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.
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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.

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.

![Figure 2: Cycles of Continuous Improvement](image)

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.

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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>Cost (Import)</th>
<th>USD/Shipment</th>
<th>USD/Shipment</th>
<th>USD/Shipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (Import)</td>
<td>Hours</td>
<td>Hours</td>
<td>Hours</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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary theme</th>
<th>Documentary Compliance</th>
<th>Border Compliance</th>
<th>Domestic Transportation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation for product and partner pair of economies trading the product</td>
<td>Captures the efficiency of Customs and other regulatory agencies of the economy</td>
<td>Measures the effectiveness of domestic logistics operations and capabilities of the economy</td>
<td></td>
</tr>
<tr>
<td>What are the time &amp; costs involved?</td>
<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>
<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>
<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>
<tr>
<td>What could be the factors?</td>
<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>
<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>
<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>
<tr>
<td>Inclusions</td>
<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>
<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>
<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>
<tr>
<td>Exclusions</td>
<td>Excludes all one-time document requirements (e.g. registration certificates), and documents needed to produce and sell in the domestic market.</td>
<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>
<td>Costs beyond the terminal gate of the port and terminal handling at the port terminal.</td>
</tr>
<tr>
<td>Basis</td>
<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>
<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>
<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.

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**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

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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><strong>Core declaration processing</strong></td>
<td>Y if automation covers a range of procedures accounting for over 90% of clearances by value and volume; otherwise N.</td>
</tr>
<tr>
<td><strong>A1</strong></td>
<td>Import declarations</td>
</tr>
<tr>
<td><strong>A2</strong></td>
<td>Export declarations</td>
</tr>
<tr>
<td><strong>A3</strong></td>
<td>Transit declarations</td>
</tr>
<tr>
<td><strong>A4</strong></td>
<td>Data review &amp; standardization</td>
</tr>
<tr>
<td><strong>A5</strong></td>
<td>Supporting documents</td>
</tr>
</tbody>
</table>

| **A4** | Data review & standardization |
| Y if the declaration data requirements have been reviewed comprehensively in the past five years to ensure that unnecessary data and processing requirements are removed; otherwise N. |
| Y if data is standardized with respect to the WCO Data Model and/or UN/TDED; N if no standardization has been attempted. |
| Y if standard electronic messages are based on UN and/or WCO standards; N if electronic messages are based on proprietary standards. |

<p>| <strong>A5</strong> | Supporting documents |
| Y if supporting documents can be submitted online and linked to the respective declarations; otherwise N. |
| N if trade requires a hard copy for release purposes, despite online submission of supporting documents; Y if officer accesses all supporting documents online. |
| Y if Customs accepts native electronic documents, if such documents can be extracted from source systems; N if only digital images of supporting documents. |
| A6 | Periodic review of documentation requirements | Y if the list of the required supporting documents has been reviewed comprehensively in the past two years to ensure that unnecessary document requirements are discontinued; otherwise N. |  |
| A7 | Duties, taxes &amp; fees | Y if all duties, taxes and fees are computed automatically; N if some taxes have to be computed manually. | Y if tax payment bills are handled electronically; N if printed records of payable and paid amounts need to be maintained. | Y if input data in declaration is sufficient to compute all duties, taxes and fees. N if some data that is relevant for computing duties taxes and fees is entered manually. |
| A8 | Electronic payments | Y if the majority of duties, taxes and fees is collected through e-payment; N if payments are to be deposited at bank or treasury counters. | Y if no printouts are needed for making payments; N if printouts are necessary as proofs of payment. | Y if fees of other government agencies (inspection fees, lab testing fees and quarantine and other facility charges) are collected online. N if a majority of the fees is collected offline. |
| A9 | Refund and drawback claims | Y if refund and drawback claims are made electronically, without the need to submit hard copies; N if such claims have to be made manually and with hard copy documents. | Y if refund/duty drawback is not required to be claimed separately if claims can arise from declaration processing; N if separate filing of claims will be necessary in all cases. | Y if payments of refund/duty drawback are credited online to the bank accounts of the traders; N if traders have to collect cash or cheques. |</p>
<table>
<thead>
<tr>
<th>A10</th>
<th>Bonds and guarantees management</th>
<th>Y if traders can register securities and bank-backed guarantees online; N if the documentation has to be submitted online.</th>
<th>Y if bonds and guarantees ledgers are maintained online; N if such ledgers must be maintained in manual registers.</th>
<th>Y if system provides for all-purpose bonds and securities; N if system requires one obligation guarantee for each type of requirement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A11</td>
<td>Risk assessment &amp; selectivity</td>
<td>Y if the system supports automatic selection of documentary or physical examination; N if manual selection prevails.</td>
<td>Y if system captures risk-based instructions; N if exam and other processes have to be handled manually.</td>
<td>Y if a large percentage of consignments has to be inspected and examined; N if most consignments routinely inspected/examined.</td>
</tr>
</tbody>
</table>

**Part B Cargo Control Capability**

<table>
<thead>
<tr>
<th>B1</th>
<th>Customs receives and uses manifests to apply cargo control</th>
<th>Y if manifests are received electronically; N if manifests are received manually.</th>
<th>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.</th>
<th>Y if manifests/cargo reports are meant to cover admissibility risks; N if manifests/cargo reports are required largely for inventory purposes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2</td>
<td>Transhipment in-bond movements</td>
<td>Y if cargo reports double up as requests for transhipment; N if separate transhipment permits need to be filed.</td>
<td>Y if transhipment permits are handled electronically; N if transhipment approvals are processed manually.</td>
<td>Y if electronic linkages exist between gateway ports and inland Customs stations; N if no such links exists.</td>
</tr>
<tr>
<td>B3</td>
<td>Cargo control</td>
<td>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.</td>
<td>Y if Single Window supports online reconciliation of cargo inventories; N if the process is carried out manually.</td>
<td>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.</td>
</tr>
<tr>
<td>Part C</td>
<td>Single Window Capability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>C1</strong></td>
<td>Compliance requirements information</td>
<td>Y if trader can access all documentary and process compliance information on all products at a single point; N if a trader has to visit the websites of individual agencies to find out about compliance requirements for different products.</td>
<td>Y if the process flow for clearing different types of commodities and for different Customs procedures is available at a single point; N if such information is available on the respective websites of different government agencies.</td>
<td>Y if the required contact information and enquiry points in respect of different commodities and different clearance locations are available at a single point; N if such information is available at different locations or not available at all.</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>
<td>Y if the systems of other government agencies are connected, or if other government agencies are working in the same system; N if the other government agencies are working in systems that are not connected with the Customs system.</td>
<td>Y if the system can make automated referrals to other agencies; N if system requires manual entries to refer consignments to other agencies in hard copy.</td>
<td>Y if the other government agency systems share/re-use data provided to Customs; N if separate online declarations have to be filed.</td>
</tr>
<tr>
<td><strong>C3</strong></td>
<td>Integrated risk assessment for all participating agencies</td>
<td>Y if all agencies have agreed to follow the principles of risk-based selectivity; N if some agencies insist on examining all consignments, regardless of risk.</td>
<td>Y if all agencies have established criteria for risk-based selectivity for referrals and testing; N if some agencies have no criteria developed.</td>
<td>Y if there is common, integrated, automated risk assessment and selectivity; N if each agency maintains a separate system for risk assessment.</td>
</tr>
<tr>
<td></td>
<td>Co-ordinated processing for inspection, release and clearance</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>
<td>Y if all agencies carry out the necessary document review online and in parallel; N if agencies carry out documentary checks sequentially.</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>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>C5</td>
<td>Common systems access, account and helpdesk framework</td>
<td>Y if traders can access online services of all participating agencies with a single sign-on; N if a trader must maintain separate logins and user accounts with each participating agency.</td>
<td>Y if traders can maintain a common payment account in regard to payments and receivables across all participating agencies; N if traders must maintain separate payment accounts for each agency.</td>
<td>Y if traders receive transaction status (e.g. tracking, clearance and accounts) at a single point; N if traders must log in to the systems of individual agencies to ascertain their transaction status.</td>
</tr>
<tr>
<td>C6</td>
<td>Importer/exporter/broker/carrier registration, i.e. trader identification</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>
<td>Y if a common registration for all Customs brokers with all agencies is possible; N if it must be done separately for each agency.</td>
<td>Y if a common registration for all carriers with all agencies is possible; N if it must be done separately for each agency.</td>
</tr>
<tr>
<td>C7</td>
<td>Common registration of carriers, transport workers (drivers, cargo handlers), means of transport</td>
<td>Y if a common registration for all carriers with all agencies is possible; N if it must be done separately for each agency.</td>
<td>Y if a common registration for all transport workers/broker employees with all agencies is possible; N if it must be done separately for each agency.</td>
<td>Y if a common registration for all means of transport with all agencies is possible; N if it must be done separately for each agency.</td>
</tr>
<tr>
<td>C8</td>
<td>Certificates of origin</td>
<td>Y if a trader can apply online for issue of a general/preferential certificate of origin; N if such applications have to be filed manually.</td>
<td>Y if the issuing authority generally issues preferential/general certificates of origin electronically; N if such certificates are mostly issued manually.</td>
<td>Y if the authority generally accepts preferential/general certificates of origin electronically; N if such certificates must be presented in hard copy to regulatory agencies.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>C9</td>
<td>Sanitary/phytosanitary certificates &amp; permits</td>
<td>Y if a trader can apply for sanitary/phytosanitary certificates or permits online; N if such applications must be filed manually.</td>
<td>Y if the issuing authority issues sanitary/phytosanitary certificates or permits electronically; N if such certificates are mostly issued manually.</td>
<td>Y if the authority accepts sanitary/phytosanitary certificates or permits electronically; N if such certificates must be presented in hard copy to regulatory agencies.</td>
</tr>
<tr>
<td>C10</td>
<td>Product licences &amp; certificates</td>
<td>Y if a trader can apply for product certificates or licences online; N if such applications must be filed manually.</td>
<td>Y if the issuing authority issues product certificates or licences electronically; N if such certificates are mostly issued manually.</td>
<td>Y if the authority accepts product certificates or licences electronically and maintains them electronically; N if such certificates/ licences must be presented in hard copy to regulatory agencies.</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 (averaged)</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”\(^3\).

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.