

Working Paper No. 4

Customs Information and Communications Technology

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I. INTRODUCTION

1. Adequate Information and Communications Technology (ICT) infrastructure not only facilitates trade through automation, but also fundamentally changes the concept of the customs service through various IT-enabled customs techniques, such as risk management and real-time information sharing with relevant agencies within and across national borders. However, most of the Customs in the East and Central Asia do not yet have adequate ICT infrastructure and systems to support the application of these modern customs techniques or allow data sharing between countries. Customs in several of the countries have established systems, but others are still engaged in modernization efforts by undertaking needs-assessments and developing open and cost-effective customs modernization plans according to their respective economic circumstances. In the Region as a whole, the variation in the application of ICT within the customs organizations is significant and this potentially compromises the ability to develop regional exchange capabilities needed to enhance processing and risk management capacity.

2. Customs in Azerbaijan, Kazakhstan, Mongolia and PRC have installed automated customs clearance systems (ACCS). Both the Kyrgyz Republic and Tajikistan are currently undertaking needs-assessment programs in connection with customs modernization funded by ADB. Turkmenistan and Uzbekistan have ICT applications but have not installed full ACCS applications at this stage. It can be seen that considerable progress has and is being made to make ICT an effective tool in improving customs performance and assisting in overall reform of the service throughout the Region and such progress should be acknowledged.

3. For those countries yet to install a ACCS, careful selection of ICT architecture with an open network system is the most crucial step for the (i) introduction of a full declaration processing system; (ii) introduction of modern customs techniques, such as risk management; (iii) sharing of information by supporting “electronic data interchange (EDI)” or a national data-transfer system; and (iv) establishment of a regional intelligence system for combating drug-trafficking, gun-smuggling and other illegal transactions. Consequently, the ICT developments are linked with the potential to implement several other components of the Common Action Plan.

4. This Working Paper provided information on some of the issues discussed at the joint working group meeting in Almaty, Kazakhstan in April 2003 and the Capacity Building Seminar at Issyk-kul in August 2003. It is recognized that ICT initiatives in customs are predominantly country-specific, but that it has a regional dimension in relation to many of the CCC components through the ability to interface between the various country systems so as to exchange data on a regional basis.

II. GENERAL PRINCIPLES FOR THE INTRODUCTION OF ICT IN CUSTOMS MODERNIZATION

5. At the CCC Regional Capacity Building Seminar on Trade Facilitation and Customs Modernization held in August 2003 in Issyk-kul, Kyrgyz Republic, the ADB Consultants provided guidance to participants on ICT development within a customs environment based on the experience of other countries. This endorsed the development approach that had been discussed at the joint working group meeting in April in Almaty, Kazakhstan. It is considered that these guidelines were particularly useful for those countries currently engaged in needs-assessment audits and defining their ICT needs, so as to avoid some of the problems that have occurred in other countries when undergoing a similar development process.

- (i) Reform customs legislation in line with country circumstances and international best practices;
- (ii) Improve and re-engineer existing processes first, and only then build a computer system to suit or reinforce the improved process. Do not computerize poor processes in the hope that it will improve them;
- (iii) Define the requirements in detail;
- (iv) Ensure that project management and technical skills are available;
- (v) A customs automation system must link with other relevant agencies, such as Ministries of Finance, Trade, Transport, etc.;
- (vi) ICT must have the capacity to interface with the systems of other countries;
- (vii) Consult interested non-customs parties, such as trade representatives, brokers, agents, declarants, etc., at every stage;
- (viii) Exercise caution in introducing and procuring a customs automation system that has never been implemented before;
- (ix) Phase the implementation; and
- (x) If feasible, assure sustainability (e.g. meeting ongoing operation, maintenance, upgrade and consumables costs) and lower budget pressures by charging fees for computer data-entry and processing.

III. SYSTEMS AND SUPPLIERS

6. There have been automated Declaration Processing Systems or ACCS for many years, commencing with the advent of ASYCUDA and the French Sofix system. Although Declaration Processing was the hub of such systems, later systems have been progressively oriented towards the trade facilitation processes that tend to relegate the declaration processing function to a more subordinate role, though nevertheless recognizing its key importance.

7. No single system is currently a “front-runner” as an “international” system when considering purchasing new systems for the Central Asian Republics. All systems have their advantages and disadvantages. Whether the systems have a price tag or are offered as “free”, they all carry a significant cost, both monetarily and in the major commitment of resources. The initial price relates only to the system software and does not include the substantial additional capital costs of the hardware and systems-support that often exceeds the cost of the system itself.

8. The situation with regard to these systems and their suppliers is that it is difficult to make direct comparison between equivalent customs applications packages. Figure 1 gives some indications of key international and regional systems, commenting on their advantages and disadvantages. Each system is then described in the following sections.

Table 1: Status of Systems and Suppliers

SYSTEM	SUPPLIER	COMMENT
ASYCUDA	UNCTAD	Still the most installed system
AsycudaWorld	UNCTAD	New, Internet-based system
TATIS	Tatis S.A.	Complete system from knowledge management viewpoint
TIMS	Crown Agents	Emphasis on risk management and trade facilitation
Sofix	Douanexport	Limited penetration
UAIS (Russia)	Russian Customs	Basic, but a real player in the region
UAIS (Kazakhstan)	Kazak Customs	More advanced, but not all modules implemented
National Systems	Various	Unlikely to be well supported
Bespoke Systems	Various	High risk, but successes established

A. ASYCUDA

9. The Automated System for Customs Data known as ASYCUDA, ASYCUDA++ and, more recently, AsycudaWorld, is offered by UNCTAD, the United Nations Conference on Trade and Development. It is provided to countries free of charge, but UNCTAD indicates an average of \$2 million for an ASYCUDA implementation against their estimate for bespoke developments of over \$20 million. Based on the experience in some of the Former Soviet Union countries this estimate appears low. However, the later support and monitoring of the systems by UNCTAD is considered expensive and thus operating costs can be high.

10. It is the most widely-used system having been installed in the customs authorities in 84 countries and can legitimately claim to be the “international system”. However, this may overstate the case as its application has had varying levels of success. UNCTAD claim that all implementations are viable, though 30% of the country applications are limited in their operation and another 30% are not operating as well as they might. Certainly the best installations, such as those in the Philippines and Romania, are highly rated, but other countries, such as Mongolia, have dropped ASYCUDA in favor of in-house development, while other countries have moved over to other bespoke systems. None of the countries in the Central Asian region operate the system. It has been noted that there is some opposition to ASYCUDA within the Central Asian Republics (CARs), partly based on the desire to promote their bespoke systems rather than use “foreign” systems and partly as a result on problems in ASYCUDA application in the Caucasus countries.

11. UNCTAD describes ASYCUDA as more than just a simple Declaration Processing System, having the following modules:

- (i) MODCBR is the Customs Post module and deals mainly with the input, validation, storage, registration and assessment of Customs declarations;

- (ii) MODBRK is a modified version of MODCDBR designed for a declarant or customs broker and gives them a direct electronic connection (limited to only those functions relevant to their dealings) to ASYCUDA++;
- (iii) MODACC covers all accounting and payment functions;
- (iv) MODSEL facilitates control of the selection and flow of declarations through the system and contains controls to block assessment of selected declarations, plus a range of querying and reporting functions;
- (v) MODCAR is for the preparation and transmission of cargo reporting details, such as carrier or transport manifests, in electronic format, which can be used with other ASYCUDA++ modules for cargo controls, including clearances and cargo accounting;
- (vi) MODSDI provides external trade statistical data;
- (vii) MODTRS is specifically for transit operations;
- (viii) MODCHQCF accommodates currency changes;
- (ix) Head Office and Configuration Modules for set up of the ASYCUDA++ system to meet national requirements (e.g. forms of declaration, national tariff, tax rates) and for maintaining database reference data used by the system, such as rates of exchange, and codes including importer, declarant, bank, warehouse, etc.

12. ASYCUDA++ will not be undergoing major functional amendments in the foreseeable future, though technical modifications will continue. UNCTAD has instead invested their expectations in AsycudaWorld, a web-based, e-customs platform, not only using the Internet to integrate customs operations but also using advanced techniques to communicate without permanent connection over difficult terrain encompassing “from palm top to mainframe”, and therefore deliberately targeted at developing countries with poor telecommunications infrastructure. It is compatible with and can be added to ASYCUDA++. The first installation is due during 2003, though UNCTAD are not disclosing the identity of the country concerned.

13. This approach by UNCTAD, while technically logical, has left some countries with problems because of the high cost of updating their systems to later versions. The initial installation programme is often funded by the International Financial Institutions, such as the World Bank, but there is no provision for later financing and the countries then have insufficient resources for this expensive up-date process, such as has occurred in Armenia that is still using initial versions.

B. TATIS

14. The TATIS system is being promoted by a Swiss company, Tatis, as constituting “a complete knowledge management solution covering all customs regimes” by providing “integrated tools and methodologies that capture, validate, analyze and deliver customs data to the critical user”. It is understood that it has been developed based on the Canadian customs system, but this is unconfirmed. The key elements of the system are as follows:

- (i) Declaration Processing, covering all customs regimes within import, temporary admission, and export, and is able to function independently or integrated with duty suspense and compliance management solutions;
- (ii) Compliance Management, including risk management, import verification services, customs reform and trade facilitation, post-

- release audits, transit or bonded warehouse quality control, industry and company assessments and human resource development;
- (iii) Enforcement Technology, supplying delivery and feed-back mechanisms to distribute the output generated by compliance, automation tools through instructions, reporting and tracking solutions, post-entry audit and mobile task force solutions, workflow management and integration with declaration processing systems;
- (iv) Suspense Regime Management, covering Transit, Bonded Warehousing and Bonded Manufacture.

15. On the technology front, Tatis emphasize their SmartDocument™, which uses a secure 2-D bar-coded document to carry confidential risk and enforcement data to border points, compatibility with other customs systems, such as ASYCUDA, and communications via the Internet.

16. In order to meet across-the-board requirements, Tatis have formed strategic alliances with:

- (i) Price Waterhouse Coopers, for tax and legal expertise;
- (ii) SGS, known primarily in the customs domain for Pre-Shipment Inspection services, but keen to dispel the limited image that that invokes and to push their expertise in revenue protection and trade facilitation. They are using some developments of the Singapore system in some African countries;
- (iii) Hewlett-Packard, for computer systems supply, implementation and support; and
- (iv) Oracle, the leading database environment supplier.

17. This is a formidable teaming, ostensibly therefore able to meet the vast majority of requirements of prospective clients. However, the lack of installation to date in any country is seen as a significant disadvantage, though this could potentially be turned to advantage during any contract negotiations.

C. TIMS

18. TIMS stands for Trade Information Management System and is offered by Crown Agents, a UK company with a Customs background and with worldwide experience in that sector. Rather than describe the application as a Customs Automation System or even as a Declaration Processing System, Crown Agents refer to TIMS as “a powerful investigative tool that undertakes risk analysis, price comparison and manages intelligence data”. They emphasize that though it is standalone it can readily be interfaced with others systems, such as ASYCUDA, thus in agreement with their strongly expressed philosophy of fitting-in and complementing customs operations by working with customs authorities to augment overall development. Examples of this are in Bulgaria where the assistance is specific and complements the bespoke system developed by Bulgarian Customs and to Mozambique, where “they didn’t put in a single computer for a year, following careful assessments of the actual needs”. It should be noted that Crown Agents manage the customs services in Mozambique on behalf of the Government, thus having an operational as well as ICT involvement.

19. Crown Agents almost seem to devalue the system in describing it as undertaking risk analysis, price comparison and managing intelligence data, with a design that will assist in the reduction of fraud and the collection of the correct

revenue. They also indicate that TIMS can be adapted to meet individual requirements, used to improve frontier control and risk targeting, as well as being a valuable tool for post importation audits, warehousing and transit management. All of which, although it is an impressive list, is stated in a rather low-key manner. Its benefits are listed as:

- (i) efficient utilization of resources;
- (ii) revenue protection;
- (iii) trade facilitation; and
- (iv) timely and reliable trade statistics;
- (v) faster processing of declarations and therefore clearance.

20. In terms of advanced technology, Crown Agents consider that I-Seal™, their intelligent electronic seal for transit, will provide substantial benefits in that it not only provides security and carries the data associated with it, but will record any attempts to interfere with it during the journey. Crown Agents provide web enablement but, in contrast to UNCTAD and Tatis, do not believe that it will necessarily be the future route for customs communications.

21. Regarding presence in the general region, Crown Agents are in process of delivering a radical programme of customs reform to Bulgarian Customs, are working with Russian Customs in Moscow and are assisting Development Agencies in Afghanistan. In general, the system appears well-developed and has all the key elements, but its application worldwide is limited when compared to systems such as ASYCUDA.

D. Sofix

22. Sofix, owned by Douanexport, was developed in the 1980s and therefore is of a similar age to the ASYCUDA systems. It is the UNIX version of the French Sofi system and is understood to have been developed primarily on the basis of the processing demands of maritime import and export movements. Despite gaining some early installations in Africa, the system is not widely installed, though the Turkish BILGE system installed in May 2000 is based upon it. It is unlikely to be considered as a serious contender for applications in the CARs given its maritime background, age and limited implemented in non-French speaking countries.

E. UAIS

23. The UAIS (Unified Automated Information System) is the system developed for the Russian Customs. It is reportedly offered to other countries free of charge and is reputed to work well, though Russia does not have a homogeneous system and this package is only installed in certain Oblasts (regions). Nevertheless, the historical ties with Russia and the position of that country as a major trading partner make this a serious consideration for areas influenced by the former Soviet Union, such as the CARs.

24. The system is designed on a decentralized principle in both hardware and software domains. This was necessitated by the geographical remoteness of regions, resulting in local computing networks interactive between themselves through networks of Rostelekom (Russian Telecom) data communications in on-line or off-line mode – in effect, a heterogeneous information system with a unified format of primary data gathered in central database servers based on input from decentralized sources of information and admissions (entrances) into the system.

25. UAIS is client-server/web-server architecture with the following components:

- (i) Information storage and archive devices (Compaq, Sun Microsystems);
- (ii) PCs and peripheral equipment (Dell, Compaq, Hewlett-Packard);
- (iii) Network equipment and routers (Nortel, Bay Networks, Cisco);
- (iv) Operational systems Solaris, WinNT (Sun Microsystems, Microsoft);
- (iv) Database management systems (Oracle, MS SQL).

F. CCIS

26. The Computer-Aided Information System (CCIS) was developed for Kazak Customs through a build, operate and transfer (BOT) agreement with Accept Corporation. It commenced development in 1997 and is now fully operational throughout the country. The funding for this development was provided by an exclusive right to Accept to prepare all customs declarations and to charge \$56 per declaration over a 5-year period (though this was modified in September 1999). The contract specified 77 LAN with servers, 1,680 Customs workstations, 400 broker workstations, 108 satellite ground stations and 62 radio bridges.

27. Its development was planned on the basis of a phased implementation. The first phase planned the following components:

- (i) foreign trade statistics;
- (ii) regional foreign trade statistics;
- (iii) transit;
- (iv) directories of legal acts appertaining to customs;
- (v) customs registration in trade and non-trade turnover;
- (vi) customs-banking currency control: export and import;
- (vii) control of accuracy and completeness in customs charges;
- (viii) control of licensing and quotas, especially on export of strategic goods;
- (ix) customs control of processing outside and within Kazakhstan customs territory;
- (x) temporary import/export control; and
- (xi) information support of tariff regulations.

28. The second development stage consists of the installation of the following additional modules:

- (i) information support against smuggling and other violations;
- (ii) control of warehouses, including temporary storage;
- (iii) control of Free Economic Zones;
- (iv) control of confiscated goods;
- (v) information support for safety within the Customs Service;
- (vi) customs registrations in non-trade turnover;
- (vii) customs registrations of cargoes at airports, border posts, internal posts, rail terminals, ports, carriers, temporary warehouses, power plants and excise offices; and
- (viii) customs registrations of objects concerned with intellectual property rights

29. It is noted that this CCIS runs in parallel with a manual paper system and there is little evidence to date to indicate that it has resulted in improved clearance

performance at this stage, though it is recognized that from a customs perspective there is improved control. The full potential of this investment has consequently yet to be realized but it represents a major achievement and a significant improvement on past systems.

30. The CCIS represents a substantial investment for Kazakhstan and is still not fully operational in all its components. It is understood that in the 2003 program 23 more components will be installed. Given its complexity and high development cost there is concern as to whether neighboring countries could afford a similar type of development program, given their limited access to funds.

G. Adaptations of National Customs Systems

31. The most notable system in this respect is Cusmod, the customs modernization system developed by the highly-rated New Zealand Customs. Its suitability for the CARs might be questionable in that it focuses principally on maritime and air traffic as befits an island environment. Its claim to excellence is based on its advanced intelligence and trade facilitation features. Andersen Consulting, now Accenture, helped in its development and was rumored to be marketing it, but it does not appear in their promotional material as anything other than a case study. The absence of Cusmod from Accenture's portfolio would explain its absence from the marketplace, since New Zealand Customs itself is not in a position to market the product internationally.

32. It is evident that the customs authorities in many developed countries would like their bespoke system to form the basis for a commercial application to generate licensing fees, but few, if any, are prepared or able to meet the requirements needed to market, implement and support such an undertaking. Examples could include TDS from Swedish Customs, Model 90 from Swiss Customs and the German Atlas system. Benefits would depend on funding from the donor country, the state of completeness of the system and the modernity of both platform and approach. Taking a system in development, one step behind, as proposed for Poland's installation of Atlas, is not recommended as it results in implementation problems.

H. Bespoke Developments

33. The approach of developing bespoke systems using either in-house or external resources is attractive in that the resulting system is designed to fit the specific perceived needs of that particular country. It also in some cases fulfills a psychological desire to demonstrate the national ICT capabilities within national customs. The disadvantages of this approach are that the identification of needs has to be correct as later modifications are difficult and such systems often have significant problems in interfacing with other customs organizations. The bespoke development approach is considered to carry a high risk and potentially escalating and uncontrolled costs. However, with proper management and the support, it could be a development option.

34. It is worth noting that most developed countries have developed and implemented bespoke systems and other countries have then successfully adapted these bespoke systems. The development of bespoke systems in the CARs is a concern in that in some countries the application of ICT within the customs environment is low and access to sustainable IT resources needed to develop and manage such systems is limited. The experience of Kazakhstan that has access to such resources demonstrates that this is not a cheap approach.

I. IT Suppliers

35. Major IT multi-national corporations, such as Hewlett-Packard, Microsoft, Oracle, Siemens-Fujitsu, Dell and IBM, have yet to adopted a proactive presence in or strategic approach to the customs market. Their methodology has been to respond in association with systems developers on a bid-by-bid basis. None of these organizations offer customs application packages of their own, despite the numerous projects that have been implemented with their products. Not even IBM, for example, who won the multi-billion dollar project to automate the US Customs, has used that bespoke development as a springboard to develop a marketable package. Hewlett-Packard has an association with Tatis and is working on the Lithuanian Customs ASYCUDA++ implementation promoting a strong interest in e-government, but they too have not opted for application development.

36. The corporations cannot perhaps be blamed if their marketing presence in the customs sector is not well-defined, since there is no market in developed countries for a unified system that would underpin a global marketing venture. Table 2 shows some of the different systems in operation in the some of these developed countries and none are based on a packaged approach.

Table 2: Automated Customs Systems in Developed Country Customs Authorities

COUNTRY	SYSTEM	DESCRIPTION
Belgium	Sadbel	Système Automatisé de Dédouanement pour la Belgique et le Luxembourg
Canada	CCS	Customs Commercial System
France	Sofi	Système d'Ordinateurs pour le traitement du Fret International
Germany	Atlas	Automatisiertes Tarif und Lokales Zollabwicklungssystem
Ireland	AEP	Automated Entry Processing
Italy	Aida	Automazione Integrata Dogane e Accise
Luxembourg	Sadbel	Système Automatisé de Dédouanement pour la Belgique et le Luxembourg
Netherlands	DIS	
Spain	Adabas	
Sweden	TDS	Customs Data System
Switzerland	Modèle 90	
United Kingdom	Chief	Customs Handling of Import and Export Freight
United States	ACE	Automated Commercial Environment – superseding ACS (Automated Commercial System)

IV. Data Exchange

37. The CCCs Working Group has focused on the goal of “initiating coordinated ICT development in the region’s customs organizations in order to make systematic and readily-available data across borders for faster processing, better enforcement of laws and regulations, and increased co-operation and integration” and proposed a two component strategy in relation to data exchange:

- (i) exchange of information on the use of classifiers and development of a code-translation table to be shared with all participating countries; and
- (ii) recommendations for and development of an information exchange mechanism among member customs.

38. These components were discussed in detail at the meeting at Issyk-kul, Kyrgyz Republic in August 2003. The following results were agreed by the WG and were to be submitted to each customs organization:

- (i) a recommended list of information for information exchange;
- (ii) XML (Extended Message Language) format as a possible format for data submission, together with other formats;
- (iii) Possibilities were discussed to exchange information on export, transit and intelligence.

39. On the first component exchange information on the use of classifiers and development of code-translation tables, the data elements were agreed as forming the information base for exchange between customs organizations in the Region. These are shown in Appendix 1. This agreement is considered to be a first step towards gaining standardization of data assigned for information sharing.

40. On the second component of recommendations for and development of an information exchange medium among member customs, a major achievement was the agreement reached was the possibility to using information-sharing mechanisms based upon replication of their data between customs servers in the participant countries, as well as on the basis of Web technologies. The XML format, alongside with other formats that are becoming more popular, was proposed as possible format for data exchange.

Data Element in Customs to Customs Messages	Standard Used	SAD Equivalent Field No.	Format
Customs Cargo Declaration Number		7	
Consignor		2	
Consignee		8	
Country of Destination Code		17	
Country of Departure Country		15	
Code of Country of Origin		34	
Number of Vehicles at Border		21	
Vehicle Identifier at Border		21	
Code of Transport Means at Border		25	
Commodity Code		33	
Net Mass		38	
Supplementary Units		41	
Number of Items		31	
Goods Description		31	
Marks and Numbers		31	
Customs Procedure Code		37	
Statistical Value		46	
Code for Foreign Currency		22	
Contract Invoice Value		42	
Contract Number and Date		44	
Weigh Bill Number		44	
Carrier		50	
TIR Carnet Number		53	
CMR Number		44	
Container Number		31	