BUILDING A SINGLE WINDOW ENVIRONMENT
The business case answers the most important questions concerning the Single Window: What kind of Single Window will be built? Why will it be built? (In other words, who will benefit from it, by when and by how much?) How will it be built and who will build it? How much will it cost and who will pay for it? And how and by when will we know if it provides any benefit at all?
Contents

1. Introduction ................................................................................................................................. 3
   1.1 Relationship to other Parts of the Compendium ................................................................. 3
   1.2 How is this Part Organized? ................................................................................................. 3

2. The Need for a Business Case .................................................................................................. 5
   2.1 What is a Business Case? .................................................................................................... 5
   2.2 Collaboration is Vital ........................................................................................................... 6

3. The Strategic Business Case .................................................................................................... 7
   3.1 Economic Rationale and Strategic Value ............................................................................. 7
   3.2 Outcome of the Strategic Business Case ............................................................................ 9

4. The Detailed Business Case ..................................................................................................... 10
   4.1 Locating the Right Templates and Frameworks ................................................................. 12
   4.2 Establishing the Stakeholder Perspective on Value ......................................................... 12
   4.3 Benefits Profiling ................................................................................................................. 14
   4.4 Cost-benefit Analysis and Project Appraisal ...................................................................... 14
   4.5 Concluding the Detailed Business Case ............................................................................ 15

5. Implementation, Monitoring and Feedback ............................................................................ 16
   5.1 Firming up the Project Plan ................................................................................................. 16
   5.2 Tracking Project Risks ........................................................................................................ 17
   5.3 Accounting of Costs and Benefits .................................................................................... 18

6. Conclusion ................................................................................................................................ 18
1. Introduction

This Part explains the process involved in putting together the business case for a Single Window solution. Before undertaking any project, it is necessary to write the reasons for doing so. A ‘Single Window’ might sound attractive to the policy leadership in any country. To unpack the words systematically, and to put together concrete project proposals, is a technical challenge and a management process.

This Part explains how governments can organize information and documentation to provide the strategic and financial reasoning behind projects to implement the Single Window approach to regulating international trade. Executives from Customs and other cross-border regulatory agencies responsible for strategic management, programme management, information technology projects and collaborative inter-agency initiatives will benefit from the information provided here. Financial controllers and project evaluation and review teams will also be able to use templates and other guidance on what to expect at each stage of business case development.

1.1 Relationship to other Parts of the Compendium

This Part underpins all the other Parts. It is the business case that serves as the basis for pursuing a project. A sound business case defines what aspects of import, export and transit procedures should be part of the Single Window project, and to what end. It serves to scope the Single Window. The scoping decides all further activities, including functional assessment (Part III), innovation in business processes (Part IV), data harmonization (Part V), dematerialization and paperless processing (Part VI), and architecture (Part VII). Furthermore, business case development may lead to a decision on choosing a managerial and financial path characterized by a public-private partnership (Part II).

1.2 How is this Part Organized?

Section 2 introduces the concept of business case development and relates it to the task of project formulation for building a Single Window environment. It explains how a business case differs from a project brief or a project plan. A business case answers the question as to why a project should be conducted, and the consequences of not doing so. A business case is also about understanding and documenting the business benefits of the project. Questions on whether the same benefits can be obtained through alternative means will have to be answered thoroughly in the business case. Lastly, the business case addresses the issue of who is paying for the project and why.

Section 3 describes the strategic business case and its role in obtaining political commitment to the Single Window project. The objective of the strategic business case is to produce the political mandate for the initiative. This mandate provides several high-level decisions concerning the governance model, the executive authority structure, and the broad scope. The mandate also
provides clear support for the overall operational concept of business. As well as specifying the timeframe, the mandate contains assurances regarding finances.

Section 4 provides detailed information, including standard templates/a standard framework, for preparing the detailed business case for the selected projects to establish Single Window services. The Section includes information on documenting estimated business benefits, cost-benefit analysis and project selection.

Section 5, the final Section before the Conclusion, discusses implementation, monitoring and feedback. All projects are required to be reviewed against the final business case. Part of the review includes documenting the extent to which the project has been able to establish business benefits.

This Part is not intended to provide information on the basics of project management or procurement practices. Only the key aspects of business case development have been included. In preparing this document, the WCO Secretariat referred primarily to the following documentation:

- The WCO Standard Business Case Template
- Business Case Guidance (Capacity Building Guidance, Communities and Local Government, HM Government, UK)
- A model/method for cost-benefit analysis within Customs administrations (WCO Capacity Building Compendium).

This Part summarizes the process of developing the business case and the documentation that is produced at each stage.

The diagram below provides a schematic of the recommended process.

![Diagram of business case process](image)

Figure 1: The selection and formulation of appropriate projects.
2. The Need for a Business Case

The proposal for a Single Window project will involve long-term organizational commitment, not just in terms of human and financial resources, but also in terms of leadership and executive support. To this end, there should be a clear projection of the business needs, as understood collectively by the community of stakeholders.

A business case looks at any financial investment from the perspective of the investment return and the derivation of business benefits. Even a simple proposal for hardware procurement or a software upgrade can be presented as a technical case for a much needed improvement in system performance. The same proposal can also be fashioned as a document which states that the investment would lead to better operational performance and improved service through lower processing times and reduced maintenance costs.

The way a problem is presented determines how it will ultimately be addressed. Any proposed investment in assets and resources has a better chance of being accepted if the appropriate strategic perspective is understood.

It is, however, not always easy to project all investment in terms of business benefits alone. Some of these benefits are quantifiable (e.g. improvements in performance and financial savings). Other benefits are qualitative and intangible (e.g. those linked to customer satisfaction). For a large-scale effort like the development of a Single Window, the process of capturing the business benefits, and a clear justification for the project, is a very challenging exercise.

2.1 What is a Business Case?

A business case is a written document containing reasoned arguments for initiating a project. It is often a formally structured document, reflecting the organization’s needs for financial accountability. While a business case should include financial justification for a project, that is not its only purpose. The business case is the document where all relevant facts concerning the project are formally arranged to present the complete picture. That picture includes the definition of the project, services to be covered in its scope, costs and benefits, risks and returns, outlays and outcomes, and schedules and timelines, etc. The picture also includes information about the key project participants, and their roles and responsibilities.

Projects to develop a Single Window involve substantial investment, long gestation periods and large gaps of time between financial outlays and business outcomes. It is therefore essential to view the business case as a management process. The process lasts throughout the life-cycle of the project and broadly includes activities such as initial development, refinement through consultation, executive approval for the project concept (and subsequently the preferred project), implementation of the project, and project review. The diagram below explains the difference between a project brief, a project plan, and a business case. Naturally, the business case should be established before a project can come into being, making it the most important strategic document in a Single Window initiative.
2.2 Collaboration is Vital

As mentioned above, the development of a business case is a management process, in which executive management has the lead role. There are, however, several different parts of an organization that are involved in this vitally important process. In addition to the strategic and policy-making divisions, the organizational units that are normally responsible for formulating information technology (IT) initiatives play an important role. The business case involves support from specialist individuals who are well versed in using tools and techniques to support the decision-making process (e.g. tools and techniques for computing returns on investment, cash flow projections, and cost-benefit analysis). Skills and competencies not just of Customs staff, but also of those in other participating government agencies, should be engaged in a collaborative effort. Joint working of this kind helps the business case achieve broad support and acceptance.

Each organization has its own way of running projects and of holding people accountable for project outcomes. The recent WCO Surveys have suggested that the majority of all Single Window projects are funded by governments. If governments play the lead role in providing support to the Single Window, the investment process is normally driven by rules on public accountability for government expenditure. But how those rules translate into practice is largely driven by the norms and values of the participating organizational units. These norms and values will also determine the quality of the business case that is put together for the Single Window initiatives and projects.

Very often, IT projects in government are approved as a leap of faith. E-governance initiatives generally enjoy a high level of political support as they tend to be treated as the panacea for governance problems. The Single Window concept has an intuitive appeal, and the political leadership are likely to agree with the overall principle, without the need for much convincing. The Single Window is a simple concept with a grand vision. That vision promises to lead cross-border regulatory agencies (CBRAs) to transformative changes in the way that business and government
interact in international trade. The actual realization of the vision may be quite a challenge. While the project will involve substantial investment in technology, there will also be significant breakthrough efforts required in delivering policy and service outcomes. The business case brings a touch of reality to the vision by documenting activities, changes to business and investment schedules and, most importantly, the risks that stakeholders will face in deriving benefits from the initiative. The management process that governs business case development plays this part.

3. The Strategic Business Case

The objective of the strategic business case is to produce a political mandate for the project, leading to high-level decisions concerning the governance model, the executive authority structure, and the broad scope. The mandate will also provide clear support for the overall operational concept of business. As well as specifying the timeframe, the mandate will contain assurances regarding finances.

The strategic business case must explain how the Single Window concept ‘fits’ with the strategic programme for Customs modernization. For example, how does the Single Window support the key Customs initiatives of intelligence-based risk management, post-audit control, client education, authorized economic operators, border management strategies, and automation of services? Similarly, the alignment of the Single Window approach with the strategic imperatives of modernization for other participating CBRAs needs to be documented.

Likewise, the strategic business case will need to make clear to partner CBRAs how the Single Window links up with government-wide programmes to improve trade facilitation and ‘de-clog’ and accelerate transport logistics. It will also need to explain how the Single Window fits with national programmes on electronic governance and public service reform.

Parts III and IV of Volume 1 discussed the question of strategic alignment between the Single Window and other major programmes. In this stage of preparing the business case, there is an opportunity to pinpoint the issues to be covered by the Single Window project, and to place them in the broader political and strategic context.

The audience for the strategic business case is initially senior management, and ultimately the political executive. These tiers of decision-making require high-level information, along with alternatives on the way forward. The strategic business case should include the economic rationale for pursuing the Single Window approach, and address the overall gains to the economy through growth in international trade; improved competitiveness by reducing trade transaction costs; and the government’s commitment to lowering total costs of trading, including the costs of transportation, logistics services, financing and regulation.

3.1 Economic Rationale and Strategic Value

The audience for the strategic business case is a high-level one. It is interested in the broad issues, and likes proposals to be presented along with alternatives on the way forward. There is a need to provide the economic rationale for pursuing the Single Window approach. The following list of sources can help make that case.
The literature on international trade is replete with theoretical and empirical evidence that welfare benefits accrue to the economy through growth in international trade. Factors hindering or limiting trade must receive priority attention from the political executive.

Measures on trade facilitation have a lasting value in promoting international trade. In the longer term, the benefits of these measures greatly exceed the perceived costs of their implementation (Duval, 2006).

Improving trade competitiveness by reducing transaction costs in trading (United Nations, 2006). Transaction costs can vary between 2 to 15 per cent of the total value of the transaction. Studies have tried to document and quantify actual trade transaction costs (Walkenhorst and Yasui, 2004).

Governments around the world have committed themselves to lowering total costs of trading – including the costs of transportation, logistics services, financing and regulation. For example, the ASEAN nations have mandated national economies to implement the Single Window to reduce transaction costs (ASEAN Secretariat, 2009).

The WCO Single Window repository provides information about numerous instances of implementation of the Single Window around the world. Global trends in Single Window implementation provide indirect evidence that it is useful.

The strategic business case should explain how the Single Window approach lowers all these costs. Intuitively, reduced costs are a function of the following factors:

i. The Single Window promotes ease of submitting information to the government.
ii. The cost of one-time submission is less than for multiple submissions.
iii. Lower document preparation costs.
iv. Reduced interaction with different government agencies – combined response on release, co-ordinated inspection, etc.
v. The overall reduction in time, leading to reduced costs in carrying inventory.

Demonstrable impact on human resources: inspectors can focus on substantive aspects of regulation, while efficiencies created by the Single Window reduce the compliance verification effort linked to cross-checking routine documentation.

Improved Clearance Times

Sometimes, it is useful to provide upfront information about possible benefits from implementing a Single Window.

Take the case of Rwanda: The authorities there have reported that clearance times have fallen sharply, from 11 days to one day 10 hours, saving businesses $6.8 million in 2013 alone.

Similarly, under a scheme implemented in the East African Community, the Uganda Revenue Authority has implemented the Electronic Cargo Tracking and Customs Management System, helping reduce transit and clearance times to a quarter of the time taken prior to implementation. Traders save approximately $56 million annually because of these changes.

The strategic business case should also clearly explain how the Single Window approach lowers all these costs. The Single Window project can demonstrably lead to simplification of the interface between trade and government (for example, the time spent by inspectors on verification). Besides practical information, the strategic business case should also contain precise empirical information which is based on research. Examples are:

✓ General research describing the positive impact of trade facilitation measures on growth in trade.
✓ ‘Firm-level’ (or microeconomic) evidence confirming improved competitiveness of domestic industry due to effectiveness in handling trade information and documentation.
✓ The impact of Single Window implementation as documented around the world in case stories.
✓ The strategic value of the project can be established by projecting different scenarios, covering the risks associated with alternative courses of action – including the decision which involves taking no action. Potential risks of continuing with the status quo should be fairly presented, along with risks associated with alternative courses of action.

3.2 Outcome of the Strategic Business Case

A substantial part of the strategic business case should be devoted to a clear statement of the outcome sought. This outcome is the political mandate to develop a Single Window environment. Part V of Volume 1 briefly summarizes the contents of the political mandate, which should broadly cover the following:

<table>
<thead>
<tr>
<th>High-Level Structure of the Political Mandate</th>
</tr>
</thead>
<tbody>
<tr>
<td>The details contained in the high-level political mandate for a Single Window project may vary from country to country. The following main points may, however, be considered:</td>
</tr>
</tbody>
</table>

✓ Statement of objective and purposes
✓ Definition of terms used
✓ Activities/services covered by the Single Window concept
✓ Establishment of the organization acting as lead agency, and the identification of partner organizations/CBRAs:
  o Legal definition of the entity acting as lead agency
  o Financial dispensation for the lead agency and operating philosophy
  o Lead agency organizational and consultative structures
✓ Powers vested in each of the identified organizations, including the lead agency, to:
  o Approve projects
  o Recommend changes to legislation
  o Set service standards
  o Adopt changes to business processes
  o Adopt interoperability standards
  o Evaluate and review project implementation
  o Handle disputes
✓ Date of applicability
✓ Schedules for the implementation of the Single Window initiative
4. The Detailed Business Case

The strategic business case will have established the strategic intent of the government; the political mandate resulting from approval of the strategic business case will have established the importance of the initiative. In general, the political mandate will ‘kick-start’ the various activities leading to the ‘establishment phase’. Upon conclusion of these activities, the country concerned should be able to answer the following in the affirmative:

a. Objectives, scope and coverage of services of the Single Window broadly defined? (Yes/No)
b. Overall strategy for service delivery defined, and high-level strategy defined? (Yes/No)
c. Lead agency nominated and formally notified? (Yes/No)
d. Organizational structure with leadership positions, roles/responsibilities created? (Yes/No)
e. Financial dispensation – indicative budgetary allocation notified? (Yes/No)
f. Consultative structures notified and group members nominated? (Yes/No)
g. Decision-making authority defined and commonly understood by all participants? (Yes/No)

When the initiative reaches this stage, full agreement on the above details will have already been reached. Specifically, the organizational structure, the financing strategy, the operating model (including arrangements for public-private partnership) the service delivery strategy and priorities, and the consultative structures will be known. This opens the way for the relevant organizations to become ‘live’ and to begin consultations on the preferred project(s), including discussion on the detailed business case.
Figure 3: Process flow for creating a detailed business case, with a document produced at each milestone.

The detailed business case for the chosen project covers project objectives, project components, the procurement plan, project organization, investment schedules, and cost-benefit analysis. Baseline information on current processing costs and times taken for cargo release and border processing should be established to help define benefits in concrete terms. The WCO documentation referred to in this Section provides information that can help with these tasks, including techniques for the appraisal of options.

This is even more necessary because computerization projects often meet with scepticism from senior executives. E-governance projects have a long history of failure, of over-promising and of under-delivering. Carrying out a doability study for Single Window projects is therefore also part of this stage. The development of a detailed business case for the chosen project will involve the essential steps below.
4.1 Locating the Right Templates and Frameworks

Governments have their own templates and formats for writing detailed business cases. These templates are often prescribed to maintain financial accountability and investment governance. The reader is advised to obtain national templates as advised by the government concerned.

4.2 Establishing the Stakeholder Perspective on Value

The business case should include a summary of the documented studies touched upon in preceding paragraphs. These studies (presumably carried out in other contexts) should, however, be supplemented with information at a more practical level. In particular, a statement of benefits endorsed by national stakeholders would be of immense value in bolstering the business case. The statement could be prepared by:

(i) Launching a joint industry-government mission or taskforce to carry out analytical studies on cargo-processing bottlenecks and the various regulatory touch-points along the supply chain. The taskforce could put forward recommendations on the features of a Single Window solution that would give maximum benefit to trade and to regulatory authorities.

(ii) Alternatively, carrying out an industry survey to ascertain the industry rating of perceived benefits. The survey could be supplemented with longitudinal field studies that describe the typical ‘as-is’ picture for cargo clearance, and the difference that a Single Window approach could make. An example of typical questions which could form part of a survey on Single Window benefits can be found in the list below.

It is important that the communication of benefits is clear, straightforward and easily understood.
For each of the points mentioned below, the respondents are asked to rate the benefit as **Significant, Moderate, Insignificant or Non-existent**:

**Combined declaration to different agencies (e.g. Customs, agriculture, and food and drug administration):**

1. Single Window helps reduce the burden of procedures and paperwork.
2. Single, integrated declaration implies one-time entry of data.
3. Single form implies co-ordinated changes to interface specifications by government agencies. This reduces the cost of re-orienting the trader’s software applications for creating entries. If governments carry out uncoordinated changes to the interface specifications, there will be extensive customization costs.
4. Redesigned applications enable submission of minimum data.
5. Redesigned advance data allows logistics operators to carry out logistics planning of: (1) on-arrival operations in the case of imports, and (2) pre-loading operations in the case of exports.
6. Trade data sets that are standardized for government-wide use would support more accurate and more detailed trade statistics for trade policy across different business sectors.
7. Trade data sets that are standardized for government-wide use would provide better supply chain process and performance statistics. This leads to a more optimized performance by logistics players.
8. Standardized government-wide response messages could help recipients in the supply chain better plan cargo clearance, with clear savings in cost and time. (For example, terminal operators, warehouse operators and road hauliers would not have to process multiple messages from different government agencies.)
9. The system will enable different permit-issuing agencies to receive electronic permit applications in a standardized format, and enable electronic approval of permits via the Single Window.

**Benefits of SICEX: The Single Window in Chile**

The acronym SICEX stands for ‘Integrated System of Foreign Trade’. This is a single Electronic Window (SEW) which facilitates the processing by the Chilean Customs Service and other OGAs of export, import and transit operations, allowing users to enter requested information via a single website, at any time and from any place.

SICEX facilitates foreign trade by means of a world-class system, designed in accordance with best practice and international standards. In the future, it will even allow the exchange of information with other countries.

SICEX seeks to reduce time and cost, expediting the foreign trade processes which are carried out electronically, and eliminating duplication of data entry through a single data entry point. The data is shared among the different OGAs that participate in the operation.

The result is that administrative efficiency and transparent management of foreign trade operations are achieved through a single assistance platform which includes monitoring, alerts and traceability of the operations.

**Source:** Chile Customs

See [https://www.sicexchile.cl/portal/en/web/sicex/preguntas-frecuentes;jsessionid=1C47C01DAEEE4F956994C7FAF865F9AA.portal1](https://www.sicexchile.cl/portal/en/web/sicex/preguntas-frecuentes;jsessionid=1C47C01DAEEE4F956994C7FAF865F9AA.portal1)
10. A mention of the approval reference in the common declaration at the time of lodging the entry would suffice.
11. Improves market access through internationally acceptable e-permitting.
12. The system permits payment of fees for all border services; the consignment clearance fee is consolidated along with all duties, taxes and terminal fees; and reports are available online as to the composition of, and justification for, the charges.
13. Combined response on processing status of licence/permit applications or transaction clearance status.
14. The Single Window environment will enable digitization of supporting documents, such as certificates and permits.
15. It helps traders to manage their respective registration details, including agency authorization for different government agencies.
16. Co-ordination of inspections between agencies helps reduce spending by traders, leading to better compliance outcomes.
17. Co-ordination in the scheduling of inspection arrangements makes physical attendance by trader agents easier.
18. Shared infrastructure with jointly operated IT systems, along with redeveloped border management model, lower costs to both government and trade.
19. Improves targeting and risk assessment by providing more data and quality data that is pooled from different agencies.
20. Will improve the provision of information and guidance to Customs and MAF officers, supporting quality and consistency of decision-making and advice to clients.

4.3 Benefits Profiling

The projected business value and the benefits profile are part of the strategic business case, but it has to be framed in general economic terms for a high-level audience. The business case for the chosen project is required to take the benefits profile to a more practical level.

Typically, IT projects in government tend not to define project benefits rigorously and realistically. The typical business case provides a simple list of benefits. What often does not happen is the mapping of benefits against project deliverables. Such mapping should include a matrix (also called the ‘ADRC’ matrix) which describes assumptions, dependencies, risks and constraints against each benefit. A clear sequential structure of benefits realization needs to be developed. Responsibilities have to be assigned within the project structure for the realization of agreed benefits from the project.

The UK Government has established a methodology for profiling and managing benefits. A key aspect of preparing and projecting project benefits is the creation of a benefits profile. The benefits profile should contain the list of benefits, detailed descriptions, the ADRC matrix, a schedule for the realization of the benefit, and indicators or measures of the benefit, along with baseline measures. Business case development and realization of benefits go hand in hand. Non-realization of benefits could prompt a review of the business case.

4.4 Cost-benefit Analysis and Project Appraisal
Cost-benefit analysis is a crucial aspect of business case development. The WCO has developed a specific model/method for cost-benefit analysis within Customs administrations. It provides a structured approach to cost-benefit analysis and a way in which ‘Customs benefits’ can be determined.

Several Parts of Volume 1 describe the business value of a Single Window environment in terms of preservation of the value of goods by reducing transaction costs and times. It is important that the project or programme management team have an agreed understanding of the procedure for measuring baseline business benefits.

Examples of measurable baseline for benefits
1. Baseline results of Time Release Study (based on the WCO TRS methodology).
2. Each component of time is a measurable element indicating baseline performance.
3. Baseline results of UN/ESCAP Time Cost & Distance method.
4. Number of documents required for completing the average transaction.
5. Average person-hours of data input for an import, export and transit transaction.
6. Number of independent system interfaces involved in a single transaction.
7. Number of data elements required to be re-keyed – for import, export and transit declarations.
8. Average brokerage and agency charges per transaction (costs other than those for transportation, storage and handling services).

Cost-benefit analysis can be carried out using a variety of methods. Option appraisals would normally lead to the most appropriate solution being sent for executive approval. At the stage of executive approval, it is important to have the following: (i) submission of the business case in the appropriate template (often mandated by government); (ii) all supporting documents; and (iii) a clear statement of resource implications.

4.5 Concluding the Detailed Business Case

The detailed business case for the chosen project proposal should include all supporting documents. Clarification sought by the participants of the decision-making body may be provided as appropriate. It is recommended that separate notes be provided:

a. Outlining the role of each agency in the decision-making process;
b. Indicating the implications of the project/decisions for each impacted stakeholder;
c. Outlining consequential actions and/or decisions as a result of the approval. In particular, the implications for:
   • Financial resources (budget allocations, delegation of financial authority, physical assets);
   • Human resources – especially concerning restructuring, redeployment, and redesignation of regulatory authority.

The specific resource implications for these two areas should be understood and agreed by the decision-making authorities. This implies that the body making decisions on the business case has the necessary authority to do so.

Lastly, the decisions and relevant details should be communicated to all participants and stakeholders.
5. Implementation, Monitoring and Feedback

Work on the business case does not end with financial approval. The documents relating to the business case remain relevant to the subsequent stages of project implementation (e.g. resourcing, procurement, scheduling and roll-out). More importantly, the business case is useful for identifying and tracking costs, risks and benefits. This is vital during project implementation.

5.1 Firming up the Project Plan

Activities being undertaken by the project team will follow the overall project implementation plan. An important component of this stage is the procurement strategy. Government policies on public procurement will significantly impact activities of the Single Window project. These policies could be qualified and more sharply defined during the earlier phases of business case development. For instance, empowered structures may be delegated authority to make procurement decisions about Single Window projects.

Procurement strategies vary from country to country. They will also depend on the agreed structural arrangements and financial models. The involvement of the private sector in the management structures makes their role in procurement clearer. Some operating models involving the collection of user fees provide built-in financial benefits as part of operations.

Contract management, procurement management, and vendor performance management are vital for the business case. There is an argument for having an independent unit to deal with contract issues, which are the most complex and challenging of all project issues. Risks arising out of contract provisions pose a serious threat to the achievement of benefits described in the business case. Vendors spend substantial amounts on legal services relating to contractual issues. Single Window projects involve long gestation periods, extensive inter-agency integration, and complex and evolving requirements. The key decisions to be taken at this stage include procurement decisions on the strategy for software development.

The following box provides information concerning the main basis for software project procurement.
At the project implementation stage, when the detailed project plan must formally be put into operation, project performance can be held up as a mirror to the detailed business case. At the outset, the detailed project plan needs to be signed off by all participants, especially the vendors, leading to a ‘final version’ of the business case. Since the project plan contains the complete work breakdown structure, detailed roles and responsibilities, project milestones, project risks and project resources, it is useful to compare actual ‘points in time’ results with initial projections. Specialized, computer-based project management tools can also help the project team capture and manage all the project information and shape it into a coherent document.

5.2 Tracking Project Risks

Inadequate attention to project risks is the biggest danger to achieving the benefits described in the final business case. Typically, at the time of approval of the strategic business case, high-level decisions are taken about: (i) lead agency responsibilities; (ii) assignment of tasks between agencies; (iii) restructuring of regulatory organizations; and (iv) the business process. These decisions have a far-reaching impact on the realization of business benefits. In general, senior management of the lead agency need to pay attention to the monitoring of project risks and to mitigation efforts. These efforts should be in line with projected schedules. Likewise, due attention must also be given to the solution design assurance process, project procurement, project monitoring and project reporting.
5.3 Accounting of Costs and Benefits

Upon reaching different milestones for the delivery of the project, the time comes for the accounting of benefits based on agreed measures. These measures can be used for comparison with the baseline measures and agreed projections.

The review should take into account qualitative and quantitative measures of outputs. Review reports should also be widely published for comment. The review exercise should also help establish how the documented risks have impacted the project. During project implementation, there could be changes to budgeted projections in terms of time, quality and costs. The projected benefits may be only partially achieved; recorded risks may have impacted project goals and projected business benefits. The review process provides the opportunity to record these changes and to document them against initial projections.

A statement of outcome, describing how the project has performed and impacted service outcomes, is important during the review. The statement should use the performance measures and indicators that impact Single Window service delivery, including efficiency gains for trade and government. Of special significance is progress made on organizational outcomes, such as inter-agency collaboration and collaborative practices.

The final business case is a complete document, providing the entire case story of the project, and incorporating the lessons learned into later business cases.

6. Conclusion

In the context of development of a Single Window environment, managing the business case is the most important responsibility for executive management. That responsibility begins when a decision is reached on adopting the Single Window solution. It continues through to the development of the strategic business case, the business cases for the chosen projects, the process of monitoring implementation, and the derivation of business benefits.

Business case development is a management process involving specialized competencies, skills and organizational roles, and established procedures. To run a business case successfully, there should be appropriate organization, an effective communication system, and a well-defined process.

Senior management in Customs and cross-border regulatory agencies need to persist with the business case until arriving at the final documentation on the benefits received, with the lessons learned documented and communicated to stakeholders.
INTRODUCING PUBLIC PRIVATE PARTNERSHIPS

PART II
VOL 2
Provided that there is a sound commercial basis and complementarity between the public and private sectors, Single Window projects offer an excellent opportunity to transform services through completion, efficiency, and economy. To make PPP a success, there should be a fair distribution of risks and returns between partners.
Contents

1.1 What is a PPP in the Single Window Context? ................................................................. 3
1.2 Different Types of PPP Model.......................................................................................... 3
2. Defining Single Window Services....................................................................................... 5
3. Understanding the Costs ..................................................................................................... 6
4. Appreciating and Allocating Risks ................................................................................... 6
5. Revenue Models and Incentive Structure ....................................................................... 8
5.1 PPP Viability and Usage Fees......................................................................................... 9
6. The Single Window Operator as a Special Purpose Vehicle ........................................... 10
Annex: Examples of Public-Private Partnerships in the Single Window ....................... 13
   I. Singapore: A PPP Success Story .................................................................................... 12
   II. NACCS – Nippon Automated Cargo Clearance System (Japan) .............................. 13
   III. Mauritius Network Services Ltd (Mauritius)............................................................ 14
1. The Public-Private Partnership Option

As a measure to facilitate trade, the Single Window promises to be a ‘one-stop’ service for businesses interacting with government agencies in the context of formalities to clear goods and means of transport at the border. Single Window operations can also cover commercial and logistics procedures associated with service providers that are present at border crossings, ports, airports and dry ports. In addition, the Single Window has the potential to usher in a paperless environment, replacing archaic paper-based processes with electronic documents and online, real-time exchange of structured data. It offers governments efficiency in implementing border procedures, and effectiveness in applying regulatory controls.

The Single Window is a win-win proposition, with savings and ‘customer value’ accruing to all stakeholders. However, it is not easy to implement and can be very costly to develop and operate. On the one hand, there are risks associated with implementing any large-scale ICT projects; on the other, there are challenges associated with bringing all participating government agencies on board to align all their regulatory procedures into a typical process flow. Public-private partnerships (PPPs) have been used successfully in implementing Single Window solutions in different regions of the world and in various types of economies. Is there a right way and a wrong way to implement a Single Window through the PPP route? What are the most important points when considering a PPP option?

1.1 What is a PPP in the Single Window Context?

A public-private partnership is an arrangement between a public/statutory body and a private sector body, and has the following characteristics:

(1) Public assets and/or public services are provided through investment and/or management undertaken by the private sector body in a contractual arrangement between the public body and the private sector body;
(2) The arrangement is for a specified period;
(3) Operating and financial risks are allocated between the private sector and the public body;
(4) Payment to the private sector partner is linked to delivery and achievement of predetermined performance standards;
(5) Attainment of service levels and performance standards is against publicly defined measures.

The primary goal of a PPP for a Single Window is to be able to harness the expertise and efficiency that private sector bodies can bring to the project. It is easier to align incentives to support the delivery of high-quality services to users.

1.2 Different Types of PPP Model

The involvement of the private sector can take many forms and will influence the financial and operating governance of the Single Window environment. The form of public-private partnership
will determine the extent of government involvement in financing capital and revenue expenditure, and the structuring of the inflow/outflow of funds in the Single Window initiative. The forms of PPP can vary in line with two factors – the increase in the degree of private sector risk, and the level of private sector involvement, especially when it comes to dealing with the operating infrastructure. However, a common underlying theme remains: regulatory authority, and the accountability for regulatory compliance, stay with the government, regardless of the form of PPP.

Figure 1 below illustrates the options for PPP. The italicized items describe the choices available to the government.

The essential forms of PPP are: (i) operations and management contracts; (ii) asset acquisition or leasing deal; (iii) DBFO (Design-Build-Finance-Operate); (iv) BOO (Build-Own-Operate); (v) BOOT (Build-Own-Operate-Transfer); and (vi) joint venture. The reader is referred to the widely available literature in this area.

One of the above forms of PPP will emerge, based on a careful analysis of the following questions:

- Does the private sector take over existing assets involved in the Single Window project, whether through acquisition or lease?
- Will the existing ICT assets that are leased to the private sector be returned at the end of the period of operation of the lease or contract?
- Is the private sector permitted to acquire additional capital assets, or will only government decide on capital investments?
Will the operating expenditure be met through revenue streams by charging user fees, or will
the government fund partially or wholly the operating costs?

In the asset acquisition cycle, will the private sector also be involved from the design stage?

How long will the private sector partner be permitted to operate?

How will the private sector partner be penalized for non-delivery or poor performance?

Will the government and the private sector jointly build and operate the unit where risks and
returns are shared?

Singapore: A PPP Success Story

Singapore is one of the world’s biggest trading hubs. Many people attribute this to its success in
streamlining trade processes. Singapore is one of the earliest and best examples of a Single
Window. Almost three decades ago, it implemented automated systems and procedures. It has
worked tirelessly with systems and procedures to reduce trade costs and process times. In the
TradeNet system, declarations are processed and cleared in as little as 10 minutes. This is
accomplished because over 90% of declarations are machine-processed, without a Customs
officer ever handling them during a ‘live’ clearance process. To a large extent, the agility and
dynamism in Singapore’s system was achieved through its public-private partnership (PPP)
model. The private sector partner was selected through a transparent, open tender process and
tasked with the design, development, operation and maintenance of the Single Window.

Notwithstanding strong internal IT capabilities within government, Singapore Customs opted for
the PPP model because it enabled them to leverage the flexibility and dynamism of the private
sector partner.

The PPP model of implementation extends beyond Customs clearance. Port operation and port
clearance processes are similarly supported through partnerships.

While PPP implementation of the Single Window stands out, one should not lose sight of
Singapore Customs’ overall capacity in terms of governance. To make partnership work,
Singapore involved the private sector in Single Window implementation. The private sector
participated in project activities ranging from the development of functional requirements,
through to process improvements and data standardization. As a result, 20 forms previously
required for international trade were reduced to a single online form.

The PPP has since grown from strength to strength and offers a success story to the rest of the
world.

2. Defining Single Window Services

Government agencies are obligated to provide border services in relation to the clearance of goods,
people and means of transport. Likewise, as ‘public’ assets/facilities, port and airport operators are
obligated to provide ‘public’ services to businesses and citizens. The Single Window is essentially a
collection of services provided on a common platform. Part I of Volume I gives a detailed
classification of services. The Single Window provides regulatory services, such as broker registration or filing of declarations, and ancillary services, such as location of cargo or time of cargo release (where it can provide access to information).

3. Understanding the Costs

Broadly speaking, the costs of developing a Single Window can be divided into fixed costs and operating expenses. Fixed costs include design and development costs, as well as ICT infrastructure costs. Operating expenses are broadly threefold: training, support, and change requests. Support includes helpdesk support (level 1), and technical support for equipment and software (level 2 and level 3). In the early years, more resources will be required on all three counts (support, training and change requests).

The cost of design and development of a Single Window is significant, considering that the Single Window is an ‘enterprise class’ software, involving multiple internal and external dependencies. The real costs of trying to meet requirements are often underestimated. These are due to the time-consuming process of negotiation and agreement between agencies. In enterprise class solutions, it is acceptable to estimate annual operating costs as a percentage (20% to 30%) of fixed costs.

4. Appreciating and Allocating Risks

Risks to a Single Window project necessarily relate to potential financial losses arising from non-delivery and the cost of lost opportunities. Risks can arise at different stages of the project, and varying levels of risk occur with the different types of PPP model. It can be said that the success or failure of a Single Window PPP depends on whether the PPP arrangement has a symmetry and a sense of proportion in sharing risks and costs.
Table 1: Risk allocation by project phase in public-private partnerships which involve the operation of IT systems.

The above table illustrates an ideal distribution of risk in a Single Window PPP. In the first column, where the traditional model of procurement is followed, the entire risk lies with the government. In the PPP model, however, there is a rational allocation of risk, so that proper risk transfer can take place to the private sector partner. This might present a compelling case for moving to a PPP mode of delivery. With sufficient skills in tendering and contract development, it is possible to develop a reasonably good PPP project for the Single Window. However, it is not as straightforward as the table suggests. Not all countries start from a zero base of IT investment. At any given time, there is dead stock of active and passive ICT assets and data assets. Apart from the existing ICT base, the human and technical capital which is engaged with the current systems, the working arrangements, ongoing contracts, partnerships and EDI relationships, etc. weigh heavily in a country’s decision. PPP comes in many forms, and risk allocation also varies according to the model adopted. The principle of risk sharing is that risk is managed by the PPP partner which is in control and is best capable of handling it. Figure 2 below illustrates how the model itself impacts risk.

In Figure 2, “Design and build” indicates a traditional procurement model. A tender is issued, and a vendor chooses to deliver the solution. The rest of the risk remains with the government. If the
vendor also has a stake in operating and maintaining the Single Window, the vendor takes some degree of risk. Further, if the vendor also designs, builds

Figure 2: The risk to the private sector correlates with the business model and the allocation of public and private sector responsibility.

Source: Canadian Council for Public-Private Partnerships

and finances (for a return proportionate to the financial costs and risks), then the risk is allocated to industry to a higher degree. The highest level is reached when complete control is given to the private partner through a concession. A concession involves delivery of assets and an opportunity to invest in capital and operational infrastructure, in exchange for the ability to generate revenue from the operations for a fixed period (with or without sharing a portion of the income with the government). This model has a high level of private sector engagement and freedom of operation, and a high degree of risk.

5. Revenue Models and Incentive Structure

PPPs can be leveraged effectively by aligning government objectives and outcomes with private sector incentives. Care should be taken at the beginning of the PPP project: when inviting tenders, the scope of work and the payment terms should be such as to align government objectives and outcomes with the private sector incentive structure. These terms should be reflected in the contract or concessionaire agreement. Table 2 below provides an example of the alignment between government objectives, expected outcomes, and private sector revenues.
### 5.1 PPP Viability and Usage Fees

#### Whether to Charge for Services?

<table>
<thead>
<tr>
<th>Processing Items/Services</th>
<th>Single Window coverage is must?</th>
<th>Volumes/ Frequency</th>
<th>User Fees?</th>
<th>Certainty of Billing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trader Registration</td>
<td>Yes</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>User Registration</td>
<td>Yes</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Warehouse Registration</td>
<td>No</td>
<td>High</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>AEO Application</td>
<td>No</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Carrier Registration</td>
<td>Yes</td>
<td>Low</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Import Declaration</td>
<td>Yes</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cargo Reports</td>
<td>Yes</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Export Declarations</td>
<td>Yes</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Refund Applications</td>
<td>No</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Drawback</td>
<td>Yes</td>
<td>Medium</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Transit Declarations</td>
<td>No</td>
<td>Medium</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>TIR Carnet Processing</td>
<td>No</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Case Management</td>
<td>Yes</td>
<td>Medium</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Appeals</td>
<td>No</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Adjudications</td>
<td>No</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 3: How the industry partner may examine profitability.
Table 2 outlines how incentives to the private sector can be aligned with government objectives and targeted outcomes. The tender invitation should provide adequate information to the PPP partner to assess revenue risks. The PPP contract should ensure that the project is attractive to prospective bidders, and there should be a balance between private sector risks and rewards. If revenue is risky and based on uncertain milestones or volumes that cannot be determined in advance, the bidding process will be skewed. Table 3 gives an example of how the scope of operations can be presented. Only the government can confirm which processes will be covered by the Single Window, and which will be excluded. Only government policy can determine which services will be free, and which will involve user fees. It should be kept in mind that governments need not require businesses to pay fees in all cases: it may prefer not to charge businesses, but to compensate the private sector partner based on system usage.

Incentive structures can be used to encourage the private sector to carry out the necessary changes to government forms and business processes. To ensure that the PPP partner focuses beyond the revenue-generating modules for import and export transactions, it will be necessary to incentivize: (a) quick implementation of ancillary and support functions; and (b) rapid follow-up in implementing changes to forms. The following table is an example of how this can be achieved.

<table>
<thead>
<tr>
<th>Core Modules</th>
<th>Percentage fees per transaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Transactional Modules</td>
<td></td>
</tr>
<tr>
<td>Import and Export Declarations</td>
<td>50</td>
</tr>
<tr>
<td>Automated Targeting &amp; Selectivity</td>
<td>20</td>
</tr>
<tr>
<td>License Application</td>
<td>10</td>
</tr>
<tr>
<td>Ancillary Modules</td>
<td></td>
</tr>
<tr>
<td>Refund</td>
<td>5</td>
</tr>
<tr>
<td>Drawback</td>
<td>5</td>
</tr>
<tr>
<td>Case Management</td>
<td>5</td>
</tr>
<tr>
<td>Enforcement &amp; Other Modeules</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4: Transaction fees can be imposed for services delivered by the PPP partner.

This example shows that the private sector partner receives only a small percentage of fees if simply the core modules are implemented. The full complement of transaction fees is not made available, and a percentage of transaction fees is withheld, if the ancillary modules are not delivered.

Of course, the framework of incentives and penalties includes other considerations. Incentives should not be withheld if the government fails to meet requirements on time, or issues faulty specifications. There are, therefore, enough incentives available to the private sector partner to ensure that Single Window functionality is complete and up-to-date.

6. The Single Window Operator as a Special Purpose Vehicle

A particular case of public-private partnership (PPP) projects is the creation of a business entity referred to as a ‘special purpose vehicle’ or ‘SPV’.
The SPV provides a framework not only to create a legally ring-fenced structure for delivering services, but also for raising funds and achieving financial closure. The foundational documents establishing the SPV help bind the stakeholders legally into a sound arrangement for providing Single Window facilities and supporting Single Window operations. There are plenty of examples in the area of Single Windows, port community systems and EDI value-added networks (VANs).

<table>
<thead>
<tr>
<th>Name of SPV</th>
<th>Country</th>
<th>Area of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NACCS</td>
<td>Japan</td>
<td>Single Window</td>
</tr>
<tr>
<td>TradeNet (&amp; TradeXchange)</td>
<td>Singapore</td>
<td>Single Window (&amp; VAN)</td>
</tr>
<tr>
<td>Cupia</td>
<td>Korea</td>
<td>Single Window &amp; VAN</td>
</tr>
<tr>
<td>KT NET</td>
<td>Korea</td>
<td>Trade Services &amp; VAN</td>
</tr>
<tr>
<td>KL NET</td>
<td>Korea</td>
<td>Logistics Services &amp; VAN</td>
</tr>
<tr>
<td>GSTN</td>
<td>India</td>
<td>Goods &amp; Services Tax</td>
</tr>
<tr>
<td>GCNET</td>
<td>Ghana</td>
<td>Customs clearance &amp; VAN</td>
</tr>
<tr>
<td>TradeLink</td>
<td>Hong Kong</td>
<td>VAN</td>
</tr>
</tbody>
</table>

Table 5: Examples of special purpose vehicles.
Annex: Examples of Public-Private Partnerships in the Single Window

I. Singapore: A PPP Success Story

Singapore is one of the world’s biggest trading hubs. It has ranked consistently as one of the most competitive economies in the world and has made great efforts to streamline its trade processes. Singapore is one of the earliest examples of successful national Single Window implementation, with TradeNet® first launched in 1989. TradeNet® has undergone several enhancements and evolved since that time. Improvements in system functionalities and procedures have steadily brought down trade documentation costs and processing times. Currently, TradeNet® is able to process within 10 minutes over 90% of declarations submitted. TradeNet® also permits data to be available to the Immigration and Checkpoints Authority, which undertakes inspections, if necessary, when the cargo has arrived in Singapore.

The decision to move towards a public-private partnership (PPP) model was made in 2007 as part of Singapore’s ongoing evaluation and exploration of how to achieve greater efficiency and cost-benefits for the government and taxpayers. One of the decisions taken was the establishment of TradeXchange® – a neutral platform for providing interconnectivity between private sector and regulatory systems. TradeNet® was redeveloped and located within TradeXchange®. Private sector value-added service (VAS) providers were able to come on board TradeXchange® to enrich the ecosystem, and enhanced the seamless exchange of data between services offered within TradeXchange®.

The PPP partner was selected through a transparent, open tender process, with sharing of costs and risks between the government and the PPP partner. The government paid an up-front fee to develop TradeXchange®, as well as an annual fixed recurring fee to maintain TradeXchange®. The PPP partner, on the other hand, paid for the full development, operation and maintenance cost of the new TradeNet®, as well as the variable costs to operate and maintain TradeXchange®. Ownership of the system was vested in the government, while the PPP partner was contracted to build and operate the system for 10 years.

As part of cost recovery, and to establish a viable and sustainable operating model, usage fees for the system were collected by the PPP partner. These are distinct from duties and taxes, which are paid directly to the government.

The decision to choose a PPP model for TradeXchange® and TradeNet® was motivated by the potential for lower fees and improved service and functionality by leveraging the PPP partner’s expertise and know-how.

While its choice of a PPP model for the Single Window stands out, one should not lose sight of Singapore Customs’ overall capacity in terms of governance and project management. To make such a partnership work, the cost, risk sharing and incentives must be carefully structured to achieve a win-win equilibrium. Usage fees should provide a sufficient basis for cost-recovery and
sustainability, but yet remain affordable so that they do not pose a burden to traders. The administration of service standards and service level agreements must be done diligently, so that the PPP partner is able to provide its services on time and on budget. The government must also ensure that the project has been properly documented and knowledge retained within its ranks, so that flexibility is retained in the event that it is necessary to shift to a different operating model or a different PPP partner.

Singapore resumed its journey to seek the next breakthrough in bringing facilitative and innovative regulatory services to the public. With the impending expiry of the PPP contract in mind, a revamp of TradeNet® and TradeXchange® was undertaken in 2015 and culminated in the award of the tender for the next-generation National Trade Platform (NTP) in 2016. The journey continues.

II. NACCS – Nippon Automated Cargo Clearance System (Japan)

Since its introduction in 1978, NACCS has been operated as a public-private system, processing both Customs procedures and related services provided by the private sector.

In October 2008, the Port EDI System and the Crew Landing Permit Support System for Immigration were integrated into NACCS, boosting it into the fully-fledged Nippon Automated Cargo and port Consolidated System (NACCS) that covers all port and import/export procedures. In addition, the Japan Electronic open network TRAde control System (JETRAS), which processes applications for import and export licences, was integrated into NACCS in February 2010. Subsequently, the Food Automated Import Notification and Inspection System (FAINS) of the Ministry of Health, Labour and Welfare, and Plant Quarantine NETWORK System (PQ-NETWORK) and Animal Quarantine Inspection Procedure Automated System (ANIPAS) – systems of the Ministry of Agriculture, Forestry and Fisheries – were also integrated into NACCS in October 2013. Since November 2014, NACCS has also been operated as a system processing the medicines import/export procedures of the Ministry of Health, Labour and Welfare. NACCS continues to be a core system to process import/export procedures and port clearance procedures beyond the boundaries between the private and public sectors and among different ministries.

The NACCS Center, operating NACCS system, was first established in 1977 as a government-authorized body and reorganized as an Incorporated Administrative Agency in 2003. In October 2008, it was privatized as Nippon Automated Cargo and port Consolidated System, Inc. Regarding the government-owned stock (10,000 shares) of the Nippon Automated Cargo and Port Consolidated System, Inc. (NACCS Center), the operator of the NACCS system, the NACCS Law (Act on Processing, etc. of Business Related to Import and Export by Means of Electronic Data Processing System) stipulates that the government shall sell the company’s stocks other than those which the government is obliged to hold (more than one half of all the issued stock to secure the majority of the voting rights) as quickly as possible.

Accordingly, the government sold approximately one half of the total issued stock (4,999 shares) through general competitive bidding in March 2016. Because of this sale to private entities, it is expected that the NACCS Center will further streamline its management and improve the
convenience of the NACCS system for its users. NACCS or ‘Nippon Automated Cargo Clearance System’ is a significant example of public-private partnership. It is now an integrated national Single Window system, but two decades ago it started as a modest air cargo clearance system. It gradually grew to cover all modes of transport (Air & Sea NACCS). Initially, it was a central computer with direct data connectivity to all users in the government and the private sector. Subsequently, it introduced comprehensive EDI interfaces and web interfaces. After that, it took steps to integrate through data interchange with FAINS (Food sanitation), ANIPAS & PQ-NETWORK (Animal & Plant Quarantine) and JETRAS. This arrangement resulted in the emergence of a ‘one-stop service’ or a virtual Single Window system. It is a comprehensive trade information platform which was developed jointly by the government and private sector.

III. Mauritius Network Services Ltd (Mauritius)

Incorporated in 1994, Mauritius Network Services Ltd was established as a self-sustaining value-added network operator under a public-private partnership business model. Mauritius Network Services Ltd has developed and is maintaining the current Trade Net System, which was modelled as per the Singapore TradeNet system. The Trade Net System has been designed to promote B2B, B2G, G2B and G2G electronic exchanges, by ensuring secure and efficient electronic transmission and processing of cargo declarations, licence/permit requests and certificates of origin, and electronic payments settlement, with due care taken in adopting international security/messaging standards and best practice for the development of the Mauritius Revenue Authority Customs Department and other government agencies’ (licensing/permit) workflows. As such, the Trade Net System is pivotal to the linkage of the trade community with government, and to the future development of national and regional Single Windows. MNS handles maintenance and operation support for its services, including a helpdesk. Authorized users have to pay an initial registration fee and software charges. Thereafter, the pricing is based on transactions, in terms of transmission costs. Using these revenue streams, MNS becomes a self-sustaining entity.
The first task when developing a Single Window is to systematically gather data and documents covering the requirements of the Single Window. This calls for comprehensive and easy-to-use templates which can be completed by lay persons, but which will also be very useful for the professionals who will work on the data.
## CONTENTS

1. **Introduction** ................................................................................................................................. 3
   1.1 Instructions for Completion ........................................................................................................ 3

2. **Demographic Information** ........................................................................................................... 4

3. **CBRA Functions and Capabilities** ............................................................................................. 5
   3.1 Manage Accounts ..................................................................................................................... 5
   3.2 Manage Release (Import) Processes ......................................................................................... 6
   3.3 Manage Post-Release ................................................................................................................. 9
   3.4 Manage Export .......................................................................................................................... 10
   3.5 CBRA Licences, Permits, Certificates and Other (LPCO) ....................................................... 13
   3.6 Manage Enforcement ............................................................................................................... 14
   3.7 Manage Business Intelligence .................................................................................................. 16
   3.8 Manage Legal and Policy .......................................................................................................... 18
   3.9 Manage Finance ........................................................................................................................ 19

4. **CBRA System Information (‘As-Is’)** ....................................................................................... 20
1. Introduction

This guide has been developed to assist WCO Member Customs administrations in conducting a functional assessment of the data required by cross-border regulatory agencies (CBRAs) for the development of a Single Window environment. The outcome of the assessment will specify the kind of data required by CBRAs for different business processes, and how such data may be used in a Single Window environment for release and clearance in the context of import, export and transit procedures.

The purpose of this assessment guide is to help compile the functional needs of the relevant CBRAs. The content of the questionnaire is designed to allow Customs to identify the current functions of the CBRAs in the context of cross-border transactions, as a precursor to the detailed initial process assessment. Information gathered during this assessment can be used as source material by the CBRAs for internal use, and by Customs administrations for a variety of purposes, including to assess ‘as-is’ requirements, to compile and model current data requirements, and to assess conformance with international trade data standards. This functional assessment guide is not a substitute for the detailed business process analysis, but is a useful tool for high-level scoping within a Single Window project.

1.1 Instructions for Completion

Only one questionnaire/assessment should be completed per CBRA. If responses vary by office or division, please identify and include responses for all divisions or offices represented by the CBRA, and indicate the office or division to which the answer applies (e.g. the import, export, licences, guarantees or audit office/division).

This questionnaire is designed to help Customs administrations identify CBRA functions in relation to WCO Single Window Business Process Analysis documentation, and to Version 3 of the WCO Data Model and its ‘as-is’ operations.

Although some of the functions and capabilities described below could be manual (e.g. inspections and other verification activities), it is important for the business process modellers to know about them in detail in order to model appropriately. Equally important for the modellers is to know whether the data requirement would be at the transaction (header level) or the item (goods) level.

The questionnaire is designed to be filled in electronically. Please note that tables have been added to some questions to allow the same format for the answers. The use of the tables is not limited to the number of lines displayed.
2. Demographic Information

Please provide the main point of contact (POC) of the CBRA, and the contacts for each division or office within the CBRA. Please note that tables have been added to some questions to facilitate responses; respondents are not limited to the number of lines displayed in the table.

<table>
<thead>
<tr>
<th>CBRA name:</th>
<th>CBRA central POC:</th>
<th>Phone nr:</th>
</tr>
</thead>
<tbody>
<tr>
<td>POC e-mail address(es):</td>
<td>Fax nr:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Division/office name:</th>
<th>Division/office primary POC:</th>
<th>Phone nr:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail(s):</td>
<td>Fax nr:</td>
<td></td>
</tr>
</tbody>
</table>

| Division/office mission: | 

<table>
<thead>
<tr>
<th>Do you have a border presence?</th>
<th>Yes:</th>
<th>No:</th>
</tr>
</thead>
</table>

| Division/office border and staff function(s): |

<table>
<thead>
<tr>
<th>Division/office name:</th>
<th>Division/office primary POC:</th>
<th>Phone nr:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail(s):</td>
<td>Fax nr:</td>
<td></td>
</tr>
</tbody>
</table>

| Division/office mission: | 

<table>
<thead>
<tr>
<th>Do you have a border presence?</th>
<th>Yes:</th>
<th>No:</th>
</tr>
</thead>
</table>

| Division/office border and staff function(s): |

<table>
<thead>
<tr>
<th>Division/office name:</th>
<th>Division/office size:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division/office primary POC:</td>
<td>Phone nr:</td>
</tr>
<tr>
<td>E-mail(s):</td>
<td>Fax nr:</td>
</tr>
</tbody>
</table>

| Division/office mission: | 

<table>
<thead>
<tr>
<th>Do you have a border presence?</th>
<th>Yes:</th>
<th>No:</th>
</tr>
</thead>
</table>

| Division/office border and staff function(s): |

Table 1: Demographic information.
3. CBRA Functions and Capabilities

This Section is intended to allow the CBRA to describe its ‘as-is’ operations. Although some of the functions and capabilities described below are manual (e.g. inspections and other verification activities), it is important for the business process modellers to know about them in order to model appropriately.

Please note that tables have been added to some questions to facilitate responses; respondents are not limited to the number of lines displayed in the table.

Please also note that questions may be applicable to one or more Sections. For example, the question regarding forms applies to all forms, not just those within the ‘pre-arrival/pre-departure’ timeframe. In those instances, please answer the question in full, regardless of the time element.

3.1 Manage Accounts

‘Account management’ is defined as the activities and functions involved in the establishment and maintenance of trade accounts, in issuing and maintaining their guarantees, and establishing communication with them.

At what points during the import and/or export process does the CBRA communicate with trade (e.g. request more information or clarification)? Please describe the types of communication. What methods are used to achieve this communication?

<table>
<thead>
<tr>
<th>Import</th>
<th>Export</th>
<th>At what point(s)</th>
<th>Type of communication</th>
<th>Methods</th>
</tr>
</thead>
</table>

Table 2(a): Manage accounts.

What demographic or contact information does the CBRA currently collect from trade participants?

**Contact particulars:**

What (if any) unique identifiers or numbers does the CBRA issue or record with respect to a trade participant? Please provide the name, format and use of this identifier. Note: Only indicate CBRA-generated unique identifiers, not identifiers generated by other agencies.

<table>
<thead>
<tr>
<th>ID name</th>
<th>Format</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2(b): Manage accounts.
What (if any) guarantee requirements does the CBRA impose on trade? For what commodities or conveyances is a guarantee required? Is a guarantee required for import, export or transit? Does the CBRA monitor guarantees, or rely on another official body to validate?

<table>
<thead>
<tr>
<th>Guarantee type</th>
<th>Commodity/conveyance</th>
<th>Import/export/transit</th>
<th>CBRA validates?</th>
<th>Other body validates?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2(c): Manage accounts.

Please identify any special programmes (e.g. filing options, special treatment) that the CBRA offers trade. Please identify the requirements of these programmes, the focus (carriers, brokers, etc.) and the benefits to trade for each of these programmes.

3.2 Manage Release (Import) Processes

‘Manage release’ encompasses the processing and release of Cargo/goods, Conveyances, Individuals (crew) and associated Equipment (CCIE) for import, tracking and monitoring. CCIE involves the import process, and culminates in the decision to release goods. It can also cover the processing of authorized movements, such as in-bond, warehouse, free trade zone and special import declarations. Processes within this area can be divided into two distinct groups: pre-arrival, and arrival.

‘Pre-arrival’ is regarded as the period of time before cargo/goods/conveyances are presented for import. Functions during this time period may include, but are not limited to, the receipt of commodity, manifest and transportation data; the validation of licences, permits and certificates presented for certain commodities; and the editing and validation of data. While selectivity and targeting functions may be executed during this timeframe, questions dealing with those functions are in Section 3.6.

‘Arrival’ is regarded as the point in time at which cargo/goods are physically presented for import or an authorized movement, such as in-bond, warehouse or free trade zone. Functions during this time period may include (but are not limited to) the receipt of commodity, manifest and transportation data; the granting of release for import; and the processing of free trade zone, warehouse and in-bond transactions. While selectivity and targeting functions may be executed during this timeframe, questions dealing with those functions are in Section 3.6.

What forms related to import does the CBRA currently collect from trade? Please attach a copy of the form, if possible, and identify the name and number of the form. Provide details below on the primary method trade uses to submit the information (electronic vs. paper), and indicate whether this information is submitted directly to the CBRA, or collected by another official body on behalf of the CBRA. By when is trade required to submit the form?
<table>
<thead>
<tr>
<th>Form number/name</th>
<th>Timing requirement</th>
<th>Primary submission method</th>
<th>CBRA collects?</th>
<th>Other official body collects on behalf of CBRA? (Specify official body)</th>
</tr>
</thead>
</table>

Table 3(a): Manage release (import) processes.

For what import data does the CBRA rely on another official body’s system to perform data validation and editing (not risk assessment or selectivity)? Please specify the data, the other official body that performs the validation, the point during the import process this validation is performed, and how the results of this validation are transmitted to the CBRA.

<table>
<thead>
<tr>
<th>Data validated</th>
<th>Other official body</th>
<th>Point in process</th>
<th>Results transmission method</th>
</tr>
</thead>
</table>

Table 3(b): Manage release (import) processes.

For what import data does the CBRA perform its own data validation and editing (not risk assessment) and transmit these results to Customs for use in the import process? Please specify the data and the time during the import process this validation is performed.

<table>
<thead>
<tr>
<th>Data validated</th>
<th>Point in process (timing)</th>
</tr>
</thead>
</table>

Table 3(c): Manage release (import) processes.

Please list the type of notifications that the CBRA receives from Customs during the import process. Please specify the reason for the notifications (e.g. cargo/goods released), the timing of the notifications, and how they are received (e.g. electronically or by phone).

<table>
<thead>
<tr>
<th>Notification</th>
<th>Reason</th>
<th>Timing</th>
<th>Receipt method</th>
</tr>
</thead>
</table>
Table 3(d): Manage release (import) processes.

Please list the type of notifications that the CBRA sends to Customs during the import process. Please specify the reason for the notifications (e.g. cargo/goods released), the timing of the notifications, and how they are sent (e.g. electronically (system), by e-mail or by phone).

<table>
<thead>
<tr>
<th>Notification</th>
<th>Reason</th>
<th>Timing</th>
<th>Receipt method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3(e): Manage release (import) processes.

Please list the type of notifications that the CBRA sends directly to trade during the import process. Please specify the reason for the notifications (e.g. cargo/goods released), the timing of the notifications, and how they are sent (e.g. electronically (system), by e-mail or by phone).

<table>
<thead>
<tr>
<th>Notification</th>
<th>Reason</th>
<th>Timing</th>
<th>Method used to send</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3(f): Manage release (import) processes.

Please describe the decisions that the CBRA issues regarding cargo/goods/conveyance release (e.g. hold, release, inspect). Specify the type of decision and the timing of the decision (i.e. when the decision is made).

<table>
<thead>
<tr>
<th>Decision</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3(g): Manage release (import) processes.

Please describe the decisions the CBRA issues regarding crew (of conveyances) crossing the border. Specify the type of decision and the timing of the decision (i.e. when the decision is made).
Table 3(h): Manage release (import) processes.

What data does the CBRA require trade to submit regarding the authorized movement of cargo/goods and/or conveyances that enter ‘in-bond’, into or out of a free trade zone, into or out of a warehouse, etc.? Please specify the type of authorized movement (free trade zone, in-bond, etc.) and whether the CBRA collects this information directly from trade or Customs.

<table>
<thead>
<tr>
<th>Data</th>
<th>Authorized movement type</th>
<th>CBRA collects?</th>
<th>Customs</th>
</tr>
</thead>
</table>

Table 3(i): Manage release (import) processes.

What data or notifications regarding the authorized movement of cargo/goods and/or conveyances that enter ‘in-bond’, into or out of a free trade zone, or into or out of a warehouse, etc. does the CBRA currently receive from Customs?

<table>
<thead>
<tr>
<th>Data</th>
<th>Authorized movement type</th>
<th>CBP system</th>
</tr>
</thead>
</table>

Table 3(j): Manage release (import) processes.

### 3.3 Manage Post-Release

‘Manage post-release’ encompasses the processing of summary declarations, declaration summaries and goods declarations, and the completion of the clearance process in relation to the import process. It also covers the processing of drawback declarations and appeals that are lodged by trade during the liquidation process.

Please identify the CBRA’s role within the clearance process. Does the CBRA currently place ‘holds’ on transactions during the clearance process?

| Yes | No |

Table 4(a): Manage post-release.

Does the CBRA currently monitor commodities for anti-dumping or countervailing duty violations? If so, from whom does the CBRA receive this information, and by what method?
Table 4(b): Manage post-release.

Please identify the CBRA’s role (if any) in the drawback process. From whom does the CBRA receive this information, and by what method?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>From</th>
<th>Method</th>
</tr>
</thead>
</table>

Table 4(c): Manage post-release.

3.4 Manage Export

‘Manage export’ encompasses the export process, i.e. the processing of manifest, conveyance and export declaration data received from trade; the validation of licences, permits and certificates associated with the commodities being presented for export; and the editing of the data associated with the process. This process culminates in the decision to allow goods to be exported.

‘Pre-departure’ is regarded as the period of time before cargo/goods/conveyances are presented for export. Functions during this time period may include (but are not limited to) the receipt of export declaration, manifest and transportation data; the validation of export licences, permits and certificates presented for certain commodities; and the editing and validation of data. When all pre-departure data has been presented by trade and has been processed, Customs grants the carrier ‘free to go’ status if all is in order before or at the moment that cargo/goods/conveyances are presented to Customs. Departure may then be confirmed when the carrier transmits a departure message to Customs. While selectivity and targeting functions may be executed during this timeframe, questions dealing with those functions are in Section 3.6.

‘Post-departure’ is regarded as the period of time after which cargo/goods/conveyances have been granted permission to be exported/leave the Customs territory and confirmation has been received that the cargo/goods/conveyances have departed. In the case of a simplified procedure, data may be submitted at this stage. While selectivity and targeting functions may be executed during this timeframe, questions dealing with those functions are in Section 3.6.

What forms does the CBRA currently collect from trade during the export process? Please attach a copy of the form, if possible, and identify the name and number of the form. Provide details below on the primary method trade uses to submit the information (electronic vs. paper), and indicate whether this information is submitted directly to the CBRA, or collected by another official body on behalf of the CBRA. By when is trade required to submit the form?

<table>
<thead>
<tr>
<th>Form number/name</th>
<th>Timing requirement</th>
<th>Primary submission method</th>
<th>CBRA collects?</th>
<th>Other official body collects on behalf of CBRA? (Specify official body)</th>
</tr>
</thead>
</table>
Table 5(a): Manage export.

For what export data does the CBRA rely on another official body (Customs?) to perform data validation and editing during the export process (not risk assessment or selectivity)? Please specify the data, the other official body which performs the validation, the point during the export process this validation is performed, and how the results of this validation are transmitted to the CBRA.

<table>
<thead>
<tr>
<th>Data validated</th>
<th>Other official body</th>
<th>Point in process</th>
<th>Results transmission method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5(b): Manage export.

For what export data does the CBRA perform its own data validation and editing during the export process (not risk assessment) and transmit these results to Customs for use in the export process? Please specify the data and the time(s) during the export process that this validation is performed.

<table>
<thead>
<tr>
<th>Data validated</th>
<th>Point in process</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5(c): Manage export.

Please list the type of notifications that the CBRA receives from Customs during the export process. Please specify the reason for the notifications (e.g. cargo/goods/conveyances released), the timing of the notifications, and how they are received (e.g. electronically or by phone).

<table>
<thead>
<tr>
<th>Notification</th>
<th>Reason</th>
<th>Timing</th>
<th>Receipt method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5(d): Manage export.
Please list the type of notifications that the **CBRA sends to Customs during the export process**. Please specify the reason for the notifications (e.g. cargo/goods/conveyances released), the timing of the notifications, and how they are sent (e.g. electronically, by e-mail or by phone).

<table>
<thead>
<tr>
<th>Notification</th>
<th>Reason</th>
<th>Timing</th>
<th>Method used to send</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5(e): Manage export.

Please list the type of notifications that the **CBRA sends directly to trade during the export process**. Please specify the reason for the notifications (e.g. cargo released), the timing of the notifications, and how they are sent (e.g. electronically, by e-mail or by phone).

<table>
<thead>
<tr>
<th>Notification</th>
<th>Reason</th>
<th>Timing</th>
<th>Method used to send</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5(f): Manage export.

Please describe the decisions that the CBRA issues regarding cargo/goods/conveyance release (e.g. hold, release, inspect). Specify the type of decisions and the timing of the decision (i.e. when the decision is made).

<table>
<thead>
<tr>
<th>Decision</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5(g): Manage export.

Please describe the decisions the CBRA issues regarding crew (of conveyances) crossing the border. Specify the type of decisions and the timing of the decision (i.e. when the decision is made).

<table>
<thead>
<tr>
<th>Decision</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5(h): Manage export.

### 3.5 CBRA Licences, Permits, Certificates and Other (LPCO)

CBRA licences, permits and certificates in this context are documents issued by the CBRA that regulate or monitor commodities and/or conveyances associated with import and export processes. One example is the Kimberly certificate, which is required for diamond imports and which must be verified upon arrival. A further example is the International Health Certificate for meat, meat products, plants and plant products, etc. Again, this must be verified upon arrival.

Please identify any licences, permits and/or certificates regarding commodities and/or their conveyances that the CBRA issues, independently of Customs. Please identify whether these affect imports, exports, or both.

<table>
<thead>
<tr>
<th>LPCO name</th>
<th>Commodity/conveyance regulated</th>
<th>Import/export</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6(a): CBRA licences, permits, certificates and other (LPCO).

Please identify any other functions regarding licences, permits and/or certificates (LPCO) that the CBRA performs on behalf of another CBRA or foreign government (e.g. monitoring, approval for another CBRA, checking for a foreign government). Please specify and identify whether these affect imports, exports, or both.

<table>
<thead>
<tr>
<th>LPCO name</th>
<th>Commodity/conveyance regulated</th>
<th>Import/export</th>
<th>Other CBRA or foreign government</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6(b): CBRA licences, permits, certificates and other (LPCO).

Please identify any licences, permits, certificates and/or ‘other’ (LPCO) regarding commodities and/or their conveyances that the CBRA validates. Please identify whether these affect imports, exports, or both, and whether the CBRA performs the validation or relies on another CBRA to perform the validation.
3.6 Manage Enforcement

‘Selectivity and targeting’ (risk assessment) is the process associated with determining the relative risk of cargo, conveyances and their associated individuals being presented for import or export. It also encompasses the verification and enforcement activities that succeed the execution of the selectivity process.

‘Verification activities’ are those such as document review and inspections, whose purpose is to verify that cargo/goods/conveyances and the associated crew presented for import or export are in compliance with the relevant laws, rules and regulations. Verification actions may be performed as the result of a selectivity recommendation, or upon the knowledge and judgment of the CBRA representative at the border. Remedial actions (e.g. treatments) that are able to make cargo/goods/conveyances fit for import or export may be required as a result of verification activities.

‘Enforcement’ refers to the activities and functions involved in the verification and enforcement of the laws, policies and regulations governing the import and export of cargo/goods, conveyances and their associated individuals (crew and/or passengers) into and out of the Customs territory.

For what types of transaction does the CBRA rely on another official body to perform selectivity and/or targeting assessments? Please identify the other official body(ies) performing the analysis on behalf of the CBRA, and how the results are transmitted to the CBRA.

<table>
<thead>
<tr>
<th>Transaction type</th>
<th>Other official body</th>
<th>How transmitted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7(a): Manage enforcement.

At what points during the import and/or export process does the CBRA, independently of Customs, conduct selectivity and/or targeting assessments (e.g. pre-arrival, arrival, pre-departure, departure and post-release)?

<table>
<thead>
<tr>
<th>Import/export</th>
<th>At what point</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6(c): CBRA licences, permits, certificates and other (LPCO).
Table 7(b): Manage enforcement.

What information does the CBRA collect, use or generate that would contribute to government-wide selectivity and targeting activities (risk assessment)?

**What information:**

Please describe the security/safety role in respect of the **import** of weapons, explosives, chemicals, radiological devices, small arms, food products, medicinal products, etc. that the CBRA performs.

<table>
<thead>
<tr>
<th>Area/commodity</th>
<th>Security/safety role</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7(c): Manage enforcement.

Please describe the security/safety role with respect to the **export** of weapons, explosives, chemicals, radiological devices, small arms, food products, medicinal products, etc. that the CBRA performs.

<table>
<thead>
<tr>
<th>Area/commodity</th>
<th>Security/safety role</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7(d): Manage enforcement.

How does the CBRA currently submit its criteria for inclusion in other CBRA systems? If the processes are different by CBRA, please provide an answer for each.

<table>
<thead>
<tr>
<th>Other CBRA systems</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7(e): Manage enforcement.

For what mandates, special programmes, initiatives, rules or regulations does the CBRA co-ordinate its selectivity/targeting assessment with other official bodies? Please identify the official body with which you co-ordinate, and whether these efforts are expected to continue in the foreseeable future.

<table>
<thead>
<tr>
<th>‘Type’ of legislation</th>
<th>Other official body</th>
<th>To continue in future?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7(f): Manage enforcement.

Does the CBRA maintain a ‘watch list’, ‘denied party list’, ‘blacklist’ or similar list that restricts imports and exports? If so, with which other official body does the CBRA share this information?

<table>
<thead>
<tr>
<th>List: Yes/No</th>
<th>Official body</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 7(g): Manage enforcement.

What kind of activities relating to verification, validation, inspection and/or interdiction of commodities being imported or exported does the CBRA perform? Where are the results of these activities recorded? Please specify.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Import/export</th>
<th>Results recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7(h): Manage enforcement.

What kinds of activities relating to verification, validation, inspection and/or interdiction of commodities being imported or exported does the CBRA delegate to another official body (Customs?) to perform? Where are the results of these activities recorded, and how are they transmitted to the CBRA? Please specify.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Import/ export</th>
<th>Other official body</th>
<th>Results recorded</th>
<th>Transmission method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7(i): Manage enforcement.

3.7 Manage Business Intelligence

‘Manage business intelligence’ encompasses the activities and functions involved in the processing and maintenance of reference information (such as quotas, approvals, Harmonized System) and business rules needed in order to complete import and export transactions. This area also includes the generation of reports and statistics related to the import and export processes.

Does the CBRA generate statistics or reports (related to import, export, or trade promotion processes) based on public data provided by a (Central) Statistics Bureau? Please specify the type of statistics or reports the CBRA generates, and the timeframe for doing so (e.g. monthly or quarterly).

<table>
<thead>
<tr>
<th>Import/ export</th>
<th>Type of report</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8(a): Manage business intelligence.

Does the CBRA generate statistics or reports (related to import, export, or trade promotion processes) based on the public data of one or more other official bodies (not the Statistics Bureau)? Please specify the type of statistics or reports the CBRA generates, and the timeframe for doing so (e.g. monthly or quarterly).
Does the CBRA generate statistics or reports (related to import, export, or trade promotion processes) based on public data **whose source is different from the sources referred to in the two preceding paragraphs**? Please specify the type of statistics or reports the CBRA generates, and the timeframe for doing so (e.g. monthly or quarterly).

<table>
<thead>
<tr>
<th>Import/ export</th>
<th>Type of report</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8(b): Manage business intelligence.

Are there any commodities currently subject to quota or approval restrictions that the CBRA monitors? From whom (what other official body) does the CBRA receive this information, and by what method?

<table>
<thead>
<tr>
<th>Import/ export</th>
<th>Commodity</th>
<th>Official body</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8(c): Manage business intelligence.

Please describe the CBRA’s current role in the monitoring or validation of intellectual property rights (IPR) directly related to the import or export of goods.

<table>
<thead>
<tr>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

What reference material (e.g. schedules or code tables) regarding the import and export processes does the CBRA control? How often are these updated? Are these materials available online to trade or to other official bodies (Customs?)?

<table>
<thead>
<tr>
<th>Import/ export</th>
<th>Reference material</th>
<th>Update frequency (in days)</th>
<th>Available online</th>
<th>For trade</th>
<th>For official body</th>
</tr>
</thead>
</table>
Table 8(e): Manage business intelligence.

What internal reference material (e.g. standard operating procedures or internal policies) does the CBRA maintain online?

<table>
<thead>
<tr>
<th>What reference material:</th>
</tr>
</thead>
</table>

### 3.8 Manage Legal and Policy

‘Legal and policy’ encompasses activities that have an impact on statutory, regulatory, and policy requirements. This area governs the processes that are legal in nature, including the issuance of rulings, compliance programmes, and responses to mandates and judicial reviews.

Which laws, regulations, etc. grant the CBRA the legal or regulatory authority to collect trade or transportation (import, export) information from the public and/or trade? Please cite the regulation(s). Note: Only provide the citation; *do not provide the actual text of the regulations*.

<table>
<thead>
<tr>
<th>Name/title</th>
<th>Citation</th>
<th>Authority granted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9(a): Manage legal and policy.

Is the CBRA subject to recent legislative mandates requiring the establishment of new electronic filing? Please specify, including the type of information which is subject to these new mandates. Please indicate deadlines for implementing any such legislative mandates.

<table>
<thead>
<tr>
<th>Mandate</th>
<th>Process/information affected</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9(b): Manage legal and policy.

What reference material (e.g. rulings or regulations) does the CBRA maintain online? Are these accessible to trade?

<table>
<thead>
<tr>
<th>Reference material</th>
<th>Accessible to trade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|
Table 9(c): Manage legal and policy.

3.9 Manage Finance

‘Manage finance’ encompasses the data, activities and functions associated with managing and collecting revenue generated from trade compliance and fund accounting.

For what licences, permits, certificates, commodities or conveyances does the CBRA, at import, collect or impose duties, taxes, levies or fees? Are these related to the issuance or use of a licence, permit or certificate, or the import of a commodity or conveyance? Does the CBRA collect these revenues itself, or rely on another official body (Customs?) to collect on its behalf? Please specify.

<table>
<thead>
<tr>
<th>Type of revenue</th>
<th>Commodity/conveyance</th>
<th>CBRA collects?</th>
<th>Other official body collects?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10(a): Manage finance.

For what licences, permits, certificates, commodities or conveyances does the CBRA, at export, collect, impose or refund duties, taxes, levies or fees? Are these related to the issuance or use of a licence, permit or certificate, or the export of a commodity or conveyance? Does the CBRA collect or refund these revenues itself, or rely on another official body (Customs?) to collect or refund on its behalf? Please specify.

<table>
<thead>
<tr>
<th>Type of revenue</th>
<th>Commodity/conveyance</th>
<th>CBRA collects?</th>
<th>Other official body collects?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10(b): Manage finance.

What violation types trigger a fine or penalty to be levied by the CBRA when suspected violations are verified? Does the CBRA collect these revenues itself, or rely on another official body (Customs?) to collect on its behalf? Please specify.

<table>
<thead>
<tr>
<th>Violation type</th>
<th>Fine or penalty</th>
<th>CBRA collects?</th>
<th>Other official body collects?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. CBRA System Information (‘As-Is’)

What systems does the CBRA currently use to provide import and export data (e.g. trade, transportation or messages) to Customs through an electronic interface (e.g. the CBRA inputs data into Customs import, export or other systems)? Please specify the type of data exchanged (e.g. manifest, goods or conveyance), the frequency with which this data is exchanged, and the Customs system with which the CBRA interfaces.

<table>
<thead>
<tr>
<th>Data submitted</th>
<th>CBRA system</th>
<th>Customs system</th>
<th>Frequency of exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11(a): CBRA system information (‘as-is’).

Which systems does the CBRA currently use to receive import and export data (e.g. trade, transportation or messages) directly from trade through an electronic interface? Please specify the type of data exchanged (e.g. manifest, goods or conveyance), the frequency with which this data is exchanged, and the CBRA system with which trade interfaces.

<table>
<thead>
<tr>
<th>Data submitted</th>
<th>CBRA system</th>
<th>Frequency of exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11(b): CBRA system information (‘as-is’).

In what manner does the CBRA provide data to Customs? (Please tick all that apply)

- [ ] ‘Real-time’ trade, transportation or decision data
- [ ] Summarized data in a periodic declaration according to a simplified procedure
How does the CBRA currently **receive** import and export data from Customs (e.g. electronically, via tape, CD-ROM or other media)? Please specify the type of data exchanged, the medium via which this data is transmitted (e.g. online, tape or CD-ROM) and the frequency of this data exchange.

<table>
<thead>
<tr>
<th>Data received</th>
<th>Data transmission media</th>
<th>CBP system (if electronic)</th>
<th>Frequency of exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Transaction level’ trade, transportation or decision data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not applicable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11(c): CBRA system information (‘as-is’).

In what manner does the CBRA receive data from Customs? *Please tick all that apply*

- ‘Real-time’ trade, transportation or decision data
- Summarized data in a periodic report
- ‘Transaction level’ trade, transportation or decision data
- Not applicable
- Unsure

What system(s) does the CBRA currently use to perform data validation and editing functions (not risk assessment, selectivity or targeting)? Please specify the name of the system(s).

<table>
<thead>
<tr>
<th>System</th>
</tr>
</thead>
</table>

Does the CBRA currently have a system that performs selectivity and targeting or risk assessment functions? Is that system linked to the selectivity systems of any other official body (Customs?)? Please list any other official bodies that this system is linked to.

<table>
<thead>
<tr>
<th>System and official bodies</th>
</tr>
</thead>
</table>

In which system(s) does the CBRA record verification findings? Please specify the name of the system(s).

<table>
<thead>
<tr>
<th>System</th>
</tr>
</thead>
</table>
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></th>
<th>Centrally run application</th>
<th>The Single Window application will be hosted centrally, be run from a central data centre, and be supported by a disaster recovery site.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>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</td>
<td>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</td>
<td>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

---

**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 fulfills 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.

![Five dimensions of business process analysis](image)

**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.

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.

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/

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.

![Figure 3: The simple Buy-Ship-Pay process. Source: UN/CEFACT](image)

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’
(UN/CEFACT, 2007). 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
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.
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).
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 CBRAs, 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.

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:
Figure 9: Single Window registration/regulatory authorization processes*.

<table>
<thead>
<tr>
<th>REF</th>
<th>Business Process</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>Register Cross-Border Regulatory Agency (CBRA)</td>
<td>The Single Window operator captures the necessary information and performs certain actions to register a cross-border regulatory agency, enabling the CBRA officers to perform regulatory functions online.</td>
</tr>
<tr>
<td>R2</td>
<td>Register Users in the Single Window</td>
<td>The Single Window operator creates a user belonging to a CBRA or a user belonging to the economic operator.</td>
</tr>
<tr>
<td>R3</td>
<td>Register Economic Operator</td>
<td>The Single Window operator in relation to a cross-border regulation captures the relevant details and registers an economic operator for the requested services.</td>
</tr>
<tr>
<td>R4</td>
<td>Register Authorized IT System</td>
<td>The Single Window operator makes the necessary arrangements to register the IT systems linked with the operation of Single window services.</td>
</tr>
<tr>
<td>R5</td>
<td>Register Location Regulatory Facility</td>
<td>The Single Window operator in relation to cross-border regulation captures all relevant particulars of a regulatory facility.</td>
</tr>
<tr>
<td>R6</td>
<td>Register Product Regulatory Facility</td>
<td>The Single Window operator in relation to cross-border regulation captures all relevant particulars of a regulatory product.</td>
</tr>
<tr>
<td>R7</td>
<td>Register Transport Means</td>
<td>The Single Window operator in relation to cross-border regulation captures all relevant particulars of a regulatory transport means.</td>
</tr>
</tbody>
</table>

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.

---

**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.
Figure 11: Terminal delivery requires regulatory release, as well as line release.

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.
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.

| L1 | Application for licence, permit, certificate or other | The economic operator applies to a cross-border regulatory agency for a licence, permit or certificate, and receives a response. CBRAs may collect fees for application, registration, inspection, testing and processing, as well as licensing fees. These are termed ‘fees and charges’. 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’. |

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
complete harmonization of information inputted by trade. Such a standardized form can replace numerous bespoke forms issued by different regulatory authorities.

**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.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>SAFE goods declaration – pre-departure advance export declaration</td>
<td>The economic operator (exporter) submits pre-departure export data (SAFE goods declaration) for security risk assessment.</td>
</tr>
<tr>
<td>A2 &amp; A3</td>
<td>SAFE cargo declaration at export &amp; import</td>
<td>The economic operator (carrier) submits pre-departure and pre-arrival cargo data (SAFE cargo declaration) for security risk assessment at departure and destination, respectively.</td>
</tr>
<tr>
<td>A4</td>
<td>SAFE pre-arrival advance import declaration</td>
<td>The economic operator (importer) submits pre-departure data (SAFE goods declaration) for security risk assessment.</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></th>
<th>Description</th>
<th>Notes</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.

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.

---

**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).
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 confirmation. 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.

**Singapore Customs – Automatic Payments**

Traders treat funds for Customs duty as held-up working capital. They tend to hold back duty payment until the last minute. This is because of uncertainty about the actual time of clearance.

Without payment of Customs duty, it is not allowed, in many jurisdictions, to clear goods. Electronic payment is cheaper, safer and faster. However, the time of tendering of the payment amount is crucial in terms of the availability of funds. The implementation by Singapore Customs of a GIRO account for automatic payment solves this problem.

**Source: Singapore Customs**
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.

Payment Systems: The Role of Automatic Authorization

For the direct payment of duty/GST or other miscellaneous fees, importers and brokers (declaring agents) are obliged to open an Inter-Bank GIRO (IBG) account with Singapore Customs. Once the IBG account is approved, the importer may authorize his declaring agent to deduct the payment directly from his IBG account. In this way, the amount remains in the importer’s account until a debit is made in favour of Customs, which collects the calculated charges. In cases where an importer does not have an IBG account with Singapore Customs, the duties and GST will be deducted from the declaring agent’s account. This ensures that payment of all duties, taxes and fees is done in an instant, reducing inconvenience, wasted hours, and blocked working capital for all parties.

Source: Singapore Customs
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.
DATA HARMONIZATION

PART V
VOL 2
Data harmonization ensures that the data required by regulatory authorities to conduct procedures and formalities for goods clearance across borders is simple, clear and free of redundancies. Forms and electronic data submission should be based on international standards, and the same piece of information should be submitted only once. The process of data harmonization helps achieve this vital aspect of the Single Window.
Contents
1. Introduction ................................................................................................................................. 3
  1.1 About this Part .......................................................................................................................... 3
2. Benefits ........................................................................................................................................... 3
3. Recommendation .......................................................................................................................... 4
4. Guidelines on Single Window Data Harmonization ................................................................. 4
  4.1 Introduction ................................................................................................................................. 4
  4.2 Objective ..................................................................................................................................... 5
5. Harmonization Policy, Organization and Communication ....................................................... 6
  5.1 Harmonization Policy .................................................................................................................. 6
  5.2 Organization ............................................................................................................................... 6
  5.3 Communication ........................................................................................................................... 6
6. Data Harmonization Process Steps ............................................................................................ 6
  6.1 Data Capturing ............................................................................................................................ 7
  6.2 Defining ...................................................................................................................................... 7
  6.3 Analysing .................................................................................................................................... 7
  6.4 Reconciling .................................................................................................................................. 7
7. Specific Illustrations of the Data Harmonization Process Steps ............................................... 7
  7.1 Capturing ..................................................................................................................................... 7
  7.2 Defining and Analysing ............................................................................................................. 10
  7.3 Reconciling ................................................................................................................................ 10
8. The Size of the Standard Data Set ............................................................................................ 12
9. WCO Data Model and Information Packages .......................................................................... 12
  9.1 Object Classes Simplify, Analyse and Define ........................................................................ 13
  9.2 Information Packages: Catalysts for Data Harmonization .................................................. 14
  9.3 Information Packages: Accelerating Data Harmonization .................................................. 14
10. Impact on Legacy Systems ......................................................................................................... 15
Annex: Data Harmonization – Experiences .................................................................................... 16
  1. Using Harmonized and Standardized Data in the EU .............................................................. 16
  2. Data Harmonization – Oman Customs .................................................................................. 18
  3. Data Simplification and Standardization – Singapore .......................................................... 20
  4. ACE/ITDS – United States ......................................................................................................... 20
  5. Harmonized Reporting – Japan Single Window ....................................................................... 21
1. Introduction

In many countries, the design and development of automated systems, and the establishment of information and data requirements, often involves little co-ordination between regulatory agencies, and little consultation with other government agencies. As a result, trade must comply with a variety of data requirements, be they in the shape of electronic messages or of forms, resulting in increased costs and, in many cases, inaccurate data.

A Single Window environment provides a solution to the problem of redundancy and duplication in data submission via numerous forms and through different electronic messages. It also improves the accuracy of the use of data if internationally agreed standards, such as the WCO Data Model, are implemented.

1.1 About this Part

The scope of these Guidelines is:

1. To provide Single Window developers with tools that they can use to achieve data harmonization. Internationally standardized, in the context of these Guidelines, are the data element names, definitions, the UNTDED tag and the format.

2. To provide Single Window users with tools which are based on best practice and which have been successfully utilized by countries where Single Window systems are being developed or have been implemented.

2. Benefits

The use of non-standard, country-specific and/or agency-specific data is highly inefficient in terms of cost and accuracy, both for government and trade. Regulatory authorities are required to maintain or develop agency-specific systems, and trade must operate and maintain interfaces to meet these redundant and duplicative reporting requirements. This level of duplication is also evident in non-automated, paper-based systems where trade is required to provide highly redundant forms.

The situation is especially critical for large global traders who must interact with many Customs administrations and many other government agencies. The cost and complexity of meeting these requirements is staggering. Addressing this issue would benefit not only large global enterprises, but also SMEs.

The use of international standards in data and messaging with regard to export, import and transit transactions, where the same data and messages can be submitted to all government agencies, including Customs, is the main foundation of a Single Window environment. The use of the WCO Data Model ensures compatibility among government agencies’ reporting requirements, and enables

1 WTO Aid-for-Trade Case Story of the Former Yugoslav Republic of Macedonia, reported by OECD (http://www.oecd.org/aidfortrade/47381815.pdf).
the exchange and sharing of information among relevant government agencies, including Customs, thereby resulting in greater trade facilitation.

As governments begin the development of a standardized, multi-agency data set, there might be a concern about the number of data elements. To keep the number of data requirements as small as possible, the standardized data set should include only the information which agencies are currently allowed to collect – a ‘need-to-have list’ of information requirements.

The redundancy of data revealed during the data harmonization process and the ensuing standardization often results in a reduction in data requirements.

Another benefit is the stability a standardized set of data requirements provides. The outcome of data harmonization must be a maximum set of data requirements for the export, transport and import of goods when crossing borders. Governments should not require any information outside of the standard data set. It is important to note that most of the data requirements of the WCO Data Model are conditional. National governments may use the WCO Data Model, with its agreed maximum data sets, to derive their national ‘whole-of-government’ cross-border data model.

3. Recommendation

It is recommended that governments considering the development of a Single Window environment initiate the data harmonization and standardization process. It is also recommended that countries that have a Single Window in place, but that have not executed data harmonization, conduct such harmonization. The steps governments should take to implement harmonization are as follows:

1. Identify the lead agency and staff assigned to conduct the harmonization
2. Inventory current trade agency data and information requirements for automated systems and forms
3. Nationally harmonize the data and information inventory
4. Identify redundancies by comparing data definitions
5. Harmonize the information and data requirements inventory with the international WCO Data Model standards.

4. Guidelines on Single Window Data Harmonization

4.1 Introduction

These Guidelines are designed to assist governments and trade in harmonizing and standardizing government international trade information and data requirements, to develop and implement a Single Window environment. They are based on best practice and on instances of implementation of
a Single Window environment, and may be used in conjunction with UN/CEFACT Recommendation No. 33.

![Diagram showing Single Windoow environment with Data Harmonization and Single Submission]

Figure 1: Data harmonization holds the key to the development of a viable model for the development of a Single Window.

These Guidelines provide details on the policy and organizational elements needed to achieve harmonization. They also provide tools that governments can use to facilitate the harmonization process, as well as details on domestic harmonization, and the eventual harmonization of domestic requirements with the WCO Data Model.

4.2 Objective

The objective of data harmonization with the WCO Data Model is to eliminate redundancies in required data, and duplication in the submission of trade data to government authorities, such as Customs and other regulatory agencies. The outcome should be one set of standardized data requirements and standardized messages that fully comply with the WCO Data Model. Within cross-border transactions, trade will provide the required WCO Data Model data elements by submitting standardized messages to meet government requirements on export, import and transit. Standardized data facilitates trade, reduces costs and makes it feasible to provide more timely and accurate information.
5. Harmonization Policy, Organization and Communication

5.1 Harmonization Policy
UN/EDIFACT Recommendation No. 33 lists key factors in establishing a successful Single Window environment. All of these factors are essential in developing that environment. A strong lead agency is critical to a successful outcome to the harmonization process. It is the lead agency that will be responsible for drafting plans and committing the resources necessary.

5.2 Organization
It is best to have a project team executing the data harmonization process. The project team members must have extensive knowledge of international trade procedures and, specifically, the area of regulatory information requirements. The harmonization project team should, furthermore, include data architects and business process modellers. It is also helpful to dedicate a person to serve as a liaison point with participating agencies. This person is a conduit for information to and from the lead agency. Also, the participating agencies must identify a primary contact to organize the agency’s data inventory and harmonization.

5.3 Communication
Communication of the harmonization policy, procedures and steps is critical. After establishing the harmonization project team, the next step is to hold a series of meetings and briefings for all participating agencies to clearly define the project team’s roles and responsibilities. After this ‘kick-off’ briefing, the agency participants should understand the overall process for accomplishing the data harmonization, and the purpose of one-on-one meetings with the data architects and business process modellers. They should also identify the work sessions the agency should participate in and the approach planned for these work sessions. Needless to say, participants should be well aware of the agency’s responsibilities.

6. Data Harmonization Process Steps

Data harmonization is an iterative process of capturing, defining, analysing, and reconciling regulatory information requirements. It is highly unlikely that any government will be able to achieve harmonization of all agencies at one time. Governments should consider prioritizing agencies and agency requirements. The prioritization of requirements could be based on volume, revenue or supply chain security, etc. For example, every international trade transaction requires information for Customs, transportation, and statistics. They could therefore be considered to

---

2 This definition was first used in the WCO Data Harmonization Guidelines. Subsequently, it was quoted in many papers on trade facilitation and the Single Window. UNECE has used it as the basis for its definition in its trade facilitation implementation guide, ‘Data Harmonization’ (http://tfig.unece.org/contents/data-harmonization.htm).
constitute the first tier of agencies. The selection of an agency could be based on its willingness to participate in the Single Window.

The important point is that, after completion of the first tier of agencies, the data harmonization process steps should be repeated as additional agencies participate, and as additional requirements are identified.

The data harmonization process steps are listed below.

6.1 Data Capturing

‘Data capturing’ means making an inventory of identified regulatory agencies’ requirements. This can be accomplished by, for example, reviewing agencies’ forms, automated systems data requirements and regulations. It includes: the data element name; data element definition; representation (format or code); when the information is required (declaration, release or clearance); and the citation of the relevant authority to collect, validate and view the information. The information can be aggregated in an Excel spreadsheet or worksheets from any other software tool.

6.2 Defining

Defining the information requirement is critical. While information is identified by name, the data element definition – what information is conveyed by using that data element – is more important.

6.3 Analysing

The process of analysing the information consists of gathering similar data element names and having a full understanding of the definition and the information required.

6.4 Reconciling

Reconciling is the final step, in which there is an agreement to use one data element name, a common definition, common code, and standard messaging, reconciled with the WCO Data Model standard.

7. Specific Illustrations of the Data Harmonization Process Steps

7.1 Capturing

To capture data elements and other information requirements, developers of a Single Window environment can begin by reviewing forms. If the country has an automated trade processing system, data elements can be found by using the system’s logical data model. Initially, data can be
arranged on a worksheet. The worksheet should contain the following information: data element name; data element description (definition); domain the data element belongs to; representation (alpha, numeric, or alphanumeric, number of positions, delimiter); domain (code list); mode of transport (marine, air, rail, road); process (export, transit, import); whether it is used for conveyance, crew, cargo or goods (more specific than cargo) or equipment; and the data source (exporter, carrier, importer, Customs broker, driver, agent, bank, insurance company, psi company, etc.).

Figure 4:

Another important element is the legal authority to collect the data. It needs to be filed whether the agency is authorized to collect and view the data, the source of the legal authority (law, regulation, executive order, etc.) and the expiry date of such authority.

Recommended worksheet columns are as follows:

- **Agency data element number** - A reference number for the data element.
- **Data element name** - The name of the data element being defined. The naming of the data element should reflect the common business terminology used by the agency, not a computer-related name.
- **Data element description** - A description of the data element, with as much detail as possible.
- **Representation** - The data type can be either N (numeric), A (alpha) or AN (alphanumeric). And the number of positions, as well as whether a delimiter – floating or non-floating – is needed.
- **Data domain** - If the data element has a discrete list of values or a range of values, provide the list, range or a reference to the list or range. For example, the data element country could be restricted to the values in the ISO country code table.
- **Mode of transport** - Indicate the mode of transport (road, air, marine, rail, pipeline, cable) for which the element is used.
- **Process** - Indicate if required for export, transit processes or import.
- **Category of use** - Indicate if required for conveyance, crew, cargo, goods or equipment.
- **Legal permission to collect or view** - This information identifies whether the agency is legally permitted to collect or view this element. If authority allows collections, enter the word COLLECT, otherwise please enter VIEW.
The source of legal authority - Cite the source of authority to collect or to view. The authority may be derived from a specific form, regulation, legislative mandate, MOU or other. Please cite all legal authorities that apply if there are multiple sources. Do not provide the text of the citation.

The expiration date of legal authority - Provide the date on which the legal permission to view or collect the data expires for the agency. Specify N/A if this authority does not expire.

Data source - Indicate if the information is provided by trade, government, or derived from other sources. <Trade> indicates the data is filed by trade, <Government> indicates the data is created by a regulatory agency. An example of the latter would be the findings of an investigation. If unsure, enter a letter <U> here, for unknown. <Derived> data is calculated by or extracted from a reference file, e.g. the rate of duty could be extracted from a Harmonized Tariff file, or derived by the computer system from a combination of one or more other data elements.

Trade source - Indicate the trading partner who is the usual source or provides the data. If the data source attribute is <Trade>, please identify which party in the transaction is responsible for filing the data element. Suggested values are <T> (importer, exporter, broker, forwarder, etc.), <C> (carrier), or <TC>. If unsure, enter a letter <U> here, for unknown.

Timing, when data is required and provided - Identify the point of the transaction lifecycle at which the agency expects to have access to the data element. Suggested values are: <PRE-ARRIVAL>, <ARRIVAL>, <RELEASE>, <CLEARANCE><POST RELEASE> or <DATAWAREHOUSE>, etc. If unsure, enter a letter <U> here, for unknown.

Agency flow source - If the ‘data source’ is <Government>, identify the agency that creates this element.

Remarks/comments - Free-form text that can be used to annotate the data element in any way.

Upon receipt of the worksheet survey from the agencies, the data harmonization project team must aggregate or merge the agency responses into a comprehensive worksheet. The following is an abbreviated representative sample of this aggregation.

<table>
<thead>
<tr>
<th>NAME</th>
<th>DESCRIPTION</th>
<th>TYPE</th>
<th>SOURCE</th>
<th>MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port of Unloading</td>
<td>Location where goods are removed from the ship</td>
<td>Four-digit proprietary code</td>
<td>Carrier</td>
<td>Ship</td>
</tr>
<tr>
<td>Port of Unlading</td>
<td>Airport where consignment is taken off the airplane</td>
<td>Four-digit proprietary code</td>
<td>Carrier</td>
<td>Air</td>
</tr>
<tr>
<td>Domestic Port of Unloading</td>
<td>Domestic port where merchandise is removed from the mode of transport</td>
<td>Four-digit proprietary code</td>
<td>Carrier Broker Importer</td>
<td>Air, Rail, Ship, Truck</td>
</tr>
<tr>
<td>Domestic Port of Unloading</td>
<td>Domestic airport where consignment is taken off the airplane</td>
<td>UN/LOCODE</td>
<td>Carrier</td>
<td>Air</td>
</tr>
<tr>
<td>Foreign Port of Unloading</td>
<td>Foreign port where merchandise is unloaded from the conveyance</td>
<td>Five-digit proprietary code</td>
<td>Carrier Exporter</td>
<td>Air, Rail, Ship, Truck</td>
</tr>
<tr>
<td>Foreign Port of Unloading</td>
<td>Foreign airport where consignment is taken off the airplane</td>
<td>Five-digit proprietary code UN/LOCODE</td>
<td>Carrier</td>
<td>Air, Ship</td>
</tr>
</tbody>
</table>
7.2 Defining and Analysing

It is the responsibility of the data harmonization project team to conduct the analysis of these elements. In this context, the analysis of the six elements revealed a similarity in terms of names (‘unlading’ or ‘unloading’), with minor variations in the definitions. With regard to ‘domestic’ or ‘foreign’, the essence of the definition was the location where the goods are removed from the conveyance. It was determined that the terms ‘unlading’ and ‘unloading’ were synonyms. It was determined that the terms ‘foreign’ and ‘domestic’ could be defined by the type of transaction. An export would show a foreign location, an import would show a domestic location.

• Define the information
  • What do you mean when you say “import” or “declaration”??
  • Different agencies have different definitions for common terms
  • Need to be very clear on the definitions

Figure 5:

The analysis also revealed that there were three different coded representations of the element: a four-digit code, a five-digit code, and the UN/LOCODE.

• Analyze
  • The similarity and differences of common terms
  • Actual meaning conveyed by the term

Figure 6:

7.3 Reconciling

The first step is to reconcile and to arrive at one name. Given the result of the analysis – namely, that ‘unloading’ and ‘unlading’ are synonyms – it was decided to use the term ‘unlading’. Since ‘foreign’ or ‘domestic’ can be determined by function (export or import transaction), these words could be eliminated. The reconciled name is ‘port of unlading’. After agreeing to the term ‘port of unlading’, the term was checked against the international standard in the UNTDED. ‘Port of
unloading’ is not a UNTDED term. The UNTDED term is ‘place of discharge’. The issue of coded representation was resolved by an agreement to adopt the international standard of the UN/LOCODE.

Figure 7:

The figure below illustrates the harmonization and standardization detailed above.

<table>
<thead>
<tr>
<th>Currently Collected</th>
<th>From WCO DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port of Unloading</td>
<td>Place of Discharge DM</td>
</tr>
<tr>
<td>Port of Unloading</td>
<td>UN TDED 3225</td>
</tr>
<tr>
<td>Domestic Port of Unloading</td>
<td></td>
</tr>
<tr>
<td>Domestic Port of Unloading</td>
<td></td>
</tr>
<tr>
<td>Foreign Port of Unloading</td>
<td></td>
</tr>
<tr>
<td>Foreign Port of Unloading</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port Code</th>
<th>UNLOCODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 N Customs Proprietary</td>
<td>UN/ECE Recommendation</td>
</tr>
<tr>
<td>5 N Statistical Proprietary</td>
<td>Number 16</td>
</tr>
</tbody>
</table>

Figure 8: Analysis and reconciliation produce the results of data harmonization and simplification.

The lead-agency data harmonization team can undertake much of this work, using the WCO Data Model as the foundation. However, these decisions must be verified and agreed by the stakeholder participating agencies. Should there be a requirement which is not available in the WCO Data Model, the latter can be amended.

Given the broad range of data requirements, it is more efficient to focus these meetings on specific ranges of the data elements. One way to establish these focus groups is by using the data element categories of the UNTDED. The use of this categorization can also be included in the spreadsheet to sort the elements.

- Group 1: Documentation references (0001-1699)
- Group 2: Dates, times, periods of time (2000-2799)
- Group 3: Parties, addresses, places, countries (3000-3799)
Continuing with the example of ‘place of discharge’, a meeting took place involving the agencies interested in Group 3 data elements: Parties, addresses, places, countries (3000-3799). The agencies agreed that the term ‘place of discharge’ and the UN/LOCODE coded representation, as expressed in the WCO Data Model, would meet their requirements. Accordingly, these six data elements were replaced by one, and two coded representations were replaced by one.

8. The Size of the Standard Data Set

As governments and their trade communities begin to develop a Single Window environment, there is an understandable concern about the size of the data set. While the data set may be large, the intention is that it will be the maximum set of data that trade will have to provide. The important message to deliver to trade is that the entire data set will never be required for any one transaction. This WCO Data Model-based standard data set covers all transactions (export, national transit and import), all modes (air, maritime, road and rail), and all requirements of all agencies related to cross-border activities. It is logically and logistically impossible to require all of the data for any one transaction.

9. WCO Data Model and Information Packages

With the advancements made by the World Customs Organization in simplifying and standardizing Customs data, it is now much easier to carry out the steps of analysing and reconciling. However, the painstaking process of gathering (collecting data requirements) and defining (defining current data requirements) will continue to be a methodical and detailed exercise. While the illustrations above refer to the Trade Data Element Directory (TDED), the WCO has additional artefacts.

After examining data requirements carefully, across many jurisdictions and different government agencies, the WCO produced WCO Data Model Version 3.0 in 2009, which remains the only comprehensive collection of data used in a Single Window. The Data Model has since been updated, with a release each year. This not only enriches the content of the data, but also improves the methodology in definition and production of data.
It is a collection of international standards on data and information required not only by Customs, but also by government agencies, developed with the objective of achieving a consensus on the manner in which data will be used in applying regulatory facilitation and controls in global trade.

### 9.1 Object Classes Simplify, Analyse and Define

The Data Model is not only a library of data elements, it is also a collection of object classes or simply classes. A class resembles a real-life object that one comes across in the Customs clearance process. The library of classes helps cut short the time involved in searching for the appropriate definition of a data element of interest, and also helps quickly reconcile the differences. By linking ‘to be analysed’ data with an object class, one can quickly bunch the data elements together and swiftly arrive at definitions.

**WCO Data Model: Growing usage of harmonized and simplified data**

Among other things, the new release contains the new European Union (EU) Customs Data Model (CDM) Derived Information Package (DIP). The EU-CDM has been developed based on the WCO Data Model. It is included as the Technical Annex to the EU Union Customs Code (UCC) and will be used as reference on harmonized and standardized Customs data requirements for the EU Member States.

The new version also contains a report on the conformance of the ASYCUDA information model to the WCO Data Model, particularly on the import and export data requirements (Single Administrative Document – SAD). This report can be used by ASYCUDA users as the reference for establishing harmonized exchange of information based on the WCO Data Model.

Additionally, updates to several data elements are incorporated into the new package, based on the Data Maintenance Requests (DMRs) submitted by Canada, EU, Ghana, Malaysia, the Netherlands, Oman, Sweden, the United States of America and UN/ECE (eTIR), as well as UNCTAD (ASYCUDA).

Source: www.wcoomd.org
9.2 Information Packages: Catalysts for Data Harmonization

The WCO Data Model contains data sets for different border procedures. The data sets include harmonized definitions of data elements, recommended data formats, and suggested code lists.

Apart from the data sets, the WCO Data Model also groups data elements into logical groupings called ‘information models’. These information models serve as reusable building blocks with which one can build electronic document and data exchange templates.

A category of reusable information models is called Information Packages. These are standard electronic templates linked to core Single Window business processes – goods declarations, cargo reports, conveyance reports, licences/permits and certificates. It is a library of data components and electronic document templates that can be used to exchange business data effectively.

The WCO Information Packages provide an effective way to speed up data harmonization. Given the variety of Information Packages published in respect of different sectors, covering Single Window business information across a wide range of processes, it will be relatively easy to identify proper matches for data elements that are supposed to be harmonized.

9.3 Information Packages: Accelerating Data Harmonization

Figure 10
10. Impact on Legacy Systems

One problem that Single Window developers may encounter is the effect of the use of the international WCO Data Model standards on legacy systems. For example, if a country uses proprietary coding for locations, legacy systems (screening, targeting, accounting, etc.) are based on the proprietary codings. Until there is an overall conversion to the new data element names and codes, countries and traders may have to implement translation capabilities. This translation must convert the new, international WCO Data Model standards, translating them into the WCO Data Model data element names familiar to users, and into those codes used in the legacy systems.
Annex: Data Harmonization – Experiences

I. Using Harmonized and Standardized Data in the EU

The following is based on an article by Frank Janssens and Jean-Luc Delcourt of the European Union, which was first published in the October 2015 issue of WCO News (issue No. 78). Diagrams have been added by way of illustration.

The EU Customs Data Model (CDM) is the result of a massive exercise, which was conducted in the context of the implementation of the Union Customs Code (UCC). When new systems are developed based on the new harmonized and standardized data requirements, they will be compatible with the WCO Data Model.

The EU CDM will enable further harmonization of electronic data requirements within the EU, and build a three-tier interoperable structure from the global level to the regional and national levels. Among the expected results are enhanced regional integration, and better interconnection between Customs and other administrations active at the border, as well as between Customs and economic operators.

The Union Customs Code, adopted on 9 October 2013 as EU Regulation No 952/2013 of the European Parliament and of the Council, provides for further EU-wide common procedures and for many new electronic Customs systems with new data requirements. The initiative meets the need for Customs to adapt its ways to the current trade environment and to respond to the opportunity to improve data exchange efficiency, as well as the quality of information supplied by economic operators. Optimizing data exchange is indeed critical to the efficient functioning of trade facilitation-related projects which require seamless cooperation between involved public authorities, such as the setting up of a Single Window environment and the implementation of new developments in the field of supply chain security.

A three-layered approach

As a first layer, and as a seminal basis for any further developments, the WCO Data Model (WCO DM) provides the required global approach and offers the needed harmonization to make co-operative work possible with other public services active at the border. The WCO DM approach not only has indubitable global trade facilitation advantages, but also offers opportunities to further expand regional integration. Where a group of countries wishes to enjoy the economic and political advantages of regional integration, this comes with specific sets of common legislation and administrative practices, which include commonly agreed data requirements and structures.
The EU integrated approach, insofar as data management for Customs is concerned, has found its concrete form in the EU CDM, which constitutes the second layer of development, meant to be entirely compatible with the first one, i.e. the WCO DM.

While the EU Customs Union has achieved remarkable integration, some Customs and border formalities remain nationally defined. The EU CDM, built upon the WCO DM, enables the establishment of national Customs data models as a third layer of completion and detail, themselves compliant with the two others. This layer is especially useful where automated national Customs systems, which need to be compatible with other EU instruments, are developed.

The WCO DM includes Information Packages which are templates for information exchange. As part of these Packages, an EU Customs Information Package, that reflects the requirements of all EU Member States, is being produced.

EU Member States can reuse the EU Customs Information Package to cover national needs beyond the EU CDM. These needs can be administrative, technical, or be linked to other data sources – for example, transport or veterinary authorities. In the same fashion as is done at the EU level, Member States can also generate their extended XML schemas, and if they follow the same schema, both levels will be interoperable.

In terms of information dissemination, this methodology allows the EU CDM information to be made available to Member States’ administrations and their information technology teams, facilitating the development or updating of their systems.

It also allows other users, such as other administrations or economic operators, to inherit the EU CDM and customize it in accordance with their specific requirements, to the extent authorized by EU law. The publication can be done in the native tool format or in other formats which are more widely available.

**Using the EU CDM**

The EU CDM is not only available to EU Member States’ Customs administrations as a source of information on EU legislation and as an instrument to manage data in Customs procedures and automated systems, but also offers some additional opportunities at the national level:

- The reuse and customization at the national level of the WCO DM and the EU CDM Information Package;
- It provides the basis to cover EU Member States’ national requirements by extending the EU CDM Information Package, itself based on the wider WCO DM enriched by data maintenance requests (DMRs) discussed within the WCO’s Data Model Project Team (DMPT) and the Information Management Sub-Committee (IMSC).
The EU CDM is an excellent basis and tool for integrating the needs and requirements of other administrations active at the border. Special mention should also be made on the establishment of an EU Single Window environment. The EU Council recommended, in its conclusions on this subject, “accelerate the harmonization of required data by different authorities at the EU and national level, building on existing international standards, and proceeding with the digitalization agenda.”

This implies:

✓ reusing and customizing the WCO DM, in line with the needs of associated administrations active at the border, in order to establish and operate a Customs Single Window environment;

✓ implementing national adaptations in combination with the above customizations, whilst ensuring compatibility with the WCO DM and the EU CDM, the objective being to allow administrations to adapt the EU CDM to include their own national specificities which are not provided for in EU law, and therefore not included in the EU CDM – an obvious example being the national fiscal, notably excise, idiosyncrasies that can be different in each Member State;

✓ including additional border agencies’ requirements via the submission of DMRs to the WCO DMPT and IMSC.

In parallel, exploring additional opportunities for co-operation with economic operators is envisaged in relation to the use of the EU CDM for streamlining and automation projects, which should further facilitate and harmonize the exchange of information between Customs and economic operators.

Such initiatives include the data mining tool for the ‘Surveillance 2+’ system which ensures the collection of data within the framework of import/export monitoring, and the Binding Tariff Information (BTI) system which includes a database of all BTI applications, as well as the Central System/Reference Data (CS-RD2 system) which provides the bedrock for the use of common codes in the EU’s multilingual environment.

In this way, Customs will considerably improve its role, both in relation to trade facilitation and to control. Moreover, the improved interoperability, induced by better data integration throughout the supply chain and enhanced data quality that will result from the EU CDM, will contribute to a more efficient risk management approach.

II. Data Harmonization – Oman Customs

The following is based on an article published in the February 2014 issue of WCO News (issue No 73).

The Directorate General of Customs of the Royal Oman Police in the Sultanate of Oman is in the process of developing a new Customs system and Single Window based on international best practices and using WCO Data Model Version 3.3 as the basis for the messaging and data components. The Project Director explained that the challenge lay in capturing all of the requirements and accurately documenting the processes and data involved in their ‘business-to-government’ (B2G) processes.

3 The entire case story can be read in the WCO News article, which can be accessed at this URL: http://www.wcoomd.org/en/topics/wco-implementing-the-wto-atf/~/media/CE7BB188E3A.
To understand the structure of and relationships between the data elements within our standardized data set, Oman used a third party software product called GEFEG.FX. The software leverages on a new concept within WCO Data Model v3.3, known as ‘Information Packages’. By mapping its standardized data set to these information packages using GEFEG.FX, the Oman Single Window team could easily define the relationships between our data elements; this, together with the data types, sizes, formats and recommended code lists (where applicable), forms the basis for our Single Window design.

Oman worked with version 3.3 of the WCO Data Model. The team working on the data harmonization project, including their consultants and turnkey implementers, already had experience in data harmonization in several countries. The WCO Data Model proved to be a very useful tool for Oman. As part of Oman’s new Integrated Customs Management System (ICMS) and Electronic Single Window (ESW), the team developed its ‘Data Harmonization’ methodology based on UNECE Recommendation No. 34 – ‘Data Simplification and Standardization for International Trade’.

Oman Customs followed the ‘capture, define, analyse and reconcile’ process for every document and every data element used during the cargo clearance process. For example, Oman captured 110 key documents where we defined 3,783 data elements and produced our first draft of a standardized data set, which included exactly 200 data elements. Of these, Oman was able to map 190 data elements to WCO Data Model v3.3, and for the remainder, the Directorate General of Customs, which falls under the jurisdiction of the Royal Oman Police, submitted Data Maintenance Requests (DMRs) to the WCO, which were approved. The reduction in data requirements in Oman is dramatic, and the simplification Oman has achieved is also significant. The WCO Data Model provides a data set that has been developed because of years of data analysis work done by WCO Members. As more governments move towards trade facilitation, they will contribute to the WCO Data Model so that it becomes an even more useful data harmonization tool for Single Windows in the future. The following schematic presents a snapshot of Oman’s success story in data simplification and harmonization:
III. Data Simplification and Standardization – Singapore

Singapore Customs uses international data standards extensively in its Single Window. There are many international standard codes published and maintained by international bodies such as the UN, ISO, WTO and WCO. These standard codes aim to provide uniformity and consistency in the exchange of trade information between trading partners. Examples of such standard codes are WCO Harmonized System (HS) codes, ISO 3166 country codes, ISO 4217 currency codes, and UN/LOCODE for locations such as ports and airports. The use of these standard codes in the design of the Single Window system ensures that the information submitted conforms to the format set out in these codes. Importers importing the same product will use the same HS code, thereby giving consistency to import declarations. The HS code also gives certainty to traders, as they are able to know the classification of their goods and the corresponding duties and taxes. Traders can also correctly declare the origin of the goods by selecting the correct two-character country code from ISO 3166, hence eliminating potential data entry error when provided with a free-text field to enter the country’s name.

Source: Singapore Customs

IV. ACE/ITDS – United States

The Automated Commercial Environment (ACE) is the United States Single Window, the primary processing system through which the trade-related data required by all government agencies is submitted and processed. Completion of the Single Window is significant for many reasons. Across more than 47 agencies, automated capabilities, agreements, business process and technical
requirements are in place to use the ACE system. The international trade community transmits import and export data electronically in ACE, and government agencies have access to this information to determine security, safety and compliance of cargo. ACE has enabled a transition away from paper-based procedures to faster, more streamlined processes for both government and industry, as well as the divestment of the Automated Commercial System (ACS) – a system in use since the 1980s. ACE provides operational capabilities to support automated interactions between PGAs to enable near real-time decision making. This reduces international trade transaction costs for business and government; improves data quality, which further supports risk management and contributes to streamlined processing; and strengthens border security by providing government officials with better automated tools and information for facilitating release and clearance of cargo, which supports decision making.

Source: U.S.A. CBP

V. Harmonized Reporting – Japan Single Window

The ‘Nippon Automated Cargo Clearance System’ (NACCS) is an integrated national Single Window system, but two decades ago it started as a modest air cargo clearance system. It gradually grew to cover all modes of transport (Air and Sea NACCS).

Initially, it was a central computer with direct data connectivity to all users in government and the private sector. Subsequently, it introduced comprehensive EDI interfaces and web interfaces. After that, it took steps to integrate through data interchange with FAINS (Food Sanitation), ANIPAS and PQ-NETWORK (Animal and Plant Quarantine) and JETRAS (Trade). These steps resulted in the emergence of a ‘one-stop service’ or virtual Single Window system. It is a comprehensive trade information platform which was developed jointly by the government and private sector. NACCS is a comprehensive alliance between government agencies such as Customs, Immigration, Animal Quarantine, Plant Quarantine, Food Sanitation, Harbour Master, Port Authority, Coast Guard, local government, and the Trade Control Office.

A significant step in this project was the simplification of data in respect of the review forms for maritime reporting. A tally carried out indicated that there was considerable duplication in the submission of data: Originally, there were 16 forms relating to reporting formalities by the ship owner/operator to the port state control authorities (including the port authorities, the harbour master, Customs, Immigration and the Coast Guard). Likewise, beyond the reporting formalities, there were eight other forms related to permissions regarding the entry of a vessel into port. In total, there were 24 forms and around 600 data fields to be completed for each stay by a ship. After harmonization, the requirements were reduced to only eight standardized forms for formalities and landing, and only one common form for pre-arrival procedures. The figure below illustrates this clearly.
Figure 3: Reduction in data elements and in forms, achieved through simplification and standardization.

Thanks to harmonization with the WCO Data Model, the total number of forms was reduced from 24 to 9, and the number of data elements reduced from around 600 to around only 200 standardized WCO elements in line with the WCO Data Model. The above figure shows how the Japanese data standardization exercise progressed over a period of time. In the maritime domain, the progress achieved by data harmonization was significant, and the simplification of data requirements in the case of IMO FAL highly so: the reduction in data elements as a result of data harmonization is 3:1.

Figure 4: The desired simplification was achieved in approx. two years.

Japan’s engagement with the WCO Data Model began with the G7 Customs data harmonization process. Work began in July 2003, soon after the introduction of the Single Window system for port clearance. Until then, Japan’s data requirements for cargo reporting were being carried out with the G7 Customs Data Model. The following pictures illustrate how progress was made through the iterative review of forms and data requirements. By November 2005, the desired simplification and harmonization were achieved.

Source: Japan Customs
DEMATATIONALIZATION & PAPERLESS PROCESSING
Services to handle supporting documents using electronic means are an essential feature of a Single Window. Dematerialization of supporting documents is an indispensable part of a paperless processing environment. Technological developments, and the reduction in the cost of storage and networking, have made facilities for the electronic handling of supporting documents more accessible. To keep the cost of solutions low, it would be advisable to follow international standards.
Contents
1. Introduction ....................................................................................................................................... 3
   1.1 About this Part .......................................................................................................................... 3
   1.2 Background ............................................................................................................................... 3
   1.3 WCO’s Role in Supporting Dematerialization ......................................................................... 4
   1.4 Advantages of Dematerialization .............................................................................................. 5
   1.5 Paperless Processing is a Reality .............................................................................................. 5
2. What are Supporting Documents? .................................................................................................... 6
3. Documents or Data? .......................................................................................................................... 7
4. The Supply Chain and Supporting Documents ................................................................................. 8
5. Legal Underpinnings ....................................................................................................................... 10
   5.1 Revised Kyoto Convention ..................................................................................................... 10
   5.2 WTO Trade Facilitation Agreement ....................................................................................... 11
   5.3 ePhyto ..................................................................................................................................... 12
   5.4 CITES ePermits ...................................................................................................................... 13
6. Strategy and Tactics ........................................................................................................................ 14
   6.1 Preparatory Steps .................................................................................................................... 15
   6.2 Collecting Data on Supporting Documents ............................................................................ 15
7. Dematerialization Process ............................................................................................................... 16
   7.1 Referencing Supporting Documents in a Declaration ............................................................ 16
   7.2 Secure Electronic Repository of Supporting Documents ....................................................... 16
   7.3 Content of Supporting Documents .......................................................................................... 17
   7.4 Accessing Supporting Documents .......................................................................................... 17
   7.5 Electronic Signature of Supporting Documents ....................................................................... 18
   7.6 Retention and Transitional Arrangements .............................................................................. 18
   7.7 Managing a New Chain of Trust ............................................................................................. 18
   7.8 Some Ground Rules ................................................................................................................ 19
Annex: Standards and Cases for Dematerialization of Supporting Documents .................................. 20
I - WCO Recommendation ............................................................................................................. 20
II - The French Customs Pilot Project ............................................................................................ 22
III - U.S. CBP Document Image System ....................................................................................... 24
IV - WCO Data Model and the Metadata for Supporting Documents ........................................... 26
V - Regulatory Data Harmonization ............................................................................................... 29
VI - Top Supporting Documents (France) ........................................................................................ 30
### 1. Introduction

The information that Customs and other agencies require to process import and export declarations can be obtained from several documents. These documents (referred to hereinafter as ‘supporting documents’) can be divided into the following categories: (i) transport documents, such as bills of lading, air waybills, consignment notes, rail/road manifests, etc.; (ii) commercial documents, such as invoices, purchase orders, any applicable contracts, technical documentation on products, packing lists, etc.; and (iii) regulatory documents such as licences, permits, certificates, etc.

#### 1.1 About this Part

This Part provides guidelines on supporting documents in international trade. The guidelines highlight the role played in different business processes by supporting documents, how the documents are produced, and how they are managed. The end-to-end process will be described, as well as the life-cycle management of supporting documents.

#### 1.2 Background

Supporting documents are a requirement of most cross-border regulatory authorities, and one of the main causes of process delays. The Single Window environment must provide a comprehensive solution to the question of handling supporting documents through digital means.

Facilitation of cross-border clearance procedures should address dematerialization to enable electronic submission and verification. To achieve this, it would be prudent to follow the steps listed below:

1. Identify all supporting documentation required at a national level for regulatory declaration, separating trade/transport and the public sector
2. Establish an inter-agency task force with a mutually defined lead agency
3. Simplify business processes between agencies
4. Address legislative/regulation issues
5. Undertake the dematerialization process, including access requirements for private sector supporting document data
6. Provide system/human access to the information, possibly via a repository service delivered by a public sector body (e.g. Agriculture, Defence or Culture), or by a private sector body

---

**National Single Window of French Customs**

French Customs is developing the national Single Window (Guichet Unique National, ‘GUN’) for administrative formalities at the border.

Customs continues to develop the GUN and strengthens its role as a referent for managing the international flow of goods.

Thanks to the GUN, available from the secure website [https://pro.douane.gouv.fr](https://pro.douane.gouv.fr), companies no longer have to travel to obtain validation of authorizations, licences or certificates required by fifteen public administrations at the time of Customs release for goods subject to special regulations (strategic goods, products of animal origin, etc.). The interconnection between Customs and public administration applications allows **complete dematerialization of Customs clearance formalities**. The interoperability of the information systems will simplify Customs formalities, and will help businesses save time and optimize their cash flow, while securing their procedures.

**Source:** ‘Customs clearance in France – 40 Concrete measures to support businesses’, [http://www.douane.gouv.fr](http://www.douane.gouv.fr)
(e.g. banks, freight forwarders, brokers, individual companies or commercial secure storage companies).

Figure 1: Hard-copy documents are very expensive and time-consuming for the clearance process.

1.3 WCO’s Role in Supporting Dematerialization

The WCO Recommendation on Dematerialization of Supporting Documents (see Annex I to the current document) recommends that Customs administrations discontinue the requirement of presenting supporting documents (e.g. invoices, bills of lading, packing lists, licences and certificates) in hard copy, if they have already been presented in electronic form, and supports the use of electronic means to access and to verify the contents of those documents. The increased use of dematerialization of documents for Customs clearance works in favour of both government and trade.

The WCO Data Model offers information components that can be used to construct supporting documents such as licences, certificates, permits or other authorizations (LPCO). These information components are the same.

The WCO has forged partnerships with different international organizations to help establish the basis on which dematerialization can be made practical and achievable. The WCO continues to collaborate with the various international organizations that govern standards concerning licences, certificates and permits for cross-border trade. At the same time, it has also served as a platform to exchange information on the various WCO meetings and events concerning use of information technology tools to support dematerialization. Furthermore, the WCO has encouraged industry initiatives, such as IATA’s ‘e-freight’ project, which is an example of a global effort to eliminate the use of paper in cargo clearance.
The process of dematerialization is usually implemented over time and through a programmatic approach, but it must start with the decision of the Customs administrations to move towards paperless processes, including those involving ‘supporting documents’. Customs administrations must therefore work with various partners in industry and with other government agencies. Such a decision will encourage stakeholders to form partnerships with Customs to implement the changeover to a paperless mode of cargo clearance operations.

1.4 Advantages of Dematerialization

The following should be kept in mind:

- E-documents will be referenced in Customs declarations;
- These references will identify the permanent location of the e-document;
- Digital signatures are a means of maintaining authenticity and integrity of the data;
- The signatures and the archived information are long-lived and will be valid beyond the lifecycle of the certificate or the certifying authority;
- Customs can download e-document information as and when it needs.

The purpose of this document is to provide comprehensive guidelines in support of document dematerialization.

1.5 Paperless Processing is a Reality

Paperless clearance implies no hard-copy submission by trade to regulatory authorities and, likewise, no hard-copy responses from regulatory authorities to trade. It involves electronic transmission of all regulatory documents to Customs and to other regulatory agencies (via a Single Window, if one has been established). This eliminates the need to print and manually attach the documents to shipments. Printed or handwritten documents can cause avoidable difficulties in the processing of shipments, leading to costs and delays. Paperless processing means that regulatory authorities, also, can communicate electronically their decisions on release/hold/payment of shipments.

There is an opportunity created by recent technological developments. An increasingly ubiquitous, secure and wireless internet allows traders to submit and access documents anywhere, at negligible cost. The facility can be provided to officials working with regulatory authorities as well. Now, officers can access documentation electronically ‘on the go’, using portable, handheld devices where they happen to be, and not just at their desks.

The ‘apps’ or application programs that run on mobile computing devices are growing ever more popular, especially since they are easy to use: the user can launch them simply by choosing an icon on a touchscreen, and they are simpler to distribute, install and maintain than conventional computer applications. ‘Any time, anywhere’ availability of documentation does away with the need for copying and collating numerous pieces of paper.
Software applications are available for hosting electronic document repositories. The cost of such repositories has also come down significantly. These software applications store and manage the life-cycle of electronic documents effectively, irrespective of whether the documents are scanned images of paper documents, or formatted to contain reusable data. In the last decade, legislation concerning corporate governance, such as SOX (the Sarbanes-Oxley Act) in the US, and legislation on electronic healthcare records, has encouraged the establishment of robust electronic document management solutions. To support compliance with such legislation, industry provides ready-to-use and inexpensive solutions for electronic document management, including third-party document repository and archiving services.

Business processes and workflows that involve the ‘review and sign-off’ documents exchanged in business transactions have benefited from the recent growth in services of ‘on-demand’ online electronic signatures, making a thing of the past the difficulties associated with the cost of digital signatures based on public key infrastructure (PKI). The law in relation to the validity of these signatures is now settled in several countries. This has resulted in the mushrooming of electronic signature service providers to support the conclusion of sales contracts and real-estate purchase agreements. Together, the above developments provide for the deployment of very agile and efficient business processes that hold great promise for making dematerialization of supporting documents a practical reality.

2. What are Supporting Documents?

Supporting documents are documents required to be submitted in addition to the regulatory declarations. These documents are referred to and relied upon during the release and clearance of goods, means of transport and transport equipment.
Supporting documents can be broadly divided into two categories:

i. Key business documents that form trade and transport exchanges, such as the invoice, packing list, purchase order, delivery note, bill of lading, consignment note, etc.

ii. Regulatory documents, such as licences, certificates, permits and other – referred to in the WCO Data Model as ‘LPCO’.

A list of supporting documents is enclosed at Annex IV.

3. Documents or Data?

Business managers often ask how supporting documents can be relevant, given that the aim is to simplify ‘paperwork’ in a Single Window environment, and wonder whether all documents would not be converted into data. Most people do not consider small pieces of information as documents, and make a distinction between highly structured and unstructured information, associating only the former with documents. Structured data is useful for transactional purposes, while unstructured data is used for narratives.

Business processes in an automated environment relate both to data and documents. The WCO Data Model represents structured data that can be instantiated not only as meaningful units of data, but also as documents. Documents are instances of structured data that carry meaning with reference to a business process. It is well understood that business data in transactional documents has to move between documents. For instance, invoices and bills of lading contain information that ‘moves’ into regulatory documents, such as the Customs goods declaration.
The WCO Data Model identifies ‘declaration’ and ‘response’ as the main elements of cross-border regulatory transactions. The electronic declarations made to the Single Window environment contain enough information for the regulatory authorities to take regulatory decisions concerning import, export and transit of goods. The information, however, is normally based on a number of other supporting documents, whose references are provided in the declaration. These references enable the regulatory authorities to verify the declared information and help validate it by referring to external sources. Supporting documents provide solidity and certainty with regard to the information provided in the declaration. It would, of course, be preferable if regulatory authorities and businesses could get rid of references to other documents in their regulatory transactions. That, however, is far from being the practice as governments continue to insist on having access to supporting documents.

In a Single Window, routines of verification of supporting documents can be achieved by accessing the systems that host them. Such access to electronic documents is in fact access to the structured data held in automated systems. Experts therefore suggest that it is not useful to press the distinction between business data and documents.

4. The Supply Chain and Supporting Documents

The international trade supply chain is a highly complex network of business relationships and business processes. Experts have produced analytical models to depict the supply chain for different purposes.

The figure below depicts the Buy-Ship-Pay supply chain. It can be seen that, all along the supply chain, supporting documents are exchanged. They go with the goods and the means of transport from origin to destination, from the seller to the buyer, from the place of export to the place of import.
Figure 4: The different levels at which supporting documents are generated/required in the international supply chain.

**From export to import, four levels can be seen:**

The **first level (L1)** is the Customs level at the border. Declarations today are mostly lodged electronically by exporters/importers or their Customs brokers. This is also the regulatory level.

The **second level (L2)** is the transport level. This level may include multiple means of transportation, from the factory/works where the goods were produced and shipped to the delivery destination required by the buyer. The transport level (L2) includes the stops for controls at borders where controls are applied using automated systems operated by port or airport border management authorities for cargo control, logistics or traffic purposes. In several countries, these are often the port and airport cargo community systems. A cargo community system is a local federation of actors implementing a computerized workflow from the arrival to the departure of the goods, including the Customs clearance.

The **third level (L3)** is the Single Window level. This level facilitates simplified cross-border regulatory agency procedures which use dematerialized documents and data. All official requirements, including certificate requests (origin, licences, quality, sanitary, etc.) are collected. The ‘one-stop shop’ concept can result in a reduction in the number of physical controls. Limited exchange is envisaged between Customs administrations, i.e. between L3s.

Finally, the **fourth level (L4)** is the commercial level. Sellers, buyers, banks and insurance companies exchange many supporting documents that Customs may require for the clearance of goods, or more generally after clearance.

Supporting documents ‘support’ cross-border exchanges in international trade. There are several types of cross-border exchanges that take place in the course of international trade. The figure below depicts the B2B, B2G and G2G exchanges.
Dematerialized documents can be shared within and across borders. In these cross-border exchanges, cross-border jurisdiction is an important issue. While domestic exchanges are governed by national legislation, international exchanges are regulated by international commercial law and international agreements. In the flow of data across frontiers, legal issues concerning the legality and validity of exchanges must be settled.

5. Legal Underpinnings

The question of dematerialization has been discussed in different legal texts and instruments, including those below.

5.1 Revised Kyoto Convention

The Revised Kyoto Convention (RKC) states that supporting documents play an important part in the overall checking of the goods declaration, with Customs taking the necessary steps to satisfy themselves that the declaration is correctly completed. As part of this, Customs must demonstrate that the relevant supporting documents fulfil all the prescribed conditions. The RKC thus envisages a role for supporting documents, but stresses that Customs shall require only those documents necessary: (i) to permit control of the operation, and (ii) to ensure that all requirements relating to the application of Customs law have been complied with (Standard 3.16 of the General Annex). In addition, the RKC provides flexibility to Customs administrations in prescribing the timing and manner of lodgment of supporting documents. They may be lodged electronically with Customs (Standard 3.18), lodged prior to the arrival of goods (Standard 3.25), or submitted within a specified period for reasons deemed valid by Customs (Standard 3.17).
5.2 WTO Trade Facilitation Agreement

Paragraphs 1 and 2 of Article 10 of the WTO Trade Facilitation Agreement provide guidance on how governments can simplify formalities and documentation requirements in relation to import, export and transit.

Firstly, paragraph 1 requires Members to review formalities and documentation requirements with a view to simplification. Whilst recognizing that these serve “legitimate policy objectives”, such as protection against fraud, and prevention of smuggling or tax evasion, it asks governments to factor in “changed circumstances, relevant new information, business practices, availability of techniques and technology, international best practices, and inputs from interested parties”. These factors have a bearing on what constitutes proper levels of document requirements and formalities.

When the review is undertaken, the procedures adopted and/or applied should ensure rapid release and clearance of goods, resulting in reduced time and costs of border compliance (with the least restrictive methods chosen from among the available alternatives). An important part of the obligation under the Agreement is to discontinue the documentation not required to be maintained any longer.

Figure 6: The digital revolution has ensured that documents can be shared from everywhere to every person using secure and trusted repository services.
Paragraph 2 of Article 10 requires Members, on a ‘best endeavours’ basis, to accept paper or electronic copies of supporting documents required for import, export or transit formalities. Crucially, however, paragraph 2 states that where a government agency of a Member already holds the original of such a document, any other agency of that Member shall accept a paper or electronic copy, where applicable, from the agency holding the original in lieu of the original document. (The text does not specify whether the original is an electronic version or a hard copy.) This has critical implications for dematerialization and the Single Window.

In effect, paragraph 2.2 of Article 10 of the WTO Trade Facilitation Agreement enables governments to use documents issued (in hard copy or otherwise) by any of their agencies in lieu of originals submitted by the traders. This Article reminds government agencies within an administration to share documents, if such documents are required to be produced in the course of Customs clearance. Such sharing helps reduce the burden of documentation on traders. Considering that supporting documents are unwieldy when handled in hard copy, the only option left to governments is to handle them in digital form.

Customs and other government agencies need to access regulatory documents which may be systematically controlled in order to clear goods. These are generally documents issued by an authority (other government agencies or ‘OGAs’) working in partnership with Customs.

It would be beneficial if the IT systems belonging to the main OGAs are connected and can exchange data with Customs in order to release the goods. This approach is based on the circular flow of trust between Customs and authorities such as phytosanitary and CITES authorities. Phyto and CITES certificates are two specific areas where, typically, hard-copy documents are generally used. The following would suggest that this need not be the case in future.

5.3 ePhyto

Electronic phytosanitary certification (ePhyto) is the electronic version of a phytosanitary certificate in XML format. A valid document should be produced in accordance with a globally harmonized approach to ePhyto, based on Appendix 1 to International Standard for Phytosanitary Measures (ISPM) No 12. The electronic format contains all the necessary information that can be found on a paper phytosanitary certificate. ePhytos can be handled securely in a digital format, or printed out on paper when required. They can be shared between countries’ regulatory authorities (National Plant Protection Organizations – NPPOs) and the traders to whom the certificate is issued.

Under the aegis of the International Plant Protection Convention (IPPC), the Commission on Phytosanitary Measures (CPM) by approving the format of ePhyto under ISPM 12 has also set up a Steering Group to foster the ePhyto hub.

The IPPC considers that an ePhyto shared through an international hub would reduce incidents of fraudulent certificates, eliminate duplicate data entry, and improve security and efficiency. A global usage would ensure harmonized development. The Appendix which has been developed based on UN/CEFACT standards has also been harmonized with the WCO Data Model, as part of which a Derived Information Package has been developed.

---

1The outline is provided on the IPPC website, https://www.ippc.int/en/ephyto/.
5.4 CITES ePermits

The Conference of Parties to CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) has developed and is promoting an electronic permitting toolkit. The web-based toolkit provides advice on the use of common information exchange formats, protocols and standards for use with electronic permitting systems.

The toolkit was first published in 2010. In 2013, the CITES Secretariat and the World Customs Organization (WCO) reached agreement on the inclusion of standards related to the development of CITES e-permitting systems in Version 3.3 of the WCO Data Model. The agreement has helped further the use of electronic methods in paperless processing of documentation for “sustainable and traceable trade in CITES-listed species”.

For example, a CITES certificate is issued by the exporting CITES authority. This information is sent to the CITES authority on the importing side. The exporting Customs needs to access the dematerialized CITES permit identifier mentioned in the export declaration. The same applies for the importing Customs. The Customs can also update the CITES database, modifying the exported/imported quantity.

A pilot is under way between the Swiss and UK authorities with the objective of using dematerialized CITES certificates. Customs could engage with such initiatives in order to analyse and find a new reprocessing solution.

The question of document content was discussed above. A standard permit has been developed for CITES, which is maintained by the United Nations Environment Programme (UNEP). The eCert standard developed by UN/CEFACT may also be borne in mind.

---

2CITES Secretariat, 2013.
6. Strategy and Tactics

A strategy for dematerialization and paperless processing should have the following elements:

- The declarant should submit regulatory transactional data electronically via declarations, along with references to supporting documents.
- Where it is necessary to submit supporting documents, the declarant should provide electronic access; such access should be embedded within the electronic declaration.
- Supporting documents should be used for verification purposes, and the decision on verification should be driven by the principles of risk management.
- There is no need to routinely verify supporting documents to release the goods.
- Checks are required only for regulatory documents such as licences and certificates, which are legally mandated, or in cases where the risk assessment system requires verification.
- All supporting documents should be presented in dematerialized formats, which should be available in secure and trusted repositories for electronic documents.
- The following three modes of dematerialization have been identified:
  - Verification through access to online databases containing records pertaining to supporting documents. In this case, supporting documents could be generated at the instance of the transaction and the necessary verification accomplished automatically through electronic queries exchanged between the participating IT systems.
  - Supporting documents can be presented as portable electronic files to Customs in standard pre-assembled electronic formats. Data contained in these electronic files can be queried electronically and the required verification can be accomplished automatically.
  - Supporting documents are presented as digitally scanned images of supporting documents, where access is in electronic mode but verification routines are manual.
- Online verification through OGA databases and electronic documents held in trusted repositories should be preferred.
- When Customs/regulatory authorities require the presentation of a supporting document, officers should invariably access the information through an access key embedded in the electronic declarations.

The text box below describes the tactical actions that can be pursued to promote dematerialization of supporting documents.

---

3 Strategy and tactics have been discussed in detail in the WCO bodies. This Section draws extensively on Documents PM0306 and PM0280 of the WCO Permanent Technical Committee.
6.1 Preparatory Steps

In order to achieve dematerialization of supporting documents, it would be prudent to follow the steps listed below:

- identify all supporting documentation required at a national level for regulatory declaration, separating trade/transport and the public sector;
- establish an inter-agency task force with a mutually defined lead agency;
- simplify business processes between agencies;
- address legislative/regulation issues;
- undertake the dematerialization process, including access requirements for private sector supporting document data.

6.2 Collecting Data on Supporting Documents

A comprehensive list of supporting documents used in international trade may be prepared nationally. Customs authorities should collect the following data in regard to these documents.

i. Name of the document
ii. Issuing authority/agency
iii. Location of the issuing authority/agency
iv. What is the primary legislation and regulation governing the supporting document?
v. Does the regulation prescribe the format of the paper form and/or electronic form? Are there data standards that govern the electronic form? Can the issuing authority be expected to conform with the standard electronic form?
vi. At what point in the business process is the supporting document issued?
vii. At what point in the business process is the document relied upon?
viii. Does the supporting document hold deductible amounts or quantities?
ix. What is the frequency of use of the document?
7. Dematerialization Process

An important consideration in the dematerialization project is the availability of the supporting documents to regulatory authorities in real time, at an address on the web. Instantaneous access with a mouse-click will greatly facilitate control and cross-checking. To achieve this, the following is suggested.

7.1 Referencing Supporting Documents in a Declaration

Customs declarations, such as goods declarations and cargo reports filed by actors at the transport and business levels, will include references to supporting documents. The WCO Data Model contains a data grouping called ‘Additional Document’ for supporting documents. In the WCO Data Model, information on supporting documents may be provided at different levels, e.g. at the level of the declaration, at the means of transport level, at the level of the shipment, as part of the regulatory goods item, and at the level of the product. Table 1 in Annex IV provides information regarding the data elements that capture information on supporting documents which could be included in cross-border regulatory declarations.

7.2 Secure Electronic Repository of Supporting Documents

These electronic documents are required to be stored securely in a trusted facility. That facility should meet the accessibility, security and reliability needs of the parties involved. To formalize secure storage arrangements, the issuer or submitter of the supporting document may enter into a legal agreement with the subscribing party or the relying party in respect of the document. The validity of secure access must be coterminous with the validity of the original declaration to the regulatory authority. For instance, the repository service provided by the exporters/importers/Customs brokers or their trusted service providers must keep the document accessible in repositories for all regulatory entities, including the Customs authorities and their designated IT systems, as long as the goods declaration is legally valid.

This repository service can be provided by a public sector body (e.g. Agriculture, Defence, Culture) or a private sector body (e.g. banks, freight forwarders, brokers, individual companies, or commercial secure storage companies). The access to private repositories could be aligned with trusted trader preferences.

When considering port or airport cargo community systems, documents or data concerning transport will be made available to authorities.

A global repository service can also be maintained by the national Single Window in charge of gathering all documents which go with goods. The interface between the cross-border regulatory service IT systems and these storage providers should be defined (e.g. secure protocols).
Figure 8: When connected to trusted online repositories, regulatory authority systems can automatically verify supporting documents referenced in an electronic declaration.

### 7.3 Content of Supporting Documents

This guide does not include electronic formats for supporting documents. There exist several internationally accepted electronic formats to represent supporting documents. The documents can be stored in the standard format. The metadata about the document layout will provide the means for the subscribing parties to access data items in the document. If necessary, the entire content of the document can be downloaded into the regulatory authority system. Where electronic documents are not present, some parties may need scanned images of the supporting documents. In such cases, the content of the supporting documents cannot be processed by a machine as they are not dematerialized.

Today, the control of authenticity and integrity of many paper documents is based on a rubber stamp (with ink) or dry stamp. The visa is stamped by the relevant authority on the export side.

When considering dematerializing theses kind of documents, the stamp needs to be replaced by something equivalent in terms of value. Every paper-based document issued by an authority (or delegated to an authority) on the export side and presented to another authority on the import side can be identified (for example, preferential and non-preferential certificates of origin (COs), certificates of conformity, and textile import licences).

### 7.4 Accessing Supporting Documents

The supporting documents stored in the secure repository can be accessed through a secure URL link mapped to the new data element ‘Document Location’.
7.5 Electronic Signature of Supporting Documents

When supporting documents are submitted for use during processing of import and export declarations, it is useful to have the submitter endorse the documents using electronic signatures. In this way, the submitting and the relying parties enhance the credibility and trustworthiness of documents handled.

PKI-based digital signatures are just one of the means of signing electronic documents. Other types of electronic signature can be used. As well as keeping electronic signatures, the regulatory authorities should keep a time and date-stamped fingerprint of the document to protect its integrity during its life-time. An incorrect fingerprint indicates that the document has been modified/corrupted since it was fingerprinted.

7.6 Retention and Transitional Arrangements

Generally, Customs do not request certain commonly used supporting documents, such as invoices or transport documents. Instead, the Customs regulations usually provide that the importer/exporter (or other entity responsible for paying Customs dues) must provide these documents at the request of Customs, and keep them for x years (depending on the regulations), giving Customs officers the opportunity to scrutinize them as part of a post-control audit.

There will invariably initially be situations where paper cannot be dropped from the business process as the existing laws and procedures require official seals and signatures. A policy on dematerialization must address the question of transitional arrangements, with a view to using scanned paper documents, and to persuading the document issuing authority to move towards an e-document.

7.7 Managing a New Chain of Trust

The dematerialization project will have only limited effect if undertaken solely at a national level. To be more successful, the management of the chain of trust should be addressed at a more global level.

For example, in the case of dematerialization of CITES permits, sanitary certificates or certificates of origin, etc. until the connection between the exporting and importing authority is available, the importing authority may have to formalize an understanding with the exporting authority to guarantee the authenticity of an electronically signed document circulating between export and import.

An e-doc is trusted if its digital signature is valid, in other words, if:

- the e-doc has not been altered (integrity), and
- the issuer of the e-doc is safely authenticated.

It is easy to check the integrity of the e-doc, but a trust scheme is needed in order to authenticate the signer. As mutual recognition of CA signature is still a long way off, an e-document by e-document/issuer by issuer approach, using a valid certificate list (VCL), is proposed for answering the question of who is allowed to sign what.
Computerized checks which would lead to reconsideration of time-intensive (and often unexecuted) controls of paper documents are:

- the signature is cryptographically correct;
- the certificate used for the signature belongs to the VCL;
- none of the certificates of the certification path are revoked (CRL).

The VCL – storing all the approved e-certificates – can be implemented on the export or the import side, and used to certify the authenticity of the signatory.

![Diagram](image)

Figure 9: Customs has access to e-docs and integrity authenticity controls.

### 7.8 Some Ground Rules

The following ground rules should be kept in mind:

- E-documents will be referenced in Customs declarations;
- These references will identify the permanent location of the e-document;
- Electronic signatures are a means of maintaining authenticity and integrity of the data;
- The relying parties (origin and destination countries) agree on the limited question of accepting the certificates of the national certifying authority (CA) issued to the e-document issuing authority;
- The signatures and the archived information are long-lived and will be valid beyond the life-cycle of the certificate or the certifying authority;
- Customs can download e-document information as and when it needs.
Annex : Standards and Cases for Dematerialization of Supporting Documents

I - WCO Recommendation

RECOMMENDATION OF THE CUSTOMS CO-OPERATION COUNCIL\textsuperscript{4} ON THE DEMATERIALIZATION OF SUPPORTING DOCUMENTS
(June 2012)

THE CUSTOMS CO-OPERATION COUNCIL,

ACKNOWLEDGING that the Customs administrations by and large have introduced automated systems for cargo clearance and have committed to apply information technology to support Customs operations, where it is cost-effective and efficient for Customs and for the trade,

CONSIDERING that the use of paper-based documentation in international trade is expensive, time-consuming and prone to error and malpractice,

HAVING REGARD to provisions of Chapter 3 of the General Annex to the revised Kyoto Convention\textsuperscript{5} with regard to electronic lodgement of the supporting documents with Customs,

RECOGNIZING the rapid development of cost-effective, secure and trusted solutions for electronic document management and repository services, and extensive adoption of these solutions by the industry and administrations,

RECOGNIZING that international organizations, government agencies, and industry associations are increasingly introducing standard formats for electronic documents such as licences, certificates, and permits, and are promoting their use in the entire course of the international trade transaction,

AIMING to promote paperless transactions for Customs clearance as an alternative to paper-based documentary requirements,

DESIRING to reduce the cost of trade and to simplify trade procedures by alleviating the burden of delivering, storing, and presenting original paper-based supporting documents during Customs procedures, and

DESIRING to enhance Customs control through the effective use of automated verification and by adopting the principle of risk management,

RECOMMENDS that Members of the Council and all members of the United Nations Organization or its specialized agencies, and Customs or Economic Unions should as far as possible:

\textsuperscript{4} Customs Co-operation Council is the official name of the World Customs Organization (WCO).
\textsuperscript{5} International Convention on Simplification and Harmonization of Customs Procedures (as amended).
(1) identify supporting documents that are normally required to accompany the cargo and goods declarations and examine the need for those documents for Customs clearance with a view to eliminating them;
(2) discontinue the requirement of presenting supporting documents in hard copy, if they have already been presented in electronic form;
(3) process the release and clearance of cargo based only on electronic declaration and automated verification;
(4) enable automated Customs clearance systems to automatically verify information contained in dematerialized supporting documents where such information is accessible electronically in:
    (a) Other government agencies’ databases
    (b) Single Window environments (and Cargo Community Systems)
    (c) Private repositories.

REQUESTS Members of the Council and members of the United Nations Organization or its specialized agencies, and Customs or Economic Unions which accept this Recommendation to notify the Secretary General of the Council of the date from which they will apply the Recommendation and of the conditions of its application. The Secretary General will transmit this information to the Customs administrations of all Members of the Council. He will also transmit it to the Customs administrations of the Members of the United Nations Organization or its specialized agencies and to Customs or Economic Unions which have accepted this Recommendation.
II - The French Customs Pilot Project

The pilot project carried out by French Customs involves the following stages:

Figure 1: Stage 1 – The exporter asks the issuing agency for an e-doc (package PDF file + signed XML file).

Figure 2: Stages 2 and 3 – The exporter sends it (for example, by email) to his client, the importer.

The importer or his Customs broker saves the signed PDF and/or XML file in a repository and then proceeds with the import Customs declaration. Customs (or another authority) can have an access to the XML/PDF file and control it.
(1) Either: The importing authority checks the authenticity and integrity of the PDF/XML file, based on a valid certificate list (VCL of authorized agencies) and the e-signature properties (recognition of the export CA is mandatory); or
(2) The authority requests the exporting Single Window to confirm the authenticity and integrity of the file.
(3) The importer can check the PDF file by a request on the export Single Window website.

Figure 3: Stage 4 – The arrangement between administrations and the trust scheme.
III - U.S. CBP Document Image System\(^6\)

U.S. Customs and Border Protection (CBP) has transitioned to a paperless workflow in the Automated Commercial Environment (ACE). To support transactions, filers can submit supporting documentation to the government during the import process and for export manifests through the Document Image System (DIS). Instead of providing a physical copy of a form, users submit an electronic version (i.e. PDF or JPEG). This process allows government personnel to receive and review documentation in a more timely manner than with paper counterparts.

DIS allows participating trade partners to submit document images and associated descriptive data to CBP electronically. Messages are transmitted in XML format using secure web services, FTP or MQ. The documents are securely stored and made available for review by CBP and Participating Government Agencies (PGAs). Documents submitted via DIS are in lieu of paper documents. The initial phase provides basic document image submission and management capabilities.

Specifically it:

- Allows trade partners to submit document images and associated descriptive meta data to CBP and PGAs in an automated manner, using EDI communication
- Stores all submitted documents in a secure centralized CBP data store and maintains associations with related data such as entry and bill numbers
- Allows authorized users to retrieve, view and annotate documents via a web-based user interface
- Provides basic security, authorization and auditing
- Offers back-end services that facilitate search and reporting capabilities to trade partners to verify the receipt of documents
- Provides capabilities for CBP client representatives to view raw received messages

More details can be found at https://www.cbp.gov/document/forms/dis-implementation-guide.

\(^6\)This case study is based on a U.S. CBP publication which can be accessed at https://www.cbp.gov/sites/default/files/documents/ACE%20Basics%20-%20DIS_0.pdf.
Figure 4: The Document Imaging System and the flow of information in the processing of entry summary declarations.

The Document Imaging System plays a big part in the overall paperless processing strategy in the U.S. CBP ACE and Single Window.
## IV - WCO Data Model and the Metadata for Supporting Documents

<table>
<thead>
<tr>
<th>WCO ID</th>
<th>Code/Name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>185</td>
<td>Additional document name</td>
<td>Free text name of an additional document</td>
</tr>
<tr>
<td>263</td>
<td>Additional document amount</td>
<td>The amount covered by the additional document</td>
</tr>
<tr>
<td>275</td>
<td>LPCO expiration (expiry) date</td>
<td>The expiry date of the licence, visa, permit, certificate, or other document</td>
</tr>
<tr>
<td>276</td>
<td>LPCO effective date</td>
<td>The effective date of the licence, visa, permit, certificate</td>
</tr>
<tr>
<td>313</td>
<td>Additional document quantity</td>
<td>Quantity specified on the additional document</td>
</tr>
<tr>
<td>360</td>
<td>LPCO exemption code</td>
<td>Type of exemption from a licence, permit, certificate, or other document (LPCO) or indication that no LPCO is required</td>
</tr>
<tr>
<td>389</td>
<td>Additional document issuer</td>
<td>Name [and address] of the party having issued the document</td>
</tr>
<tr>
<td>D001</td>
<td>Additional document issuer, coded</td>
<td>Identifier of the party having issued the document</td>
</tr>
<tr>
<td>D002</td>
<td>Additional document issuing date</td>
<td>Date on which an additional document was issued and, when appropriate, signed or otherwise authenticated</td>
</tr>
<tr>
<td>D003</td>
<td>Additional document issuing place</td>
<td>Name of a location where a document was issued</td>
</tr>
<tr>
<td>D004</td>
<td>Additional document issuing place, coded</td>
<td>Place at which an additional document was issued and, when appropriate, signed or otherwise authenticated</td>
</tr>
<tr>
<td>D005</td>
<td>Additional document reference number</td>
<td>Identifier of a document providing additional information</td>
</tr>
<tr>
<td>D006</td>
<td>Additional document type, coded</td>
<td>Code specifying the name of an additional document</td>
</tr>
<tr>
<td>D028</td>
<td>Additional document name</td>
<td>Free text name of an additional document</td>
</tr>
<tr>
<td>DXXX</td>
<td>Additional document image</td>
<td>Binary image of the additional document</td>
</tr>
<tr>
<td>DXXY</td>
<td>Document location</td>
<td>Online location of the document in a URI/URL</td>
</tr>
</tbody>
</table>

### Parties associated with Additional Documents

- Authenticator
- Insurance Company
- Submitter
- LPCO Authorized Party

Table 1: Additional Document Class – information on supporting documents in WCO Data Model Version 3.0.
The WCO Data Model provides the ability to report supporting documents at different levels. The diagrams below illustrate this.

**Supporting Documents in Customs Declaration or Harmonized regulatory declaration**

- **Declaration**
  - 1
    - Additional Document
    - Goods Shipment
      - 1
        - Additional Document
        - Consignment
      - Government Agency Goods Item
        - * Additional Document
        - * Commodity

Information on Additional Document can be supplied at four different levels
The position of Additional Document can be supplied at four different levels
Data Structure of Additional Document Class

I. Additional Document class = Critical Regulatory
   ‘Supporting Document’ information

II. Additional Document Class ≠
    Electronic ‘Supporting Document’

III. Additional Document Class can support

   Binary images or the

   URI location of the electronic ‘Supporting Document’
V - Regulatory Data Harmonization

Regulatory data harmonization involves combining the data requirements of different regulatory agencies into a single declaration. The process is described below. Harmonization of data ensures the elimination of redundant submission of data, but still requires the trader to submit supporting documents.

Regulatory Data Harmonization

Regulatory Declarations are used in exchanges
Starting from R1 to R9 and L1, and R1 to R16
### VI - Top Supporting Documents (France)

<table>
<thead>
<tr>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial invoice</td>
</tr>
<tr>
<td>Movement certificate of origin EUR.1</td>
</tr>
<tr>
<td>Master air waybill</td>
</tr>
<tr>
<td>T2LF Certificate of Customs status</td>
</tr>
<tr>
<td>Pro-forma invoice</td>
</tr>
<tr>
<td>Packing list</td>
</tr>
<tr>
<td>External Community transit declaration/common transit, T1</td>
</tr>
<tr>
<td>Bill of lading</td>
</tr>
<tr>
<td>Certificate of origin Form A</td>
</tr>
<tr>
<td>Declaration of preferential origin on an invoice or other commercial document</td>
</tr>
<tr>
<td>Air waybill</td>
</tr>
<tr>
<td>Declaration of particulars relating to Customs valuation method 1</td>
</tr>
<tr>
<td>ATR certificate</td>
</tr>
<tr>
<td>Excises document</td>
</tr>
<tr>
<td>Authorization to use a Customs procedure with economic impact end-use</td>
</tr>
<tr>
<td>Textile documentary proof of origin</td>
</tr>
<tr>
<td>Production file</td>
</tr>
<tr>
<td>Quality control certificate</td>
</tr>
<tr>
<td>Universal certificate of origin</td>
</tr>
<tr>
<td>Freight note</td>
</tr>
<tr>
<td>Common veterinary entry document (CVED)</td>
</tr>
<tr>
<td>Imported personal belongings list</td>
</tr>
<tr>
<td>Airworthiness certificate</td>
</tr>
<tr>
<td>Declaration of non-preferential origin on an invoice or other commercial document</td>
</tr>
<tr>
<td>Road consignment note</td>
</tr>
<tr>
<td>CMR note</td>
</tr>
<tr>
<td>Internal Community transit declaration T2</td>
</tr>
<tr>
<td>Registration number</td>
</tr>
<tr>
<td>Export licence AGREX</td>
</tr>
<tr>
<td>House moving certificate</td>
</tr>
<tr>
<td>T2L Certificate of Customs status</td>
</tr>
<tr>
<td>TIR carnet</td>
</tr>
<tr>
<td>Phytosanitary import certificate</td>
</tr>
<tr>
<td>Movement certificate EUR.1 (Switzerland)</td>
</tr>
<tr>
<td>Phytosanitary certificate</td>
</tr>
<tr>
<td>CE compliance note</td>
</tr>
<tr>
<td>Information document</td>
</tr>
<tr>
<td>T5 control copy</td>
</tr>
<tr>
<td>Transit T document</td>
</tr>
<tr>
<td>Champagne certificate</td>
</tr>
<tr>
<td>Main bill of lading</td>
</tr>
<tr>
<td>Military goods export authorization</td>
</tr>
<tr>
<td>Export note</td>
</tr>
<tr>
<td>CAP import licence AGRIM</td>
</tr>
<tr>
<td>Acquit-a-caution</td>
</tr>
<tr>
<td>Declaration of preferential origin on an invoice or other commercial document (Switzerland)</td>
</tr>
<tr>
<td>CITES certificate</td>
</tr>
<tr>
<td>Dual use export authorization</td>
</tr>
</tbody>
</table>
SINGLE WINDOW ARCHITECTURE
ARCHITECTURE FOR THE SINGLE WINDOW ENVIRONMENT

To build anything that is large, complex and multi-faceted requires a solid architecture. To build a Single Window environment, detailed architectural descriptions ranging from business architecture, data architecture, application architecture and technology architecture must be produced. In Single Window, a well-developed and comprehensive architecture will save money and protect investment.
## Contents

1. **Introduction** .................................................................................................................. 3  
   1.1 About this Part .............................................................................................................. 3  
   1.2 Relationship with Other Parts .................................................................................... 3 

2. **Architecture & Single Window Environment** ................................................................ 3  
   2.1 Why architecture? ......................................................................................................... 4  
   2.1 What is Architecture? .................................................................................................... 4  
   2.2 Single Window in Architectural Terms ......................................................................... 5  
   2.3 Enterprise Architecture ............................................................................................... 6  
   2.4 Single Window in Japan – An Evolving Architecture .................................................. 8  
   2.5 Single Window Business Architecture ......................................................................... 9  

3. **Application Architecture** ............................................................................................. 13  

4. **WCO Data Model as Data Architecture** ....................................................................... 14  

5. **Technology Architecture** .......................................................................................... 14  
   5.1 Architecture & Total Cost of Ownership .................................................................... 16  

6. **Service Oriented Architecture** .................................................................................... 17  
   6.1 Implications of SOA for Single Window ..................................................................... 19  

7. **Conclusion** .................................................................................................................... 21
1. Introduction

In the context of Single Window, architecture is the process of aligning the strategic vision for trade facilitation and regulatory controls with information technology. The architect’s task is to breakdown this vision into its components in order to put together clear and coherent descriptions, definitions, maps and standards for data, business processes, and technology. The architect can provide the big picture of how the Single Window will function in order to meet the organization’s strategic goals while also producing the detailed blueprint for functional, trade-facing services.

1.1 About this Part

This Part explains the architectural contexts of the Single Window environment. It provides information on Single Window architecture to strategic planners, technology specialists and program managers. Those with a background in designing and executing large, enterprise-scale Information and Communication Technology (ICT) projects can also benefit from this material while preparing strategic plans for building Single Window solutions.

1.2 Relationship with Other Parts

This document is Part VII of Volume 2 the WCO Compendium on ‘Building a Single Window Environment’. The document builds on concepts of architecture described in the WCO Capacity Building Compendium 2010 and applies them to the Single Window environment. It refers to the practice of architecture in the field of information management and relates this practice with the challenges posed by the Single Window approach.

Architecture comprises architectural description. Architects of a Single Window environment would be concerned with different types of architectural descriptions such as business architecture, information architecture, application architecture, security architecture and technology architecture. There are different Parts in Volumes 1 and 2 of the Compendium dealing with this issue:

Part III of Volume 1 provides the strategic options and value drivers in a Single Window environment. Part III, Volume 2 provides a catalogue of basic business processes in a Single Window environment. Part VI, Volume 1 deals with the principles of service design. Business architects will find these three parts are useful in developing the business architecture. Information and data architects will find Volume 2 Part III on Data Harmonization valuable as it provides the blueprints of information. This Part brings together different aspects of business, data and technology into a common theme with the goal of promoting architectural thinking.

2. Architecture & Single Window Environment

Part I, Volume I explains that Single Window could be viewed as a collection of services provided by regulatory agencies to the actors in international trade. Through its services, the Single Window operator manages value streams for the stakeholders by using its technology and organizational resources. To produce the services, people, processes, information and technology components will be developed. These components must be brought together under a coherent architecture.
Single Window architectural processes drives the overall planning, design and development of a Single Window. Some experts call architecture the ‘master plan’, which is an essential ingredient in Single Window development. It is also well-understood that architecture is prepared and signed-off very early in any software development project.

2.1 Why architecture?

A simple system such as an ‘employee payroll package’ can be built by a few individuals, requiring minimal efforts, using simple data structures and code using simple tools. Typically, such a package would be operated and maintained by an accountant. The package would use few set of spreadsheet and database tables – and provide appropriate payroll services to employees. Such systems are relatively easy to build using simple tools and can be maintained by a few individuals.

Building larger systems, however, requires teamwork. No sooner we start building larger and more complex systems, we would begin to begin to realize that such systems require:

a. **Models** that act as artefacts for communication within the team
b. **Process** to build the system from start to finish
c. **Skilled resources** following proven processes
d. **Planning** the work breakdown structures
e. **Powerful tools** to increase productivity

The Single Window environment comprises systems of enormous scale and complexity. It is also a ‘software intensive’ system. It is easy for the project managers to start the development of the Single Window with simple services. However, as the scale and scope of a system increases, the tasks become ever more complex. Project risks regarding costs, quality and time increase. Processes become ever more important to meet schedules. Stakeholder engagement and co-ordination amongst specialists in technology become vital tasks. To help navigate effectively through all these issues, experts see a vital role for architecture.

2.2 What is Architecture?

Architecture is commonly understood in terms of buildings in the real estate. The architect of a building produces several architectural artefacts. The building façade, structural blueprint, plumbing networks, electrical wiring and data cabling, staircase and elevators, safety sensors and building management systems. Each of these artefacts represent architecture but none of them alone is the architecture.

All large systems comprise several major components, and the way these components are related to each other defines the structure of the system. These components interact in some complex ways. Architecture defines these interactions. Architecture is not expressed through a single structure. It is not possible to produce one single structure and call it the architecture of the system. Essentially, architecture defines major system components. For example, the structural blueprint of a building is the major component defined by architecture. The rest of the architectural description is produced by defining the interaction between various components. In the context of an organization, it helps provide a shared sense of understanding of the whole enterprise.
Architecture is not easy to define. Problems in producing a self-contained definition led some experts to say that “architecture is what architects produce.” In fact, architects produce architectural descriptions, which are collection of documents loosely referred to as the architecture. IEEE 1471-2000 (ISO/IEC 42010:2007) provides a systematic approach to describing the architecture process, giving us the understanding of the issues involved. The following description uses the key words from this approach applied to the Single Window Context, which are highlighted below.

2.3 Single Window in Architectural Terms

In a Single Window environment, the stakeholders may operate large systems. The concerns of the stakeholders in a Single Window lie at the root of the architecture. These concerns help identify architectural descriptions. Part VI, volume 1 explains how rigorous descriptions of services can be developed through user stories or use cases. These descriptions are expressions of the stakeholder concern containing both functional and non-functional requirements. Functional requirements are reflections of the business logic and minimally impact architecture. What impacts architecture more profoundly are the non-functional requirements usually represented by words that end with ‘ity’ such as reliability, maintainability, security, availability, accessibility, usability, quality, navigability and so on. These ‘ities’ translate directly into architectural constructs.

Systems don’t exist in a vacuum; they inhabit in an environment. The Single Window environment comprises systems from Customs, Agriculture, Quarantine Services, Veterinary & Animal Health Services, and Food Safety & Inspection Services etc. These systems may have over the years invested in information technology projects, business processes and human resources. These investments would have been made in pursuit of organizational goals or missions of the respective organizations. Each stakeholder has his viewpoint. For example, return on investment is a viewpoint.

Each participating agency would have made investment that was justified based on the projected returns and the timeframe to recover value. Other stakeholders viewpoint could be could ease of integration between systems. Further, a viewpoint establishes the method for creating models. To serve the viewpoint of information flows, one could create the domain information models.

To appreciate various viewpoints, experts have developed different frameworks for ‘enterprise architecture’. These frameworks accommodate multiple views. A popular way of representing these multiple views is shown in the diagram below:
These four layers are common to all organizations participating in the Single Window project. It would be possible to describe their respective data, application, and technological architectures. In the same manner, it would also be useful to draw-up the layers of architecture for the Single Window system.

2.4 Enterprise Architecture

To summarize, architecture is documented using architectural descriptions, which comprise different views that are developed and aggregated through models. Multiple views of the same organization would not be useful unless they are strung together in a framework. The practice of ‘Enterprise Architecture’ and architectural frameworks integrates these disparate views. Three examples of approaches are listed below:

a. Experts have developed different methodologies to develop these views. For example IBM’s Rational Unified Process (called RUP 4+1) describes the software process as comprising the logical, process, development and physical views to describe different scenarios.
b. The US Department of Defense Architectural model (called DODAF) uses three views—these are (i) the operations view that identifies the activities that have to be performed and who performs them. (ii) The systems view defines the systems that fulfill the operational needs focusing also on information exchanges (iii) the technical standards view defines the applicable technical standards, notations and conventions. These three views are interdependent.

c. A more elaborate architecture framework is described in the Zachman Framework (www.eacoe.org) for describing the enterprise. It includes the Scope view, Owner’s view, Designer’s view, Builder’s view, out of context (or Detailed View) and operational view. Each view is elaborated through a model, which is integral framework.

Enterprise Architecture has been defined variously by different authors’ definitions but this document uses the following definition: “Enterprise Architecture is the organising logic for business processes and IT infrastructure reflecting the integration and standardisation requirements of the firm’s operating model.” (Source: Massachusetts Institute of Technology (MIT): Centre for Information System Research)

These streams of developments culminated in the widely known framework of TOGAF (TOGAF stands for The Open Group Architecture Framework.) Under this framework, Enterprise Architecture is divided into three different architecture domains namely Business Architecture, Information Systems Architecture and Technology Architecture. The authors of the Single Window Implementation Framework (SWIF) (Hofman, Keretho, Phuaphanthong, Pikart, Tan, & van Stijn, 2010) adapted TOGAF for the planning and implementation of a Single Window. By applying the TOGAF enterprise architecture methodology the Single Window Implementation Framework helps produce the strategic architecture and masterplan.

Figure 1 TOGAF framework [Courtesy The Open Group]
2.5 Single Window in Japan – An Evolving Architecture.

The following is an example of how an architectural masterplan evolved over a period of time. In its lifetime, the Japanese system of Cargo clearance has morphed itself into a Single Window. The above diagram shows how the architecture of Japan’s Single Window was developed. NACCS or “Nippon Automated Cargo Clearance System” is an integrated national Single Window system, but two decades ago it started as a modest air cargo clearance system. It gradually grew to cover all modes of transport (Air & Sea NACCS). Initially, it was a central computer with direct data connectivity to all users in the government and the private sector. Subsequently, it introduced comprehensive EDI interfaces and web interfaces. Thereafter it took steps to integrate through data interchange with FAINS (Food sanitation), ANIPAS & PQ-Network (Animal & Plant Quarantine) and JETRAS. This resulted in the emergence of a "one stop service" or a virtual Single Window system. It is a comprehensive trade information platform which was developed jointly by the the participating government agencies.

The above figure shows how the Japanese system integration was being planned. It was based an architectural vision of seamless port clearance and cargo clearance. The progression of the architectural vision is shown in a time horizon in which the yearly progression of systems into a Single Window service is achieved progressively. Without architectural vision, it would be difficult to converge the various OGA systems into a Single Window solution.

In a practical example of the application of Enterprise Architecture, David Siah (Siah, 2008) explains the phases involved in the adaptation of Enterprise Architecture for a Single Window solution. It is argued that Enterprise Architecture processes drive the alignment between business strategy and program management defining the scope of individual projects and maintaining traceability between project goals and strategic business drivers. This makes Enterprise Architecture processes essential for e-government solutions. The logical flow for deriving the different
architectural components starting with the business drivers from various participating border agencies has been explained.

### 2.6 Single Window Business Architecture

A Business Architect begins by developing an understanding of the strategic drivers. The main themes of a Single Window are (i) drive towards business simplification (ii) co-ordinated approach to regulatory controls (iii) trade facilitation using ICT techniques and (iv) Co-ordinated actions between Customs and other Government agencies.

The Business Architect models value streams. Value is lost when it takes too long to clear cargo. Value is put at risk when clearance times become unpredictable. Similarly, when traders suffer excessive compliance costs, when regulatory compliance is compromised, government revenue is lost or public safety and security are put at risk, the supply chain participants lose monetarily. Businesses provide value to customers and thus generate revenue. So, the value creation path defines value streams in business enterprises. Similarly, one can model value preservation in the regulatory sphere. Of course, it makes sense for a trader to model and represent the cargo clearance process through a value stream diagram.

The Business Architect does not merely look at the business process; he also produces clear descriptions of the interactions between organizational strategies, processes, roles/structures and organizational performance. Using this intimate knowledge, he assesses how a change in one aspect impacts the other components.

The Business Architect role in a Single Window project is critical because it helps uncover the gaps between the high-level goals of the participating government agencies and their ability of the current systems to fulfil them. The Business Architect then develops "charters" to plug those gaps. Prior to Single Window, a trader needs to access different web portals belonging to different government agencies to complete a transaction. Very often data used in different portals is not in sync with one another, causing numerous difficulties in executing transactions. A Business Architect would look at this as a gap affecting several other areas of organizational effectiveness. Different agencies perform distinct trade-related functions and therefore must maintain trader profiles which are not often up-to-date. This introduces a separate set of problems. In this situation, let us say that the Business Architect charters in a proposal for "single sign-on" and "common business entity account management" to be shared among the different portals of the participating government agencies. With the introduction of these chartered components, the business process landscape changes significantly. Prior to Single Window, a trader needs to access different web portals belonging to different government agencies to complete a transaction. Very often data used in different portals is not in sync with one another and incorporate the changes introduced into the entire system. It is the Business Architect's job examine these interactions and to highlight the attendant changes that single sign-on would bring to the overall ecosystem.
The role of a Business Architect is often confused with that of a business process specialist. The latter is skilled in developing and detailing business processes and in highlighting the process bottlenecks. A business process specialist can also redo the processes in the light of the proposed changes and document the simplification achieved as a result.

The Business Architect examines whether the future strategies and scenarios match with organizational capabilities, and what, if any are the capability gaps. For example, under Single Window, it is proposed to introduce risk-assessment techniques whereby most of the risks will be addressed upfront through the interdiction of consignments based on selectivity criteria provided by participating government agencies. Do the participating government agencies have the capability to develop and maintain selectivity criteria? Do they maintain compliance histories in respect of products they are accustomed to handle? Can they validate new risk criteria against historical trends? Do they maintain risk registers? Are there any organizational roles and operating procedures to ensure that risk management strategies are developed, operated and monitored? So, the Business Architect looks at individual solutions, not in isolation but as part of a **cross-functional roadmaps** to address the identified gaps in organization structure and roles. Thus, the process of risk-based selectivity comes with cross-functional dependencies that relate more to business capability of the organization rather than just the process flow.

Whenever, a strategic review is undertaken, the Business Architect comes into play. A Business Architect typically has a general understanding of the state of the art in ICT, with a strong understanding of the functional domain, and keen awareness of the business motivation embedded into organizational structures and the interdependencies.
A Business Architect looks at the organizational capability (capability models), what drives different organizational units and key organizational roles (motivational models), how value is captured or preserved in the process flow (value streams analysis), activity intensity models depicting the corners of an organization where most of the critical work gets done (heat and risk maps) etc. Again, the role of a Business Architect should not be confused with that of a Business Process specialist who specializes in requirement elicitation, use case development and documentation of business processes.

It is not uncommon to produce high-level business architecture in lay terms. For example, the Canadian Government published document titled Single Window Framework describing the business vision of the Canadian Single Window (Canada Border Services Agency, 2008), providing the a high level description of the concept of the initiative and its benefits. Other experts have developed templates for the producing master plans for the implementation of a Single Window. It is also observed that Single Window implementation requires collaboration with agencies involved in providing services in national e-Governance programmes. (Apostolov, 2008).

Architectural descriptions however have to be systematically developed and rigorously presented. At the same time, these descriptions have to serve as effective tools of communication. The fine balance between readability and technical rigour can to be met by following any of the well-known frameworks. Most enterprise architectural frameworks contain layered approaches to architectural description.

These frameworks recommend the creation of the business architecture as the starting point. Business architecture focuses on business capability, its resource structure and how it uses them to produce business value. Business architecture results in the elaboration of workflows and the collaboration between organizational units to produce end-user services. It also provides the defining features of the engagement between service providers and service consumers.

Some examples of discussions that can take place in the context of Single Window Business Architecture are:

- What checks are participating agencies performing and which of these need to be performed after goods arrive physically? Who performs those checks, and can they be delegated to a single official? What training is required to perform these checks?
- How is the hand-off between Customs and other agency going to take place? Would they be co-located? How will they communicate between one another?
- What legal changes would be required if we cross-empower Customs officers and food & drug officers in each other’s functions?
- Where does documentary examination take place, given that the entire documentation is available online? Can documentary inspection be arranged at a remote location?
- Can we arrange to receive bonds and securities in any office, regardless of the place of import or export?
- What kind changes become possible when Customs officers provide release decisions using hand-held devices instead of desktop based operations.
- If warehouse operators can be entrusted with the stuffing of containers, should Customs supervise the stuffing?
The container yard operator has introduced RFID tags to all containers. What changes are possible as a result of this measure in Customs control of the yard operations? Is it possible to remove officers of all participating agencies from the terminal gates and rely only upon a framework where only a single agency is in control?

These are examples of some of the discussions a Business Architect can help moderate and guide. However, the end-products he would work with are the Business Capability Model and the Business Operations Model.

The Business Capability Model is especially useful in assessing organizational capabilities and how those are extended across the organization. According to Gartner’s glossary, Business capability modelling is a technique for the representation of an organization’s business anchor model, independent of the organization’s structure, processes, people or domains. Business capability models help organizations articulate their capacity in terms of its processes, organization and expertise needed in order to perform core functions. An array of functional modules can reflect an administration’s business capability.

The adjacent diagram provides a view of the functional capability groupings shown as vertical blocks. The horizontal blocks are common system capabilities that underpin all of the functional capabilities. Together, the system capabilities and functional capabilities find expression in the Business Capability Model. As we drill further down into individual blocks we can see the reflection of the organization’s true business capabilities. For example, the adjacent diagram outlines the block dealing with Risk Management & Controls. The generic functional components provide what the Single Window is capable of handling.
Under the umbrella of risk management and controls, there are several components starting with the management of targeting and selectivity to inspection, verification, compliance measurement, commodity profiling and the like. Each block articulates an organizational capability. The grouping of capabilities to support the application of risk-based controls would suggest that they are inter-related. For example, targeting and selectivity helps interdict consignments for inspection. Commodity profiling may help identify risk criteria, which will determine risk rules. These rules will not only help operate selectivity criteria but also help in determining the basis for inspection and examination of cargo in the real time, cargo interdiction at checkpoints or terminal gates, and post clearance audit based controls. In the short term, controls may be applied for on-the-spot compliance verification and in the medium term, systematic compliance measurement would help.

During the process of development of a Single Window, Business Capability Models provide a useful communication tool regarding the overall scope of the solution. Such models not only convey the requirements to the solution provider, it also helps assess business capability of all the participating government agencies and to help map their respective functional roles.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Business Capability</th>
<th>Customs</th>
<th>Plant Quarantine</th>
<th>Animal Quarantine</th>
<th>Food &amp; Drug Admin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodity profiling</td>
<td>Mature</td>
<td>Initial</td>
<td>Initial</td>
<td>Mature</td>
<td></td>
</tr>
<tr>
<td>Risk-rule development</td>
<td>Mature</td>
<td>Non-existent</td>
<td>Non-existent</td>
<td>Non-existent</td>
<td></td>
</tr>
<tr>
<td>Inspection capability</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Initial</td>
<td></td>
</tr>
<tr>
<td>Personnel presence at checkpoint</td>
<td>Always present</td>
<td>Not present</td>
<td>Not present</td>
<td>Present for surprise checks</td>
<td></td>
</tr>
<tr>
<td>Use of audit based controls</td>
<td>Mature</td>
<td>Non existent</td>
<td>Non-existent</td>
<td>Non-existent</td>
<td></td>
</tr>
<tr>
<td>Post clearance of commodities</td>
<td>Non-existent</td>
<td>In quarantine stations</td>
<td>Extensive</td>
<td>Extensive</td>
<td></td>
</tr>
</tbody>
</table>

The above tabulation helps compare functional capability of organizations participating in a Single Window. Artefacts of business architecture help establish the as-is and to-be positions in respect of each function. Capability and performance gaps are identified and addressed well it time before Single Window functionality comes into operation.

### 3. Application Architecture

The application architecture provides arrangement of the supporting software application components that make-up the solution. It includes the IT systems, IT services and functional use cases. The application architecture is supported by the information architecture such as data objects, electronic messaging artefacts and rules and controls over information. The entire set of applications also need to be supported by technology. Information architecture provides a holistic picture of the
intra and inter-organizational flows of information and would include the enterprise data dictionary and the conceptual data model. For example the WCO Data Model which has been described as the data blueprint for the Customs and cross border regulatory agencies could be part of the data architecture. This is explained briefly in the following paragraphs.

4. **WCO Data Model as Data Architecture**

Single Window Environment brings together a number of information systems that interact with each other. In order that these information systems work together and interchange data efficiently, there is a need to produce the common information architecture. This architecture is essential in order that the conflicts between data are eliminated and each of the participating systems in a Single Window is conformant.

Single Window participants are often found to be operating IT systems based on different technology platforms, business processes and data definitions, making it difficult to produce interoperable systems. It is commonplace to have conflicts occurring between information models of participating agencies. For example, in the Australian standard data set (SDS), it was reported that there were more than a dozen different definitions of the term ‘exporter’ in different governmental systems.

In addition to conflicts in definition, there could also be conflicts in the way the definitions are represented in different ways (example: the coded representation of exporter is a maximum of 13 characters in one system and a maximum of 15 characters in another. Structural conflicts could occur when information used in one system is structurally different from those that are used in another system. Experts (Glushko & McGrath, 2008) have documented different types of conflicts that can occur and come in the way of interoperability. Content conflict could occur when two parties use different sets of values for the same component – different code sets being used to describe a coded data element or where the same set of values are used for different set of components (eg. when codes used for units of measure and unit of quantity interchangeably). Encoding conflicts occur when different types of syntax are used. Even when the same syntax is used, if there are structural differences (for example, the structure of an address), it is not possible to share information.

These conflicts can be resolved only when a common information model is used by all participants. To guide players within a Single Window into using standard data architecture, the WCO Data Model has defined the generic content of information for cross-border regulatory agencies. By aligning with the WCO Data Model, Cross-border regulatory agencies can produce and use common content, semantics, syntax and structures for the Single Window Environment. Chapter 4 of Volume II describes techniques of Single Window Data Harmonization, which is the methodical approach to collecting, defining, analyzing and reconciling information for a Single Window Environment.

5. **Technology Architecture**

The arrangement of technology components is described in the technology architecture – interface components, security components, messaging, workflow and database management components are part of the workflow architecture. All these elements are supported by infrastructure components
such as hardware, software platform (operating systems) and networking (infrastructure architecture).

Technology Architecture forms the ‘Phase D’ of the TOGAF Cycle. It consists a set of definitions reusable standards, guidelines, individual components and configurations that are technology-related. By technology-related is meant the different layers of technology eg platform, network, security, application integration, database and governance tools/ Technology Architecture also describes the way these components should be reused to provide the core IT infrastructure-related services through these technical areas. For a Single Window project, it is necessary to establish the Technology Architecture before application development can begin. In the TOGAF Cycle, application development doesn’t begin until Phase E, which is the very next phase.

Technology Architecture must take into account front offices and back offices located in buildings geographically distributed around the country and the functions and services handled in these offices. The criticality of functional services must be assessed in terms of the organization’s core business processes (such as cargo reporting and goods declarations, risk management, post-event activities, pre-arrival and preventive activities, trader account management and policy support). These offices also form the major information generating, information processing and information consuming units. The non-functional requirements necessary to support these core business processes and information flows have a direct bearing on the technology architecture,

Using the analogy of architecture in real-estate once again, it is nearly impossible to effectively build or maintain a large building (say, a high rise) without being in possession of accurate architectural documents—the blueprints for structural, plumbing, electrical wiring, heating, cooling and a variety of other systems and sub-systems. In exactly the same way, a Single Window Environment cannot be effectively built in a multi-agency setting without knowledge of their architecture. Most managers
understand the structural components of their organization through their organization charts where it is easy to locate functional units (such as operations, enforcement, audit, statistics, policy etc) and the reporting relationships and hierarchies. This is a simplistic view of the organization’s architecture. It is possible to draw multiple architectural views of the organization with each view providing distinct value to the process of build and maintaining systems. Enterprise Architecture is the discipline that examines these views.

5.1 Architecture & Total Cost of Ownership

In the event of a breakdown, the building manager keeps the relevant blueprints handy for the repair activity. These blueprints are even more vital for major renovation or refurbishing activity. Likewise, to support the strategic management process of the ‘enterprise’, it is necessary to produce and maintain the relevant organizational blueprints. One of the main reasons for investing in enterprise architecture is to ensure that Information Technology assets are responsive to the strategic activities for Customs. Enterprise architecture provides the strategic context for the deployment of IT systems. It is one of the ways to ensure that the Customs executive management understands the value of Information Technology and its indispensable role in achieving the strategic goals for Customs.

Investment into a Single Window without having the enterprise architectural view is very risky. For example, as the Single Window solution grows, IT systems need to be in line with the organization’s Information Security architecture. New and need to fit with the already existing systems and procedures.

Together, these capabilities and resources define entrenched ways of doing business by both individual government agencies and the private sector organizations. Single Window moves away from this intra-organizational ‘command and control’ operation to one of collaborative exchanges between all stakeholders government agencies. To that extent, a Single Window project has disruptive influence on the status quo.

To understand how the shift to a ‘Single Window mode’ of operating can be achieved, it is essential to produce a rigorous description of the structure and functioning of each of the participating Cross-Border Regulatory Agency, its components and their inter-relationship. Such a description should include the following:

- Organizational structure, roles and goals – in relation to meeting the objectives of cross-border regulation.
- Business processes, business information flows and information systems that participate in service delivery.
- The logical organization of the functions, resources and capabilities of the organizations at the level of businesses. This will include the role that information systems play in the service delivery process.

The specialist task of producing such a description is that of an enterprise architect. Enterprise architecture is a discipline that specializes in providing a architectural solution, which helps produce the IT strategy based on business strategy and providing the background for the organization to improve its effectiveness. Section 8 of the WCO Capacity Building Compendium 2010 provides a
detailed overview on the practice of Enterprise Architecture. The essence of ‘Enterprise Architecture’ is about “finding direct links between the business imperatives of the enterprise and the deployment of technology in order to achieve some kind of alignment between the two.” Such an alignment enhances the possibility for an optimum use of available resources and getting rid of redundant resources. Enterprise Architects help streamline the organization’s use of Information and Communication Technology (ICT) in order to ensure high Return on Investment (ROI) and low Total Cost of Ownership (TCO).

Architectural development also has a capacity building angle. In general, reforms in Trade Facilitation depend on political will. Ideas and initiatives such as the Single Window Concept need strong political support over sustained periods of time. Ideas of architecture can help rally divergent forces towards forging a consensus on the common needs. A country’s internal motivations for reform can find a voice in documents of architecture. Architectural blueprints help countries identify with something concrete on the agreed future and course of action.

In recent time, the role of platforms in technology has increased. A platform is a pervasive service driven by compelling technology. It users can’t afford to be without it, and different types of businesses and software developers bind their own applications to it.

6. Service Oriented Architecture

In Part I of Volume 1, it was mentioned that a Single Window may be understood as a collection of services that support the core regulatory functions of import, export & transit and trade facilitation. These services are predominantly enabled by the information and communications technologies. The appointed Single Window operators (or orchestrators) provides (or supports) the enablement of these services on behalf of CBRAs through a common platform. Broadly, these services result in the regulatory clearance of goods, means of transport and crew.

The ‘services’ paradigm places at our disposal a number of useful technical and managerial tools that can help answer many questions that we may face in the process of building a Single Window Environment. The taxonomic analysis of Single Window Service allows the breaking-up of larger services (business-oriented description of services) into more elemental business services. These business services are supported by IT application services and infrastructural services. To illustrate, the service to process import and export goods declaration is dependent on a service that fulfils cargo examination. For Cargo-examination to occur, the services of scheduling and calendars services of the inspecting staff may have to be invoked. While services describe the fulfillment of a business need, business processes provide the steps involved in fulfilling a business service. One can rearrange business processes to fulfill the same service. All these services have underlying IT and infrastructural components.

Traditionally, these services were established by the respective government departments and logistics service providers as disjointed, discrete services, with little thought given to the inter linkages. At the core of the electronic Single Window is the notion of ‘joined-up’ services in which the focus is on service outcomes for the client. The taxonomy of services helps in charting the process of joining-up and provides a framework to scope Single Window –related projects. Experts have suggested that a typology and a hierarchy of services is a useful methodology for analysis.
A reasonable classification that brings out the dependencies is critical for describing the currently provided services and their inter-relationships. It provides a common language to business analysts and technology architects enabling the platform for effective decision making. This description can be exploited in developing the business and technology architecture for the Single Window Environment.

The most important part of designing the Single Window solution is to describe the ‘to-be’ state of the trader’s (or brokers/ transporter’s) ‘experience’ of a transaction. A statement of description of this ‘to-be’ would serve as the binding link for all stakeholders as they engage in a series of activities of architecture and design.

Each Government Agency can provide a separate view of its services. However, the Single Window concept requires that these should be imagined from a whole of Government and regulatory agencies perspective. Whichever way it is conceived, Service Oriented Architecture provides a clear way forward in delivering a scalable and maintainable Single Window Environment.

Service-Oriented Architecture (SOA) begins with a strong focus on the business services. It does not focus on the technical infrastructure (servers, storage etc) and its associated technical services. SOA is an architectural approach and is technology neutral. This architectural approach is strongly rooted in business services and therefore it is a reasonable choice for architecting the Single Window Environment. Service Oriented Architecture can facilitate the implementation of change in information systems. Traditional IT systems were pieced together by rigidly integrating hardware, software and networking making it difficult to implement. Service Oriented Architecture advises the building of software applications using components that are easy to assemble and build. These building blocks are not pieces of software but are business services that are performed in order to fulfill business needs. Commonly used services can be re-assembled to create new services. Organization for the Advancement of Structured Information Standards (OASIS) developed a standard Reference Model for Service Oriented Architecture (OASIS Technical Committee on SOA, 2006).

In the Single Window environment, the concept of re-usable service components is extremely useful. In spite of differences in areas of regulation, most cross-border regulatory agencies require common business services. These relate to inspection of cargo, crew and means of transport, documentary examination, recording of test results, drawing of samples, computation of duties and taxes, risk assessment framework etc. These service components are re-usable firstly in the sense of business operations and then in the sense of the underlying software service components. While the subject of inspection may vary between government agencies, the stages of process are the same, while the parameters for calculation of duties, taxes and fee may vary, they are all linked to the process of levy and collection. Payment services can be abstracted into utilities that can service all payments arising in the course of cargo clearance.

The Information Technology (IT) components that underpin the reusable services are building blocks that are loosely coupled. This enables re-use of the component. Such loose coupling minimizes the impact of change. Service Oriented Architecture relies upon common parlance use of terms. Where the service consumer (being a software component) requests for a service from a service provider (another software component). The exchange service request and service response is driven by messages and the quality of service is governed by service contracts between the interacting service components.
These characteristics require a ‘service’ to be a self-contained unit whose performance does not depend on the state of other services. It is a logical encapsulation of self-contained business functionality. This autonomous nature of a service component allows software developers to remove it, make changes and plug it back without impacting other components. Services can be orchestrated. This implies that services can be rearranged or re-ordered to suit business purpose. This is of considerable value in handling business processes in a Single Window environment. The figure below shows the ability of SOA components to be orchestrated into

A service communicates with another service using messages. For services to be work together, messages should be interoperable and should work across platforms. These messages should be able to describe and discover services. These should be reliable and secure and based on industry standards.

### 6.1 Implications of SOA for Single Window

Single Window Environment involves exchange of electronic documents (or information units) using standard communication interfaces between the trader’s systems and CBRA systems and between CBRA systems. Standard communication interfaces need to be developed for communications to take place between different service components. Web services are based on international standards.

It is useful to visualize Single Window as a collection of IT driven business services, which form into non-overlapping categories and hierarchical structures. This helps understand the composition of services in terms of IT components. The application architecture under SOA favours loose coupling (modules are easy to detach and re-attach) as against tight coupling where software components are tightly integrated, resulting in compact but inflexible solutions.

Loose coupling of components help identify and lower of cost of services, since software components contribute to specific services. This also helps derive the return on technology and application investments. Historically IT investments were made based on the tight integration between hardware software and networking. The trend on ‘SOA enablement’ started several years ago under which existing (or legacy components) were converted into SOA components by wrapping software interface around them and making them re-usable. While this was expensive, it became an imperative for organizations since the current market environment required the organizations to be lean and agile.
To summarize, Service Oriented Architecture (SOA) is recommended for building the Single Window Environment for the following reasons:

a. SOA is built based on the notion of services. Single Window being Collection of Services makes SOA an attractive conceptual basis.

b. Management understands the attributes of service operations - service availability, service quality, and cost of services. SOA clearly identifies with these concepts and brings them to life.

c. Single Window Environment involves integration of multiple systems investments made by a number of agencies. SOA facilitates integration requires Single Window to be made on the perspective of IT architecture – SOA as the imperative – description of SOA and how SOA can drive interagency integration. Why SOA is the right approach in the current environment.

d. SOA can be designed to be event driven. In Chapter 6 of Volume 1, we had proposed that workflow of business processes should be event driven. Each event in the supply chain would result in incremental flow of data. Depending upon the state of the transaction, different players can access different sets of data to enable them to progress in a Single Window Environment.

e. SOA development is aligned with the software support lifecycle, it enables integration and assembly of disparate software components helping in leveraging existing applications and infrastructure.

f. Under SOA, services are not seen to belong to particular systems or network. Therefore, SOA enables usage of services provided software application services within the Single Window Environment, regardless of the location of the system. It however does not mean that participant can access all services. Appropriate authentication and authorization can be supported at various levels to ensure level to ensure dynamic connectivity and organization between services.

g. Single Window, by nature involves composite services. SOA provides the ability build composite applications based on requirements of different CBRAs.

h. The discipline of SOA helps build an common taxonomy of services and information models.
i. SOA is against building proprietary, built to custom applications. It helps deliver better business value than those delivered by proprietary applications.

In the WCO Survey on Single Window Developments (please refer to Section 1 of this volume, the commonly used business processes and services in a Single Window Environment were described. One of the emerging themes from our study is that success in developing a Single Window environment depends on the ability to identify and establish the basic services that run across government departments and converting them utility-grade services which are:

- Widely used valued within the Single Window user community.
- Highly standardized and cannot be customized easily
- Highly available and fail-proof
- Simple to access using known and openly available interface
- Supported with commonplace skills.

Examples of these type of basic services are identify management, authentication management, electronic messaging, transaction routing, document workflow, document repository services, regulatory information services for products, product identification, visibility services for cargo, containers, and means of transport etc would qualify in this category. In order to support these ‘utility grade’ services, SOA provides the architectural paradigm.

The technology components that support SOA are commonly understood and explained by various authors. Specific technologies that enable SOA will not be described in this document. However, the standards for SOA Reference Architecture exist. The draft standard produced by the Open Group (The Open Group, 2009) describes SOA architecture as comprising 9 layers. The industry provides solutions of different description to fulfill the functionality of these layers, which are described variously by different technology vendors.

7. Conclusion

This Part introduces the concept the architecture in an organization and the role of enterprise architects as developers of master plans for the Single Window Environment. It describes the different architectural views that can be prepared in order to support the high-level planning of a Single Window solution. In order to support the strategic management process of the ‘enterprise’, it is necessary to produce and maintain the relevant organizational blueprints.

One of the main reasons for investing in Enterprise Architecture is to ensure that Information Technology assets are responsive to the strategic activities of the organization by providing the strategic context for the deployment of IT systems. It is one of the ways to ensure that the executive management understands the value of Information Technology and its indispensable role in achieving the strategic goals for the organization. IT investment without having the enterprise architectural view is very risky.

The enterprise architectural view includes business architecture that describes the functions of the organizations and how it performs them. Information architecture provides a complete picture of the intra and inter-enterprise flow of information. It includes the conceptual data model. The inventory of software applications that that serve the organization’s business objectives and missions would form a part of the application architecture. This architectural view also describes how the
applications fit-in with each other as well as with the overall business purpose of the organization. The software platform that mediates between applications – called middleware provides the software environment for the execution of applications. Technology architecture deals with these issues and drives other architectures such as security and software architectures.

Subsequently, this Part dealt specifically with Service Oriented Architecture as the basic paradigm for building large-scale solutions based on information and communications technology. Defining ICT projects in terms business services can help deliver results transparently to project stakeholders. Drawing upon the concept of Single Window as a collection of services which can be deployed using information and communication technologies, Service Oriented Architecture is proposed as the bedrock of design and deployment of software applications. Service Oriented Architecture or SOA as the name implies, is architecture.

Service Oriented Architecture is a methodology involving the use of IT in designing and implementing business services. It has replaced the practice of monolithic architecture that was prevalent for over three decades. It is a fundamentally different way of thinking about IT solutions including software development that has the business side of the enterprise at its heart and can serve as the focus of efforts to integrate different IT applications.

The WCO Data Model which has been described as the data blueprint for the Customs and cross border regulatory agencies could be part of the data architecture. The chapter explains that WCO Data Model supports the manner in which data gets created in the business processes of international trade. It helps us in arriving at a simple functional model for Single Window. The resolution of internal conflicts in data structures and content between different government agencies ensures meaningful communication of information and the analysis of information and documentation is the bridgehead to effective requirements analysis for the Single Window environment. Data architecture is a critical aspect because finding architectural patterns simplifies the identification of the rest of the requirements.

Finally, the central idea of this Part is that architecture can help rally divergent forces towards forging a consensus on the common needs. A country’s internal motivations for reform of international trade can find a voice in documents of architecture. Architectural blueprints help project participants identify with something concrete on the agreed future and course of action. Visualizing Single Window as a collection of IT driven business services and helps understand service composition in terms of IT. Technology platforms for SOA produced by different vendors may vary but all have the underlying philosophy that favours loose coupling over tight coupling. Since this has implication for costs of IT platform and operations and consequently the ‘cost of services’ which is a determinant of the Return on Investments.
INTEGRATED RISK ASSESSMENT

PART VIII
VOL 2
Risk assessment and management are integral to the application of border regulations and compliance. This Part deals with the handling of risks and the implementation of risk-based selectivity in a Single Window environment.
# Contents

1. Introduction 3
   1.1 Relationship to other Parts of the Compendium .......................................................... 3

2. Risk Assessment in a Single Window 3
   2.1 The SPS Agreement and Risk Assessment ................................................................. 7
   2.2 Why Integrated Risk Assessment? ............................................................................. 8
   2.3 Commodities Attract Multiple Regulations .............................................................. 9
   2.4 Risk Management from Concept to Operations ......................................................... 10
   2.5 Identification of Hazards and Risk Areas, and Assessment of Risk Levels ............ 10
   2.6 Agency Response to Risk ..................................................................................... 12
   2.7 Targeting and Risk Assessment Centres – a CBM Perspective .............................. 14

3. Case Studies 15
   An integrated Risk Management Platform Leveraged on Single Window (SW) Infrastructure for Co-ordinated Border Controls 15

Conclusion 20
1. Introduction

The Single Window primarily serves as a platform for the regulatory reporting of import, export and transit goods for release and clearance. In Customs, it is an established principle that goods will be controlled selectively, based on risk. It would not be possible for regulatory authorities to check each consignment. Therefore, in a Single Window, all participating agencies must apply a system of risk-based selectivity to better target consignments posing a potential risk, and to judiciously utilize resources for the effective application of the regulations. The principles of risk-based selectivity apply to all participating government agencies, including Customs. As the lead agency, Customs must build the necessary features in the Single Window environment to facilitate risk-based interdiction.

1.1 Relationship to other Parts of the Compendium

This Part provides an overview and introduction regarding the concept and practice of risk management as currently employed by agencies other than Customs. It supports the basic standards of risk-based controls in the Revised Kyoto Convention and the SAFE Framework of Standards. This Part also discusses the concept of risk assessment, as applied in the context of food and agricultural products, in terms of the principles contained in the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (the ‘SPS Agreement’) and the standard-setting organizations recognized under that Agreement. It considers a range of initiatives promoted under the Green Customs programmes of the United Nations and the WCO, and provides examples of risk assessment in Mauritius Customs. This Part further refers to the case study ‘Integrated Risk Management System’, which was prepared by the Korea Customs Service and published in Volume 1 of the WCO Risk Management Compendium. The strategic context of the Single Window is discussed in Part III of Volume 1 of the Single Window Compendium, which places a high value on the holistic implementation of risk management techniques. Part III of Volume 2 describes business processes where risk assessment is prominent. The current Part elaborates on what it means to provide risk management.

2. Risk Assessment in a Single Window

Most Customs administrations have adopted automated declaration-processing systems. These systems typically provide Customs administrations with the facility to apply selectivity criteria for drawing regulatory attention to different declarations, based on an analysis of risk associated with those declarations. Where a Single Window is not implemented, the declarations are simply Customs declarations. However, in a Single Window, information required by all participating agencies for the regulatory clearance of goods is submitted at a single entry point. The common data requirements of various agencies are harmonized into a single integrated declaration, which may be submitted in different parts. Data received at the single entry point, i.e. at a single virtual address, is used to process the release and clearance of the goods. This arrangement offers an opportunity to all participating agencies to co-ordinate action in terms of inspection and controls based on risk.
The perception of what constitutes risk is different for each agency. However, the framework for managing risk is a common one and can be described with reference to the approach in ISO 31000:2009. This ISO standard comprises a set of high-level principles and guidelines on how to implement risk management in any organization. The framework is based on the ‘plan, do, check, act’ cycle. Planning what needs to be done, executing the plan, checking if the actions have helped achieve the goals, and acting in the identified areas for improvement in the subsequent cycles. This framework is not only useful for Customs, but has largely been adopted by all participating government agencies, as will be seen in the following analysis.

The WCO Risk Management Compendium recommends the adoption of the framework described in this ISO standard, with Volume 1 of that Compendium describing the framework’s application in the Customs context.

Figure 2 illustrates the essence of the risk management process. Any systematic application of risk management will resemble this ISO-defined process. Early iterations of the same basic process have been adopted by different organizations, including the WTO. Article 5 of the WTO SPS Agreement states, “Members shall ensure that their sanitary or phytosanitary measures are based on an assessment, as appropriate to the circumstances, of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organizations.” Figure 2 illustrates the three stages involved in risk assessment – Identify risks, Analyse risks and Evaluate risks. Another organization to have done so is the World Organization for Animal Health (OIE), the intergovernmental organization concerned with the improvement and protection of animal health globally. OIE has developed a framework that looks at the cross-border flow of animals and animal products from the perspective of preventing the spread of disease in animals. Importing countries face a degree of risk of disease and infection when animals and animal products are brought in. OIE recommends that the importing administration conduct import risk analysis in a transparent manner for the importation of animals, animal products, animal genetic material, feedstuffs, biological products and pathological material.

![Figure 3: Framework of risk analysis used by OIE.](image)

To summarize, the text box below provides different definitions of risk assessment adopted by international organizations associated with standards for import and export of food products and products of plant and animal origin.

**Risk Assessment Definitions & Contexts**

*Risk assessment* – the evaluation of the likelihood of the entry, establishment, or spread of a pest or disease ... and the associated potential biological and economic consequences ... (SPS Annex A)

*Risk Assessment: Risk assessment is the process of estimating, as objectively as possible, the probability that an importation would result in the entry of an exotic disease agent and that local livestock would be exposed to the agent. Risk assessment ought to examine the effect of the introduction of an exotic disease. Risk Assessment in the OIE context - MacDiarmid S.C. (1993)*

*Risk Assessment: A scientifically based process consisting of the following steps: (i) hazard identification, (ii) hazard characterization, (iii) exposure assessment, and (iv) risk characterization. (Codex Alimentarius – Definitions of Risk Analysis Terms-related to food safety)*

*Risk assessment: The process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures to be taken against it - (1997 IPPC)*

For decades, Customs administrations have used the tools and techniques of risk management to determine areas of exposure to risk, and the allocation of the limited resources to effectively
manage these risks. In risk management, the technical terms are often used interchangeably and could potentially be a source of confusion. The WCO has developed a glossary of risk management, which serves as a controlled vocabulary. Some of the terms and definitions are listed in the text box below.

**Controlled Vocabulary on Operational Risk Management**
(Source: WCO Risk Management Compendium, Volume 1)

- **Risk**: Effect of uncertainty on objectives.
- **Risk analysis**: Systematic use of available information to determine how often defined risks may occur and the magnitude of their likely consequences.
- **Risk appetite**: Amount and type of risk that an administration is willing to pursue or retain.
- **Risk assessment**: Overall process of risk identification, risk analysis, risk evaluation and prioritization.
- **Risk evaluation and prioritization**: Process of comparing the results of risk analysis with risk criteria to determine whether the risk and/or its magnitude is acceptable or tolerable.
- **Risk indicators**: Specific criteria which, when taken together, serve as a practical tool to select and target movements that pose a risk of potential non-compliance with Customs laws.
- **Risk management**: Co-ordinated activities by administrations to direct and control risk.
- **Risk management framework**: Set of components that provide foundation and organizational arrangements for designing, implementing, monitoring, reviewing and continually improving risk management throughout the organization.
- **Risk management plan**: Scheme within the risk management framework specifying the approach, management components and resources to be applied to the management of risk.
- **Risk management policy**: Statement of an administration’s overall intentions and direction regarding risk management.
- **Risk management process**: Systematic application of management policies, procedures and practices to the activities of documenting, communicating, consulting, establishing the context, and identifying, analysing, evaluating, treating, monitoring and reviewing risk.
- **Risk owner**: Person or entity with the accountability and authority to manage a risk.
- **Risk matrix**: Tool for ranking and displaying risks by defining ranges for consequence and likelihood.
- **Risk profile**: Description of any set of risks, including a predetermined combination of risk indicators, based on information which has been gathered, analysed and categorized.
- **Risk register**: An organizational planning document identifying the administration’s risks and allocating risks to risk owners.
- **Risk tolerance**: An administration’s or stakeholder’s readiness to bear the risk after risk treatment, in order to achieve its objectives.
- **Risk treatment**: Decision or action taken in response to an identified risk.
- **Targeting**: The selection for examination/audit of a certain consignment, passenger, means of transport, transaction or entity based on risk analysis, profiling, document review, observation and questioning techniques.
2.1 The SPS Agreement and Risk Assessment

The Agreement on the Application of Sanitary and Phytosanitary Measures deals with the application of food safety, and animal and plant health regulations. Under Article 2 of the SPS Agreement, Members have the right to take sanitary and phytosanitary measures necessary for the protection of human, animal or plant life or health, which are not inconsistent with the Agreement’s provisions. The measures should be based on scientific evidence, and not be arbitrary or discriminatory. The SPS Agreement defines risk assessment as:

The evaluation of the likelihood of entry, establishment or spread of a pest or disease within the territory of an importing Member according to the sanitary or phytosanitary measures which might be applied, and of the associated potential biological and economic consequences; or the evaluation of the potential adverse effects on human or animal health arising from the presence of additives, contaminants, toxins, or disease-causing organisms in food, beverages or foodstuffs.

The SPS Agreement does away with the need for risk assessment where the applied measures are based on international standards. This is because the international standards are themselves based on thorough risk assessment. Deviation from international standards is allowed, but must be supported by risk assessment.

![Figure 4: A process overview of risk analysis (Source: IPPC).](image-url)
Under the SPS Agreement, where standards do not exist or are judged inappropriate, risk assessment is needed to provide the justification for applying control measures. The International Plant Protection Convention (IPPC) adopted standard guidelines for pest risk analysis (PRA) in 1995, along with the SPS Agreement. PRA is based on risk assessment and risk management. The decision to implement control measures is based on PRA. It also vital to communicate the analysis to officials who make decisions on controls. PRA helps justify phytosanitary measures and is vital in the implementation of phytosanitary systems.

Risk Assessment: What does the WTO Trade Facilitation Agreement Say?

Article 7 of the WTO Trade Facilitation Agreement lays down that each Member shall, to the extent possible, adopt or maintain a risk management system for Customs control (paragraph 4.1 of Article 7). In designing and applying risk management, each Member shall avoid arbitrary or unjustifiable discrimination, or a disguised restriction on international trade (paragraph 4.2 of Article 7).

Paragraph 4.3 of Article 7 clearly indicates that the risk management system may be applied beyond the realm of Customs, and states: “Each Member shall concentrate Customs control and, to the extent possible other relevant border controls, on high-risk consignments and expedite the release of low-risk consignments. A Member also may select, on a random basis, consignments for such controls as part of its risk management.”

The practice of introducing selectivity criteria is also enshrined in the Agreement. Paragraph 4.4 of Article 7 even spells out some of the risk criteria: “Each Member shall base risk management on an assessment of risk through appropriate selectivity criteria. Such selectivity criteria may include, inter alia, the Harmonized System code, nature and description of the goods, country of origin, country from which the goods were shipped, value of the goods, compliance record of traders, and type of means of transport.”

The WTO Trade Facilitation Agreement recommends that the processes of release and clearance of goods be informed by a system of risk management. It clearly suggests that risk assessment may inform not just Customs clearance processes, but also other border agency controls.

2.2 Why Integrated Risk Assessment?

The WTO Trade Facilitation Agreement and the WTO SPS Agreement both align in supporting strategies for border control based on risk. The question is: Should risk assessment and management be disjointed, with each agency looking at risk separately – or should there be a more inclusive, co-ordinated process, resulting in convergence among border agencies when it comes to decisions on interdiction and selectivity?

Figure 5: Risk analysis framework (Source: Food Standards Australia New Zealand).
Risk assessment is a scientific process which is carried out on the basis of data and advance information. It is a systematic process, involving the identification of hazards and the formulation of a qualitative and quantitative assessment of risks. Mitigation steps are taken based on results of the assessment, scientific analysis of data received upon verification to enable authorities follow up actions. Risk assessment involves data, statistical analysis, qualitative judgment and inferencing, and should be viewed as part of the overall process of risk management.

Risk management, on the other hand, is a policy-driven process, involving different layers of administration. Risk management determines the overall levels of interdiction, risk thresholds, governance of selectivity criteria, the workflow processes to manage risk, performance metrics, and the risk management organization. This allows the risks involved in the import or export of goods to be handled in a very flexible manner between organizations participating in a Single Window. The scientific process of risk assessment and the development of risk-based selectivity criteria can be managed by the organization having the relevant expertise. Likewise, the decision-making process in relation to the application of risk-based techniques can be conducted by the agencies that have legal and administrative responsibilities. Independent of these processes, the chosen risk criteria and mitigating measures will be implemented separately in automated systems, such as the Single Window.

2.3 Commodities Attract Multiple Regulations

While Customs is concerned primarily with duties and taxes, it is also often responsible for a host of other regulatory requirements related to economic security, national security, public safety and health. Imported and exported commodities must meet different regulatory requirements. An imported item could be subject to control simultaneously by multiple agencies. Fresh fruits and vegetables are a case in point: producers and exporters must bear in mind the regulations in place in the importing country. Likewise, the regulatory authorities in the importing country should be able to assess the risks attaching to the importation of the produce. In some cases, the regulatory authorities in the exporting country also support compliance with regulations on export products through a compliance and quality assurance process.

Figure 6 provides a glimpse of the number of risks and controls that could apply to fresh fruits and vegetables, with risks indicated in italics.
vegetables. Application of these controls in a haphazard and uncoordinated fashion, with no regard to the overall process, will be detrimental to trade facilitation, as well as to the actual application by regulatory authorities. The Single Window environment provides an opportunity to ensure that the controls are applied in a manner that earns the confidence of businesses, participating government agencies and all other stakeholders.

The analytical process of risk assessment and development of risk criteria could be carried out in a distributed process by the respective agencies. However, the application of controls and actions to mitigate risks can be carried out in a co-ordinated manner. In a Single Window, all data and documents are submitted at a single entry point. This ensures the simultaneous availability of information to all participating agencies. In the absence of a Single Window, where multiple agencies open Windows to receive and process data, the function of risk-based interdiction is distributed. This requires the trader or his broker to approach different agencies and to wait for their individual responses. This splitting up of operations is avoided in a Single Window: as stated, all the regulatory data and documentation must be provided at a single entry point; in addition, there is the opportunity to assess risk and take mitigating action at a single entry point. The implementation of this concept allows all participating agencies to assess risk and identify consignments suspected to be in violation of regulations. Participating government agencies will thus be able to intervene and implement risk-based selectivity for physical inspection, documentary examination, and drawing of samples for testing.

2.4 Risk Management from Concept to Operations

In order for each participating agency to take advantage of the Single Window in managing risks, it must develop an overall concept of risk management at the organizational level. This will include a determination of organizational priorities and responsibilities in respect of risk. Managerial and decision-making roles must be established as part of the operational concept of risk management. The concept will cover surveillance to identify hazards and risks associated with different commodities. It will also include development of the capacity for producers and importers to understand compliance requirements (informed compliance). And it will further cover the implementation of selectivity for inspection, testing and verification of compliance of incoming and outgoing consignments. Selectivity criteria are developed based on a study of risk indicators.

2.5 Identification of Hazards and Risk Areas, and Assessment of Risk Levels

The objective of the risk management process is to identify hazards in terms of impact, assess levels of risk in terms of probability and impact, and then select and implement mitigating measures. During the entire process, there should be two-way communication and monitoring of the actions in that process and the organization implementing it.

The process of risk management begins with the identification of hazards and the risks associated with them. In a typical Customs environment, risks are understood in terms of the loss of revenue, and the smuggling of prohibited/restricted goods. The risks against which a Customs system will take preventive or mitigating action include loss of Customs revenue due to misdescription, under-
 invoicing and over-invoicing, misdeclaration of quantity, and other types of misrepresentation. Traditional Customs violations, such as concealment to smuggle illicit goods, are also risks. Protection against dumping, supply of spurious goods, and goods infringing intellectual property rights, are also of concern for Customs. In a Single Window, however, participating government agencies are concerned about other types of risk. The table below provides examples of hazards and the associated risks.

<table>
<thead>
<tr>
<th>Hazard Type of Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological hazard</td>
</tr>
<tr>
<td>Chemicals hazard</td>
</tr>
<tr>
<td>Radiological hazard</td>
</tr>
<tr>
<td>Product/Equipment hazard</td>
</tr>
<tr>
<td>Communications equipment hazard</td>
</tr>
<tr>
<td>Vehicle/road hazard</td>
</tr>
<tr>
<td>Machinery hazard</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazard Type of Risk</th>
<th>Biological hazard</th>
<th>Chemicals hazard</th>
<th>Radiological hazard</th>
<th>Product/Equipment hazard</th>
<th>Communications equipment hazard</th>
<th>Vehicle/road hazard</th>
<th>Machinery hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risks to hygiene; risks of disease and infection.</td>
<td>Risk to human, plant/animal life and environment exposure</td>
<td>Risk of exposure to radiation; impact on health &amp; safety</td>
<td>Risk of electrical safety, noise, temperature etc</td>
<td>Risk of radio interference, electromagnetic radiation etc</td>
<td>Risk to road safety, environmental pollution etc.</td>
<td>Risk to operational safety with machinery and hand tools.</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Hazards and associated risks.

These types of risk do not fall within the traditional scope of Customs action, but are matters for plant and animal health authorities, food safety authorities, and drugs/pharmaceutical control authorities. Inspectors from each agency may not have a presence in all locations. Some agencies will therefore delegate to Customs the authority to inspect, or to take samples from, import and export goods. (Volume 1 of the Risk Management Compendium describes techniques on risk likelihood, consequence/impact and tolerance ratings, and provides several illustrations.)

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Insignificant Impact</th>
<th>Minor Impact</th>
<th>Moderate Impact</th>
<th>Major Impact</th>
<th>Critical Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near Certain Occurrence</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Extreme</td>
<td>Extreme</td>
</tr>
<tr>
<td>Likely Occurrence</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Extreme</td>
</tr>
<tr>
<td>Possible Occurrence</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Extreme</td>
</tr>
<tr>
<td>Unlikely Occurrence</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Rare Occurrence</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Table 2: Likelihood scale.

Identification of hazards is followed by risk assessment, which is a scientific process involving qualitative and quantitative factors. The analysis involves an assessment of probability and impact. Here, probability is an a priori determination, based on the analysis of past data. The level of risk is assessed based on a combination of probability and impact. The level of risk will in turn help determine the nature of the mitigating action that needs to be taken to deal with it. Table 3 provides an example of risk mitigating strategies for different levels of risk.

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>What does it means?</th>
<th>How to respond?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>If consumers are exposed to this product there is very little probability of any harm to health or safety</td>
<td>Existing controls suffice</td>
</tr>
<tr>
<td>Medium</td>
<td>If consumers were exposed to this product, there would be some probability of harm to health and/or safety</td>
<td>Consider additional preventive controls</td>
</tr>
<tr>
<td>High</td>
<td>If consumers are exposed to this product, there would definitely become some risk to health and safety of the consumers</td>
<td>Additional controls would be necessary starting at the origin of the product going down the supply chain</td>
</tr>
<tr>
<td>Extreme</td>
<td>If consumers are exposed to this product, there would certainly be irreversible, debilitating or catastrophic consequences to life</td>
<td>Immediate and pervasive measures to contain and eliminate the threat at the origin</td>
</tr>
</tbody>
</table>

Table 3: Risk mitigating strategies for different levels of risk.
different levels of risk. The example in Table 3 relates to the risk to consumers from the use of a product. The matrix of probability (likelihood) and impact gives rise to risk levels. Each risk level has a corresponding preemptive, preventive and mitigating response.

2.6 Agency Response to Risk

In light of the risk levels for the importation/exportation of commodities, regulatory authorities calibrate their responses to counter those risks. The types of response can be made by the regulatory authorities, but also by businesses themselves through self-regulation. The following table presents a range of responses that it is possible to roll out when implementing a Single Window environment.
Table 4: Regulatory authorities risks response types.

Each of the above risk mitigation strategies has implications for a Single Window environment. As a minimum, each participating agency must:

(i) Adopt policies based on the principles of risk management.
(ii) Establish a lead office for risk. All agencies should maintain a central risk register, and maintain and use data on compliance history.
(iii) Establish functional roles in respect of risk assessment; appoint officers to the risk management function and communicate with the organization responsible for risk management.

(iv) Proactively publish the list of requirements, with a view to educating industry on regulatory requirements and mitigating risks.

(v) Adopt pre-approval processes for the certification of products and product facilities to reduce risks.

(vi) Adopt a system of licensing and permitting for controlled commodities, along with regimes of inspection to mitigate risks.

(vii) Rely on a system of selective inspection and testing, instead of routine selection of all consignments for examination, testing and referral.

In real time, risk-based selectivity becomes an important aspect. If participating agencies routinely refer consignments for testing, this will reduce levels of facilitation and defeat the main purpose of the Single Window. All participating agencies must spell out, in the necessary detail (within the Single Window administrator), their respective risk-based criteria. Such criteria may include: recommended indicators for referrals; levels of sampling for testing different categories of items; delegation of authority regarding the drawing of samples; periodicity for drawing samples; key risk indicators; percentage selection for physical examination; label checking; and norms for documentary examination.

2.7 Targeting and Risk Assessment Centres – a CBM Perspective

Targeting and risk assessment centres can contribute to integrated risk assessment. Such centres embody the operational concept of inter-agency co-operation in the context of co-ordinated border management (CBM).

Several countries have established targeting and risk assessment centres to promote closer interaction between specific risk management and intelligence personnel from multiple disciplines and agencies. The WCO Risk Management Compendium (Volume 1) briefly discusses this topic, pointing out that there are different organizational models for operating a risk assessment/targeting centre: some are centralized, whilst others are decentralized or hybrid; some are focused on security and protection against terrorism, whilst others are more focused on regulatory compliance.

Regardless of the model, targeting centres depend on the centralization of sources of information, and the availability of advance information. Whilst the WCO study on these types of facilities reveals that there is no ‘one size fits all’ solution, there are nonetheless common themes, including: centralized management of selectivity and targeting criteria; control over information sources and systems; round-the-clock operations; capacity to co-ordinate with field officers and operations; real-time action on risk; active hotlist tracking; and the provision of a feedback loop on the results of action based on targeting. With the presence of key resources from all participating agencies, targeting centres provide a platform for co-ordinated border management.
Targeting centres help manage centrally all systems of selectivity across multiple agencies. Such management would not be possible without close co-operation and co-ordination between agencies. When the selected targets result in a ‘hit’, the centres can quickly decide on how to deal with it, by rapidly dispatching the required information to frontline staff regarding the nature of required intervention. Targeting and risk assessment centres also act as hubs for exchange of information on alerts, lookouts and offenders. This helps move information rapidly into the selectivity system and also to the field offices. Volume 1 of the WCO Risk Management Compendium suggests that, in many countries, Customs have invited other border agencies to work in the centre. Targeting and risk assessment centres can greatly contribute to the successful implementation of integrated risk assessment in the context of a Single Window.

3. Case Studies

There are considerable gains to be derived from following a system of integrated risk assessment. These are discussed in the case study by the Korea Customs Service, 'Integrated Risk Management System', which has been published in Volume 1 of the WCO Risk Management Compendium. Furthermore, the Customs Administration of Mauritius has contributed a paper on risk assessment in the context of a Single Window. The case study below is based on that paper.

An integrated Risk Management Platform Leveraged on Single Window (SW) Infrastructure for Co-ordinated Border Controls¹

1. Customs administrations are playing a major role in promoting trade facilitation, as well as enforcing effective control over the movement of people, goods and conveyances. An integrated and holistic risk management approach has been recommended in the WCO Risk Management Compendium, with a view to ensuring co-ordinated border controls, allowing effective allocation of resources, and targeting of high-risk consignments/passengers. In turn, this should expedite clearance of low-risk consignments and genuine passengers/traders.

2. With the advent of the Single Window concept, Customs and other government agencies (OGAs) have been brought together to work on a single platform/architecture, underlying the need for effective communication, increased collaboration and co-ordinated interventions to keep the balance between trade facilitation and border control. Before the inclusion of OGAs in the Single Window architecture, Mauritius Customs was implementing its own risk management approach, embedded in its national Customs system, called the Customs Management System (CMS).

¹ A paper by Anoushka Permalloo, Mauritius Customs, presented to the WCO Information Management Sub-Committee in June 2013. This case study is based on that paper.
3. Based on internal risk parameters, Customs routes traders’ (import, export, transit) declarations to three different channels: the Green Channel, the Yellow Channel and the Red Channel. Green Channel declarations relate to consignments involving no risk/low-risk criteria, implying clearance from Customs within 30 minutes. Yellow Channel declarations relate to consignments requiring documentary evidence or involving queries, as determined by Customs. These declarations could be cleared within one hour. Red Channel declarations involve mandatory sending to examination bays because of the high-risk indicator settings hit. Red Channel declarations could be cleared within three hours to one day, depending on the nature of consignment inspection.

4. At a later stage, with the arrival of the Authorized Economic Operator (AEO) concept recommended in the WCO SAFE Framework of Standards, the Blue Channel was introduced for automatic clearance of consignments for authorized operators. This involves faster Customs clearance, based on a trusted relationship with economic operators, and their proven compliance. The channel distribution and related treatment are depicted in Figure 7 below.

![CUSTOMS RISK MANAGEMENT](image)

**Figure 7: Channel distribution and related treatment.**

*Note: BOE = Bill of Entry (goods declaration)  
COR = Customs Offence Report*

5. The Single Window architecture is based on one-time submission of electronic trade data from a single point of entry in real time. ‘One-time’ submission implies that data submitted will be incrementally used as one moves through the process workflow in the Single Window. OGAs included in the existing Single Window architecture for electronic licence/permit approvals must comply with best practice in terms of Customs risk
management and the AEO concept, through risk intelligence exchange. The SW architecture for the Mauritius national Single Window is shown below.

Figure 8: Single Window Architecture.

6. In order to provide low-cost implementation of the Single Window, a web portal has been chosen to allow increased flexibility and efficiency of processes, and the plugging in of future OGA workflows. The one-time submission of goods declarations and licence/permit applications is effected by a declarant/authorized trader from a single point of entry, which is the Single Window portal. As one moves through the process embedded in the Single Window workflows, data is incrementally provided, without the need for the declarant/trader to enter the same data repeatedly in the logic of business processes, covering OGA clearance in its entirety.

7. Both OGAs and Customs will have independent risk parameter settings to ensure the confidential treatment and independent consignment hits of agencies. The risk engine for OGAs will process the data entered and provide alerts to the respective agencies, based on individual risk settings. Possible fields of concern include country of origin of consignments/products, commodity code, supplier identifier, importer identifier, exporter identifier, Customs regime for transaction, country of intermediary destination (transit),
port of landing, and manifest details (e.g. vessel name, flight number, voyage number, bill of lading number, container number).

8. OGAs may decide on an internal logic for determining the degree of risk of a submission. Risk will be classified into three categories: low, medium, and high. Each category will be attached to a set of predefined workflows in the Single Window. Once submission goes through the OGA risk engine, the agency will be alerted to the degree of risk pertaining to the goods declaration submitted. Probable scenarios for OGAs are listed below:

<table>
<thead>
<tr>
<th>Risk category</th>
<th>Risk Settings</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>Highly compliant Importer/ Country of Origin/ low risk commodity code</td>
<td>Agency clearance granted</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>Country of Origin under monitoring</td>
<td>Agency clearance may be granted if documentary evidence in order</td>
</tr>
<tr>
<td>HIGH</td>
<td>Highly non-compliant importer/ country of origin, dangerous commodity, risk of contamination</td>
<td>Request for Consignment Inspection to Customs Authority</td>
</tr>
</tbody>
</table>

Table 6: Treatment for risk categories.

9. If an application has been hit by a high risk parameter setting, the OGA will be alerted on the SW portal with parameters for which the consignment was selected. The agency will electronically send an inspection instruction to Customs through the Single Window, into the linked Customs Management System. It should be noted that a consignment may be hit by multiple agencies’ risk settings in cases where an application involves the approval of multiple agencies for clearance or for the issue of permits/licences. Under current legislation, any inspection needs to be carried out in the presence of the trader or his authorized representative (broker). Consequently, mutual agreement needs to be reached by Customs, the agency and the trader/broker to call at an examination bay for the physical inspection. The request for an appointment may be electronically triggered through the Single Window portal by the trader/declarant who will be informing agencies and Customs about the consignment’s arrival/departure. The SW electronic platform may be extended to automatic allocation of examination slots at regular time intervals.

10. The consignment will be inspected jointly by Customs and the OGA(s) concerned, thus eliminating several distinct inspections, and enforcing co-ordinated border control. Due to the harmonized business processes and data elements encompassed in a Single Window, standard messaging will be enabled for different exchanges of information/consignment statuses, including G2G, G2B, B2B (for linkage between a cargo community system and trader/declarant) and B2G. The trader/declarant will thus be kept informed electronically about agency clearance, Customs clearance and inspection requests, where applicable. As recommended by the WCO SAFE Framework of Standards, more than one solution may be used for data exchanges, which can include international standards such as XML, UN/EDIFACT, or email. The trader/declarant may be informed of consignment status through either email notifications or through the portal.
11. The second risk engine (that located at Customs level) will be solely for Customs control, and agencies will have no visibility on the same, unless required under legislation for criminal investigations. Once an application has gone through the OGA risk engine, it will be routed to the engine embedded in the Customs system, where the routine of selectivity will be triggered to alert Customs about the channel for treatment (Green, Yellow, Red or Blue Channel). The scenarios below are highlighted to better illustrate co-ordination.

<table>
<thead>
<tr>
<th>Agency Risk Settings</th>
<th>Customs Risk Settings</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Hit to Red Channel</td>
<td>Customs carrying out examination</td>
</tr>
<tr>
<td>Hit to High Risk</td>
<td>None</td>
<td>Agency/Agencies request for Inspection to Customs for joint/coordinated inspection</td>
</tr>
<tr>
<td>Hit to High Risk</td>
<td>Hit to Red Channel</td>
<td>Agency/Agencies request for Inspection to Customs and all CBRAs perform joint/coordinated inspection</td>
</tr>
</tbody>
</table>

Table 7: Joint/co-ordinated interventions.

12. The outcome of an effective risk management approach also results in promotion of voluntary compliance by traders. The AEO programme, whereby recognized traders benefit from fast-track cargo delivery, is another Customs best practice which can be applied at OGA level. As per the compliance management model in the WCO Risk Management Compendium, a high risk level is associated with highly non-compliant clients. This is shown in the table below.

Table 8: Compliance management model.

13. Risk parameters for AEOs will be set by OGAs, such that their agency clearance process is expedited, with examination excluded unless high-risk cargo criteria are hit. The holistic risk management approach will thus provide incentives for trader compliance, and effectively and efficiently detect and punish non-compliance.

14. A legal framework needs to be established to cater for the SW processes flow. Legal issues to be handled for a co-ordinated risk compliance approach for CBRAs include:
The electronic movement of information between CBRAs, which should be prescribed in relevant legislation. A single electronic submission of data legislation may be applied for all the CBRAs;

The legal liabilities and obligations of agencies in relation to data handling;

The legal liabilities and obligations of the service provider in relation to data handling, data confidentiality, the helpdesk and maintenance of the system; data privacy and information transparency; and submission of electronic documents as part of the SW process;

Legal definition of the liability of third parties in relation to their ability to use and exchange data;

Action of checking declarations, confirmation of verifications and legally valid notifications arrived at by CBRAs;

Binding agreement on the service levels to be achieved across the different business processes of CBRAs;

Legal amendments to cater for fast-track clearance for authorized economic operators;

Government Management Entity, to be mandated by national legislation, to manage any changes to be introduced in the risk management module of the Single Window; and

Any conflicting issues relating to co-ordination among CBRAs.

Conclusion

Integration of the risk management platform in a country’s Single Window architecture is of critical importance to enforce both trade facilitation, and effective and co-ordinated border control assisted by standardized information, advance receipt of cargo information for risk management, and standardized data exchange, leading to efficient real-time communication and joint interventions. As part of this, the national Single Window will apply international standards for joint interventions by CBRAs, and expedite clearance for compliant traders, with the aim of promoting trade facilitation and voluntary compliance by traders.
PERFORMANCE MANAGEMENT & SUSTAINABILITY
Volume 2

Part IX

Performance Management & Sustainability

This Part provides an overview of measures of performance, methods for measuring, benchmarking, and the processing of measured results, with a view to problem solving and to sustaining cycles of continuous improvement in the Single Window environment.
## Contents

1. Introduction ....................................................................................................................................... 3  
   1.1 Relationship to other Parts of the Compendium ................................................................. 3

2. Performance Evaluation and Measurement ...................................................................................... 3  
   2.1 Frameworks for Balanced Performance ............................................................................. 4

3. Cycles of Continuous Improvement ................................................................................................. 4  
   3.1 Process Orientation ............................................................................................................... 5
   3.2 Developing Measures and Indicators .................................................................................... 5
   3.3 Achieving Excellence in Customs (AEC) ............................................................................. 6
   3.4 Maturity Models and Indices .............................................................................................. 7
   3.5 The UNECE Single Window Roadmap ................................................................................. 7
   3.6 World Bank and other Global Indices ................................................................................. 9

4. WCO Single Window Maturity Model ............................................................................................... 12

5. Analysis of Results ......................................................................................................................... 19  
   5.1 Time Release Study (TRS) .................................................................................................... 19
   5.2 TRS in the Korean Single Window ....................................................................................... 20

6. Single Window – Continuous Improvement .................................................................................... 20  
   6.1 Reduced Time and Cost from a Single Window ................................................................. 21
   6.2 Satisfaction Surveys – Qualitative Measures of Performance ............................................. 22
   6.3 Balanced Scorecard for Performance Measurement ........................................................... 22
   6.4 Business Continuity ............................................................................................................. 23

7. Decision-Making and Implementing ............................................................................................... 23  
   7.1 Quality and Continuous Improvement ............................................................................... 23
1. Introduction

A Single Window is only as good as what it does. Ultimately, any Single Window facility will be judged by its performance, and this should be evaluated and measured using a sound methodology. Has the Single Window achieved the business process goals which were originally set, in terms of savings in release and clearance times and in compliance costs? Has it delivered on its scope and coverage? Have the desired functional features of a Single Window been implemented? Do the services deployed meet the benchmarked levels of performance? Are the users of the Single Window satisfied with their service experience? Has the Single Window resulted in improvements in the effectiveness of regulatory controls? Has the clearance process led to reductions in transaction costs and cycle times?

Performance evaluation and measurement is the art and science of answering these questions. It is a management process that assists the governance of any system or project, including the Single Window, by providing concrete answers to the most significant ‘value for money’ questions.

1.1 Relationship to other Parts of the Compendium

This Part describes an approach to performance measurement and continuous improvement in a Single Window environment. It relies on qualitative and quantitative data collected on the performance of a Single Window. It takes into account a range of techniques, such as the WCO Time Release Study (TRS), performance measurement, satisfaction surveys and inter-agency business continuity plans. It is in tune with the overall WCO framework ‘Achieving Excellence in Customs’, and includes a concrete example provided by the Korea Customs Service.

The strategic context of a Single Window is discussed in Part III of Volume 1. This Part provides the tools needed to assess whether the organization is moving in the predetermined strategic direction. Part I of Volume 2 describes the development of the business case. Hard numbers on performance are necessary to establish the business case a priori and post implementation.

2. Performance Evaluation and Measurement

Implementation of a Single Window is a relatively hard task because it involves regulatory issues relating to Customs, other government agencies, and the compliance behaviour of businesses. The business processes of production, shipping, and obtaining clearance, are highly interdependent and involve multiple agencies. To clearly identify bottlenecks and achieve the goals of the Single Window, it is necessary to have numbers. In assessing the performance of the facility, one will be able to show how well the participating agencies are working together towards shared goals after implementation. This is challenging for the Single Window ‘system owner’. The lead agency should assume responsibility for undertaking performance evaluation and assessment on a regular basis.
2.1 Frameworks for Balanced Performance

Most Customs administrations implement performance measurement systems. These systems help senior management pay close attention to results achieved, to responsibility for targets, and delivery. Performance indicators and measures can serve many purposes. They communicate to the outside world the ‘state of health’ of the organization. In the context of service, they provide a picture of the quality of service.

There are many frameworks available for looking at performance holistically. One such framework is the balanced scorecard, a strategic tool that allows structured reporting. It is used by management to keep track of the performance of activities by employees, and to monitor the impact of their actions. The balanced scorecard approach forces executive management to recognize that there are several layers of activities that contribute to an organization’s success. The most important task of senior management is to ensure that the monitoring of these activities is fair and balanced.

The WCO has developed a series of benchmarks in relation to the performance of Customs administrations. The framework ‘Achieving Excellence in Customs’ aims to align the goals of Customs administrations with international instruments. It seeks to achieve a balance between the competing objectives of trade facilitation, security, protection of society, and fair and efficient revenue collection. This balanced approach must be underpinned by institutional and human resource strategies, including strategic planning, HR policies (such as balanced performance monitoring), training and skills development, and preventive vigilance.

![Figure 1: A holistic and balanced performance.](image)

3. Cycles of Continuous Improvement

Continuous improvement is the ongoing programme of improving products, processes or services. Improvements can be incremental (through efficiency measures) or breakthrough (based on re-engineering or problem solving).
The four-step ‘Plan-Do-Check-Act’ model (the Deming Cycle) is a commonly used model for continuous improvement. Other well-known models are Six Sigma, Lean Manufacturing, and Total Quality Management (TQM). All these frameworks have common themes: process standardization, process measurement, cycle times and reduction in variability. Improvements are accomplished through teamwork and close involvement of personnel.

Figures 2: Cycles of Continuous Improvement

To further illustrate the key aspects in the context of the Single Window, this Part looks at the four-step cycle ‘Measure-Analyse-Decide-Implement’. One of the most popular ISO standards, ISO 9000:2000, promotes this concept of quality improvement.

3.1 Process Orientation

The ISO 9000:2000 standard defines a process as “an integrated system of activities that uses resources to transform inputs into outputs”. As outlined in Part III of Volume 1, the Single Window can be broken down into several key process models, made up of many interconnected processes which are bound together through input/output relationships. Each process can be broken down into subprocesses. This breaking down of processes can go on until the elemental processes lend themselves to the identification of specific activities and of individual roles that are responsible for the activities. Each activity has an indicator for successful completion and a measure for effectiveness (how well do results correlate with targeted objectives?), as well as for efficiency (how well do resources get converted into results?). Thus, process orientation must involve process modelling, the description of activity structure, the identification of roles and responsibilities, and the measurement of activities.

3.2 Developing Measures and Indicators

Process measures and indicators help test whether stakeholder expectations will be met. Several types of measures and indicators can be formulated in the context of a Single Window environment. This Part looks at many high-level measures and indicators which are used globally. It then moves onto specific measures in the context of a Single Window environment.
3.3 Achieving Excellence in Customs (AEC)

The WCO framework ‘Achieving Excellence in Customs’ draws on WCO Members’ experience of performance measurement to derive a core set of performance indicators which they have found useful. This helps in producing measures and indicators that meet stakeholder expectations. The AEC consists of 20 first-layer indicators, depicting the four primary areas of work covered by the WCO and contained in the Strategic Plan: ‘Trade Facilitation and Security’; ‘Fair and Effective Revenue Collection’; ‘Protection of Society’; and ‘Institutional and Human Resource Development’. In addition to the first layer of high-level indicators, the ‘Achieving Excellence in Customs’ framework anticipates a second layer of performance measurement, to be developed as a maturity model. The latter may include necessary elements, such as steps to be taken, or may act as a development guide or simple set of specific indicators. Using these, WCO Members will be able to assess their performance with reference to three levels: ‘implemented’, ‘under development’ and ‘still to be done’. This Part discusses a maturity model in the context of the Single Window.

![WCO AEC Maturity Model](image)

Figure 3: WCO AEC Maturity Model

---

1 Discussed at meetings of the WCO Permanent Technical Committee.
## 3.4 Maturity Models and Indices

A maturity model for the Single Window will allow a Customs administration to assess its implementation using best practice, against a clear set of external benchmarks. The evaluation of Single Window implementation against a maturity model will result in the awarding of a particular ‘maturity level’. In the WCO AEC, there will be indicators, but no numbered levels. A ‘maturity level’ helps develop the precise path towards making improvements and reaching the next level of maturity. The WCO maturity models in the AEC framework are meant to be used as self-assessment tools, but are based on a set of globally understood benchmarks that can be independently verified. Such benchmarking should help Customs administrations continuously develop their Single Window implementation.

In the AEC framework, ‘Single Window’ comes under ‘Trade Facilitation and Security’, and is part of the subcategory ‘Partnership & Connectivity’. The Single Window is treated as an indicator of performance under the umbrella of ‘Co-ordinated Border Management’.

## 3.5 The UNECE Single Window Roadmap

The UNECE Single Window Implementation Framework (SWIF) outlines an evolutionary Single Window roadmap with five maturity levels, allowing implementation specialists to assess the ‘as-is’ situation and gradually move towards the desired ‘to-be’ system. The following diagram was presented at the UN Global Trade Facilitation Conference, held in 2011 in Geneva.

![Figure 4: The UNECE Single Window Implementation Framework.](image-url)
The framework divides implementation into the five levels described below.

**Level 1 - Paperless Customs:** The Single Window system at this initial stage should support paper-free Customs declaration submission, including the electronic submission of images of supporting documents, and electronic payment of Customs duties and taxes. The system should also support the implementation of automated, risk-based selection for inspections. The system should be pervasive and cover all the main Customs entry points.

**Level 2 - Regulatory Single Window:** Under the said framework, in the second stage, the automated Customs systems are integrated with those of other regulators issuing trade-related licences, certificates, permits and other authorization documents (LPCO).

**Level 3 - Port Single Window or B2B Port Community System:** The framework places the port Single Window in the third stage of the Single Window. This level, posited as the business-to-business facility serving the community of port users, would be used as the extension of the Single Window. The connectivity between the regulatory Single Window and the port community system would help serve the logistics-related processes and the ports, airports and land-border stations. In this level, business users can submit information at a single point to the port-based logistics players, such as the terminal operators, port authorities, shipping lines, freight forwarders, stevedores and container freight stations.

**Level 4 - Fully Integrated Single Window:** This level is reached when the integrated national logistics platform is established. The platform interlinks the regulatory authorities, all businesses, and all entities in the logistics chain associated with the entire import and export process. The UNECE guide does not recommend that every economy develop a fully integrated system. Such a system should be attempted if it is cost-beneficial to do so.

**Level 5 - Cross-Border Single Window Exchange Platform:** In this level, interconnectivity is achieved in the international arena, whereby Single Windows across the region are involved in the cross-border exchange of electronic information at a bilateral or multilateral level. These possibilities for data exchange exist under regional agreements and in regional frameworks, such as those of MERCOSUR, ASEAN, and the European Union.

**A critique of the levels:** These levels cannot serve as a Single Window maturity model for the following reasons:

(a) The levels are simplistic, not rigorous. They do not indicate what services would be provided, but broadly describe what the level entails. The levels should be rigorously defined so that indicators can be developed to place a country in one of the levels.

(b) The levels are not reliable as a measure of sophistication of a Single Window. For example, the majority of Customs administrations would claim to fall into level 1. One might find that despite the introduction of automated Customs declaration processing systems, they may encourage the parallel use of paper and electronic filing. Such parallel use can nullify the benefits of electronic filing and of the Customs declaration processing system.
(c) The levels do not necessarily progress linearly from level 1 to level 5. A country may have a regional arrangement (level 5) to share certificates of origin with partner countries, but not have an integrated Single Window. A port community system (level 3) may be up and running, without there being in place a regulatory Single Window (level 2).

(d) The explanation provided for each stage should elaborate in detail what is expected to be achieved through connectivity between the automated Customs system and the systems of other regulatory agency partners. For example, in a regulatory Single Window (level 2), the range of facilities would include the provision of a standard application form for licences, permits, etc. The output of the regulatory system could simply be an electronic record, rather than a document. Further, the LPCO data may be shared between the regulatory agency system and the Customs system. Additional sophistication would cover automatic verification and matching of licences with Customs declarations. More sophistication would include the re-use of data submitted at the time of application for licences, in the actual clearance.

### 3.6 World Bank and other Global Indices

A well-known, globally followed performance indicator is published by the World Bank in the form of its annual ‘Doing Business’ report. The report ranks countries in terms of various categories of performance, covering a wide variety of technical regulations which affect the ease of doing business. The group of measures related to ‘Trading Across Borders’ helps assess the ease with which businesses can import and export. The report contains hard numbers that assist in evaluating qualitative and quantitative improvements in process measures regarding the cost and time for border and documentary compliance. It mainly assesses the efforts of each country over the course of a year; how countries have been applying changes regarding cargo clearance procedures; and what impact, if any, these have had on improving process measures. Ultimately, an improvement in the ranking for ease of doing business will benefit the national economy.

<table>
<thead>
<tr>
<th></th>
<th>Documentary Compliance</th>
<th>Border Compliance</th>
<th>Domestic Transportation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost (Import)</td>
<td>USD/Shipment #</td>
<td>USD/Shipment</td>
<td>USD/Shipment</td>
</tr>
<tr>
<td>Time (Import)</td>
<td>Hours</td>
<td>Hours</td>
<td>Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost (Export)</td>
<td>USD/Shipment</td>
<td>USD/Shipment</td>
<td>USD/Shipment</td>
</tr>
<tr>
<td>Time (Export)</td>
<td>Hours</td>
<td>Hours</td>
<td>Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary theme</td>
<td>Documentation for product and partner pair of</td>
<td>Captures the efficiency of Customs and</td>
<td>Measures the effectiveness of domestic logistics operations and capabilities of the economy</td>
</tr>
<tr>
<td></td>
<td>economies trading the product</td>
<td>other regulatory agencies of the economy</td>
<td></td>
</tr>
</tbody>
</table>

* denotes the data is not shown in the table.
<table>
<thead>
<tr>
<th>What are the time &amp; costs involved?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time and cost of preparing the bundle of documents that will enable completion of the international trade; time and cost of obtaining, preparing, processing, presenting and submitting documents.</td>
</tr>
<tr>
<td>Time and cost compliance for a shipment to cross the border for inspection and clearance due to Customs and other government agency regulations.</td>
</tr>
<tr>
<td>Time and costs associated with transporting the cargo from the warehouse in the largest business city of the economy to the most widely used seaport, airport or land border of the economy.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What could be the factors?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of documents required; level of automation – the extent to which data and records are handled electronically; whether manual documents are requested, despite electronic handling. Electronic information is considered as documents.</td>
</tr>
<tr>
<td>Time and cost of border compliance depends on where, and in how many places, border compliance procedures take place; who requires and conducts the procedures; and the probability that inspections will be conducted.</td>
</tr>
<tr>
<td>Distance from the economic hub to the nearest port or airport; intermediate cargo handling, deconsolidation, and reconsolidation within the country; cost and efficiency of national systems of transportation and logistics.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Includes all necessary documents – whether handled electronically or in hard copy; whether required by regulation or based on the perception that they ease the passage of shipments. Includes documentary requirements of all government agencies of the origin economy, the destination economy, and any transit economies.</td>
</tr>
<tr>
<td>Includes documentary and physical inspections carried out for any purpose, including revenue and the prevention of smuggling; handling that takes place at ports or borders; clearance and inspection procedures that take place in the majority of cases (the ‘standard’ case).</td>
</tr>
<tr>
<td>Includes time and cost of the actual transport from the warehouse to a Customs post or terminal for clearance or inspection, and then onward travel to the port or border; any traffic delays and road police checks; loading or unloading at the warehouse or border.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excludes all one-time document requirements (e.g. registration certificates), and documents needed to produce and sell in the domestic market.</td>
</tr>
<tr>
<td>Not included for compliance with the regulations of any other economy; not included where procedure does not apply to the vast majority of shipments.</td>
</tr>
<tr>
<td>Costs beyond the terminal gate of the port and terminal handling at the port terminal.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs and time are tallied document-wise. The greater the number of documents, the greater the cost and time. These are estimates reported by respondents.</td>
</tr>
<tr>
<td>The cost and time reported for inspection by all government agencies, including Customs, for the chosen commodity. The greater the number of inspections and the longer they are, the greater the cost.</td>
</tr>
<tr>
<td>Reported costs of the most widely used mode of transport (truck, train, riverboat); the most widely used route (road, border posts); per container (TEU) or transport of 15 tons of non-containerized products.</td>
</tr>
</tbody>
</table>

* Not included in the index

# A standardized shipment of 15 MT equivalent to a twenty-foot equivalent unit (TEU)

The World Bank ‘Doing Business’ report is popular and influential. It is a document which is eagerly awaited by governance reform professionals. In one form or other, more than 800 academic papers have used this index and the data. Several governments have a declared policy of setting targets regarding the index ranking. Nonetheless, there are also individuals who have been critical of the report (Høyland, Moene, & Willumsen, 2011). While noting that the report does capture the economic environment of business, the indicators do not distinguish very well between a large proportion of the economies. Some indicators presented in the report are not used for ranking, and the process of excluding indicators from the ranking has been considered not transparent. However, the World Bank has been attempting to address these concerns with each year’s report.

Other reports, such as the ‘Logistics Performance Index’ (a World Bank biennial report), ‘Indices of Economic Freedom’ (published by the Wall Street Journal and the Heritage Foundation), and the ‘Global Competitiveness Report’ (published by the World Economic Forum), also contain numbers that convey information on a country’s business climate.

### Logistics Performance Index
- Published by the World Bank
- The efficiency of customs and border management clearance ("Customs").
- The quality of trade and transport infrastructure (Infrastructure)
- The ease of arranging competitively priced shipments (Ease of arranging shipments’)
- The competence and quality of logistics services—trucking, forwarding, and customs brokerage ("Quality of logistics services").
- The ability to track and trace consignments ("Tracking and tracing").
- The frequency with which shipments reach consignees within scheduled or expected delivery times ("Timeliness").
- The LPI uses standard statistical techniques to aggregate the data into a single indicator that can be used for cross-country comparisons.

### Global Competitiveness Report
- Published by the World Economic Forum
- Burden of customs procedures
- In your country, how efficient are customs procedures (related to the entry and exit of merchandise)? [1 = extremely inefficient; 7 = extremely efficient]
- World Economic Forum, Executive Opinion Survey.

### OECD Trade Facilitation Indicators
- Published by the OECD
- State of implementation of the various policy areas and measures included in the WTO Trade Facilitation Agreement.
- Countries self-designate the WTO provisions.
  - already implemented
  - not implemented
  - in the process of implementation

These indicators draw immediate attention and pay off, demonstrating improvements achieved in terms of the friendliness of a country’s business environment. Similarly, Customs (or the lead agency of the Single Window) needs to develop such evaluation techniques. Performance indicators for the Single Window will serve as a catalyst for effectiveness and efficiency in cross-border trade; they will also help meet the needs and expectations of the private sector.
4. **WCO Single Window Maturity Model**

Under the WCO Framework ‘Achieving Excellence in Customs’ (AEC), the indicators developed should:

1) Provide a more objective assessment of the outcomes that Customs is striving towards;
2) Inform government, other border management agencies and the public of the scope of Customs' obligations; and
3) Assist Customs to justify expending and seeking resources.

The performance indicators are not meant to be used in a ranking exercise but, rather, as an assessment tool to help Customs administrations determine their current state of development, and as inputs for policy making. The maturity model as a performance measurement framework can serve as the second layer.

The maturity model not only looks at system capability, but also business capability in terms of performing operations in a Single Window. This means that it is not enough to have systems that perform a function; it is also necessary for the organization and personnel to be mature enough so that users are able to use the Single Window facility to provide the desired result.

The maturity level of paperless processes within a Customs administration has a direct relationship with its interest in reaching out to other Customs authorities for the cross-border flow of data. In other words, unless the maturity of interconnectivity and interoperability between Customs and various border regulatory agencies, logistics operators and other stakeholders within a country reaches a certain threshold, Customs administrations may perhaps not perform the cross-border flow of data or a digital handshake with other Customs administrations in a bilateral or a multilateral arrangement.

The following table can help Customs administrations assess their maturity levels by answering Yes/No questions. The capability matrix is divided into three parts. The core Customs capabilities of declaration processing (Part A) and cargo control (Part B) are vital preconditions for any Single Window capability (Part C) to be expressed in implementation. The least sophisticated system will have few Yes answers, and the most sophisticated system will have the most Yes answers. If there are no Yes answers in Part C, then the system may not be able to call itself a Single Window.
<table>
<thead>
<tr>
<th>Part A</th>
<th>Declaration Processing Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Core declaration processing</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A1 Import declarations</td>
</tr>
<tr>
<td></td>
<td>A2 Export declarations</td>
</tr>
<tr>
<td></td>
<td>A3 Transit declarations</td>
</tr>
<tr>
<td></td>
<td>A4 Data review &amp; standardization</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A5 Supporting documents</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>A6</td>
<td>Periodic review of documentation requirements</td>
</tr>
<tr>
<td>A7</td>
<td>Duties, taxes &amp; fees</td>
</tr>
<tr>
<td>A8</td>
<td>Electronic payments</td>
</tr>
<tr>
<td>A9</td>
<td>Refund and drawback claims</td>
</tr>
<tr>
<td>A10</td>
<td>Bonds and guarantees management</td>
</tr>
<tr>
<td>A11</td>
<td>Risk assessment &amp; selectivity</td>
</tr>
</tbody>
</table>

**Part B**  
**Cargo Control Capability**

<p>| B1 | Customs receives and uses manifests to apply cargo control | Y if manifests are received electronically; N if manifests are received manually. | Y if manifests/cargo reports are received well in advance of the arrival of the means of transport; N if complete manifests are not received until after the arrival. | Y if manifests/cargo reports are meant to cover admissibility risks; N if manifests/cargo reports are required largely for inventory purposes. |
| B2 | Transhipment in-bond movements | Y if cargo reports double up as requests for transhipment; N if separate transhipment permits need to be filed. | Y if transhipment permits are handled electronically; N if transhipment approvals are processed manually. | Y if electronic linkages exist between gateway ports and inland Customs stations; N if no such links exists. |
| B3 | Cargo control | Y if Single Window can convey electronically a release and hold to the carrier or terminal operator; N if release or hold has to be conveyed manually. | Y if Single Window supports online reconciliation of cargo inventories; N if the process is carried out manually. | Y if regulatory authorities can access the warehouse/terminal operator systems to find out the cargo location in real time; N if the process is carried out manually. |</p>
<table>
<thead>
<tr>
<th>Part C</th>
<th>Single Window Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C1</strong></td>
<td>Compliance requirements information</td>
</tr>
<tr>
<td><strong>C2</strong></td>
<td>Interconnectivity with other border regulatory agencies, such as plant &amp; animal quarantine agencies, food safety, and drugs</td>
</tr>
<tr>
<td><strong>C3</strong></td>
<td>Integrated risk assessment for all participating agencies</td>
</tr>
<tr>
<td></td>
<td>Co-ordinated processing for inspection, release and clearance</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>C4</td>
<td>Y if all agencies converge their release decisions onto a single point; N if the trader has to collect separate release decisions from all agencies concerned.</td>
</tr>
<tr>
<td>C5</td>
<td>Y if all agencies carry out the necessary document review online and in parallel; N if agencies carry out documentary checks sequentially.</td>
</tr>
<tr>
<td>C6</td>
<td>Y if a common registration for all traders with all agencies is possible; N if it must be done separately for each agency.</td>
</tr>
<tr>
<td>C7</td>
<td>Y if there is co-ordinated inspection or delegated inspection such as to provide a single point of inspection or examination of goods; N if each agency carries out its own separate inspections.</td>
</tr>
<tr>
<td>C8</td>
<td>Certificates of origin</td>
</tr>
<tr>
<td>----</td>
<td>------------------------</td>
</tr>
<tr>
<td>C9</td>
<td>Sanitary/phytosanitary certificates &amp; permits</td>
</tr>
<tr>
<td>C10</td>
<td>Product licences &amp; certificates</td>
</tr>
</tbody>
</table>

Table 2: Single Window maturity model (proposed to IMSC).
5. Analysis of Results

Following the taking of measurements, there must be a thorough analysis of results. This analysis will be guided by benchmarking, client expectations/specifications, and internal criteria. Do the results of the implementation of the Single Window match up with the parameters developed for the processes? Do the performance parameters meet expected internal standards? Do the results match the expectations of stakeholders?

The tasks of regulatory authorities in a Single Window are complex and include the collection of duties and taxes, security and homeland protection, environmental and health protection, and the application of national and trade policy.

In the course of cargo clearance, Customs and other regulatory agencies obtain access to, and control over, the release of export and import consignments on their journey.

Stakeholders focus to a considerable extent on the period of time that border agencies (including Customs) cause cargo to be stalled, thereby impeding the movement of the goods. Any analysis of the results will be analysed in terms of these time periods. Stakeholders are concerned about delays affecting the costs of onward logistics, demurrage and handling, and about the ability to provide just-in-time deliveries.

Performance measures focused on time taken to handle cargo are critical and provide invaluable feedback in terms of process efficiency.

5.1 Time Release Study (TRS)

The WCO defines a Single Window environment as a cross-border ‘intelligent’ facility. The system’s function of intelligence provides users with predictable release times, and its performance is an imperative consideration for the system owner. In this context, issues which must be addressed are ongoing improvements to the IT system, along with performance measurement to ensure that acceptable service levels for the trading community are put in place for faster cargo clearance and release.

One of the widely used parameters of external stakeholder expectations is the WCO Time Release Study. The WCO has introduced TRS methodology, which is designed for Customs to measure the time taken between cargo processing procedures. If TRS is implemented properly, its results enable Customs authorities to identify problems and bottlenecks in clearing goods. Ultimately, unnecessary barriers to the flow of goods may be removed or minimized, satisfying traders, while contributing to trade facilitation.
The case of Korea Customs is provided below by way of example, and to facilitate understanding.

5.2 TRS in the Korean Single Window

The Korea Customs Service (KCS) conducted a time release study, based on WCO TRS guidelines, to measure the overall performance of its electronic clearance system, including its Single Window. As well as this overall performance measurement, Customs evaluated the performance of the Single Window specifically. In addition, a survey was conducted in the private sector to assess how clients/users of the system viewed the Customs computer system.

Firstly, in relation to the overall system, the results indicated that cargo processing times and logistics costs decreased significantly, as shown in the figure below. The target procedures covered by this measurement extend from arrival at the port, to release of cargo.

![Figure 6: Time reduction in cargo processing (Source: Korea Customs).](image)

In 1997, the average time taken from the cargo’s arrival at port to its release from Customs control was 14.8 days. However, in 2008, this had decreased to 3.7 days, and in 2012 it was 2.3 days. The cargo processing times were automatically calculated and registered in the Customs logistics information system in real time.

6. Single Window – Continuous Improvement

The Korea Customs Service developed and introduced a Single Window system from 2004 to 2006, as part of its national project ‘trading hub’. It has proved to be a breakthrough in maintaining the importance of its role at the border. Thanks to regular investment to enhance system functionality, and major efforts to attract other government agencies into the Single Window, 38 agencies have been connected in the system since December 2012.

The introduction of the Single Window has made possible effective and efficient cross-border regulatory operations, thanks to the reduction in cost and time for traders who are required to gain
OGA approval to import certain products. From the outset, KCS made every effort to persuade OGAs to participate in the Single Window project, and provided a Single Window service alongside eight OGAs, including the Korea Food and Drugs Administration, the Veterinary Quarantine Authority, and the Animal Quarantine Authority.

In the second stage of improvement in 2007, five more agencies joined the Single Window, and KCS established an Application Service Provider system. This provides computer-based services to smaller agencies and assists them with electronic licensing, without their having to create computerized licensing systems within their organizations. The level of client satisfaction was greatly enhanced by converting paper-based applications and approvals into an electronic service.

As part of the third stage in upgrading the system, KCS formed a task force to support the strategy, holding meetings and workshops both for operations and management officers. Practical ideas and suggestions were elicited through face-to-face discussions.

In total, seven stages of improvements were carried out, and the results exceeded the lead agency’s expectations. Out of about 60 candidate agencies for the Single Window, 38 are now processing their licensing through the Single Window. More importantly, the service usage rate for the Single Window system has jumped significantly – from just above 4% in 2006, to 97.3% in 2011. This shows that the system’s performance is highly appreciated by users.

<table>
<thead>
<tr>
<th>Year</th>
<th>'06</th>
<th>'07</th>
<th>'08</th>
<th>'09</th>
<th>'10</th>
<th>'11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usage rate</td>
<td>4.3</td>
<td>6.9</td>
<td>19.3</td>
<td>67.2</td>
<td>91.6</td>
<td>97.3</td>
</tr>
</tbody>
</table>

Table 3: Single Window system usage rate (%).

### 6.1 Reduced Time and Cost from a Single Window

Before implementing the Single Window, it generally took more than four days to clear goods that required licences, inspections or approvals from relevant government agencies; two to three days for the licensing agency internal process; one day to transfer licensing agency decisions to KCS; and three or four days to make importers ready for Customs approval.

Before the introduction of the Single Window, traders had to submit licence applications, then visit the appropriate OGA counter and collect the written certificate of approval, and then physically forward it to KCS for a document check. The Single Window, however, enables importers to log in and apply for licences and permits online; Customs officers simply check discrepancies between what has been written in the application and approval on the screen, linking a licence to a Customs declaration.

Traders no longer visit licensing agencies as well as the Customs office, thereby reducing the processing time for document delivery to Customs by one day. Consequently, clearing goods that require licences now takes approximately three days, and just under two hours for Customs declarations.
Traders have experienced reduced costs as a result of the KCS Single Window in two ways: firstly, they have saved on the transportation cost of moving between the licensing agency and Customs. Secondly, it is no longer necessary to complete and submit several kinds of document, saving costs in preparing paperwork. Moreover, the Single Window system has enabled traders to save transaction fees that would otherwise have been charged by value-added network (VAN) service companies.

6.2 Satisfaction Surveys – Qualitative Measures of Performance

How the users think of the system in the context of performance is very important in order for agencies to enhance the efficiency and effectiveness of its operation. The central purpose of using measurements – or any other technique – in Customs and tax reform should be to help agencies improve effectiveness, while optimizing their efficiency (T. Cantens and R. Ireland, 2012).

The KCS survey indicates satisfactory levels, both for internal users (Customs officers) and for external users, such as traders and public officers from OGAs. The survey is outsourced to guarantee fair evaluation and eliminate bias, and seeks users’ opinions in two categories.

The first category covers operational aspects of the electronic clearance system, including the Single Window and the system helpdesk. The second category covers questions on five aspects of system service: accuracy, ease, promptness, improvement, and client assistance.

The survey results indicate that service levels have gradually improved, and that there are increased levels of satisfaction (from 83.8 points in 2011, in the survey of public service conducted by the Ministry of Public Administration, to 75.5 points in 2011).

<table>
<thead>
<tr>
<th>Year</th>
<th>‘08</th>
<th>‘09</th>
<th>‘10</th>
<th>‘11</th>
<th>‘12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level (averaged)</td>
<td>81.4</td>
<td>82.3</td>
<td>82.7</td>
<td>83.8</td>
<td>84.3</td>
</tr>
<tr>
<td>Comprehensive</td>
<td>81.5</td>
<td>82.2</td>
<td>83.1</td>
<td>84.5</td>
<td>85.2</td>
</tr>
<tr>
<td>Five Factors</td>
<td>81.2</td>
<td>82.4</td>
<td>82.4</td>
<td>83.2</td>
<td>83.4</td>
</tr>
</tbody>
</table>

Table 4: Satisfactory level of e-clearance system (points).

6.3 Balanced Scorecard for Performance Measurement

As a ‘control tower’ with 40 regional Customs nationwide, Korea Customs headquarters adopted a Balanced Scorecard (BSC) in 2006 to evaluate the performance of all the bodies within the organization. All regional Customs offices can have their own matrix to achieve certain key performance indicators set by headquarters, with the IT system being one of the important evaluation elements.

It is interesting to see which bodies are performing well and which are not, and just one glimpse of the screen shows the full list of organizational units, ranked by electronic data. It is important not to distort or manipulate the final data to influence the rankings. In this regard, it should be ensured that
system performance evaluation is carefully chosen and includes the right techniques when aligning with rankings.

6.4 Business Continuity

It is useless to say that system performance presupposes business continuity. The Kyoto ICT Guidelines clearly define business continuity planning as “the overall process of developing an action plan to ensure the continuation of business in the event of unexpected unavailability of a crucial system or facility”. For Customs, it means “the ability of an administration to maintain collection of duties and taxes, the control of goods and people crossing the border and the uninterrupted and speedy clearance of goods and people in international trade and travel”

According to the Kyoto ICT Guidelines, business continuity planning consists of four steps: initiation, business impact, risk analysis, development of individual plans, and management of the plans. The system maintenance division and special matrix team in KCS headquarters are responsible for the resumption of the system in the event of system failure following sudden outages, natural disasters, etc. and monitor unexpected events on a yearly basis.

All field officers have been given necessary guidance on how to act in the event of system malfunction, and on what to do if there is partial or total system failure. The contingency plan on system unavailability is regularly reviewed, and Customs officers required to keep up to speed.

Although the Single Window system involves OGAs, Customs can, in co-operation with other agencies, perform licensing processes manually (in the same way as it does for general import cases). Strengthening partnerships by establishing rules or signing MOUs on how to communicate in perilous situations helps better prepare for traders’ business activities.

7. Decision-Making and Implementing

Once results are analysed according to internal and external benchmarks, the process of decision-making ensues. This phase can take three forms: continuous improvement, problem-solving and process re-engineering.

7.1 Quality and Continuous Improvement

The principles of quality management systems are described in the ISO 9000:2000 standard. The following are the eight key aspects of managing performance under the standard. They are expressed in the context of a Single Window environment.

Customer-oriented organizations: The Single Window operator must understand stakeholder needs, requirements, and expectations.

Leadership: The lead agency must play a leadership role in bringing all participating agencies under a common platform, driven by a common purpose.

---

3 WCO Integrated Supply Chain Management Guidelines.
**Officer participation:** In achieving the Single Window goals, an environment of trust should be created that encourages the officials of all participating agencies to collaborate and co-execute, using their respective personal and regulatory competencies.

**Process approach:** A process describes how things normally get done in an organization. In order to efficiently manage activities and resources, a process approach is recommended for all business processes governing the Single Window.

**Systems approach:** Implementing systems requires deft change management. A systems approach is said to be followed when the inter-relationship between entities and processes is identified and their interaction is analysed while implementing change.

**Continuous improvement:** There should be a steady commitment to strive to continually improve overall performance.

**Facts-based decisions:** Decisions should be based on facts. Facts should be derived from hard analysis of data. In turn, data points should be produced from measurements from material organizational processes.

**Partnership with suppliers:** This principle has been written in the context of a manufacturing or producing organization. From the Single Window perspective, compliance is critical. Collaboration with upstream data providers and downstream consumers is necessary. Partnership between Customs and trade will remain a fundamental principle.