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CAREC Customs Automation - Technical Paper –

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I. Introduction

Over the past decade, the responsibilities of Customs agencies have been significantly altered and expanded. A rapid increase in the volume of international trade means that Customs agencies must process more shipments in the same amount of time, with little to no increase in operating staff or budget. At the same time, a heightened focus on security has forced Customs agencies to balance two sometimes contradictory functions of control (security and revenue collection) and trade facilitation.

In order to meet these increasing demands, Customs agencies, like many other government and private sector entities, have turned to Information and Communications Technology (ICT). Over the past decade the trend has been towards automation and standardization of Customs procedures. Around the world, Customs agencies are using ICT to meet these challenges by eliminating redundant processes, decreasing reliance on cumbersome paper documents, speeding up processing times, and creating international standards for data.

This report will discuss issues to be address by CAREC countries as they work towards building an IT strategy aimed at enhancing regional Customs cooperation. It will focus on the automation of core Customs procedures common to the CAREC countries and on the development of a CAREC Data Model.

II. Core CAREC Customs Procedures

The benefits of automation and computerization can be significant, and can be felt in practically every area of Customs responsibility, from revenue collection to production of trade statistics. The core functions of Customs control and Customs clearance, especially, see major gains in efficiency through the use of ICT. However, there are also numerous risks and challenges to automation that must be planned for before any automation strategy can be implemented. Decisions made by Customs in the automation process can have far-reaching consequences for the trade community and, in many cases, the full benefits to Customs can not be realized without the cooperation of industry. Proper planning and cooperation, between governments and trade partners, is necessary to mitigate these risks.

Automation of Customs clearance procedures and information exchange can result in lower costs; more accurate enforcement of laws and import duties; and increased productivity for not only Customs, but also trading partners and other government agencies. They keys to achieving these efficiencies are faster processing times associated with electronic filing and the elimination of redundant information requests.

Paperless Trading

One of the most immediate, and far-reaching, steps towards automation of Customs processes is the establishment of a “paperless” trading process – that is, allowing or requiring Customs documents and declarations to be filed electronically. In addition to eliminating the many obvious problems with paper documents – including data storage and retrieval, and human error associated with manual entry – paperless trading significantly speeds up the Customs clearance process. In a paperless environment, trading partners can electronically submit information about their consignments prior to arrival at the border. This allows Customs to process information and target suspicious consignments in advance of their physical arrival, and then provide trading partners with electronic notification of the release status immediately after a consignment comes into Customs’ control.

Single Window

This paperless environment can be taken a step further with the establishment of a Single Electronic Window, a “facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfill all import, export, and transit related-related regulatory requirements.”¹ It is, in other words, a process by which trading partners can submit all necessary data, whether required by Customs or other government agencies, at once, in a standardized format. Once the data has been submitted through this single entry point, the responsibility lies with the government for ensuring that all relevant agencies are provided access to the necessary information. The implementation of a Single Window ensures that the trade partner will not have to submit the same data to multiple government authorities, and significantly reduces redundant paperwork within the government. In instances where physical inspection of the goods is necessary, the government agencies involved can achieve further efficiency by ensuring that inspection is coordinated as well.

Risk Management

In addition to helping facilitate smooth cross-border trade, a paperless environment can aid Customs agencies in their primary missions of controlling the border and collecting revenue. With the volume and speed of modern international trade, it is impossible for Customs agencies today to inspect every individual consignment that passes through their control. Because of this, Customs agencies have turned to risk management techniques to help them identify and target suspicious consignments (and people) for further inspection. Although it is possible to implement a risk management system without having an automated system in place, automation makes the system much more efficient, consistent, and accurate. An automated risk management system can combine the information received electronically from trade partners (prior to the arrival of the consignment), historical data on shipments and compliance, and intelligence fed in by Customs and other government agencies. This combination of timely and broad-based information can increase the consistency and reliability with which fraudulent and illegal shipments are detected, while simultaneously expediting the processing of legitimate shipments.

¹ See, the United Nations Economic Commission for Europe Recommendation on Establishing a Single Window (Recommendation 33, ECE/TRADE/352).
(http://www.unece.org/cefact/recommendations/rec33/rec33_ecetrd352_e.pdf).

Authorized Economic Operator

With the use of consistent risk management processes comes the possibility of developing a program of expedited processing and release for Authorized Economic Operators – trade partners who meet specific requirements laid out by Customs (these could include, for example, the electronic filing of documentation in advance of shipment and a track record of full Customs compliance). With an accurate and reliable risk management system in place, Customs can release Authorized Economic Operators' goods based on a minimum amount of information – thus reducing transit time, encouraging consistent compliance with Customs regulations, and freeing up Customs resource to focus on targeted suspicious consignments.

This set up can be taken another step further with the implementation of an Authorized Supply Chain program. In an Authorized Supply Chain, all participants in the supply chain – everyone handling a consignment from shipment to arrival – have verified security procedures in place and have been authorized by Customs. In an Authorized Supply Chain, security and control would be extended to the supply chain in its entirety, through the use of Uniform Consignment References (UCR), allowing the use of simplified reporting procedures.

Other Customs Functions

An automated system offers benefits beyond the core functions of Customs clearance and Customs control as well. For example, with an electronic system, data such as trade statistics can be generated much more quickly and with much higher accuracy than in a manual system. Revenue collection, too, can be improved with an automated system; accounting and payment processes can be built into the system to aid in the tracking and collection of payments due.

Challenges

The benefits of an automated system are obvious: for Customs, faster and more accurate processing of more shipments, using fewer resources; for trade, elimination of redundant paperwork, and expedited release of goods, allowing for faster shipments and more tightly managed supply chains. But there are also a number of issues and challenges that need to be addressed before the switch to a paperless environment can be made.

The most serious of these issues is the effect that a move to an automated environment can have on trade and government partners who deal with Customs on a daily basis. Any change to the system for filing Customs documents and declarations will have an impact on the trade, and a change mandating the adoption of new technology will be particularly burdensome. Trade partners may have to revamp many of their internal processes, or even invest in compatible systems or software, in order to meet the requirements of the automated system. This concern may be especially relevant in developing countries. Without cooperation from trade partners, even the well-designed automated system will be ineffective. Similarly, implementation of a Single Window requires cooperation from other government agencies; without the active participation of all government agencies with border control responsibilities, the utility of the Single Window system is greatly diminished.

In addition, any automated system must be implemented within a country's legal framework. In some cases, there may be legal impediments, such as requirements for hard-copy signatures or paper copies – that prevent the full benefits of a paperless environment from being realized. In all cases, though, systems should be designed for flexibility and adaptability, to allow it to be kept up-to-date with changing laws, regulations, international agreements, and technological advances.

Technology Solutions

The latest technologies and international best practices facilitate the development of this kind of adaptable, interoperable, collaborative system. Rather than rely on expensive, proprietary, custom-built solutions, Customs agencies are frequently turning to open source commercial off-the-shelf (COTS) software for its adaptability, standards compliance, transparency, and low cost. Standards compliant open source software can be customized to meet an individual country's characteristics, needs, and Customs legislation, while remaining flexible enough to adapt to changing national and international requirements.

Similarly, a system based on Service Oriented Architecture (SOA) produces benefits in terms of adaptability and interoperability. Service Oriented Architecture refers to a framework for designing computer systems, where each service provided by the system exists as its own discreet module. These loosely connected modules can be used by other systems, and can interact with each other. Thus, an organization can efficiently link multiple disparate systems together through a series of reusable modules.

Web-based systems, in particular, can be used to increase interoperability and collaboration. Systems operating over the Internet allow both Customs agencies and trade partners to operate in a familiar environment, using international standards such as XML, and reduce the need for investments in software and systems. Web-based systems can simplify communications between Customs and trader partners, and can allow Customs agencies to collaborate on-line.

Whatever type of automated system is implemented, however, a truly interoperable and collaborative environment is impossible without a data model – a model that describes how data is represented and used.

III. CAREC Data Model

To ensure that automation of core Customs procedures results in increased efficiency and allows for regional collaboration, a standardized CAREC Data Model should be developed, based on the WCO Data Model and other international best practices.

A Data Model lays out a framework of standards, harmonized data sets, and electronic messaging guidelines to be used in sharing of Customs information between and among Customs and trade partners. Implementing a standardized model for information exchange and communication can reduce costs, expedite cross-border trade, and simplify compliance. The Data Model itself can be broken down into two parts: a Business Process Model and an Information Model, both of which can be described using the international standard Unified Modeling Language (UML).

Business Process Model

Business Process Modeling is a technique for describing, analyzing, and optimizing business processes. Using a modeling language like UML, a business process model shows the progression of activities – submissions from trade partners, automated systems processes, electronic notifications, actions by Customs authorities, and so on – carried out as part of the overall Customs process. By taking a big-picture view of the process, examining associates, dependencies, and other characteristics, Business Process Modeling can be used to design an optimized process for implementing the automation of the core Customs procedures discussed above.

The Business Process Model for CAREC should take into account relevant international agreements – including the Revised Kyoto Convention, the WCO Guidelines on Integrated Supply Chain Management (ISCM) and the WCO’s SAFE Framework of Standards – as well as modern best practices in areas such as E-Customs, Single Window, and risk management.

The Revised Kyoto Convention (RKC) is an international agreement on the simplification and harmonization of Customs procedures, which provides a detailed blueprint – in the form of approximately 600 Standards, Recommendations, and Practices – for instituting an efficient, modern Customs system. The Convention, the General Annex of which is binding on signatories (including CAREC members Azerbaijan, China, and Mongolia) promote transparency and uniformity of Customs processes between countries, resulting in predictability and consistency for all international trade participants.

In addition to the Revised Kyoto Convention, CAREC’s business model should look to two documents produced by the WCO: the Guidelines of Integrated Supply Chain Management (ISCM) and the SAFE Framework of Standards (SAFE FoS). Building on the RKC, the ISCM establishes guidelines for common control and risk management procedures, as well as exchanges of Customs information. The ISCM guidelines take a holistic view of the supply chain to ensure proper Customs control of consignments from shipping to arrival. Drawing from both the RKC and the ISCM, the SAFE FoS establishes 17 standards, meant to be a “minimum threshold” for WCO members, in the areas of Customs-to-Customs and Customs-to-Business cooperation.

A business model for CAREC based on these documents will thus include both the compliance with international standards and the adoption of modern best practices for critical Customs procedures necessary for regional Customs collaboration.

Information Model

The Data Model for CAREC should also include an Information Model. Information Modeling describes harmonized and standardized data sets, international code standards, and guidelines for electronic messaging. Creating these standards enables Customs services and trading partners to communicate more effectively, eliminates much redundant and duplicative reporting, and reduces costs to both Customs and trade. In particular, a harmonized CAREC Information Model would allow greatly increased Customs-to-Customs collaboration and cooperation by ensuring that all countries collect the same data, in the same formats, using the same code sets.

The World Customs Organization (WCO) has developed a Data Model to “standardize and reduce the amount of data necessary to meet Customs

requirements.”² This data model, which is referenced as a standard in the WCO SAFE Framework of Standards, describes a harmonized data set, international code standards, and message implementation guidelines, all of which contribute to simpler, more consistent information exchange between Customs agencies and trader partners. The WCO model can serve as a basis for a regional CAREC Data Model.

One of the central tenets of the WCO Data Model is the establishment of harmonized and standardized data sets for cross border trade. The model contains a comprehensive series of data sets, covering cargo reports, import, export, transit, and conveyance. Having standardized data sets significantly reduces the reporting burden on trade partners, who would no longer have to deal with redundancies and differences in data requested by different countries. The WCO Data Model also aligns import and export data, using a Uniform Consignment Reference, allowing data to be re-used and eliminating redundant filings. Finally, the data sets could be expanded to include data necessary for a Single Window system – that is, data requested by other government agencies with border control responsibilities – resulting in a single, internationally uniform data submission to fulfill all cross-boarder reporting requirements.

Using this as a model, CAREC countries should work together to come up with common data sets for use in all participating countries. The data sets should cover cargo, imports, and exports, and should require the minimal amount of data necessary to verify compliance with Customs regulations.

In addition to harmonized data sets, an effective Information Model requires standard code sets and message implementation guidelines. These provide a thorough explanation of how the harmonized data sets are using in Electronic Data Interchange (EDI) – in other words, standardizing not only the content of the messages, but also the electronic “container” in which they are sent. Standard codes allow electronic messages to be sent more quickly, and at lower cost, while message implementation guidelines provide for greatly increased Customs-to-Customs collaboration.

The WCO Data Model’s message implementation guidelines make use of UN/EDIFACT, an international EDI standard developed by the United Nations and maintained by UN/CEFACT. As a worldwide EDI standard, EDIFACT provides an electronic information exchange format understandable by many organizations, both government and private sector. Within EDIFACT, there are standardized messages – conveyance reports, cargo reports, and Customs Declarations – for use in Customs reporting. As a widely-used international standard, supported by the WCO Data Model, EDIFACT offers many benefits as an EDI standard, but there are some drawbacks and alternatives as well.

While EDIFACT is widely implemented within major organizations, small and medium enterprises are less likely to have done so, due to high cost and complexity. An alternative solution could be XML, a markup language based on tags and attributes. XML is much more flexible than EDIFACT, is more easily implemented, and is ideally suited for use in web-based applications. Taking into account the trend toward use of XML for EDI, the WCO Data Model includes recommendations for the development of XML messages.

² See “The WCO Data Model – Version 2.0, Fact Sheet” (http://www.wcoomd.org/ie/en/topics_issues/FacilitationCustomsProcedures/Données%20Douanières%20EN.PDF)

Another developing international standard for information exchange in a paperless environment is UN/ECE eDocs. eDocs is an electronic trade document standard, again developed by the United Nations, that aims to provide interoperability between the government and the trade. One of the objectives of this standard is to allow for increased participation by small and medium enterprises – those who might not be able to implement EDIFACT, for example – in the advanced supply chain process. Because eDocs can be generated in multiple formats (paper, XML, PDF, Microsoft, EDI), and because they can be viewed with a standard web browser, they provide a great deal of flexibility.

Challenges

Although the benefits of setting up this kind of Data Model are overwhelming, there are a number of issues that need to be thoroughly examined and planned for, to assure that the process is smooth and the expected benefits are realized. As with the automation of core Customs procedures, many of these issues centre around the affects of change on Customs services' relationships with trade and other government agencies. Additionally, the variety of technical solutions available, and the implications of each of them for system design, cost, and flexibility, requires a thorough examination, and consultation with trade and government partners.

Once again, it is vitally important in developing a Data Model that consultations with trade partners begin early in the process. Although nearly all of the standards outlined here have been developed through collaborative processes, and are internationally accepted, their affects on trade partners can be dramatic – especially so for developing countries and small/medium businesses. While there are significant benefits to trade from, for example, harmonized data sets and the Single Window concept, the ability of companies to implement the necessary internal changes – and the short-term cost of doing so – needs to be considered.

Similar care needs to be taken when implementing an electronic messaging standard. Maximum long-term benefit can only be gained by implementing a system that is fully-compliant with international standards, and that is flexible enough to adapt to changing standards in the future. At the same time, the cost of such a change – to both Customs and the trade – needs to be taken into consideration. The differences in the various options – EDIFACT, XML, UN/ECE eDocs, web-based solutions, and others – should be thoroughly explored in consultation with trade partners.

Implementing these international standards and developing a CAREC Data Model will also likely require revisions of some countries' Customs regulations, and the regulations of other agencies with border-control responsibilities. In most cases, these changes will need to be in the direction of simplifying Customs codes to allow for the use of the standardized and minimized data sets recommended by the WCO. Additionally, national regulations, processes, documentation, and formats may need to be changed to allow for effective information exchange between Customs agencies. For example, the Customs regulations detailing information requirements for imports and exports would need to be changed and standardized in order to successfully implement harmonized data sets. Likewise, before a Single Window can be put into operation, national regulations regarding requirements of other border-control agencies would need to be examined and possibly changed.

IV. Conclusion

There is a great deal to be gained from the automation of Customs processes and the adoption of a regional, standards-compliant Data Model. The benefits reach far beyond Customs – regional business can become more efficient, improving national economies; governments can increase, and more accurately track, revenues from Customs; national security can be improved and the flow of illicit goods and people stemmed. And these benefits can be multiplied even further through regional cooperation and information sharing.

Yet there are also significant risks and challenges. The costs of implementing these systems can be large, and the indirect costs to trade partners can be even larger. Care needs to be taken that technologies are chosen that are both powerful and widely-supported. A great deal of work will be required to ensure that new methods, technologies, and standards are adopted in compliance with national laws and regulations, and done so consistently across the region.

By working closely with trade and other stakeholders, and by taking advantage of international standards and best practices, these concerns can be mitigated and efficient, effective Customs systems can be put in place and harmonized across the region – to the benefit of everyone.