

## WCO Research Paper No. 17

# A Survey of Single Window Implementation

(August 2011)

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#### Abstract

Customs administrations require an active use of information and communication technologies (ICT) to become more effective and efficient. The objective is to use electronic data instead of paper documents and to connect different computer systems of government agencies and businesses. Against the backdrop of a fast-changing international trade environment and information technology innovation, the *Single Window* concept emerged and has been adopted by several governments with a view to streamlining and simplifying regulatory requirements in the trans-border movement of goods. Single window systems aim to simplify border formalities for traders and other economic operators by arranging for a single electronic submission of information to fulfill all cross-border regulatory requirements, and it is thus preeminently a tool for trade facilitation.

This research paper, which constitutes part of the WCO Single Window Compendium: How to build a Single Window Environment, summarizes the results of a WCO survey that aimed to provide a global snapshot of single window implementation using a convenience sample of WCO Members. The main purpose of the study is to offer an overview of Customs cargo clearance systems that are the basis for a single window environment; to outline the implementation of single window in its practical and operational dimensions; to shed light on technical tools for data harmonization such as the WCO Data Model as well as security frameworks (as an enabler of information exchange between border agencies); and to present challenges in developing and advancing a single window system.

#### **Key words**

Single window, trade facilitation, cargo clearance system, data harmonization, WCO Data Model, information exchange

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### **Table of Contents**

### **List of Abbreviations**

I. Overview	- 4
<ul> <li>Introduction</li> <li>Structure and analysis</li> <li>Participating member countries</li> </ul>	
II. Survey Analysis	- 6
1. Overview of Current Customs Clearance	- 6
<ul> <li>Adoption of a computer-based cargo clearance system</li> <li>Electronically reported Customs declarations</li> <li>Government agencies involved in cross border transactions</li> <li>Government agencies having electronic links with Customs clearance system</li> <li>Key factors hindering the establishment of an electronic linkage among border agencies</li> </ul>	
2. Single Window Planning and Development	. 10
<ul> <li>Types of cargo clearance system in operation</li> <li>Single window system development</li> <li>Beginning of single window operation</li> <li>Single window service provider</li> <li>Source of funding for maintenance and operation of single window</li> <li>Problems and difficulties hindering the development of a single window</li> <li>Coverage of cargo clearance system</li> </ul>	
3. International Interoperability	18
<ul> <li>Harmonization of single window data with international standards</li> <li>International standards for the harmonization of single window data</li> <li>Interface and messaging standard in single window design</li> <li>WCO Unique Consignment Reference (UCR)</li> <li>Information exchange with trade partners</li> <li>Methods of data/information exchange</li> </ul>	
4. Single Window Security Governance	24
<ul> <li>Security standards implementation framework</li> <li>Authentication tools for accessing single window</li> <li>Common identity management system</li> <li>Implementation of Single Sign-on</li> <li>Other agency's access to data in single window</li> </ul>	

III. Conclusion	 	 	 29
References			

### **List of Abbreviations**

**AEO** Authorized Economic Operator

APEC Asia-Pacific Economic Cooperation

**EBXML** Electronic Business using eXtensible Markup Language

**EDI** Electronic Data Interchange

ICT Information and Communication Technology

IEC International Electrotechnical Commission

IMSC Information Management Sub-Committee

**ISO** International Organization for Standardization

MQ IBM's Message Oriented Middleware offering

**OFTP** Odette File Transfer Protocol

PIN Personal Identification Number

**PKI** Public Key Infrastructure

**SCCP** Sub-Committee on Customs Procedures

**SSL** Secure Sockets Layer

**UBL** Universal Business Library

**UCR** Unique Consignment Reference

**UN** United Nations

**UNECE** United Nations Economic Commission for Europe

**UNTDED** United Nations Trade Data Elements Directory

UN/CEFACT United Nations Center for Trade Facilitation and Electronic Business

**UN/EDIFACT** United Nations EDI Directories for Administration Commerce and Transport

WCO World Customs Organization

**XML** Extensible Markup Language

#### I. Overview

#### Introduction

The single window concept grew out of efforts to simplify border formalities for traders and other economic operators by arranging for a single electronic submission of information to fulfill all cross-border regulatory requirements. The concept has turned into a reality for some countries due to advances in information and communication technologies (ICT) and the political will mustered by coordinated border management (CBM).

The World Customs Organization (WCO)¹ and other international organizations such as the United Nations (UN)² have promoted the benefits of single window. Many Customs administrations, working with other border agencies and partners in the private sector, have endeavored to establish a single window system. Constructing and advancing a single window is a challenging project, which entails strategic planning, effective use of information technologies, securing financial and human resources and indispensably, the mobilization of political support. The WCO conducted this survey to provide a snapshot of single window implementation worldwide, and thus assist Customs administrations to gain a better understanding of challenges and opportunities in developing and improving single window systems.

#### Structure and analysis

The format and questions in this study were originally conceived by the Asia-Pacific Economic Cooperation (APEC).<sup>3</sup> The WCO used the same survey questions to streamline the analysis workload as well as to avoid duplicate responses from the APEC economies.<sup>4</sup> The survey has a total of 27 questions, which are grouped into four sub-sections:

- Overview of current Customs clearance systems;
- Single Window planning and development;
- International interoperability; and
- Single Window governance.

Under the auspices of the APEC, the WCO obtained individual APEC economies' survey responses and incorporated them into this study. In the course of analysis, WCO members were contacted by the WCO Secretariat to ensure consistency and clarification of their responses.

<sup>&</sup>lt;sup>1</sup> WCO (2007), *The WCO Data model: Single Window Data Harmonisation, Version 2*, February 2007, and WCO (2008) *Single Window: Implications for Customs Adminitrations*, November 2008, WCO. Both documents are available at <a href="http://www.wcoomd.org/sw">http://www.wcoomd.org/sw</a> guidelines.htm>.

<sup>&</sup>lt;sup>2</sup> UNCEFACT (2005), Recommendation 33 – Recommendation and Guidelines on Establishing a Single Window, July 2005, United Nations Centre for Trade Facilitation and Electronic Business (UNCEFACT), and UNCEFACT (2010) Recommendation 35 – Establishing a legal framework for international trade Single Window, October 2010, UNCEFACT. Both documents are available at <a href="http://www.unece.org/cefact/recommendations/rec\_index.htm">http://www.unece.org/cefact/recommendations/rec\_index.htm</a>>.

<sup>&</sup>lt;sup>3</sup> APEC (2010), SCCP Single Window Report - Working Toward the Implementation of SW in the APEC Economies and International Interoperability, September 2010, APEC

<sup>&</sup>lt;sup>4</sup> Of the 21 APEC member economies, 20 are WCO members.

### Participating member countries

In 2010 the WCO Secretariat circulated the survey questionnaires to all 177 WCO members. A total of 58 members - 20 from APEC and 38 from non-APEC members - took part. The study contains representation from all six WCO regions.

Table 1: List of participating members<sup>5</sup>

WCO region	Name of country	
East and Southern Africa region	Angola, Ethiopia, Mauritius, Mozambique, Rwanda, South Africa, Uganda	7
Europe region	Albania, Azerbaijan, Belgium, Bulgaria, Denmark, Finland, France, Germany, Latvia, Lithuania, Macedonia, Malta, Netherlands, Poland, the Russian Federation*, Slovakia, Slovenia, Sweden, Switzerland, Turkey, United Kingdom	21
Asia-Pacific region	Australia*, Brunei-Darussalam*, China*, Hong Kong China*, India, Indonesia*, Japan*, Korea*, Malaysia*, Mongolia, Myanmar, New Zealand*, Papua New Guinea*, the Philippines*, Singapore*, Thailand*, Vietnam*	17
North of Africa, Near and Middle East region	Jordan, Morocco, Tunisia	3
Americas region	Argentina, Canada*, Chile*, Dominican Republic, Mexico*, Paraguay, Peru*, United States*	
West and Central African region	Benin, Burkina Faso	2

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<sup>&</sup>lt;sup>5</sup> Asterisks refer to APEC member economies.

#### II. Survey Analysis

#### 1. Overview of Current Customs Clearance

ICT is indispensible for modernized Customs administrations. The computerized system speeds up the processing of information, enables risk management approach in the selection of goods and passengers, enhances compliance by the private sector, and provides better service to businesses. To maximize the benefit of computerization, vigorous information exchange between departments as well as border control agencies is required. Computerization and inter-agency co-ordination nurture a conducive environment for the implementation of a single window system.

This section provides an overview of Customs clearance systems as well as the relationship between a Customs administration and other border agencies in dealing with cross border regulatory requirements.

#### Key findings are:

- 1. A strong indication was observed that Customs administrations generally operate a computer-based (automated) cargo clearance system.
  - All survey participating Customs administrations have adopted a computer based cargo clearance system.
- 2. The vast majority of Customs goods declarations appear to be reported electronically.
- 3. Only a small number of government agencies have electronic links with Customs clearance system.
  - An average of three other government agencies has electronic links with Customs clearance system, while 15 agencies, on average, are directly involved in the cross border transactions.
- 4. Key factors that hinder the establishment of an electronic linkage by other government agencies with Customs clearance system are:
  - Lack of information and communication technology (ICT);
  - Budget and human resource constraints:
  - Inadequate legal framework; and
  - Difficulties in inter-agency co-ordination.

#### Adoption of a computer-based cargo clearance system

All 58 Customs administrations (100%) responding to the survey indicated that their countries have adopted a computer based (automated) cargo clearance system.

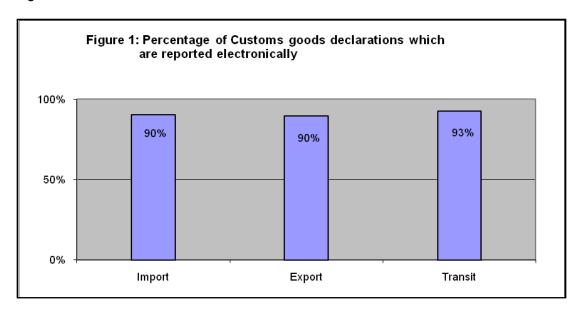
#### Electronically reported Customs declarations

The vast majority of Customs goods declarations are reported electronically to Customs administrations.

Of Customs administrations responding:

- An average (mean) <sup>6</sup> of 90% of Customs declarations for import was reported electronically;
- An average (mean) of 90% of Customs declarations for export was reported electronically;
- An average (mean) of 93% of Customs declarations for transit was reported electronically.

See figure 1



#### Government agencies involved in cross border transactions

With respect to the number of government agencies which have a direct regulatory involvement (or require information) in the cross border movement of goods, conveyances, crews and transport equipment, the median (the number in the middle in value order) was 15.

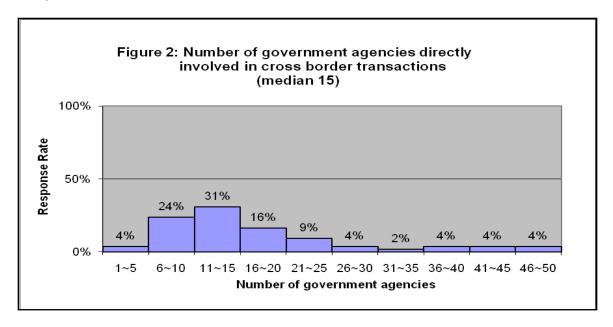
Out of Customs administrations that responded:

- 32 (58%) indicated less than 16 government agencies are involved;
- 16 (29%) indicated 16 to 30 government agencies are involved;

<sup>&</sup>lt;sup>6</sup> The percentage figure refers to the sum of the percentages provided by Customs administrations divided by the number of Customs administrations responding to this question (58).

• Seven (13%) indicated more than 30 government agencies are involved.

#### See figure 2



These government agencies are engaged in a range of activities including:<sup>7</sup>

 Trade & industry; transportation & communication; patent & registration; export control; import licensing; immigration; environmental protection; phytosanitary; quarantine; food safety; tax administration; and statistics.

#### Government agencies having electronic links with Customs clearance system

Regarding the question of how many government agencies have electronic links with Customs clearance system, the median was three.

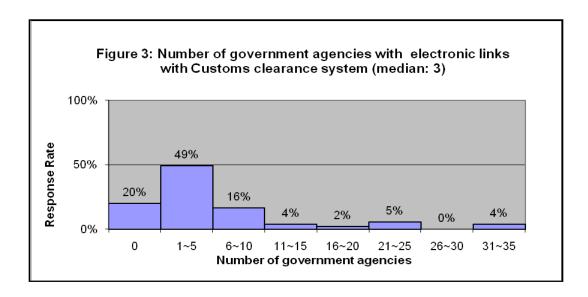
Among Customs administrations that responded:

- 11 (20%) indicated no government agencies;
- 27 (49%) indicated one to five government agencies;
- Nine (16%) indicated six to ten government agencies;
- Eight (15%) indicated over 11 government agencies.

See figure 3

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<sup>&</sup>lt;sup>7</sup> This is not part of the survey questionnaire. Some Customs administrations provided names of their government agencies.

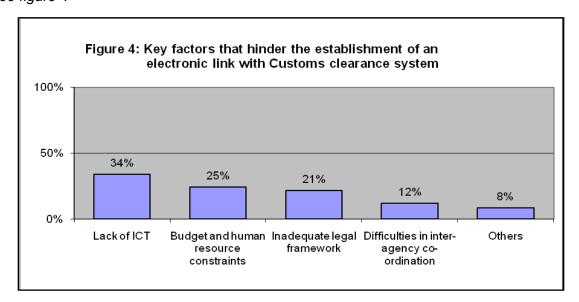


# Key factors hindering the establishment of an electronic linkage among border agencies

As to key factors that hinder the establishment of an electronic linkage by other government agencies with Customs clearance system, Customs administrations that responded indicated:<sup>8</sup>

- Lack of information and communication technology (ICT) (29, 34%);
- Budget and human resource constraints (21, 25%);
- Inadequate legal framework (18, 21%);
- Difficulties in inter-agency co-ordination (10, 12%);
- Others, (seven, 8%).

#### See figure 4



<sup>&</sup>lt;sup>8</sup> This is an open ended question with no multiple choices given. The WCO Secretariat categorized qualitative responses into five areas. Others include no identified (or pressing) needs, lack of strategy, and lack of political decision.

#### 2. Single Window Planning and Development

For most Customs administrations, implementing a single window is a daunting project, which may take several years for planning and developing, while involving many stakeholders. It requires extensive planning and a phased approach based upon an analysis of the gap between the existing and future systems. Cost is also a key element. The very nature of a single window system providing a variety of services and functions may give rise to the question of ownership, although it is generally recognized that Customs administrations have a critical role in the establishment of a single window owing to their extensive business coverage at borders.

This section gives an overview of implementation of single window in its development and operation, particularly with respect to single window models, main functions, service providers, maintenance and operations, and challenges of developing a single window.

#### Key findings are:

- 5. Most Customs administrations have a non-single window type cargo clearance system.
  - Among single window systems, the hybrid model is most frequently adopted by Customs administrations.
- 6. The majority of single window systems became operational in the 2000s. The number of single window systems has been steadily rising.
  - Single window systems have been developed on a phased approach, and are still in the process of development as the scope of single window functions continues to expand.
  - Customs administrations are generally in the process of developing or improving a single window system.
- Customs administrations appear to be the dominant single window service
  provider either alone or in collaboration with other government agencies or the
  private sector.
- 8. Government finance seems to be the major source of funding for the maintenance and operation of a single window. User fees and the public-private partnerships are also found as a funding source.
- 9. It was observed that Customs administrations have incorporated a range of business processes, functionalities and services into their cargo clearance systems, single window systems, or one-stop service.

#### Types of cargo clearance system in operation

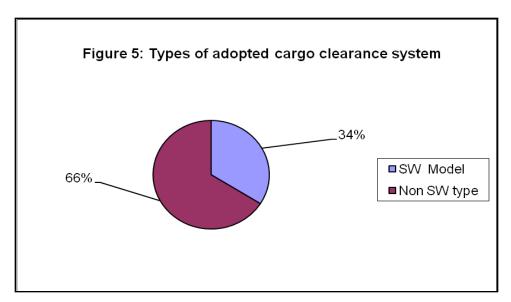
For this survey, five categories were conceived as to the classification of Customs cargo clearance system. The first three are the single window model and the last two are other non single window type.

- Single Window: Integrated Model Individual data elements are submitted once to a single entry point (integrated automated system) to fulfill all import, export and transit-related regulatory requirements (i.e., enables multiple procedures to be performed from a single submission).
- Single Window: Interfaced Model Individual data elements are submitted once to a single entry point (e.g., gateway server or Internet/'Value Added Network' service provider) to fulfill all import, export and transit-related regulatory requirements (i.e., enables multiple procedures to be performed from a single submission). Under the Interfaced Model, each regulatory agency will maintain its own automated system but will connect with other systems through specially developed electronic interfaces.
- Single Window: Hybrid Model A combination of the Integrated Model and the Interfaced Model.
- One-Stop Service A single website or terminal links to the computer systems of Customs and trade-related government agencies, providing a one-stop service to stakeholders. However, stakeholders are required to undertake each procedure/declaration separately.
- Stand-alone system for Customs clearance

Among the surveyed Customs administrations, the majority have a non single window type than a single window model in their current cargo clearance systems. Of the Customs administrations responding:

- 19 (34%) indicated that they operate a single window system;
- 37 (66%) indicated that they operate non single window system.

#### See figure 5



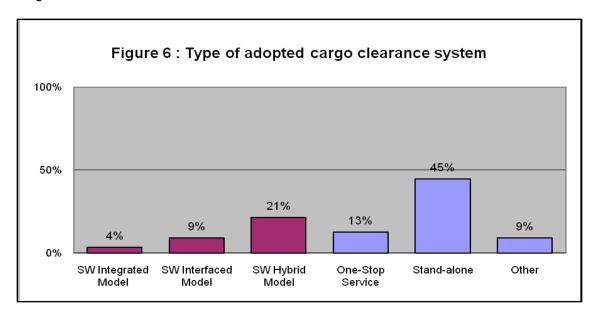
Among the single window model, the integrated model, a most advanced one, was not generally chosen by Customs administrations. Instead, the hybrid model was most frequently adopted.

When it comes to non single window type, the stand-alone system was most frequently adopted.

Of the Customs administrations responding:

- Two (4%) indicated that they operate a single window the integrated model;
- Five (9%) indicated that they operate a single window the interfaced model;
- 12 (21%) indicated that they operate a single window the hybrid model;
- Seven (13%) indicated that they operate the one-stop service;
- 25 (45%) indicated that they operate the stand-alone system;
- Five (9%) indicated that they operate other systems.

#### See figure 6



#### Single window system development

It was strongly implied that Customs administrations without a single window system are generally in the process of developing a single window system.

Among Customs administrations which indicated that they adopted non single window type system such as the one-stop service, the stand alone system or others, all of them indicated that a single window system is under development.

<sup>&</sup>lt;sup>9</sup> Customs administrations which selected this choice provided details as below: (1) "a stand-alone system with interface to statistical office, foreign trade surveillance office and agricultural surveillance office"; (2) "a multifunctional stand alone system with integrated single window functionalities linking with some other authorities and EU common domain"; (3) "a system in which all customs data submitted electronically for imports with limited electronic data for a few other government agencies"; (4) "all customs data submitted electronically for imports with limited electronic data for a few other government agencies"; and (5) "very similar to hybrid model, but the system accepts the declarations which are shared with other important stakeholders".

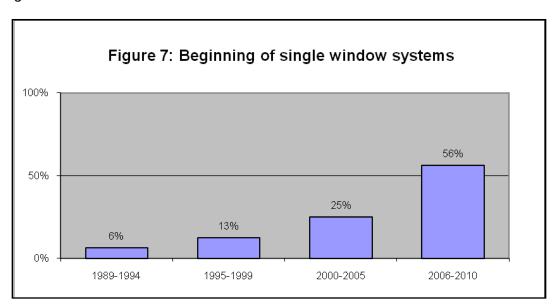
#### Beginning of single window operation

The number of Customs administrations launching a single window system has been steadily rising since the 1990s. This trend seems to be in part facilitated by the information technology innovations in the last decade or so.

As to the question of when a single window system was adopted and placed in operation, it was observed that the majority of current single window systems became operational after year 2000, some had started in the 1990s.

Among Customs administrations responding:

- One (6%) indicated that their single window systems became operational between 1989-1994;
- Two (13%) indicated that their single window systems became operational between 1995-1999;
- Four (25%) indicated that their single window systems became operational between 2000-2005;
- Nine (56%) indicated that their single window systems became operational between 2006 -2010.



#### See figure 7

Some Customs administrations stated that their single window systems have been developed on a phased approach and thus are in the process of development as the scope of single window functions continues to expand.<sup>10</sup>

#### Single window service provider

Customs administrations appear to be the dominant single window service provider either alone or in collaboration with other quasi-government agencies.

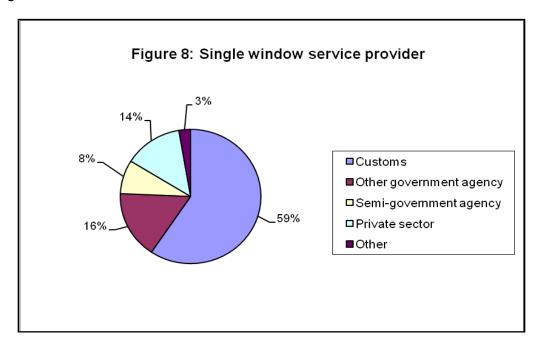
 $<sup>^{10}</sup>$  This is not part of the survey questionnaire. Some Customs administrations provided further explanations.

The majority of Customs administrations responded to this question indicated Customs (22, 59%) as single window service provider, followed by other government agency (six, 16%), the private sector (five, 14%), semi-government agency (three, 8%) and other (one, 3%).<sup>11</sup>

Six Customs administrations implied that they provide single window service jointly with other government agencies or with the private sector which include:

 Port Authority; Ministry of Foreign Trade and Tourism; Business Advice and Support Service; Department of Environment, Food and Rural Affairs; and Department for Business Innovation and Skills.

#### See figure 8



#### Source of funding for maintenance and operation of single window

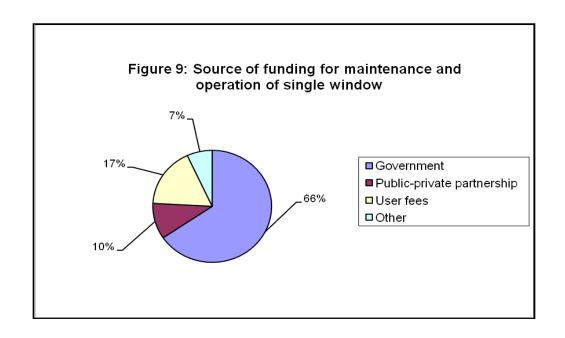
Government finance seems to be the major source of funding for the maintenance and operation of single window, while other sources such as user fees and the public-private partnerships are also found.

The majority of Customs administrations responded to this question indicated government (19, 66%) as a source of funding in the maintenance and operation of single window, followed by user fees (five, 17%), the public-private partnerships (three, 10%), and other (two, 7%). 12

See figure 9

<sup>&</sup>lt;sup>11</sup> Six Customs administrations selected more than one choice.

<sup>&</sup>lt;sup>12</sup> Two Customs administrations selected morea than one choice.



#### Problems and difficulties hindering the development of a single window

With respect to the problems and difficulties that hinder development of a single window, Customs administrations that responded indicated:<sup>13</sup>

- Lack of information and communication technology (ICT) (17, 29%);
- Budget and human resource constraints (12, 20%);
- Difficulties in inter-agency co-ordination (12, 20%);
- Inadequate legal framework (eight, 14%);
- Lack of leading agency (four, 7%);
- Others, six (10%).

See figure 10

Figure 10: Issues, problems and difficulties that hinder the development of a single window 100% 50% 29% 20% 20% 14% 10% 7% 0% Lack of ICT Difficulties in Lack of leading Others Budget and Inadequate human resource inter-agency co-legal framework agency constraints ordination

<sup>&</sup>lt;sup>13</sup> This is an open ended question with no multiple choices given. The WCO Secretariat categorized qualitative responses into six areas. Others include bureaucracy, absence of diagnosis, change management, reluctant to modernize existing processes, and cultural management problems.

#### Coverage of cargo clearance system

It was observed that Customs administrations have incorporated a range of business processes, functionalities and services into their cargo clearance system, single window system, or one-stop service.

Among Customs administrations that responded:

- More than 60% indicated that their cargo clearance systems (single window system, or one-stop service) included functions, which cover many of traditional Customs functions. These are:
  - Cargo clearance procedures for import and export; bonded transit approval/permission; online information on tariff, restrictions and prohibitions for commodities/products; computation of duties, taxes and fees; duty and tax payment/refunds; warehouse cargo control; submission of cargo manifest; filing of inspection/examination results; automated profiling/risk assessment of cargo; statistical reporting; and tracking information on goods and consignments.
- From 30% to 60% indicated that their cargo clearance systems (single window system, or one-stop service) included functions designed to facilitate the procedures of cross border transactions including those of other government agencies. These are:
  - Common business entity registration service; reporting and processing of vessel entrance/departure notice; applications and permissions for import/export license and food sanitation; reporting of dangerous goods; application for and issuing of advance ruling; and time release survey capability.

Table 2: business process, functionalities and services in single window system/one-stop service/Customs clearance system

Business Process/Functionality/Service	Responses (rates)
Common Business entity registration service	22(43%) <sup>14</sup>
Common Directory of locations and facilities	15(29%)
Single user registration service (relevant only for the integrated model)	14(27%)
Shared services for Digital Signature certificates	15(29%)
Shared user authentication	13(25%)
Import cargo clearance procedures	50(98%)
Export cargo clearance procedures	47(92%)
Bonded transit approval/permission	34(67%)
Online information on tariff, restrictions and prohibitions for commodities/products	42(82%)
Computation of duties, taxes and fees (as a shared service across departments and services)	37(73%)
Duty and tax payment	45(88%)
Duty and tax refund and other similar procedures	35(69%)

<sup>&</sup>lt;sup>14</sup> The percentage figures refer to the ratio of survey responses divided by total participating Customs administrations (58) except for tracking information on goods and consignments (19/31 = 61%).

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Business Process/Functionality/Service	Responses (rates)
Warehouse cargo control	33(65%)
Submission of cargo manifest	36(71%)
Reporting and processing of vessel entrance/departure notice or report to Customs administration (e.g. ship, aircraft)	23(45%)
Submission and processing of crew/passenger list	13(25%)
Inspection/examination, includes automated scheduling of equipment and human resources	13(25%)
Filing of inspection/ examination results	34(67%)
Quarantine application and approval/permission	15(29%)
Food sanitation application and approval/permission	16(31%)
Import/Export license application and approval/permission	21(41%)
Immigration procedures	1 (2%)
Airport authority's procedures, e.g. aircraft arrival/departure permission	6(12%)
Port authority's procedures, e.g. ship arrival/departure permission	12(24%)
Reporting of dangerous goods	17(33%)
Application for and issuing of certificate of origin	13(25%)
Application for and issuing of other licenses and permits not specified above	12(24%)
Application for and issuing of advance ruling, e.g. classification, valuation	16(31%)
Automated profiling/risk assessment of cargo (selectivity)	35(69%)
Statistical reporting capability	44(86%)
Time Release Survey capability	22(43%)
Tracking information on goods and consignments	19(61%)
Other <sup>15</sup>	3 (6%)

<sup>15</sup> Other includes: risk management system; securities and temporary imports; and online survey.

#### 3. International Interoperability

Either in an automated system or paper-based system, the adoption of non-standard data will result in higher cost and redundancy. The use of international standards in data and messaging for export, transit and import is one of the core elements of single window concept. The WCO Data Model ensures compatibility as well as interoperability among border agencies' reporting requirements and thus will pave the way for vigorous information exchange.

The third section of this study delves into the subject of "how" and "to what extent" Customs administrations pursue the notion of interoperability between Customs administrations and other stakeholders. In particular, this section looks into data harmonization standards, interface and messaging standards, the WCO UCR, and the exchanging of trade related data with other stakeholders.

#### Key findings are:

- 10. It appears that the majority of Customs administrations harmonize single window data with internationally recognized standards.
  - While the WCO Data Model is widely adopted for the harmonization of single window data, traditional methods of UNTDED and UN/EDIFACT are also substantially used by Customs administrations.
- 11. Customs administrations have incorporated or are planning to incorporate XML, Webservices and EDI into their single window design as an interfacing and messaging standards.
  - The former two standards seem to gain grounds as more and more electronic data exchange takes place on the Internet environment.
- 12. Significant efforts need to be made for the promotion of the WCO Unique Consignment Reference (UCR) as only a small number of Customs administrations incorporated it in their single window systems.
- 13. While some Customs administrations have started to exchange trade data/information with other trade partners via single window systems, the majority have not yet started.
  - Where information exchange takes place, various types of data/information were shared between Customs administrations and trade partners.
- 14. It was indicated that XML was the most frequently used method in the exchange of data/information through single window system. The widespread use of XML seemed to be in part attributed to the booming of the Internet.

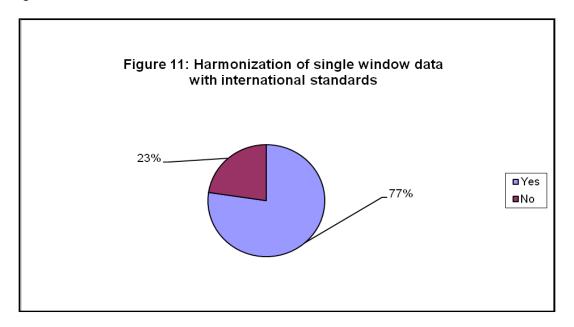
#### Harmonization of single window data with international standards

The majority of Customs administrations harmonize single window data with internationally recognized standards.

Among Customs administrations responding:

- 41 (77%) indicated that they harmonize single window data with internationally recognized standards;
- 12 (23%) indicated that they do not harmonize single window data with internationally recognized standards.

See figure 11



#### International standards for the harmonization of single window data

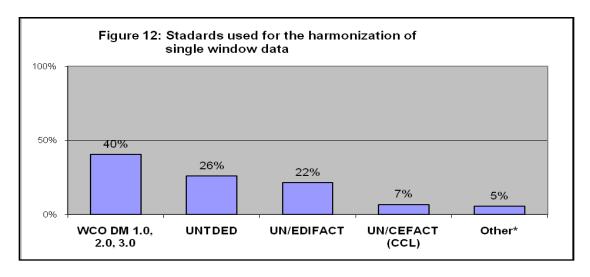
While the WCO Data Model is adopted among many Customs administrations for the harmonization of single window data, traditional methods such as UNTDED (United Nations Trade Data Elements Directory) and UN/EDIFACT (United Nations EDI Directories for Administration Commerce and Transport) are also substantially used in many Customs administrations.

Of Customs administrations responding;

- 36<sup>16</sup> (40%) indicated that they use WCO Data Model;
- 24 (26%) indicated that they use UNTDED;
- 20 (22%) indicated that they use UN/EDIFACT;
- Six (7%) indicated that they use UN/CEFACT Core Component Library;
- Five (5%) indicated that they use other.<sup>17</sup>

<sup>&</sup>lt;sup>16</sup> This number is a combination of the WCO Data Model version 1.1 (one response), version 2.0 (17 responses), and version 3.0 (18 responses).

<sup>&</sup>lt;sup>17</sup> Many Customs administrations selected more than one choice. Other includes: Universal Business Library; EBXML; and other national and EC standards.



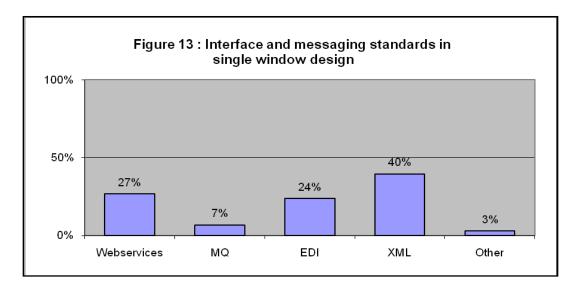
### Interface and messaging standards in single window design

It appears that many Customs administrations have incorporated or are planning to incorporate XML, Webservices and/or EDI into their single window design as an interfacing and messaging standards.

Of Customs administrations responding:

- 27 (27%) indicated that they adopted Webservices;
- Seven (7%) indicated that they adopted MQ;
- 24 (24%) indicated that they adopted EDI including UN/EDIFACT;
- 40 (40%) indicated that they adopted XML;
- Three (3%) indicated that they adopted other.<sup>18</sup>

#### See figure 13



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<sup>&</sup>lt;sup>18</sup> Many Customs administrations selected more than one choice. Other includes OFTP via X.25, and EBXML.

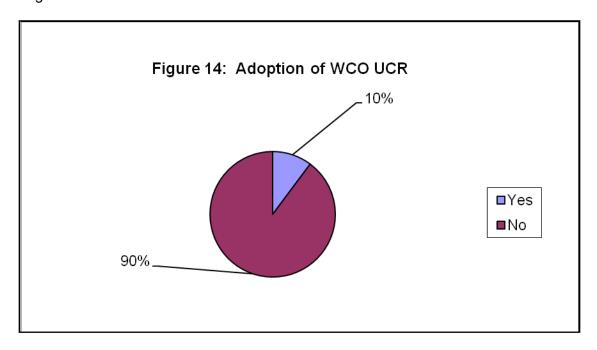
#### WCO Unique Consignment Reference (UCR)

It was strongly indicated that significant efforts need to be made for the promotion of the WCO Unique Consignment Reference (UCR) as only a small number of Customs administrations incorporated it in their single window systems.

Of Customs administrations responding:

- Five (10%) indicated that they incorporated the WCO UCR in their single window systems;
- 44 (90%) indicated that they did not incorporate the WCO UCR in their single window systems.

See figure 14



#### Information exchange with trade partners

Some Customs administrations have started to exchange trade data/information with other trade partners via single window systems. The majority of Customs administrations have not yet started however.

Of Customs administrations responding:

- 22 (39%) indicated that they have started exchanging trade data/information;
- 34 (61%) indicated that they have not started exchanging trade data/information.

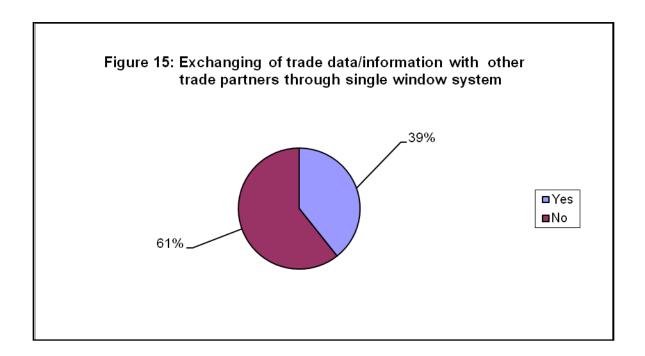
#### See figure 15

Some Custom administrations provided the names of trade partners engaging in the exchanging of trade data/information with Customs administrations using a single window system.

Those trade partners' main responsibilities include:

 Trade & industry; foreign affairs and international trade; export, transportation (railways, port); agriculture; natural resource; environmental protection; food inspection; statistics; and commercial banking.

It was also noted that only a few Customs administrations have started or planned to exchange trade/information with *other Customs administrations*.



Where information exchange takes place, a varying kind of data/information was exchanged between Customs administrations and trade partners. This includes:

 Import permits; export permits; cargo clearance; advance cargo information; sea/air/land cargo manifest; railway manifest; external trade statistics; export details; foreign trade licenses; customs declarations; AEO related information; certificate of solid waste and toxic chemical; certificate of pesticide; certificate of origin; agriculture licenses; phytosanitary sanitary certificates; payment confirmation; and payment data of duties and taxes.

With respect to the question of what kind of mutual authentication or Bridge Certification Authority PKI mechanism are used to trust bilateral identification in the exchange of single window data, some responding Customs administrations provided details as below:

Password system; a direct link between the institutions; user authorization level 3;
 PKI cross certification authority; capsuled MQ between two defined database servers;
 identification and authentication through user name and password over a dedicated line service; electronic signature; SSL secured connectivity; and Korea-VeriSign.

It was observed that XML was the most frequently adopted method in the exchange of data/information between different IT systems of Customs administrations and other government agencies. The widespread use of XML seems in part attributable to the Internet boom.

Of Customs administrations that have started exchanging data/information through single window systems:

- Six (17%) indicated using EDI (including UN/EDIFACT);
- 17 (47%) indicated using XML;
- Nine (25%) indicated harmonized data elements between the two;
- Four (11%) indicated other.<sup>19</sup>

#### See figure 16

Figure 16: Methods of data/information exchange through single window

100%

47%

25%

Using EDI

Using XML

Harmonized data elements between the two

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<sup>&</sup>lt;sup>19</sup> Some Customs administrations selected more than one choice. Other includes: agreed message formats via MQ, and two different PKIs.

#### 4. Single Window Security Governance

Security governance, although a relatively new concept, has grown and evolved significantly in recent years. This term may be interpreted as a systematic approach aimed to safeguard information systems from internal and external threats. As new technologies are introduced, security frameworks for controlling the implementation of an IT system present a challenge to system operators well as its users. Moreover, security governance gains much importance in the implementation of a single window as it is designed to inter-connect different automated systems of border agencies, economic operators and other related parties.

The last section of the survey is designed to explore how Customs administrations cope with challenges in protecting single window systems from unlawful or unauthorized access as well as in managing identity checking and authorization process.

#### Key findings are:

- 15. Significant efforts need to be made for the adoption of security standards such as ISO 28000 or BS 7799 in the implementation of single window systems as only a few Customs administrations adopted the standard.
- 16. Both PIN (and/or password system) and Public Key Infrastructure (PKI) appear to be the most frequently adopted type of authentication tool for accessing single window system.
  - Non-PKI digital certification, authentication token, biometrics, smartcard are also in use.
- 17. Some Customs administrations have adopted a common identity management system for partnering agencies access to single window system.
- 18. Some Customs administrations implement "Single Sign-on" aimed to assist partnering agencies in their authentication and access to different applications on a single window system.
- 19. While information exchange takes place between Customs administrations and other trade partners, Customs administrations generally do not allow other agencies' access to all raw data in their single window systems.

#### Security Standards Implementation Framework

Substantial efforts need to be made for the implementation of security standards such as ISO 28000 or BS 7799 in single window systems.

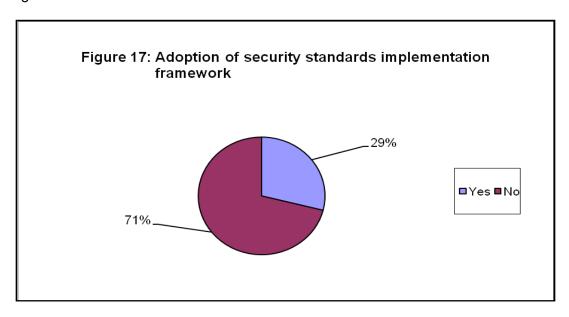
Of Customs administrations responding:

- 11 (29%) indicated that they have a security standard implementation framework;
- 27 (71%) indicated that they did not have a security standard implementation framework.

Types of security standard implementation framework currently adopted by responding Customs administration include:

 AFIP standard security framework; BS7799, Information Security Manual and Gatekeeper; ISO 27001; and ISO/IEC17799:2000.

See figure 17

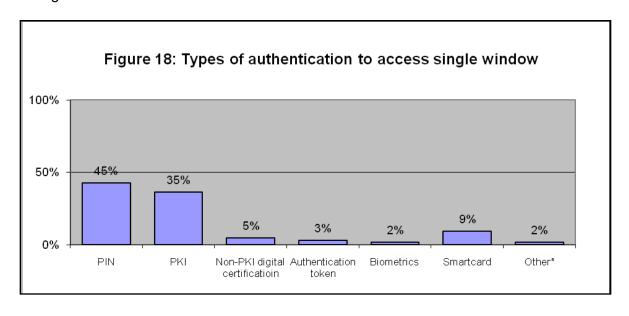


#### Authentication tools for accessing single window

Both PIN (and/or password system) and Public Key Infrastructure (PKI) were the most frequently adopted type of authentication tool for accessing single window system.

Among Customs administrations responding, the following types of authentication tools which clients use in order to access single windows were noted:

- PIN and/or Password system (29, 45%);
- Public Key Infrastructure (PKI) (23, 35%);
- Non-PKI digital certification (three, 5%);
- Authentication tokens (two, 3%);
- Biometrics (one, 2%);
- Smartcard (six, 9%);
- Other (two, 2%).



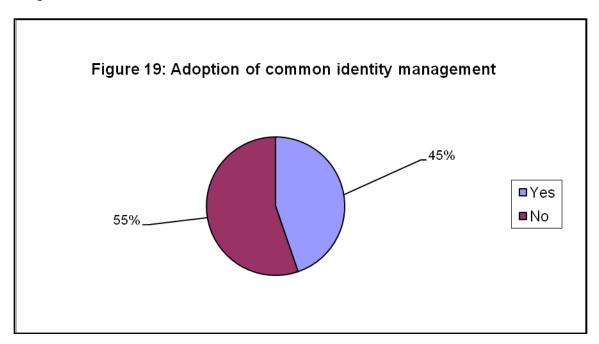
#### Common identity management system

It appears that some Customs administrations have adopted common identity management system for partnering government agencies' access to single window system.

Of Customs administrations responding:

- 17 Customs administrations (45%) indicated that they use common identity management system;
- 21 Customs administrations (55%) indicated that they do not use common identity management system.

See figure 19



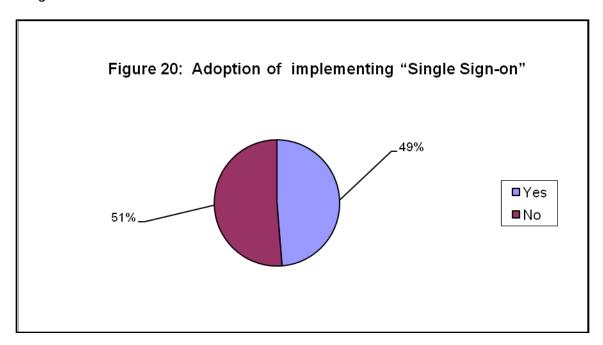
#### Implementation of Single Sign-on

It is noted that about half of Customs administrations adopted to implement "Single Sign-on" which assists partnering agencies in their authentication and access to different applications on a single window system.

Of Customs administrations responding:

- 19 (49%) indicated that they implemented "Single Sign-on";
- 20 (51%) indicated that they did not implement "Single Sign-on".

#### See figure 20



#### Other agency's access to data in single window

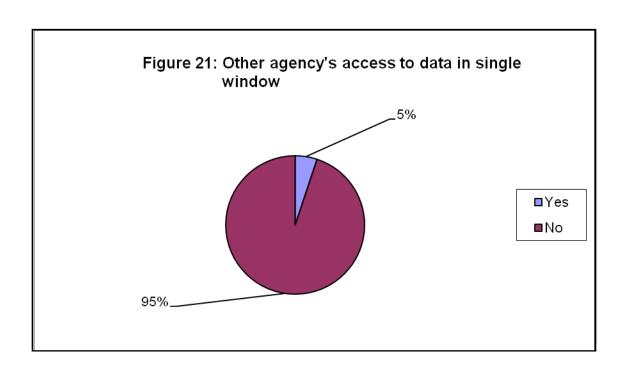
There was a strong indication that Customs administrations generally do not allow other agencies to access to all raw data in their single window systems.

Of Customs administrations responding:

- Two (5%) Customs administrations indicated that they allow other agencies' access;
- 37 (95%) Customs administrations indicated that they do not allow other agencies' access.

It should be noted that this outcome does not mean that information exchange hardly takes place between Customs administrations and other related entities. As was observed with figure 15, a range of data/information is being exchanged between Customs administrations and trade partners using single window systems.

See figure 21



#### III. Conclusion

International trade places continuing pressure on Customs administrations to exploit information and communication technologies (ICT) to further streamline trade flows. In particular, there is momentum to develop ICT tools that promote trade facilitation, such as single window systems. In an effort to promote the implementation of single window, the WCO, for the first time, conducted an aggregated study of how WCO members worldwide engage in planning and implementation of single window systems in dealing with cross border transactions. With active participation from all six WCO regions as well as cooperation from the APEC, this study presents many notable observations.

One of the core findings is that Customs administrations worldwide generally operate automated cargo clearance systems, enabling economic operators' electronic reporting and lodgment of Customs declarations. Most Customs administrations, however, are running a non-single window system. The majority of single window systems appear to have become operational after 2000, and the number keeps rising as many new systems are under development. The unprecedented advancement of information and communication technology (ICT) in the last decade or so is certainly behind this trend. The survey also confirmed that Customs administrations generally take the initiative in providing single window service either alone or in collaboration with other government agencies, most notably, using government finance.

Information exchange between stakeholders depends on wholesome security governance as well as data interoperability. The survey confirms that many Customs administrations harmonized single window data attuned to the international standards such as the WCO Data Model, UNTDED and UN/EDIFACT. The survey also suggests that Customs administrations need to attach more importance to single window security governance.

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