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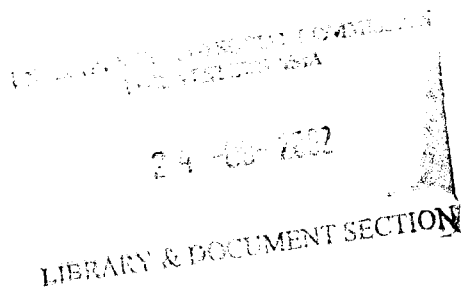
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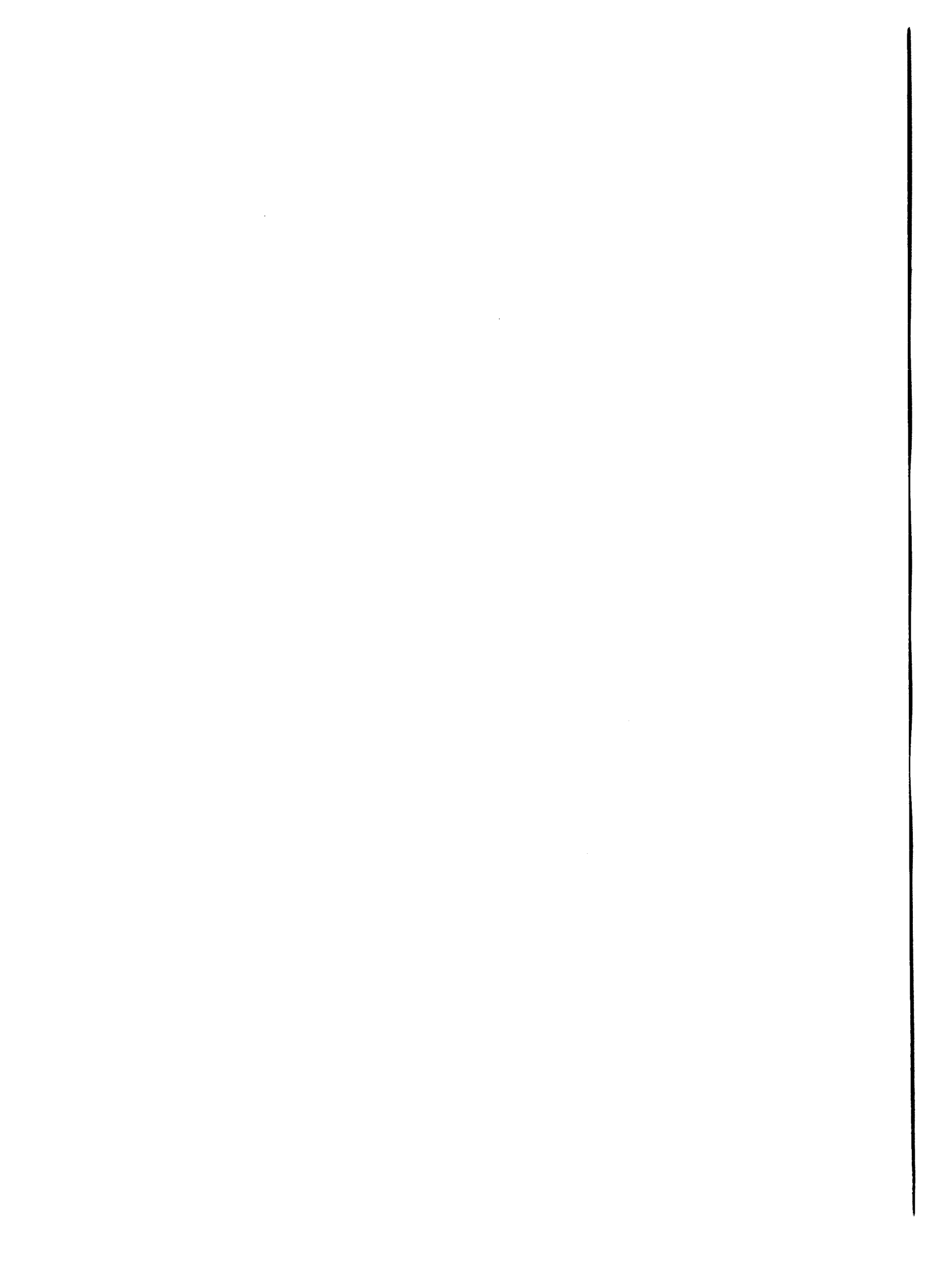
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Cairo, 24-26 September 2002



**INFORMATION AND COMMUNICATION TECHNOLOGIES  
IN CUSTOMS IN THE ESCWA REGION**

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**Economic and Social  
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**Expert Group Meeting on Transport  
and Trade Facilitation for Regional Integration  
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**Cairo**

**Information & Communication Technologies in Customs  
in The ESCWA Region**

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## 1. Why ICT in Customs?

Information and Communication Technology (ICT) has transformed the means by which Customs carry out their traditional national tasks of control and revenue collection. It continues to stimulate radical adjustments of the ways in which the international Customs community services world trade and transport.

Traditionally, Customs procedures were concerned with the goods themselves. Maritime transport of bulk and general merchandise, which almost monopolized international trade until a few decades ago, provided ample time for Customs to lay out or sample and inspect cargo at both export and import.

Earlier Customs administrations procedures were also complicated by the requirement of compulsory submission of many "original" copies of a range of different versions of forms. Subsequently, the trend has been to reduce the contents of standard declarations down to one or two page forms. Even so, this process still required the physical presentation of pieces of paper, by the declarant or his representative, at a place and time convenient to, and specified by, Customs.

Today, most Customs administrations have gradually developed controls which have shifted much of the focus of their interventions from inspecting all goods to checking information on paper documents handled manually and inspecting a reduced number of consignments. The most effective way of meeting commercial needs was to try and focus all major Customs requirements at a single procedural point - the export or import declaration.

Leading Customs Administrations use of ICT has transformed the procedural rules. ICT has allowed Customs to separate fiscal and physical controls to meet their own and commercial convenience. Customs can receive physical control information well in advance of the arrival of the goods and, conversely, can postpone the collection of fiscal data for days or weeks after the goods had been released.

Given Customs obligations, in major trading economies, to seek effective control with reasonable concern for the legitimate requirements of honest business, the problem was to identify and grant concessions to transactions presenting the least risk to revenue collection and such other official concerns as prohibited goods, the protection of intellectual property rights and endangered species. This depended on comprehensive data bases, skilled profiling and expert criteria for the identification of suspect persons and consignments. ICT has allowed Customs to respond to, and facilitate, a range of commercial innovations (such as express, multi-modal delivery services and global intra-company supply, production and distribution systems fed by just-in-time logistical networks) using and developing highly innovative information handling and communication techniques. These developments are by no means complete. Currently most Customs procedures are still electronic equivalents of the old documentary exchanges. Traders just send EDI messages instead of handing over paper declaration forms, but Customs authorities do not always key and reuse data into their own systems. However, Customs and operators alike have gradually seen that the data required by Customs is, almost without exception, already present in the commercial information systems used to service the business transaction. The most economical arrangement for all concerned is for Customs to be able to rely on these systems for their own purposes, either by using the commercial data directly or by integration data into Customs authorities own systems, subject to audit and access for specific control requirements.

All Customs ICT applications, so far, have been designed to improve the processing of export and import consignments in a purely national setting. However, Customs need to recognize the fact that between one third and a half of all international trade today is made up of intra-company transactions, in which materials, components and partly processed, or finished products, are moved across national frontiers within an integrated commercial management system and subject to increasingly diminishing time-frames. Currently, the Customs community still treat such movements as a series of unconnected exports and imports (in other words, one country's export is another country's import). The key is Customs-to-Customs mutual assistance through the application of a single transactional set of physical controls and fiscal procedures. Already a number of pilot and prototype projects have been started by Customs administrations and major international traders to examine various aspects of this single transaction set. These projects have demonstrated that the technology exists to support the concept. They have also shown that the existing legal framework, under which international trade is conducted, will need to be examined and revised as necessary.

It is likely that the implementation of just-in-time techniques will result in a larger number of smaller consignments being traded. This could have a serious impact on Customs operations since the processing of a consignment is the same regardless of the number of items it contains. Therefore, if Customs do not wish to be paralyzed by the resulting increase in traffic and paperwork, they must adopt e-commerce systems, including Electronic Data Interchange (EDI), to handle these changes efficiently and effectively.

The development of new technologies and telecommunications infrastructures, such as those offered by e-commerce technologies, give Customs the possibility of low cost methods to receive and disseminate information. The application of these technologies in a coordinated and strategic manner will ensure that Customs can offer many different means of information exchange.

The growth in the number of people using the Internet will also have a significant effect on the quantity of goods (particularly small consignments) being moved across international boundaries. People can now log on to the Internet and "go virtual shopping", buying a wide variety of items from "virtual shops" around the world, which will have to be imported and exported.

Many administrations have or will implement EDI solutions using standard message formats, principally UN/EDIFACT. Some small or medium sized trading partners have been reluctant to adopt EDI, because of its perceived complexity and potentially high set-up costs. Other e-commerce technology solutions, such as electronic forms through the World Wide Web and the Internet, could offer more cost-effective alternatives.

## **2. Customs processes suitable for automation/computerization**

There are many areas where the introduction of ICT can benefit Customs through automation and computerization. The following section outlines the principal Customs processes and procedures where ICT can have a very significant impact.

### **Data validation**

Computer systems have to: Identify and report critical errors; and identify and report possible errors, (thus applying some judgmental criteria to the data). Data can be validated by computer based or computer assisted checks. For instance, credibility checks can be done by using pre-set parameters to determine the quality of the data input. These are generally comparison checks which will attempt to identify incompatible data (e.g. price of certain commodity from a country which is lower than expected etc.)

### **Cargo inventory control**

The control of cargo from time of arrival until duty has been paid or secured and the goods cleared can present many problems for Customs administrations. Customs must ensure that all cargo arriving in its territory can be properly accounted for. The process of manually matching paper-based records for this purpose is cumbersome, error prone and labor intensive. In an automated cargo control system, manifest data and Customs declaration data can be matched automatically. Amendments to the data may take place in order to record any overages or shortfalls following Customs examination of the consignment. Cargo data may be screened against predetermined selectivity criteria in order to alert Customs officers to high-risk consignments. Following presentation of the goods declaration for the goods in question the computer will automatically write-off the cargo inventory record or produce a discrepancy report for follow-up action. Reports of cargo not entered within predetermined time limits are usually produced for further investigation.

The acceptance of automated pre-arrival cargo manifest information into the Customs system allows Customs to do an initial risk assessment. In many cases where the goods are low value or unrestricted no further assessment may need to be carried out.

In certain circumstances Customs do not maintain their own computerised cargo inventory control system but rely on the automated systems of carriers, port authorities, etc. Customs maintains control of such systems by means of supervisory audit. This approach to cargo inventory control can provide a cost effective solution for Customs, particularly as the majority of carriers and port authorities are automated.

### **Goods declaration and processing (import and export)**

The processing of goods declarations for import and export is one of the major tasks facing any Customs administration. Therefore many administrations have realized major productivity gains by automating this process. Data capture can be achieved in the following ways: Keying of data by Customs officers; Keying of data through Direct Trader Input (DTI), by trading partners or bureau services; and/or using other e-business techniques.

Once the goods declaration data has been entered into the computer system it will be subjected to a number of processes. The core processes are: data validation; classification and country of origin; value control, duty calculation.

Implementation of an integrated tariff database will ensure fast, accurate identification of any restrictions or preferences linked to the declaration, ensuring that correct duty rates are

applied. Accurate valuation of commodities is the basis for correct duty calculation. A valuation database can be used to identify the acceptable values for specific commodities from particular countries. The database can also highlight valuations which fall outside acceptable ranges. Having calculated the duty amounts (including currency conversion), the information can be transmitted to the revenue accounting system.

During the course of this processing the user will be notified of any errors by system generated messages and will have an opportunity to make corrections. They will also be notified of any supporting documents which may be required before clearance of the goods will be permitted e.g. licenses, certificates of origin, etc. When Customs formalities are complete, a release note is produced by the system. Where the cargo inventory control function is also automated, a reconciliation of cargo data and goods declaration data will be performed and the cargo inventory written off.

Lately, The World Trade Organization (WTO) has recommended to simplify valuation of goods by using commercial valuation data instead of pre-specified valuation databases. This will improve predictability and should simplify the valuation process – and goods declaration processing in general – significantly – and further stimulate the use of keyed data in electronic data exchange systems (electronic commerce, electronic supply chain management systems etc.).

Goods declaration processing systems can produce periodic reports for trading partners. These can show amounts owing under deferred payment for the transfer of funds electronically from the trading partner's account to Customs.

Accepting automated pre-arrival Customs declaration information allows Customs to carry out all the necessary processing, including accounting for duties in advance of the physical goods arriving in the Customs territory. Any errors can be notified to the trading partner in advance, thus allowing corrections to be made and consequently reducing potential release time delays.

Pre-arrival Customs declaration information is processed using the same routines as are used for normal declarations. Generally the release status of the goods is not given until the manifest details have been entered into the system, thus proving that the goods have actually arrived in the Customs territory. It is possible that in some cases the release status is held back to reduce the possibility of any fraud being perpetrated (e.g. switching the goods at the last moment). However, where a trading partner is authorized (this would normally be indicated in the trading partner profile held on the Customs system) it may be possible to indicate the release status before the goods have arrived. A release status is not normally notified until after a waybill has been issued by the carrier.

#### **Data reconciliation**

Automated data reconciliation - "data matching" - is one of the most important system processes for Customs, for example, between cargo inventory control and goods declaration processing systems. Any discrepancies between the matched data can be highlighted and a report of over- or under-declarations generated by the system.

Transit and transshipment movements can be more easily controlled in an automated environment. The declaration information can be captured at entry and matched and written-off when the goods leave the Customs territory. Basic validation and credibility checks are carried out on the data and a unique declaration number is given by the system. At the point of departure Customs access the original details using the unique declaration number.

The use of automation allows any incomplete or mismatched transit movements to be identified in a more timely and efficient manner. The application of computerized data

reconciliation techniques can also be applied to the Customs procedure of “temporary admission for re-exportation in the same state”. As part of the automation of the revenue accounting system the reconciliation of actual duties owed, as extracted from the goods declaration information, can be matched against receipts to produce timely accurate accounting information. In the area of drawback of duties the accounting system can be used to validate claims.

### **Release notification**

Although goods declaration processing is definitely an area for the introduction of ICT, the implementation of electronic release notification can be addressed as a separate initiative. Many benefits can be achieved by interfacing with existing automated release systems and capturing the release for electronic means of commerce distribution to one or more trading partners. An electronic release notification system can be implemented even if all transactions are processed via paper. The timely distribution of electronic releases can provide positive benefits to Customs and their trading partners, in terms of faster release times, and avoid having trucks waiting unnecessarily.

### **Customs enforcement**

The advantage of using ICT for control purposes is its ability to make information easily available to all authorized Customs officials. Furthermore, ICT opens up the possibility of access to information held on databases maintained by other law enforcement agencies, such as police records, immigration files, etc. The application of ICT also allows Customs officials to assess various data, such as selectivity criteria, speedily and accurately, in order to identify high risk traders and cargo.

In order to ensure proper compliance with Customs regulations, using scarce resources efficiently, Customs must employ selectivity and risk assessment techniques. While these techniques are not necessarily dependent on information technology for their implementation, they cannot really be applied efficiently and consistently without it. In an automated environment the same principles for selectivity and assessing risk can be applied to both goods and persons.

### **Selectivity**

This is the process which will determine if a particular consignment or person is to be examined in more detail by Customs. In an automated environment three selectivity filters can be applied, namely national profiles, local profiles and a random selection system. The first two of these are based on a system of profiles which are built up from the knowledge base of Customs and from utilizing data analysis systems which assess the risk of loss and non-compliance. The identification of risk and the typical data elements used in profiles are covered in detail in the WCO Guideline on Customs Control.

When building up a set of profiles the designer should be aware that the system needs to be flexible and capable of handling relatively complicated combinations of data elements as well as simple single data elements. Using combinations allows Customs to fine tune its targeting capabilities. In other words, Customs might, for example, only want to select a particular commodity if it comes from a particular country and not if it comes from any other country.

The principle difference between national and local profiling is that national ones are mandatory for all Customs offices while local profiles only affect a group, or a single Customs office. However, information from the local profiles should be used as part of the general risk analysis and where relevant upgraded to national status. All profiles should be reviewed on a regular basis. Criteria related to who can change profiles at both levels needs to be established.



The random selection system uses an algorithm to select a declaration for further examination by Customs.

Another important element in the system design is to ensure that the co-ordinated interaction between the three levels of selectivity is monitored so that the overall target for examinations is not exceeded.

The system will also have to be designed to ensure all data goes through the national profiles but only the declaration data relevant to a specific region or Customs office goes through the local profiles for that region or office. Facilities are often included to allow profiles to be switched off temporarily by authorized managers.

### **Risk management**

Risk Management is fundamental to the effective targeting of consignments for examination. Methodologies necessary to conduct risk management are outlined in the WCO Guideline on Customs Control. Selectivity profiles are only as good as the information they contain. Regular review of profiles will tell Customs officials which data elements and combinations of data elements have successfully detected non-compliant declarations. Analysis of the declaration information itself will also present clues to trends and identify potentially high risk consignments.

### **Advance passenger processing**

Advance Passenger Information (API) allows Customs to expedite passenger processing. To obtain fully the benefits of API and to use it as an efficient tool, co-operation between the border control agencies (Customs, police, immigration) and the carriers (airline and shipping companies etc.) is required. The Joint IATA/WCO (International Air Transport Association/World Customs Organization) Guidelines on API specify the maximum data requirements Customs should request and the standards to be used. International standard messages already exist which will allow the exchange of API data.

### **Revenue accounting**

Revenue collection is one of the primary functions for many Customs. Therefore the automation of the revenue accounting process is an essential part of any integrated Customs IT system. A revenue accounting system has to:

- Account for all duties collected and refunded;
- Provide a mechanism for the collection and refund of the duties at the time of clearance;
- Provide a mechanism for the deferment of duty payments for a specified period.

The application of a deferred payments system necessitates the setting up of a trading partner registration system. This controls the guarantees and identifies the revenues payable for a specified period of time. In a revenue accounting system the following tasks are ideally suited to the application of ICT:

- Automated control of duty security;
- The maintenance of trading partners' deferred payment accounts; and
- Production of fast and accurate revenue accounts.

The collection of duties at the time of clearance requires the acceptance of cash, cheques, bank drafts and/or credit cards from the declarant and/or the use of real time electronic funds transfer (EFT). Customs must be able to reconcile the actual duties collected with the total duties calculated by the goods declaration system. Typically the actual duty amounts collected for each transaction together with the Customs declaration number should be recorded by the system. The means of payment should also be recorded. Normally the type of duty (excise,

Customs duty, export tax, etc.) with the duty amount for each type is also recorded, thus allowing the Customs authority to identify how much duty is collected for each duty type.

The acceptance of payment cards requires that Customs install the necessary technology, linking the Customs stations to the banking system, in order to validate the details on the card and ensure acceptance of the total duty amounts.

The application of a deferred payments system is significantly different from collecting duties at the time of goods clearance. The foremost advantage is that it allows for quick release of cargo. Such systems are based on maintaining individual accounting information for each approved declarant or trading partner. Normally a maximum limit for deferred duties is agreed between the trading partner, Customs and the trading partner's bank through the issuing of a guarantee. Details of this amount together with details of each transaction (Customs declaration number and duty amounts) are maintained on a database which is linked to the trading partners registration system. The controls and maintenance of a manual system require a large amount of resources and are more open to fraud or errors. It is also not practical to operate a manual deferred system on a national basis (i.e. one account per trading partner to cover transactions for every location). However, with the implementation of an automated revenue collection system, a national deferred payment system can be easily operated.

In an automated environment the latest deferred account balance is always available whereas in the manual environment this cannot be guaranteed. Further, in the manual environment the possibility of the deferred duty amounts exceeding the guarantee will always be a possibility. This could expose the Customs to a risk of revenue loss. However an automated revenue accounting system will not allow the trading partner to exceed the guarantee limit. If the duty amounts for a particular transaction are greater than the balance of the guarantee, the system will alert Customs.

Where electronic exchange of information takes place the Customs system will send a response message to the trading partner indicating that duties cannot be deferred due to insufficient credit. The trading partner would normally be able to submit a request for information concerning the deferred account balance or a statement of the account.

When the duty becomes payable, the total amounts owed by each approved trading partner together with their bank account details (account number, branch sort code, etc.) should be transferred to the relevant bank. Agreement on the information exchange standard and the medium (EDI, tape, disc) between Customs and the banks will need to be addressed. International standard messages for use in the EDI environment are available for the transmission of payment information.

#### **External trade statistics**

As the declaration database will also be the primary source of external trade statistics data, these requirements need to be considered during the design phase of the database.

#### **Management Information System**

Once data is held electronically, it is capable of being analyzed using off-the-shelf software or programs written in-house. Before choosing one of these options it is essential that an analysis of the types of queries and reports required is undertaken. Data analysis tools can be used to do simple things like extracting every occurrence of a name or for complex processing like merging related pieces of data from various files to produce a report not otherwise readily available.

These techniques have a great value in enforcement and fraud investigations. However, Management Information Systems can also be used by management to ensure that resources

are used efficiently. Reports can be produced on the number of declarations processed in a particular Customs office, the identification of peaks and troughs in the work flow, types of consignments, etc.

#### **Trading partner registration system**

Trading Partner Registration Systems are often developed as part of a deferred accounting system but can be used for other purposes, for example, to identify which special facilities the trading partner has been allocated by Customs. Such a system will typically hold basic trading partner details such as:

- Trading partner unique registration number (common across all agencies, where possible);
- Trading partner details (name, address, phone no., etc.);
- Bank account details (bank name, address, account no.);
- Guarantee amount (the maximum monetary amount guaranteed by the trading partner's bank);
- Duty debit date (date when the duty should be debited from the trading partners bank account);
- Special Customs procedure facilities (periodic declarations, bonded warehouse, etc.);
- List of relationships with a parent company and/or branches, where these exist.

The declarant will be required to quote the registration number on each declaration. Then duty details can be matched against the correct deferred account or a particular facility or Customs procedure can be activated. Each individual account should hold the declaration number and date together with total duty amount for the declaration. A running balance of the current guarantee amount should also be maintained.

#### **Other applications**

In addition to the application areas mentioned already, other Customs functions which can be automated include:

- The refund of Customs duties which have already been paid (drawback);
- Control of quotas;
- Administration of Customs fines, penalties, etc.;
- Binding tariff information (BTI);
- Classification decisions; and
- Warehousing, including the movement of merchandise under Customs bond.

### **3. Interoperability of ICT Applications**

Customs should develop information systems on the basis of an integrated information architecture that can consist of the following application sub-systems and relevant databases.

#### **Application sub-systems:**

- Import system
- Export system
- Transit system
- Excise system
- Warehouse system
- Drawback system
- Risk management system
- Enforcement system

These information systems support the basic Customs procedures for goods processing. Between the relevant information systems, interfaces are needed to enable communications between the systems. For example, transit systems need interfaces with the export and the import systems.

#### **Administration databases**

- Trading partner registration database
- Integrated Tariff database
- Revenue accounting database
- Selectivity database
- Declaration databases
- Commodity database
- Origin and destination database
- Deferred payment database

The information architecture should guarantee the common use of stored data within Customs. Each database can be used by several application sub-systems. For the management of databases it is recommended that data which are closely related to each other be stored in one database. This means that the data, together with the data relevant for the management of this data, are stored in the same administration database wherever possible. Identification of data relationships and data organization must be carried out as part of the initial systems analysis.

It is recommended that development of information systems separates the logistic part of the Customs procedures (processing) from the data relevant for the Customs application (files, databases). This enhances the re-use of functional components of systems, and makes maintenance of information systems more efficient and effective.

## **4. Availability & Accessibility: Communication means**

Customs engaged in the introduction of electronic information exchange systems should recognize that success will be based on the availability and accessibility of the system. This can only be guaranteed through the use of fully recognized international standards at all appropriate levels of system development. There are four areas of interest related to international standards: Data transfer standards, telecommunication standards, messaging standards, coding standards. These four standards are presented briefly in the following.

### **4.1 Data transfer standard options**

There are three main data transfer options :

- physical delivery of magnetic media such as tapes and disks via postal/courier services;
- point-to-point data transmission; and
- communication networks, which provide store and forward and other services which add value.

#### **Tape/disk**

This method is slow as it requires the media to be physically exchanged by post, or by the trading partner calling into the Customs office. These methods are used where telecommunications are poor or expensive. However, media exchange can be seen as the first step to the implementation of electronic commerce, because international standard messages, as outlined in the WCO Data Mapping Guide, can still be used. Implementing such a system can give Customs and the trading partners valuable practical experience in the application of electronic commerce.

#### **Point-to-point**

Modems are used to link two computers over telephone lines or satellite link so that they can communicate. Traditional telephone lines are intended for voice rather than for computer communications. Consequently modems and telecommunications software are required before information can be exchanged.

If dedicated leased lines are used instead of regular dial-up telephone lines, the sending and receiving computers may use a communications controller instead of a modem. The essential difference between having a dial-up line and a leased line is speed (and costs). The dial-up has a much slower rate of transfer, which makes it suitable for low-volume use only.

#### **Communication networks**

The typical scenario for a communication network is that all trading partners who wish to exchange information will have an electronic mail box each, which will be managed by the communication network. Electronic messages will be transmitted over the communication network from mail box to mail box. This means that, unlike point-to-point where both systems have to be available and open to receive data at the same time, the transmission and temporary storing of information is separated from the application system. If the Customs system is not operational for some reason, trading partners can continue to send information to the Customs mail box.

A Value Added Network (VAN) is a third-party communications network that can accept a message from any computer hardware and software configuration and deliver the message to a receiver that uses different hardware and software. A VAN can provide not only communication services but also EDI translation and security services. Most VANs can support a wide range of communications protocols. Since the technology of communications and protocol conversion can become extremely complex, a VAN offers a true value-added

service by handling this aspect of the communication between pairs of trading partners, or within groups of trading partners, with dissimilar computer configurations.

Customs will have to examine the most effective ways in which to receive information. Many countries do not have VAN services available but do have Internet services. These tend to be cheaper than VANs, and Internet is strongly believed to be the dominant medium for data and information exchange between Customs authorities, trading partner and Governments in the future. Administrations are already turning to the Internet and World Wide Web (WWW) as a means of making vital information concerning regulatory requirements available to the trading partners, and Customs Administration systems such as Asycuda++ has recently become available in an Internet version, called "AsycudaWorld".

#### **4.2. Telecommunications**

At the telecommunications level, Customs needs to ensure that the protocols used for physical connectivity are recognized ones. These standards are generally applied by national telecoms companies or institutions. However, if administrations are engaging private telecommunications network suppliers, it is important that they ensure the use of ISO standards at this level. The use of networks, such as Internet, also require careful consideration in relation to transmission protocols.

#### **4.3. Messaging**

The issue of electronic information standards is an area in which Customs can and have exerted a more direct influence on the reduction of ambiguity of messages. During the past number of years Customs has been engaged in the development of electronic message standards through the United Nations. These UN/EDIFACT messages have become the international standard used in EDI. The WCO produces annually, the "WCO Data Mapping Guide for UN/EDIFACT Messages". Customs should use this UN/EDIFACT with the Data Mapping Guide as the base document for the implementation of these messages formats.

The development and rapid expansion of the Internet has opened up new possibilities for information exchange. Consequently new information exchange formats will become *de facto* international standards through global usage, for example electronic forms, hypertext mark-up language (HTML), XML, open document architecture (ODA), etc. While many of these are still under development, Customs looking at future electronic information exchanges will need to take these formats into account in their business strategies.

#### **4.4. Codes**

The WCO recommends the use of international codes, such as the ISO country and currency codes, UN transport codes, WCO Convention on the Harmonized Commodity Description and Coding System, etc. The use of available international codes will ensure the maximum openness, accessibility of international trade, and avoid ambiguity. It will help simplify systems development for trading partners and other government agencies who wish to communicate with Customs. It will also make the exchange of information between Customs administrations more viable.

## 5. Customs Automation & Computerization Systems

Around the world a large number of standardized (“off the shelf”), tailor-made or in-house proprietary developed Customs automation and computerization systems exist. Like in all software development and implementation it is questionable, which solutions should be chosen, and it requires thorough analysis of needs, functionalities, and environmental situation (economical, technical, and cultural) to make the right choice – and to continue to make the choice being right. In the ESCWA region several standardized Customs automation and computerization systems are implemented and used, such as Asycuda++, E-mirsal, and proprietary tailor made systems. In the following the UNCTAD’s Asycuda system’s functionalities will briefly be presented.

### 5.1. UNCTAD’s Asycuda

Automated SYstem for CUstoms DAta (ASYCUDA) is a computerized customs management system, which handles manifests and customs declarations, accounting procedures, transit and suspense procedures. ASYCUDA also generates trade data that can be used for statistical and economic analysis.

International codes and standards developed by ISO (International Organisation for Standardisation), WCO (World Customs Organization) and the United Nations are taken into account by ASYCUDA, and it can be configured to suit the national characteristics of individual customs regimes, national tariff, legislations, etc.

ASYCUDA provides for Electronic Data Interchange (EDI) between traders and Customs using EDIFACT (Electronic Data Interchange for Administration, Commerce and Transport) rules.

The ASYCUDA software is developed in Geneva by UNCTAD ([www.asycuda.org](http://www.asycuda.org)), and is now implemented in over 80 countries

Originally developed in 1981 on micro-computers, which were extremely limited in capacity by today’s standards, Asycuda stretched the capacity of these machines to their limit. However, over the years capacity and performance of microcomputers have rapidly improved and major revisions of the Asycuda software have led to a stable and reliable system.

Nowadays, Asycuda has been re-designed and developed to use object oriented tools in a client/server architecture and is based on a Relational Data Base Management System (RDBMS). This latest version has been ported to a wide range of both Intel and risk-based platforms, and is being called Asycuda++<sup>1</sup>. In the spring 2002 an Internet based version called “AsycudaWorld” was launched.

AsycudaWorld, will be particularly useful to developing countries, where poor fixed-line telecommunications can be a major problem for e-government applications. AsycudaWorld should be powerful enough to accommodate the operational and managerial needs of customs operations in any developed country. This way, AsycudaWorld can result in greater tax revenue collection and lower transaction costs even in less developed countries compared to the functionality which is already provided by the current version of the system, ASYCUDA++. A secondary benefit is its effectiveness in combating fraud, corruption and illicit trafficking, as it gives customs authorities in different countries a tool for working together online.

The AsycudaWorld platform is based on a technical architecture that does away with the need

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<sup>1</sup> [www.asycuda.org](http://www.asycuda.org)

to maintain permanent connections with a national server – something that is especially important for countries with unreliable telecommunications. Where telecommunications are more reliable, the traditional Web approach can be used. AsycudaWorld can work with several database management systems (including Oracle, Sybase, DB2, Informix, SQLServer, etc.) and operating systems, such as Linux, Windows and Solaris. The choices of software and hardware suppliers are left entirely to user countries. The platform's use of XML (extensible mark-up language) will allow for the exchange of document inside and outside the system, between customs administrations and traders and between customs administrations in different countries. It is "Java-native", meaning that it was designed as an open standard to be used with Java. Countries can thus modify or extend the application without requesting assistance from UNCTAD. It is fully compatible with ASYCUDA++, ensuring a smooth transition to e-customs for user countries. AsycudaWorld will typically cost a maximum of 2 million dollars to implement according to [www.asycuda.org](http://www.asycuda.org).



## 6. Conclusion: Advantages of ICT in Customs

Many of the benefits which Customs derive from the introduction of ICT can only be obtained with good co-operation from the trading community. The introduction of certain types of ICT technologies, for example EDI, require traders to invest resources in the development of the necessary interface software in their own systems and, perhaps the payment of additional on-going costs for example, network traffic charges. In order to ensure the successful introduction of new systems, which will have an impact on the trading community, Customs should involve representatives of that community in the planning and decision making process where necessary and appropriate. This involvement can take a number of forms, but the most common methods are the establishment of a trade/Customs consultative group, public meetings, information packs and newsletters.

The consultative group is very important as those outside Customs directly impacted by the proposed system should have a voice in how it should be implemented. This group needs to be established very early in the planning stage of the project and should meet regularly throughout its full lifecycle. The use of public meetings, open to all traders and their representatives, is a useful method to give information to a large audience. Furthermore, it is a way to receive feedback so as to ensure that reforms have the intended effect and to avoid sub-optimization and the introduction of new hurdles. Finally, it is also useful to gauge the feeling of the trading community to the proposed new system. Information packs, containing details about the actual system itself and how it will impact or change the working methods of the trading community, should be made publicly available. They should also contain detailed information covering trader system requirements.

### **More effective Customs controls**

Effective Customs control in order to prevent duty/tax evasion, fraud and smuggling is Customs' main aim. Given limited Customs resources it is not possible, or indeed feasible, to examine every consignment that enters a country. Thus, in carrying out their control function, Customs must be selective. Risk assessment and selectivity criteria, in order to identify consignments for examination and documents for checking can be applied in a manual system.

However, where the functions of cargo control and/or goods declaration processing have been automated such selectivity can be carried out on a much more informed and thorough basis. Intelligence gathered by Customs can be fed into the computer system and be taken into account when selectivity processing is taking place. The probability of uncovering fraudulent practices is therefore increased in an automated environment, where selectivity profiles can be analysed more systematically, accurately and in a more timely manner.

ICT can also be of assistance in identifying importations when the declared value of products falls outside predetermined parameters.

### **More efficient Customs clearance**

The efficient processing of goods declarations is one of the main benefits of automation, by providing :

- increased productivity for both Customs and trading partners;
- better use of resources;
- reduction in costs to both Customs and trading partners by :
- expedited release of goods;
- more accurate and timely information;
- better enforcement capabilities;
- less congestion at ports and airports.

Automation of Customs procedures in conjunction with electronic exchange of information, such as cargo data and goods declarations, enables pre-arrival information processing. Processing of regulatory information in advance of the physical goods arriving in the Customs territory allows Customs to verify the information and carry out an initial risk assessment on the consignment. With the information already available, decisions on the release status of the goods can be transmitted immediately the goods arrive using Electronic Commerce techniques.

#### **Uniform application of Customs law**

The increase in the quantity and complexity of the laws which Customs are obliged to enforce is significant. In a manual environment Customs can find it difficult to be certain that they have taken all existing regulations into account when processing individual importations and exportations. In a computerised system all transactions are processed in a consistent manner, thus ensuring a uniform application of national laws and the equitable treatment of all trading partners.

#### **More efficient revenue collection**

For many countries revenue collected by Customs is a significant source of government revenue. The efficient collection and accounting of this revenue is vital to the national economy. The automation of the revenue collection process can help ensure that revenue is collected and accounted for in a timely manner. Outstanding or bad debts can be identified quickly and dealt with. In a manual environment, reconciliation of revenues received and revenues due is slow and prone to errors.

#### **More effective data analysis**

Customs is the primary source of international trade data. Information held manually is bulky and time consuming to evaluate and organize properly. It is almost impossible to extract meaningful and related data from a variety of files without a very labor intensive exercise. This is the principal difference from data held in an IT system. The automation of Customs systems allows Customs immediate access to up-to-date information and, with the application of Management Information Systems (MIS), the possibility to manipulate this information in a meaningful way. Customs automation also enables more effective post-audit control at national and local level.

Another advantage is that data captured electronically is likely to be more accurate as a result of validation and credibility checks built into the automated capture process. This in turn will ensure that any data analysis carried out will be more accurate.

#### **Efficient production of external trade statistics**

Almost all Customs Administrations have responsibility for the collection of trade data and many of these are also responsible for the compilation of the country's external trade statistics. Many politically and economically important decisions have to be taken in the light of the most recent trade statistics. It is difficult to perform this task efficiently and effectively without the use of IT techniques. Data for the compilation of external trade statistics is generally extracted from import and export goods declarations. Where goods declarations are not processed by computer for clearance purposes, the capture of data must take place at a later time. Where, however, automated goods declaration processing does take place, the trade statistics are included in a structured way with the data captured at the point of importation and exportation. This is very cost effective and the statistics produced in this way will be more accurate and up to date. This enables other government agencies to take any necessary action very quickly.

#### **Improved quality of data**

A further benefit of IT is the improved accuracy brought about by data validation during the capture process. Since this is done while goods are still under Customs control it is easier to

resolve discrepancies. These checks ensure the reliability of the basic raw data which will be contained in the Customs computer system.

Data Validation (ensuring incorrect information does not enter a computer application) is of paramount importance if the benefits of IT are to be realized. If invalid data is allowed to enter the system, the results of any processing are worthless and the investment of resources and money are wasted.

## **6. Recommendations**

The introduction, implementation and use of automated and computer assisted Customs Administration Systems must continue as the “win-win” benefits among Government, traders, administrators and the business society are manifold.

It is important to understand the functional, technical and financial aspects of ICT in Customs better do determine decisions and choices, both prior, under and after the implementation.

Meanwhile, the establishment of harmonized and standardized conditions for interregional and interregional trade and transport must continue, and the establishment of regional trade and transport Committees with the purpose of facilitating this process is important.

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