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STAKEHOLDERS' PERSPECTIVES: COUNTRIES, SECTORS AND STANDARDS DEVELOPMENT ORGANIZATIONS

Single Window Common Standards And Interoperability

Note by the secretariat

This document is the UN/CEFACT background paper for the UN/CEFACT Symposium on Single Window Standards and Interoperability, Geneva, 3-5 May 2006. It provides in Annex I the conclusions of the Symposium.

1. Introduction

1. International Trade Single Window facilities are becoming increasingly popular and offer enormous benefits to both government and trade. Key to the success of a Single Window is the ease in which data can be submitted and exchanged.

2. This paper[1] describes the functions, benefits and challenges of a Single Window facility. It outlines the approach and data standards required to enable a Single Window to exchange data with government agencies within a country and with Single Windows in other countries. The paper concludes that the requirements for the above objectives are totally inter-related and can only be met simultaneously through the use of a common international data standard. The paper looks at the current availability of such an instrument, considers the additional work required for its further development, and suggests a mechanism through which it can be developed and maintained.

2. International Trade Single Window

3. The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) defines an International Trade Single Window as a facility that allows parties involved in trade and transport to lodge standardized information in the form of electronic messages and paper documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements. If information is electronic, individual data elements need to be submitted only once[2]. This enhances the availability and handling of information, expedites and simplifies information flows between trade and government and results in a greater standardization and sharing of the relevant data across governmental systems.

4. UN/CEFACT also recommends that Single Window facilities:

(a) disseminate and/or provide access to the relevant information to participating governmental authorities or authorised agencies

(b) provide trade related government information and receive payment of duties and other charges

(c) ensure that the sharing of all information in respect of international trade transactions is supported by a legal framework that provides privacy, confidentiality and security in the exchange of information;

(d) co-ordinate the controls of the various governmental authorities.

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[1] This paper was prepared by members of the Single Window Symposium Organizing Committee, namely Ger Diepens (WCO), Michael Dill (UN/CEFACT, TBG2 Chair), Bill Nolle (US Customs and Border Protection), Julie Olarenshaw (Director SDS Project team, Australian Customs Service), Sue Probert (UN/CEFACT, Forum Vice-Chair), Mats Wicktor (Director, Swedish Customs Future Centre), Gareth Lewis (WCO), Markus Pikart (UNECE/CEFACT secretariat) and Tom Butterly (UNECE/CEFACT secretariat).

[2] UN/CEFACT Recommendation and Guidelines on Establishing a Single Window to enhance the efficient exchange of information between trade and Government.
http://www.unece.org/cefact/recommendations/rec33/rec33_trd352e.pdf.

5. Using such a facility can improve efficiency and effectiveness of official controls and reduce costs for Governments and traders.

2.1 Two models: regulatory convergence and trade logistics

6. Two major Single Window models currently exist[3]. The first is a regulatory convergence model, generally driven by Customs. It focuses on harmonizing procedures, electronic messages and data for submission and sharing by Customs and other government agencies. The second focuses more on trade-logistics and tends to be driven by trade and business interests. Although it includes some Customs processes, it essentially revolves around the process, procedures and data related to operating ports and similar facilities. Some Single Window facilities focus both on regulatory convergence and on trade logistics. While the dynamics of each model may differ, the basic concept - data standardization and process simplification - is the same, and the same issues of data standards and interoperability emerge.

3. Why do Governments / trade establish a Single Window?

7. Governments and trade have set an extensive range of agency-specific and country-specific regulatory and operational requirements for international trade without much co-ordination either internally or amongst each other. As a result, traders are confronted with duplicative and redundant reporting requirements, forms, systems, data sets, data models, and messages. Governments and trade have had to develop and maintain different systems to meet these costly requirements.

8. The lack of coordination has become a more prominent issue in recent years as a result of the requirements for faster information delivery, often in advance of shipping, for security and other purposes, and the expanding requirements for data standardization in international supply chains. The ability to handle data efficiently and swiftly has become a key element in international competitiveness, especially in international supply chains.

9. An International Trade Single Window is designed to overcome this complex system of data submission and regulatory control. Single Window solutions enable seamless, electronic processes between trade and Government and between government agencies. This ensures harmonisation and transparency, i.e. the creation of a level playing field with the greatest predictability possible. Furthermore, electronic processes must be considered more secure, from both the perspective of an economic operator and from governmental level, since integrity and harmonisation is then improved. For example, the use of ICT results in less opportunity for individual officers to infringe the process of decision making in various situations.

10. A primary objective in establishing a Single Window is the single submission of data. This necessitates a major rationalisation of the current approach and requirements for data exchange, especially the reuse and elimination of duplication of existing data. This is an iterative process of regulatory convergence and elimination of unnecessary procedures which includes the following main steps:

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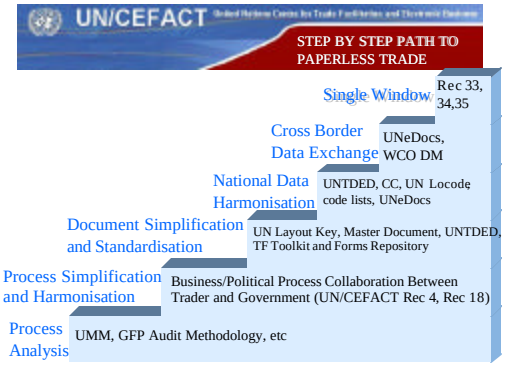
[3] See UN/CEFACT Case Studies on SW Implementation:
www.unece.org/cefact/single_window/welcome.htm

(a) Process analysis and harmonisation to the extent possible/necessary
(b) National data standardization
(c) Cross border data standardization and exchange
(d) Document/message simplification and standardisation
(e) Customisation of a data model framework



4. Legal implications of cross-border data exchange

11. The current legal environment in many countries regarding the flow of trade-related information consists of a complicated network of written agreements including memoranda of understanding, service-level agreements, legislation, policy and procedures that exist in order to manage and regulate the data currently collected, stored and shared. With the introduction of a Single Window facility, these agreements need to be reviewed and streamlined.

12. An assessment of the information that is to be collected, who collects it and how that information will be collected, stored and shared needs to be conducted. Countries that have implemented Single Window systems and those in the development stages have commented that the legal issues are some of the more complex to resolve.

13. The legal issues encountered include:

(a) Identifying and managing the legislative change required when adopting a standardised data set
(b) Privacy legislation implications associated with sharing data and providing an earlier and "wider view" of information to some agencies
(c) Data reuse could result in multiple offences being committed from a single data entry
(d) Ensuring adequate authentication issues are addressed as a single "sign on" could provide access to multiple agency processes
(e) Government fee consolidation and electronic payments
(f) Freedom of information implications and responsibilities
(g) Establishing domestic and international agreements for the exchange of data
(h) Domestic and international liability implications
(i) Legal recourse for international party non-compliance, indemnity and liability

(j) International proof of identity / authentication
(k) Mutual recognition of authentication certificates (PKI) by governments
(l) Development of adequate security and access protocols
(m) Data storage complies with relevant retention and archive requirements
(n) Intellectual property and copyright of the single window development itself and of the data contained therein
(o) Mutual assistance / bilateral agreements between governments on the (re)use of data
(p) Decide who would be the owner of which data where information (a declaration) is sent by multiple parties
(q) Examine the possibility of information being "pushed" or "pulled" to/by Government Agencies (Customs)
(r) National legal basis for the exchange of data across government departments'

14. UN/CEFACT is planning the development of a recommendation on the Legal Framework for an International Trade Single Window.

5. Available standards

15. Business process analysis, rationalisation and data standardization are iterative processes that lie at the core of Single Window implementation. The ultimate outcome is a simplified process with a standard set of data and messages that traders will use to meet government requirements for the declaration and release of cargo, goods, means of transport and crew in international cross border transactions.

16. Data standardization is required both at the national and the international level. At the national level, Single Window operators, generally Governments (Customs), must lead the definition of a common data dictionary of the maximum set of data elements required for the exchange of information to control the flow of goods through the entire trade transaction process (or a subset thereof, depending on the focus or scope of the Single Window). This involves capturing, defining, analyzing, and reconciling government and commercial information requirements. At the international level, a similar process is required.

17. Both processes are inter-related, as most national data needs to be transmitted from a trading partner and or government in one country to a similar entity in another country. It is therefore essential that both the national and international data standardization processes are based on the same standard international data set.

18. UN/CEFACT, the World Customs Organization (WCO) and other organizations have developed tools, standards and methodologies for this purpose, including the United Nations Trade Data Element Directory (UNTDED – ISO 7372). The Directory contains a set of standard data elements to facilitate the interchange of data in international trade. These data elements can be used with any method of data interchange, either paper or electronic. They can be used within a particular system of interchange rules, e.g. UN/EDIFACT, XML.

19. The United Nations Trade Data Element Directory (UNTDED) - ISO 7372 is the primary set of standardized data elements used in international trade. It was used in developing the WCO Data Model, the UN Layout Key (UNLK) aligned series for trade documents, and UNeDocs.

20. UN/CEFACT is working on a new Recommendation and Guidelines on Data Standardization for an International Trade Single Window.

6. From data standardization to data exchange

21. Data standardization is a technology neutral process, as the same data definitions can be used irrespective of format (e.g. paper, e-mail, sms, UN/EDIFACT, XML) or the data delivery system (e.g. post, EDI). However, much of the intelligence in the exchange of data is contained in standardized data sets established in constant symbiosis with the UNTDED.

6.1 World Customs Organization (WCO) Data Model

22. The WCO Data Model is a harmonized and standardized internationally agreed maximum framework for data requirements for Customs and other official cross-border related purposes. It supports the operation of Single Window systems and allows information to be shared nationally and internationally. It complies with the UNTDED, applies UN/CEFACT's Modelling Methodology (UMM) and refers to a range of UN, International Organization for Standardization (ISO) and other international code standards such as the UN/LOCODE. It currently contains message implementation guidelines only for UN/EDIFACT but will offer XML specifications in future versions.

23. The WCO Data Model Version 2.0 focuses on the exchange of information between business and Customs' administrations. It may also be used to cover some exchange of information between governments. Version 3, to be released in 2008, will cover some other government and non-government agencies and is planned to be fully compliant with UN/CEFACT Core Components Technical Specifications (CCTS),

24. The WCO Data Model provides a new level of transparency to all parties involved. A clear structure is given to the information to be included in various Customs documents. The relationship and interdependence of information entities is presented in a clear and simple manner.

25. The use of this Data Model ensures a built-in alignment of import and export documents and information. The Customs organisations of the exporting and importing country can exchange information based on the harmonized data structures of the Model. The Model reduces, or removes, redundancy and the use of synonymous terms in different areas of application. These areas might be geo-political (countries or regions) or business related. So the Model forms a controlled and harmonized vocabulary of business terms related to Customs procedures worldwide.

26. It also helps to integrate various forms of information submission. Since it is not bound to a specific syntax (although mapped to UN/EDIFACT standard messages), it can be applied to any existing or emerging technologies without loss of information. So, besides the facilitation of

UN/EDIFACT for electronic message exchange and a consistent implementation of XML, the model can support UN Layout Key paper forms and other syntaxes such as ANSI X12.

27. For corporate business entities, this offers distinct advantages: Harmonised Customs requirements mean progress towards a centralized solution for Customs-related information processing. Designing new applications for a specific business process becomes more reliable and efficient. As the Model offers Core Data for Customs procedures, the global players can use this as a substitute for the core requirements of the different Customs administrations and Single Windows. They can see what the minimum requirements are for the global customs solutions and can build centralized solutions, which can be extended by regional and national requirements.

6.2 Data exchange beyond Customs - UNeDocs

28. Whereas the WCO Data Model focuses on the exchange of data between Customs and related agencies, the UNeDocs Data Model[4] encompasses the entire transaction process for cross-border trade, in particular the trade, transport, finance and Business-to-Government (B2G) processes. UNeDocs is currently being developed under the UN/CEFACT Open Development Process (ODP) and will form the basis of the next generation of standards for international trade documents, both in paper and in electronic format. It integrates the established paper-based standards for aligned trade forms, in particular the UN Layout Key, with the requirements of paperless trade. It provides a detailed document data model of the information structure in an abstract, syntax neutral format, based on the UNTDED and UN/CEFACT's Core Components. The document data model is a detailed description of the semantic concept of a trade document. As with the WCO Model, UNeDocs can be easily mapped into a specific syntax (e.g. XML or EDIFACT) to generate an electronic message, or to a form to generate a paper document or electronic document.

29. UNeDocs uses the concept of a generic master document that was first established for aligning paper-based trade documents (UN/CEFACT Recommendation 1). Under this concept, filling in the master document can generate a whole series of trade documents with a single submission of data. UNeDocs extends this concept by providing a master data model for the master document. Every specific document data model, (e.g. the Invoice or Goods Declaration) is a simplification of this master data model. Through a single submission of the UNeDocs Master Document, the parties can generate all required trade documents, both in paper and electronic format. This ensures that common data elements in the electronic documents, such as the goods item description or the consignor address, are interchangeable and data requirements are met with a single submission of data.

[4] The UNeDocs Data Model is developed as a project in UN/CEFACT under the Open Development Process. As a cross sector project UNeDocs integrates the different, sector specific aspects of the Trade and Business Processes Groups (TBGs) of UN/CEFACT with regard to cross border information exchange.

7. The need for a common reference data model

30. Much of the information required for regulatory cross-border processes originates from private-sector stakeholders in the supply chain. In today's supply chains, traders re-enter this data in the formats required by the different regulatory bodies. This re-entering of data is inefficient and fails to meet new security requirements.

31. In the future, administrations will demand data in electronic format directly from the originator or source of the information. This will require the facility for data interchange between the business-to-business (B2B) component of the UNeDocs data model and the WCO Data Model. This data exchange will only be possible if the data structures and the information requirements of the Business to Government (B2G) layer in the UNeDocs and the WCO data models are harmonized through a common reference data model (as illustrated in the Diagram below).

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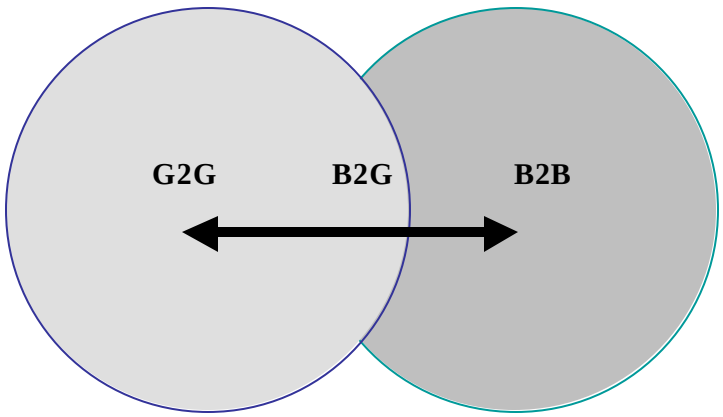


UNeDocs & WCO Common Reference Data Model:
Reuse of data structures and information flows

32. Adopting a common reference data model means agreeing on the information that is needed to conduct the trade transaction. A completed master document derived from the common reference data model is then sufficient to generate documents and/or satisfy the processes required to conduct the trade transaction.

33. This concept provides numerous advantages:

(a) Simplification of cross-border data exchange: Single Window operators in the exporting and the importing country can exchange the master documents. The partner organization in the importing country can generate the required documents with the information contained in the master document.
(b) Simplification of business processes: All business processes will use the same data. This allows comparing processes and obtaining information about simplification of the process.
(c) Simplification of data requirements.
(d) Reduction of risks and errors: all business processes are performed on the basis of the same data set.

7.1 Need for a Business Process Model

34. In practice, the information required in cross-border trade often varies with the type of products exchanged, the regulatory requirements of countries and the type of transport used. For instance, the export of fruit between two countries in the same economic zone will require very different information than the export of medical equipment into a conflict zone. Thus the information in a master document can only support a restricted set of business processes. It is therefore important to develop the master document through a business process analysis approach, using the Unified Modelling Methodology, as recommended by UN/CEFACT.

8. Moving towards a common data model: the Cross-Border Reference Data Model

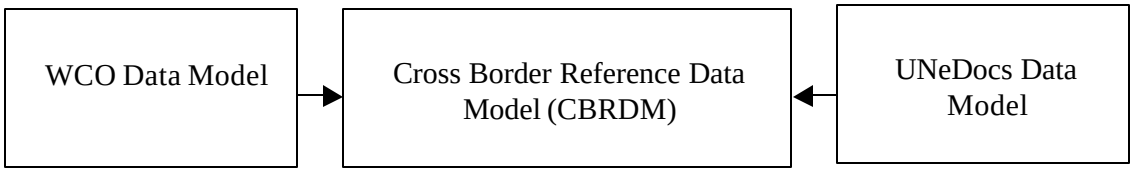
35. As described in Section 6, the WCO Data Model Version 2.0 is the core data model adopted by 169 Customs Administrations and business organisations such as IATA for the exchange of information with Customs. It is central to cross-border trade and supports the operation of a Single Window. UNeDocs encompasses the trade transaction process for cross-border trade. It facilitates the exchange of data between trade, transport, finance and business-to-government processes.

36. As yet, no integrated and globally supported international data model exists to cover the exchange of data throughout the entire cross-border process. The WCO Model will not be extended to cover all trade-related non-government areas. Nor will UNeDocs define the data requirements for Customs and other government agencies domains. Until an integrated international data model is developed for the entire cross-border process, international supply chain operators and administrators will be obliged to continue preparing multiple copies of information in different formats for different countries and for different processes.

8.1 Recommendation

37. To fill the current gap, WCO and UN/CEFACT and WCO should work together to harmonize and consolidate the WCO Data Model and the UNeDocs Data Model into a Cross-Border Reference Data Model (CBRDM), reflecting the requirements for data exchange across the entire global supply chain. Responsibility, and maintenance of the individual data models will be at the discretion of the organization, domain group or other type of body representing a specific business area. The WCO will continue to collaborate with other industry groups such as trade and transport, as well as other government agencies, to align requirements so as to make sure that they comply with regulatory requirements. UNeDocs will continue to do likewise with its relevant stakeholders.

38. This organizational concept is illustrated in the diagram below:



39. The CBRDM could be modelled on UNeDocs, which is based on UN/CEFACT standards (including UN Layout Key, UN Trade Data Elements Directory, UN Location Code), and the concept of a master document with reusable data elements for specific documents, similar to the UN Layout Key concept (one write system). It would provide both governments and trade with a consistent set of international standards for cross-border data interchange

40. The development of the CBRDM as an international standard would require support and commitment from all leading government and trade stakeholders and existing Single Window operators. The success of the process would depend on an open and transparent maintenance process.

41. The pre-conditions for such an alignment already exist. Both the WCO Data Model and the UNeDocs Data Model:

(a) are based on existing UN standards
(b) address the international cross border trade
(c) have similar reuse concepts (WCO Data Model: Overall Model, UNeDocs: master document with reusable data elements for specific documents).

42. Establishing the CBRDM would be a major step forward towards the reuse of domain specific data and would avoid duplication of effort in Data Model development.

43. The development and maintenance of the CBRDM should enshrine the following approaches and principles:

(a) no changes to the data by other than the data owner
(b) consequent reuse of data of other domains
(c) an aligned methodology on how to apply context specific requirements
(d) an aligned customization methodology
(e) use of common methodologies such as Universal Modelling Methodology (UMM) and Core Component Technical Specification (CCTS)
(f) management by version release numbers
(g) acceptance of intellectual property rights for the appropriate levels
(h) maintenance methodology
(i) degree of independence of the two foundation data models from the CBRDM, i.e. the possibilities to reuse the WCO DM as a stand-alone data model.

8.2 Benefits of and International Cross-Border Data Model

44. The benefits of such an approach are many. A Single Window based on a total trade transaction model would commence receiving data about an impending transaction at the earliest possible time, any amendments to the data would only need be updated in one place, agencies that have the legal right to receive and/or view the data could do so, data inconsistencies and human re-keying errors would be reduced, all government risk assessments could be undertaken, the progress of the transaction could be fully monitored with a single point of response for the trader resulting in faster release and clearance. A transaction history would also be maintained for reuse and statistical purposes. The effort in dealing with government agencies would be reduced and in some cases this reduction would be significant.

45. International data exchanges further enhance the Single Window's capabilities and benefits. Expanding on the example above, if the data from the exporting country was transmitted to the importing country the benefits to the trader, transport industry stakeholders and government agencies are even further enhanced. The export data from the foreign Single Window could be used to pre-populate the import data and/or verify the import data. Inconsistencies would be identified and resolved earlier.

46. Another benefit is the stability a standard data set provides. The intent is to deliver the known maximum set of data that a trader may have to provide. Governments should not require any information outside of the standard data set. Most of the data is conditional based on mode of transport, type of transaction, commodity and country of origin/dissemination. Traders will never be required to submit the entire data set. This standard data set would provide for stable base for Single Window implementations and thereby securing the return of investments.

47. These advantages also apply to traders and service providers. They can increase the quality of data provided to the Customs authorities and to their customers. Obstacles in trade are reduced and they can focus on the core business.

9. Promotion, Capacity-Building and Implementation

48. Implementation of an integrated data model for cross-border trade will require strong support from governments and trade. Initially, this will require promoting the concept to key stakeholders and providing relevant training and capacity building. UN/CEFACT and WCO should work together to achieve this goal. One possible action, amongst others, would be to hold a joint stakeholders conference for trade and other government agencies to explain and demonstrate the benefits and practical steps involved.

Annex I

SYMPOSIUM CONCLUSIONS

- A legal framework is required to support Single Window operation – stakeholders will actively support the UN/CEFACT Legal Group in the development of UN/CEFACT Recommendation 35, in cooperation with UNCITRAL and other relevant organizations.

- There is a need for a Data Harmonization methodology at the national/regional/international level – stakeholders will actively support the UN/CEFACT International Trade Procedures Working Group (TBG15) in the development of UN/CEFACT Recommendation 34.

- The WCO Data Model and UNeDocs, based on a common set of international standards including UNTDED, CCTS, and Revised Kyoto Convention, are key tools for Single Window interoperability and cross border data exchange. Both of these models will be further developed by their respective organisations.

- WCO and UN/CEFACT are committed to work towards the further integration and harmonization of these two models, to provide an integrated solution for Cross Border Data Exchange.

- The meeting supported the concept of developing a Cross Border Reference Data Model based on the WCO and UNeDocs Data Models.

- Detailed issues, including ownership and reuse of data structures and data elements, customization, and maintenance, will have to be addressed for the development of this Reference Data Model.

- The Symposium established a Stakeholder Group to assist Single Window operators in the simplification and harmonization of cross-border data exchange and the development of a Cross Border Reference Data Model to allow data interoperability for end-to-end trade transactions. The composition of the Group is as follows:

    - Chair: Mr. Mats Victor, Director, Swedish Customs Future Centre
    - Vice-chair: Mr. Bill Nolle, US Customs and Border Protection
    - Vice-chair: Mr. Gareth Lewis, World Customs Organization
    - Vice Chair: a representative of the Trade and Transport industry to be nominated
    - Liaison with Standards Organizations: Mr. Francois Vuilleumier (UN/CEFACT, Standards Liaison Rapporteur)
    - Editor: Mr. Michael Dill, UN/CEFACT, TBG2 Chair
    - Co-Editor: Ms Julie Olarenshaw, Director SDS Project Team, Australian Customs Service (To be confirmed)
    - Liaison with the Trade & Transport sectors: a representative of the sector to be nominated

- Single Window Operator liaison: Mr. Alexander Arevalo, Deputy Commissioner, Management Information System Technology Group, Philippine Bureau of Customs, Philippines
- Service Provider liaison: Ms. Eva Chan, Manager, Strategic Business Concepts, Dagang Net Technologies, Malaysia

- WCO and UN/CEFACT and other international organizations should work together to promote and build capacity in the use, implementation and customization of these data models.

- The Symposium endorses the Background Paper.

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