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.
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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

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1 WTO Aid-for-Trade Case Study 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.

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

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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</td>
<td>Carrier</td>
<td>Ship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>proprietary</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port of Unlading</td>
<td>Airport where consignment is taken off the airplane</td>
<td>Four-digit</td>
<td>Carrier</td>
<td>Air</td>
</tr>
<tr>
<td></td>
<td></td>
<td>proprietary</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic Port of Unloading</td>
<td>Domestic port where merchandise is removed from</td>
<td>Four-digit</td>
<td>Carrier</td>
<td>Air, Rail,</td>
</tr>
<tr>
<td></td>
<td>the mode of transport</td>
<td>proprietary</td>
<td></td>
<td>Ship, Truck</td>
</tr>
<tr>
<td></td>
<td></td>
<td>code UN/LOCODE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic Port of Unloading</td>
<td>Domestic airport where consignment is</td>
<td>UN/LOCODE</td>
<td>Carrier</td>
<td>Air</td>
</tr>
<tr>
<td></td>
<td>taken off the airplane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Port of Unloading</td>
<td>Foreign port where merchandise is unloaded from</td>
<td>Five-digit</td>
<td>Carrier</td>
<td>Air, Rail,</td>
</tr>
<tr>
<td></td>
<td>the conveyance</td>
<td>proprietary</td>
<td></td>
<td>Ship, Truck</td>
</tr>
<tr>
<td></td>
<td></td>
<td>code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Port of Unloading</td>
<td>Foreign airport where consignment is</td>
<td>Five-digit</td>
<td>Carrier</td>
<td>Air</td>
</tr>
<tr>
<td></td>
<td>taken off the airplane</td>
<td>proprietary</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>code UN/LOCODE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1: Sample aggregation of results of agency survey.

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.

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.

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>Analyze &amp; Reconcile</td>
</tr>
<tr>
<td>Port of Unloading</td>
<td>Place of Discharge Coded</td>
</tr>
<tr>
<td>Domestic Port of Unloading</td>
<td>UN TDED 3225</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>
<tr>
<td>Port Code</td>
<td>UNLOCODE</td>
</tr>
<tr>
<td>4 N Customs Proprietary</td>
<td>Analyze &amp; Reconcile</td>
</tr>
<tr>
<td>5 N Statistical Proprietary</td>
<td>UN/ECE Recommendation 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.
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 co-operation 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.

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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](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:
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.
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.

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