties, taxes and fees collected/exempted/foregone and refunded;
(b) Provide a mechanism for the collection and refund of duties at the time of clearance; and
(c) Provide a mechanism for the deferment of duty payments for a specified period. The functions of a Customs revenue accounting system are described in Section 6.10 of the Guidelines to Chapter 7 of the General Annex to the Revised Kyoto Convention (the Kyoto ICT Guidelines).
Figure 17: Payments in a Single Window – obstacles to trade facilitation.

An important feature of the Single Window is electronic payment of all regulatory charges for import and export (duties, taxes and fees). In addition to Customs, other agencies collect fees and charges. For example, there may be a charge for inspection and quality certification, testing fees, quarantine fees, and other regulatory charges. When a charge is to be collected: (i) the amounts have to be separately determined; (ii) a payment invoice needs to be raised; (iii) there must be presentation for payment; and (iv) payment has to be made and subsequently accounted for. In the end-to-end process of payment, e-payment is only a small component. The problem becomes severe when this has to be done for each consignment.

It is not so much the amounts that have to be paid (which are often small), but the associated administrative burden, that can cause delays and problems. Firstly, traders have to wait until the exact amounts of fees or charges are ascertained. The correct amounts have to be tendered through the right instrument of payment and at the right physical premises and location. Even where the amounts are collected through e-payment, it still involves effort: the trader needs to follow the e-payment processing steps and wait for the online conformation. Many times, the amounts received will be small when compared to the inconvenience and delay caused in collecting them.

To arrive at a system of simplified electronic payment of charges, the Single Window operators should collect the fee schedule details for all participating agencies. Given that several of these payments will involve small amounts, they impose a burden on making payments per transaction.

Typically, these are calculated by the automated system and presented as a payment request. Payments are also expected to be received in lump-sum amounts as revenue deposits against the clearance of one or more consignments. The software application for guarantee-based payments and deferred payments differs significantly from that which only supports the collection of duty at the time of clearance. To support deferred payment, systems would be required to maintain accounting information individually for each approved declarant or trading partner.
One way to tackle this challenge is to have an arrangement whereby traders and brokers maintain an account with Customs. Customs would be authorized to debit it automatically, without any action required from either government agencies or the trader. The trader would simply have to authorize the action when filing the declaration.

Such a system would result in a uniform, cashless, presence-less, queue-less and paperless processing of payments. The pre-deposit accounts could be in the name of the importer or the Customs broker. The declaration processing system may process payments by arranging to debit a GIRO account in real-time or by debiting the declarant’s account directly on online account available on the Single Window. Such online accounts can support different payment scenarios. For instance, a declarant may be permitted to pay periodically against a guarantee, (deferred payments option). Alternatively, the declarant may be asked to deposit an amount in advance into his online Single Window account, which will be debited against each transaction.
In most cases, the amount can be computed based on the data in the declaration. However, in some cases, it will be determined by the agency or laboratory on the basis of the services provided, the tests to be conducted, or the fees for the referral. In such cases, a facility may have to be provided to the agency/laboratory to raise an invoice or set up a payment channel.

When the responsibility for collection of payments is assigned to the Single Window operator, it will also be necessary to establish rules for accounting for receipts, for reporting such receipts, and for reconciliation. Business rules regarding interest on late payments and refunds will also be crucial.

It is pertinent to examine the latest techniques and methods of effecting electronic payments. Electronic payment methods differ in terms of security and process features, as well as the supporting banking infrastructure. It is useful to divide electronic payments into small payments (e.g. less than US$ 1,000), micropayments (less than US$ 10), and large payments. Although these are relative terms, such a classification helps with restricting the payment methods that could be used for different types of duties, taxes, fees and charges, and with managing collection, costs and risks. Each method of electronic payment has its challenges and management overheads.

With electronic data interchange (EDI) methods, the total amounts owed by each approved trading partner, together with their bank account details (account number, branch sort code, etc.) are transferred to the relevant bank when the duty becomes payable. Agreement will have to be reached between Customs and the bank on the information exchange standard, and whether to use EDI or another method. International standard messages (UN/EDIFACT, ISO 20022), designed for use in the EDI environment, are available for the transmission of payment information. These EDI methods have been in use for several years, and are utilized in many Customs administrations.
Electronic bill presentment and payment (EBPP) enables payment of bills online. In this method, the payer accesses the site of the payee to view pending bills, and authorizes payment. The payee asks the bank to debit the payer’s account and settle the bill. This puts the burden of collection on the payee, and simplifies procedures for the payer, as it requires the payee to maintain separate arrangements with all the banks that payers may potentially use.

Credit and debit cards are convenient methods for making small payments, particularly in business-to-consumer electronic commerce transactions.

The widespread use of credit cards has been made possible through increased security measures, such as the card verification number (CVN) and electronic signatures. Smartcards that are similar to credit cards may contain embedded microprocessors to store small amounts of electronic cash. Mobile payments have also become useful for micropayments. Special-purpose payment cards can also be used for specific applications. Person-to-person payments, mobile payments and ‘electronic cash’ methods, able to transmit funds to anyone with an email address, are also growing as e-payment schemes in the context of micropayments.

The time taken for the bank to release into government treasury accounts the funds collected from traders as duties, taxes and fees is called the ‘float’. Different methods of electronic payment will have a different float. Since Customs duties are often enormous amounts, the time allowed for receipts to be reflected in the government treasury account is important. The divisions that handle the rules for government accounts will usually deal with the procedural aspects in this regard.

An automated clearing house (ACH) network is usually implemented within a country as a batch-oriented electronic funds transfer system. It provides for the interbank clearing and settlement of electronic payments for participating financial institutions. The presence of such networks enables Customs administrations to receive payments made through banks that are a part of such networks.

To conclude, electronic payment is a significant step towards trade facilitation. In view of the variety of e-payment methods available, Customs needs to carefully examine the security risks, process efficiencies, the user convenience, national banking regulations, government accounting and treasury management norms, and services offered locally, before introducing electronic payment facilities.
Annex: Business Innovation through Single Window Processes: A Perspective from Dubai Customs, UAE

Although work on the Single Window was initiated in Dubai Customs as early as the 1990s, the original plan included only the integration of Customs with port operations. Dubai Customs was quick to foresee the huge potential that the move entailed. And with information technology (IT) becoming prevalent in society, tapping that potential was relatively easy. It was well known among stakeholders that the port authorities, shipping community, other permit agencies and the importer exchanged more or less the same data set, sometimes with significant, and sometimes with slight, variations. This paper is divided into three Parts: Part I introduces the main business process innovations; Part II discusses the key challenges in introducing those innovations and how Dubai Customs overcame them; and Part III lists the important WCO instruments that served to guide the development of the Single Window.

I. Business Process Innovation in Dubai Customs, UAE

Reuse of transport and commercial data for regulatory and operational purposes
Customs requires, for example, shipment and goods information contained in the bill of lading. The bill of lading information is used by Customs to identify the shipment for targeting, and to issue clearance instructions. Similarly, invoice information is used to calculate duty, and to identify permit requirements. Port authorities require the bill of lading information to handle, store and deliver the goods. Permit agencies require the invoice and bill of lading information to identify the shipment for release and to verify permits.

Simplifying release by dematerializing delivery orders
Dubai Customs was quick to recognize the major role played by shipping companies, which have all the shipping information at the level of the bill of lading which they provide to the port authority to facilitate storage, handling and delivery. Customs could reuse the same information electronically, instead of requiring a hard copy from its clients. Moreover, the processes were redesigned to eliminate the hard-copy delivery order of the shipping company as a requirement for the port to hand goods over to the importer.

Leveraging the common trade portal
The setting up of a common portal called ‘Dubai Trade’ as a gateway for all the supply chain players was instrumental in our innovative moves towards a Single Window process. Here, the shipping company provides the shipment information to the port system electronically, and the port shares it with Customs through the Customs system. The shipping company, after ensuring the surrender of the original bill of lading or basing on the shipper’s instructions, marks the bill of lading in the Customs system as delivery order issued. Now, both Customs and the port have the authorized electronic delivery order in their respective systems. This has eliminated the hard-copy delivery order from the process. Moreover, it has eliminated the mismatch between the declaration and the
shipping manifest due to data entry error. It has turned out to be a manifest reconciliation, which numerous Customs departments follow through separate processes.

**Using the Harmonized System to manage compliance requirements**
The importer uses Dubai Trade to lodge his declaration with Customs, and just mentions the bill of lading number. Customs retrieves the shipping data from the system. The importer further provides goods data, including HS codes at a line item level. From the HS code, the Customs system identifies the permit requirement and then checks for the permit, which might have been issued by the permit authority prior to the arrival of the shipment. (This electronic validation with some of the permit authorities is currently under build phase in Dubai Customs.)

**Integrating the release process with automated permit management**
The system will consume the permit so that it cannot be used again. In addition to having a permit, certain commodities might require inspection before release, to ensure conformity with the permit and specifications. We established an innovative process whereby, if a commodity requires inspection by the permit authority, the system sends a conditional release message to the port system. The port gate pass system identifies the condition and holds the goods until the condition has been satisfied.

**II. Business Process Innovation – Opportunities and Challenges**

**Incremental approach**
Of course, instead of a ‘big bang’ approach, we did everything incrementally, by mitigating risks at each stage and addressing issues one by one. For instance, shipping companies were apprehensive about the risk of consignments being released without the proper title document or payment of dues. The checks and balances we introduced in the various systems that were interfaced using the same common gateway portal enabled us to market and get buy-in from the shipping industry. We had to set up help desks, and even went the extra mile of developing systems for those agents who were not in a position to have integrating systems due to lack of resources or budgetary constraints.

**Stakeholder engagement**
The next challenge was from the trading community, who were apprehensive of system or human failures on the part of the shipping industry. Most of the shipping agents, in close liaison with Dubai Customs and Dubai Ports World, have their own systems, designed to transfer the required information and authorization in real time when they process their delivery orders. Not only are the controls necessary, it is also very important to convince the user community of those checks and balances. We conducted extensive awareness raising and training sessions for the trading and shipping community, and were very fortunate to have their massive buy-in.

**Data confidentiality**
Another challenge we faced was maintaining the confidentiality of information while sharing it. The system has very strict controls on data sharing, and we share only the data sets that are legitimate and may legally be shared. While pushing the information to the port and the permit authority, the system filters out the information that is not legitimate for sharing with others. As regards data
integrity and non-repudiation requirements, we introduced digital certificates, ensuring that declarations originate from a trusted source. Because the digital certificates are provided by another service provider, this involves some small overhead expenses for importers. However, they have been prepared to compromise as the certificates ensure their data integrity and prevent misuse of their logins.

**Multi-layer user support**
Another problem was that of system validation failures across all integrated systems, and business issues that arise from time to time. We introduced three levels of support for such issues: Dubai Trade is the first level of support; the Customs IT help desk and Business Process Department are the second level of support; and purely IT technical experts are the third level of support. In addition to these measures, as a safety net, we can always fall back on earlier processes of manual intervention. But such cases are rare, because of the years of experience and constant monitoring of the systems and processes.

**The human resource dimension**
Although the Single Window initiative had very good support from everyone involved, there was resistance from those who preferred the status quo, which was quite significant in our effort to integrate with other government agencies. The latter traditionally have many bureaucratic layers, and always have legitimate issues regarding existing agency policies/regulations. Budgets were also a constraint, as a higher level of authorization of funds was required. The availability of competent personnel was another problem when designing systems, as sometimes staff changed job.

**Managing expectations**
Another issue was to get right the expectations of each entity. Sometimes, people have to react and respond to urgent needs or issues. In this ‘crisis’ mode, it is possible to lose the overview of the whole process, and certain changes which are introduced might conflict with the interests of other actors involved. Moreover, in critical situations, some workaround solutions may be put in place, and this inherently has its own drawbacks. Constant monitoring is required to ensure that changes do not conflict with the regulatory requirements and financial interests of anyone involved in the process.

**Dissimilar technology architecture**
Another challenge we face relates to architectural issues, both in business processes and in the systems. Everyone involved had their own systems. These existing systems were integrated with each other by means of modifications, rather than by building brand new systems with exhaustive architectural designs. This approach, while minimizing costs, also necessitates certain compromises. Moreover, it might introduce new data sets which are unfamiliar to entities or their clients.

For instance, although we have integrated with the port community system, the collection of payments is effected through different online gateways. This means that clients need to make the payments two or three times, although they use the same data for payment. Apart from the system restrictions, the financial requirements in respect of online payment vary significantly: Customs offers deferred payments to clients through their accounts supported by guarantees, but other organizations do not offer such facilities. This results in different payment methods for clients, although ultimately the objective is the same – to get their shipment to their warehouse as the final leg in the whole supply chain.
Although any organization that joins the Single Window initiative will have difficulties to begin with, the Single Window is the future, and to have anything else is a disservice to society.

III. WCO Instruments that Inspired Business Innovation in the Single Window

Several WCO instruments played a key role in inspiring innovation in business processes. Some of them are listed below.

**WCO Data Model**
All data exchanged between Customs, ports, traders, shipping agents and other permit agencies is part of the WCO Data model, and Dubai Customs does not demand additional data from anyone involved in the Single Window process. However, certain data labels have been renamed to reflect local practice, preference and acceptance.

**SAFE Framework of Standards**

*Pillar 2: Customs-to-Business Partnership*
The shipping lines and their agents who play a major role in supply chain security are significant partners in the Single Window process. In fact, to a great extent, they ensure the safety and security of the supply chain, as the manifest and delivery order information they provide is matched internally against the import declarations traders submit to Customs. They ensure, through their own internal processes and through the validation rules built into our system, that they do not modify any information in the system that could potentially compromise security.

*Standard 6: Advance Electronic Information and Digital Certificates*
Shipping lines transfer information well in advance, before the arrival of shipments with Customs, and Customs uses this information to conduct risk assessments of the shipments. Customs uses digital certificates, recommended in the Safe Framework of Standards, to ensure the integrity of the data transmitted to it by traders and shipping agents.

*Revised Kyoto Convention: Specific Annex on Transit*
The Revised Kyoto Convention recommends that only the shipment information available on the shipping documents be requested for clearing transit. In our Single Window process, Customs uses the same information that is submitted by the shipping agents in the delivery order to clear transit, and does not demand a transit declaration in addition.