B. Data processing and database management at customs

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1.   Requirements for automation at customs

8.4.   *Need for automation at customs*. Customs administrations around the world are facing the challenging tasks of simultaneously ensuring the protection of society fighting transnational organized crime (enforcement), facilitating trade and collecting revenue, as well as providing trade statistics.[3] To support national customs administrations in increasing their efficiency and effectiveness, the World Customs Organization (WCO) develops and provides standards and guidelines (instruments) for the customs operations, many of which call for and deal with the automation of procedures and processes. Customs administrations that are contracting parties are obliged to comply with those standards.

8.5.   *Revised Kyoto Convention*. The WCO Council adopted the revised Kyoto Convention (RKC) in June 1999 as the blueprint for modern and efficient Customs procedures in the twenty-first century. The General Annex of the RKC recommends that the following standards be implemented by a modern customs administration: standard, simplified procedures, continuous development and improvement of customs control techniques, maximum use of information technology, and a partnership approach between customs and trade. Among the key elements within the RKC to be applied by modern customs administrations is the maximum use of automated systems. The revised Kyoto Convention entered into force on 3 February 2006.[4] For further information on the RKC, please see chapter II, section B.

8.6.   *Single window environment*. The establishment of the single window environment for border control procedures as recommended by United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) is considered by customs administrations as the solution for the complex problems of border automation and information management involving multiple cross border regulatory agencies. "Single window" means that trade related information and/or documents need be submitted only once at a single entry point and that this information is shared across governmental systems. An important element in the establishment of a single window is the harmonization of data requirements and formats see (http://www.wcoomd.org/sw.htm).

8.7.   *WCO Data Model*. Governments and customs administrations realize that the increasing demand for free and secure trade, in particular in an e-commerce environment, requires data standardization in order for Governments to accomplish their missions. The WCO Data Model provides a maximum framework of standard and harmonized sets of data and standard electronic messages to be submitted by trade for customs and other regulatory purposes to accomplish formalities for the arrival, departure, transit and clearance of goods in international cross-border trade. Standardized data sets and electronic messages using international code standards are key for effective and efficient exchange and sharing of information between businesses and government. The Data Model has aligned export and import data requirements and created a single electronic structure, which enables a more effective exchange of information between export and import and allows export information to being reused at import. The WCO Data Model also includes data requirements of other governmental regulatory authorities enabling a single window environment, allowing the traders to submit information only once to a single official body, preferably customs, to fulfil all regulatory requirements related to an import or and export.[5]

8.8.   *Seamless integrated data pipeline*. The above initiatives for automation at customs are addressed to countries. However, the information-sharing and the information requirements need to viewed and analysed not only from a national but also from an international perspective, as, by definition, trade transactions extend over multiple countries. The agent or trader completing the customs declaration might have only partial information about the underlying transaction, logistics and earlier or subsequent transactions. This situation has a negative impact on the quality of information provided by trade statistics, as, for example, users would prefer to obtain partner information for exports in terms of final destination, rather than and not only in terms of the last known destination which is what is frequently provided. Therefore, experts call for the construction and establishment of a web-based, seamless, electronic data pipeline linking the seller/consignor and the buyer/consignee and the interested economic operators in-between. This is the goal of the European Union-funded Cassandra pilot project.[6] Besides the technical solution, an adequate international legal framework has to be established to ensure the accuracy of the data. It is expected that statistics would gain from such an integrated data pipeline in terms of quality, timeliness and availability of data. However, it has been pointed out that, this would require trade statisticians to identify the real data requirements, become involved in customs developments and pursue a combined data legislative framework for customs and statistics.[7]

2.   Characteristics of data processing at customs

8.9.   *Characteristics of data processing at customs.* The characteristics of data processing at customs encompass the electronic submission of customs declarations (and/or provision of paper declarations) and the provision of additional documentation at geographically dispersed locations and the application of uniform but complex processing procedures leading to the clearance of the goods and the sharing of information with the parties involved. These tasks are greatly facilitated by the establishment of a single-window environment which provides the benchmark for modern data management at customs. The implementation of a single window generally entails the harmonization and alignment of the relevant trade documents and data sets.

8.10.   *Models of the single window.*[8] There are three basic models for the single window:

(a)   A single authority which receives information, either on paper or electronically, disseminates this information to all relevant governmental authorities, and coordinates controls so as to prevent undue hindrances in the logistic chain. For example, in Sweden's single window, customs performs selected tasks on behalf of some authorities (primarily for the National Tax Administration (import value added tax), Statistics Sweden (trade statistics), Sweden's Board of Agriculture and the national Board of Trade (import licensing));

(b)   A single automated system for the collection and dissemination of information (either public or private) which integrates the electronic collection, use and dissemination (and storage) of data related to trade that crosses the border. For example, theUnited States of Americahas established a programme that allows traders to submit standard data only once; the system processes and distributes the data to the agencies that have an interest in the transaction. There are various possible means of implementation:

(i)   Integrated system: data are processed through the system;

(ii)   Interfaced system (decentralized): data are sent to the agency for processing;

(iii)   A combination of (i) and (ii);

(c)   An automated information transaction system through which a trader can submit electronic trade declarations to the various authorities for processing and approval in a single application. Under this approach, approvals are transmitted electronically from governmental authorities to the trader's computer. Such a system is in use in Singapore and Mauritius. Moreover, in Singapore's system, fees, taxes and duties are computed automatically and deducted from the traders' bank accounts. When establishing such a system, consideration could be given to the use of a master data set, comprising of specific identities, which are pre-identified and pre-validated, in advance, for all relevant transactions.

8.11.   *Technical infrastructure*. The electronic submission of customs declarations and the automation at customs require the establishment of an adequate technical infrastructure for data transmission, data storage, data processing, etc. Costs for hardware and software have declined significantly and telecommunications technology has advanced in recent years. Nevertheless, the levels of investment and human resources required to establish an adequate technical infrastructure for customs automation and the implementation of a single window environment are high and constitute an obstacle for further automation in many countries.

3.   *Examples of automated systems at customs and its interface with statistical data*

8.12.   *Existing single window in Sweden*. Sweden's present single window system, known as "The virtual customs office" (VCO), allows the submission, by electronic means, of customs declarations and of applications for import and export licences, for licences for strategic products and for both import and export licences. It can be further integrated into the business system of traders and can then automatically update changes in exchange rates, tariff codes and duty rates. Import and export declarations can be processed through both the Internet and the United Nations Rules for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT). The system currently involves Sweden's Customs (lead agency), Sweden's Board of Agriculture, the National Board of Trade, the National Inspectorate of Strategic Products, the Police, the National Tax Administration and Statistics Sweden.[9]

8.13.   *Customs modernization in the United States of America*. The International Trade Data System (ITDS) is a project designed to build an electronic single window for reporting imports and exports to the Government. Currently, traders must make redundant reports to multiple agencies (often on paper). ITDS will allow traders to make a single electronic report with the relevant data being distributed to the appropriate agencies. Costs will be reduced for business and government; and agencies will obtain data more quickly, be able to process cargo more expeditiously, and be better able to identify unsafe, dangerous or prohibited shipments. ITDS is not a separate computer system: ITDS functions are being built into the trade processing systems of United States Customs and Border Protection (CBP), as part of the Automated Commercial Environment (ACE) project.[10]

8.14.   *Experience of the Philippines: Electronic-to-Mobile (e2m) Customs Project*. The e2m Customs Project is one of the mission-critical and high-impact Information and Communications Technologies (ICT) projects of the national Government. It seeks to streamline the core processes of the Bureau of Customs (imports and exports) and improve trade facilitation between the Bureau of Customs and its stakeholders, including other government agencies, through the development and integration of various systems allowing Internet-enabled and, later, SMS-enabled transactions, thus fewer face-to-face transactions, towards the realization of the national and (ASEAN) single window. Launched in January 2005, this project was financed through a multimillion dollar grant from the government's e–Government Fund of the President, which was specifically created to finance strategic ICT projects of government agencies. This e-customs system allows customs officers and traders to handle most of their transactions from customs declarations to cargo manifest and transit documents through the Internet. It makes use of advanced technology, including electronic signatures, to provide government officials, specifically customs administrators, with new tools that will enable them to make dramatic improvements in security, trade efficiency and the fight against corruption. The e2m system for the formal entry of imports was fully implemented in the major ports of the Philippines in August 2010. E2m-customs offers the following enhancements to the current system:

- Online submission of declarations
- Automatic advice on declaration status
- Engagement of value added service providers (VASPs)
- Online submission of manifests by airlines and shipping lines, including de/consolidators
- Automated process for other types of import transactions such as informal (including the passenger baggage system), warehousing and transshipment entries
- Automated process of liquidation of raw materials
- Centralized management of bonds transactions
- Links with relevant government agencies
- Online resource access through the Bureau of Customs website on issuances, processes, policies, guidelines and other related information

8.15.   *Experience of Brazil: Sistema Integrado de Comercio Exterior (SISCOMEX)*. Brazil processes its foreign trade data through a computerized system (SISCOMEX) which collects and records, in a single flow, information and procedures concerning foreign trade operations in the country. The collected data are reported by various governmental and private agents and standardized, creating a single document at the end of the process. All recorded information is stored in the system for retrieval by users at any time.

(a) The philosophy of SISCOMEX is based on:

- Harmonization of concepts, standardization of codes and nomenclatures
- Elimination of controls and parallel systems of data collection
- Simplification (and avoiding bureaucracy) of foreign trade operations
- Generation of a single document at the end of the process
- Preservation of the basic functions of managers
- Reduced administrative costs for all involved in the system
- Critical parameter data
- Preparation of timely trade statistics

(b) The advantages of SISCOMEX are:

- Online system
- Simplification and acceleration of the process
- Information provided only once
- Automatic granting of permits
- Ease of access/free from use by intermediaries
- Cost reduction with dispatch and storage of documents
- Availability 24 hours a day, 7 days a week
- Transparency of administrative controls
- News SISCOMEX: timely information about changes in the administrative processing ofBrazil's foreign trade
- Enabling legal representation by the company itself, directly through the system
- Security and integrity in processing operations

8.16.   *Automated System for Customs Data (ASYCUDA).* ASYCUDA is a computerized customs management system that covers most foreign trade procedures and has been implemented in many countries.[11] The system handles manifests and customs declarations, accounting procedures, and transit and suspense procedures. It generates trade data that can be used for statistical and economic analysis. The ASYCUDA software has been developed by United Nations Conference on Trade and Development (UNCTAD) in Geneva and operates on microcomputers in a client server environment. ASYCUDA is fully compliant with international codes and standards developed by the International Organization for Standardization (ISO), WCO and the United Nations. ASYCUDA can be configured to suit the national characteristics of individual customs regimes, national tariffs and legislation. The system also provides for electronic data interchange (EDI) between traders and customs using UN/EDIFACT (United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport). The most recent Web-based version of ASYCUDA will allow customs administrators and traders to handle most of their transactions through the Internet.[12]

8.17.   *Interface to statistical data: examples of ASYCUDA.* A group of predefined statistical reports which are produced on the server can be obtained as either a server printout or electronic files. However, most statistics from ASYCUDA++ are obtained through SQL, which is used to create reports or database extractions not covered by the standard reporting formats. Writing SQL queries requires specialist technical skills, and access to the database to run them is normally restricted, for both security and performance reasons. ASYCUDA++ has an interface which allows for the extraction of declaration and reference data from the ASYCUDA database in a format compatible with Eurotrace.[13],[14] Work is currently under way (as of July 2011) to add in ASYCUDA a statistics data extraction module which complies, to the extent possible, with the requirements of IMTS 2010 (see table VIII.1) below, specifically for international reporting in detailed trade statistics. A predefined data extraction module will facilitate the trade data flow from customs to compilers.

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[3] The main instrument of WCO for facilitating the collection, comparison and analysis of statistics is the International Convention on the Harmonized Commodity Description and Coding System, popularly known as the Harmonized System or the HS, which provides for the systematic and uniform classification of goods. With 141 contracting parties (as of 1 December 2011), the HS Convention is one of the most successful instruments developed by WCO, with its international goods nomenclature now being used by more than 200 countries, territories and customs or economic unions as a basis for the collection of trade statistics. Under the HS Convention, contracting parties are obliged to make their import and export trade statistics publicly available in conformity with the six-digit HS codes or beyond that level if they wish, thereby promoting a predictable global trading system. WCO also recommends that its member customs administrations, as well as contracting parties to the HS Convention, report their import and export trade statistics to UNSD as the world's premier depositary for global statistics. (See WCO recommendation concerning the reporting of trade data to UNSD (19 June 1997). Available from http://www.wcoomd.org/EN/topics/nomenclature/instrumentand-tools.aspx.

[4] See "Kyoto 2000: the International Convention on the Simplification and Harmonization of Customs Procedures (Revised) - pathway to efficiency and effectiveness in the customs environment".

[5] See "WCO Data Model: crossborder transactions on the fast track" (2009). Available from http://www.wcoomd.org/en/topics/facilitation/resources/resources.aspx.

[6] David Hesketh and Sandra Tudor, "Trade statistics data gathering – a concept for the future, paper prepared for the Global Forum on Trade Statistics, Geneva, 2-4 February 2011.

[7] Ibid., p.9.

[8] Economic Commission for Europe, United Nations Centre for Trade Facilitation and Electronic Business (UN/ CEFACT), Recommendation and Guidelines on establishing a Single Window to enhance the efficient exchange of information between trade and government, Recommendation No. 33 (ECE/TRADE/352) (United Nations publication, Sales No. E.05.II.E.9), pp. 6-8. Available from http://www.unece.org/fileadmin/DAM/cefact/recommendations/rec33/rec33_trd352e.pdf.

[9] Ibid., p. 19. Additional examples are provided on Mauritius, the Netherlands and the United States of America.

[10] Report to Congress on the International Trade Data System (ITDS), December 2010 available from http://www. itds.gov.

[11] According to UNCTAD, it is used or being implemented in more than 90 countries. See UNCTAD Trust Fund for Trade Facilitation Negotiations, "Automated System for Customs Data ASYCUDA", Rev. 1, Technical Note No. 21, January 2008.

[12] See Recommendation and Guidelines on establishing a Single Window to enhance the efficient exchange of information between trade and government, pp. 31-32. See also footnote 59.

[13] Eurotrace is a computer system that manages external trade statistics, allowing input of declaration and reference data into a number of different "statistical data banks". These data banks are used to pull together figures in order to provide statistics on foreign trade, transport, financial details and taxes.

[14] For user technical information on ASYCUDA, see http://www.asycuda.org. The Central Statistical Office of Trinidad and Tobago provides an example of data extraction from ASYCUDA and importation into Eurotrace (para. 8.22 below).