

# ANALYTICAL BULLETIN

## ANALYSIS AND COMPARISON OF CUSTOMS DATA AND INTERFACE SYSTEMS (ASYCUDA AND GHANA'S GCNet)

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Beginning in the 1970s, automated processing systems started to be used by Customs services in developed nations. In many ways, customs procedures for processing import and export declarations are similar to commercial transactions in that there is an invoice for goods and payments are made for those goods; albeit for duties, taxes and fees. Naturally, then, the first automated customs systems were dedicated to processing import or export declarations for information accuracy and recording payments against those transactions; a process very similar to commercial uses of automation.

For developed nations, electronic systems rapidly advanced into more complex customs functions. Developing nations, however, were not included in this processing revolution for customs cargo activities because their trade volume was lower and was mostly concentrated in natural resource products. Developing nations also lacked utilities infrastructure needed to support automated systems. As a result, commercial firms that were eager to build systems for developed nations did not consider developing nations to be a meaningful market for advanced customs processing measures.

In this vacuum, the United Nations Conference on Trade and Development (UNCTAD) developed a basic customs system competency called Automated System for Customs Data or ASYCUDA. The first version of this system was available in 1981 and was established to provide essential customs functions for import processing and revenue accounting. Over its 25 year history, ASYCUDA has undergone four major software and hardware upgrades and now provides a wide variety of routine and specialized automated customs procedures. The system has been and continues to be provided to countries on a low-cost basis and it allows user countries to choose from various customs functions, depending on

their needs and priorities. The implementation of the system and the training on how to use the system are offered by UNCTAD as part of their basic package of services. Over its lifetime, ASYCUDA has come to be regarded by its users as a low-cost and reliable basic customs automation capability. The most recent version of the system, called ASYCUDAWorld, was released in 2002.

ASYCUDA is in use in countries in Africa as noted in the following table<sup>1</sup>:

Benin	Burundi	Botswana	Burkina Faso	Cameroon
Cape Verde	Chad	Comoros	Congo	Congo DR
Ethiopia	Gabon	Gambia	Guinea	Guinea Bissau
Ivory Coast	Madagascar	Malawi	Mauritania	Namibia
Niger	Nigeria	Rwanda	Sao Tome	Sudan
Tanzania	Togo	Zambia	Zimbabwe	

As simplified methods for developing automated systems emerged through the use of streamlined application software such as Java, and as delivery systems became less complicated through the use of web-based applications, commercial vendors have shown a new interest in providing electronic customs solutions to developing country clients. In Africa, for example, Customs agencies no longer find themselves limited to using the basic ASYCUDA customs systems since local systems providers have started to emerge in many countries.

Likewise, commercially-developed scalable systems for Customs use are now more modularized and are capable of being applied in other nations to address their processing needs. One example of this situation can be found in Ghana, where the Customs Excise and Preventive Service employs a customized system called GCNet. GCNet includes two main components: a processing system referred to as GCMS (Ghana Customs Management System) which is comprised of basic customs functions, and a front end interface application called TradeNet used for communicating with traders and the multiple government agencies that are involved in regulating international trade. The Ghanaian system design is based on systems used in Singapore and Mauritius.

The purpose of this paper is to evaluate the features, uses and benefits of the ASYCUDA and Ghana GCNet systems across several key areas and to provide a general set of considerations for comparing these two systems. Their applicability to other nations will also be considered, keeping in mind factors that are important in a developing country context, such as: cost of implementation, maintenance and upgrading; required infrastructure and resources; ease of use; required skill and experience of personnel; and related issues. In order to create an equitable basis for comparison, the most current release of ASYCUDA (ASYCUDAWorld) is used in this analysis.

<sup>1</sup> All are using ASYCUDA ++ except Ivory Coast (in the early stage of implementing ASYCUDAWorld) and Gambia, Guinea Bissau, Sao Tome (still using ASYCUDA version 2.7). No country is operational on ASYCUDAWorld.

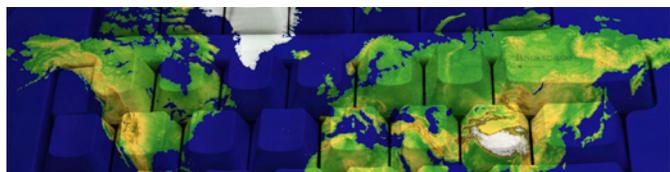
## Methodology

The first step of the methodology consisted of defining three dimensions along which to conduct the system comparison: 1) functionality, 2) conformity to international standards, and 3) technology and implementation. Evaluation criteria for each of these categories to form the basis of the comparison were identified and a functional capability rating scale was created. Through a review of publicly available documents and publications and interviews with subject matter experts, the analysts gathered information on the systems to address the defined evaluation criteria. The information on ASYCUDAWorld was gathered from detailed systems documentation that is widely available as well as through interviews with ASYCUDA experts and users familiar with the system. Attempts to get detailed information and answers to questions on GCNet were not successful, so this report is limited to analysis of information gathered from publicly available presentations and publications that have not been verified by GCNet experts or users. Finally, the competencies of each system as measured against the evaluation criteria were rated.

## Comparison 1: Functionality

Modern Customs automated systems should address mission-related functionalities in five critical areas. The GCNet and ASYCUDAWorld systems were compared across these categories.

- ▶ **Risk Assessment.** This group of Customs activities relates to evaluating data from import or export transactions for possible violations of 1) requirements for information and processing policies, 2) the loss of revenues, or 3) threats to security. Risk assessment is performed for the purpose of targeting certain transactions to receive greater scrutiny than those that can be passed without in-depth evaluation or examination.
- ▶ **Declaration Processing.** This group of Customs activities involves the processes for receiving, securing and logically processing import and export declarations so that all of the necessary regulatory requirements are successfully completed from the beginning of the transaction to its conclusion. It includes the full life cycle of processing a Customs transaction.
- ▶ **Duty and Tax Collection and Accounting.** This group of activities includes the traditional Customs financial management functions for accurately identifying duties, taxes and fees and their related payments, exclusions, refunds and penalties, as performed throughout the cycle of collection, accounting and auditing actions.
- ▶ **Special Regimes.** This group of Customs activities involves the prescribed special processing that is required for some transactions due to exceptions that have been codified in law and regulation. This is a catch-all category for specific processes that have unique requirements.
- ▶ **Trade Statistics.** This group of Customs actions involves controlling the collection, verification, evaluation and publication of import and export trade statistics.



Two of these functions, declaration processing and special regimes, are broad in scope and several subcomponents were also defined and are identified in the findings section below. The processing competencies of the systems were rated in two areas: 1) the extent to which the functionality is supported, and 2) the extent to which the functionality is automated. The following rating scale was developed with these factors in mind:

- Functionality fully supported and fully automated
- ◐ Functionality fully supported but partially automated
- ◑ Functionality partially supported and partially automated
- Functionality not available
- Information not available

The functionality findings are presented in the table below:

Criteria	ASYCUDAWorld	GCNet
<b>Risk Assessment</b>	●	◐
<b>Declaration Processing</b>		
Import	●	●
Export	●	●
Classification	●	●
Valuation	◑	◐
Data Verification	●	○
Data Validation	●	●
Liquidation	●	○
Post-release Audit	●	◐
<b>Duty/Tax Collection &amp; Accounting</b>	●	●
<b>Special Regimes</b>		
Warehouse Management	●	●
Transit/In-Bond	●	●
Temporary Imports	●	●
Temporary Exports	●	●
Quotas	●	○
Drawback	●	○
Free Zones	◑	◐
<b>Trade Statistics</b>	◑	○

## Detailed Findings

### ASYCUDAWorld

- ▶ **Risk Assessment.** ASYCUDA fully supports critical risk management functions such as criteria based selectivity, random selection, capture of inspection findings, and transaction prioritization according to level of risk. The system's flexibility allows risk criteria to be defined according to national requirements and combined to create complex risk profiles. Selectivity hits can be analyzed and programmed for future risk assessment action.
- ▶ **Declaration Processing.** ASYCUDA supports all import and export procedures. Its classification capabilities allow it to be configured to national requirements with support for harmonized tariffs of up to 10 digits. World Customs Organization (WCO) valuation rules can be applied in ASYCUDA but the rules have not been fully imposed in the system because user countries do not uniformly use the valuation rules. These decisions are left to the user countries. The system can be configured to identify shipments of commodities whose values fall outside established ranges as defined by the user nation requirements.
- ▶ **Duty and Tax Collection and Accounting.** ASYCUDA is flexible in allowing uniform application of correct duties and taxes according to national requirements. More significantly, the system can be configured to support a country's exemptions and to calculate the loss of revenue per exemption.
- ▶ **Special Regimes.** ASYCUDA supports most import and export special regimes but free zone functionality is not fully developed.
- ▶ **Trade Statistics.** Although ASYCUDA has detailed line-level transactional data in its database, it does not automatically provide reporting and analytic capabilities. Rather, UNCTAD conducts seminars to instruct implementing nations on how to use their own reporting tools to generate trade statistics. The reason for this is that there is not a standard "statistical model" that can be applied across the multiple users.

### GCNet

- ▶ **Risk Assessment.** The GCMS integrated risk assessment module uses selectivity filters at a macro level to prioritize transactions into green,

yellow, or red groupings according to level of risk. The system does not apply specific criteria individually or collectively against individual transaction data. The system allows capture of inspection findings, but the analysts were unable to determine if the findings and selectivity hits can be fed back into the algorithm for use in future risk assessments.

- ▶ **Declaration Processing.** GCMS automatically processes both import and export transactions, including the matching of electronically submitted manifests and declarations. Classification and valuation rules are supported through the use of tariff and valuation databases but not necessarily toward the WCO valuation rules. The system is also capable of data validation through the deployment of control tables, including codes, exchange rates, and regimes. GCMS is not structured to support regularly recurring, post-event audit functions across the universe of transactions. It is capable of producing information to support incidental internal audits that may arise from special circumstances that require information from individual transactions or small groupings of transactions.
- ▶ **Duty and Tax Collection and Accounting.** GCMS computes all Customs duties, taxes, and other charges and receives payment confirmation through an electronic interface with participating banks. Since deployment of GCMS, official publicity claims that there have been substantial increases in Customs revenues.
- ▶ **Special Regimes.** GCMS supports most special regimes but support of quotas and drawback functions could not be confirmed.
- ▶ **Trade Statistics.** The analysts were unable to determine whether GCMS provides trade statistics reporting and analytical capabilities.



### Comparison 2: Conformity to International Standards

The extent to which the systems comply with relevant international standards was also examined. These standards include:

- ▶ WCO / United Nations (UN) / International Organization for Standardization (ISO) data and messaging standards (e.g. WCO data set)
- ▶ Single Window
- ▶ Electronic Business-to-Government (B2G) and Government-to-Government (G2G) interface
- ▶ Agreement on Customs Valuation
- ▶ Harmonized Schedule
- ▶ Agreement on Rules of Origin

The following rating scale was used:

- Fully conforms to international standards
- ◐ Partially conforms to international standards
- Does not conform to international standards

The conformity findings are presented in the table below:

International Standard	ASYCUDAWorld	GCNet
WCO/UN/ISO data/messaging standards	◐	◐
Single Window	○	●
Electronic B2G and G2G interface	●	●
Agreement on Customs Valuation	◐	Unknown
Harmonized Schedule	●	●
Agreement on Rules of Origin	○	Unknown

### Detailed Findings

#### ASYCUDAWorld

- ▶ **Data/messaging standards.** Data/messaging standards. ASYCUDA provides support to most relevant international standards, including ISO, WCO, and the Trade Data Element Directory (TDED). However, with regard to the WCO data set, ASYCUDA only conforms to the standard at the data level. The standard message sets (e.g. CUSCAR and CUSDEC) are not supported.
- ▶ **Single window.** Although ASYCUDA provides electronic message exchange capabilities, it does not have a formal single window front end that is routinely programmed to exchange records among government trade agencies and the trader businesses, as defined by WCO trade facilitation concepts.
- ▶ **Electronic B2G and G2G interface.** ASYCUDA supports electronic message exchanges with any other entity.
- ▶ **Agreement on Customs Valuation.** ASYCUDA has not implemented the WCO valuation rules because they are not fully used by implementing nations.
- ▶ **Harmonized Schedule.** ASYCUDA uses the Harmonized Schedule and provides support up to the 10 digit level, depending upon national requirements.
- ▶ **Agreement on Rules of Origin.** ASYCUDA does not currently support this agreement.

#### GCNet

- ▶ **Data/messaging standards.** The analysts were unable to determine if GCNet uses the WCO data set, although standard EDIFACT messages such as CusDec (Customs Declaration) and CusCar (Customs Cargo) are in use.
- ▶ **Single window.** GCNet uses a single window interface, called TradeNet, for the exchange of electronic EDI information between trade and government agencies.
- ▶ **Electronic B2G and G2G interface.** Trade and government agencies are interconnected via the electronic exchange of EDI messages. Future plans include cross-border data exchange with the Ivory Coast and Burkina Faso.
- ▶ **Agreement on Customs Valuation.** GCNet's conformity to this standard was not determined.
- ▶ **Harmonized Schedule.** GCNet uses the Harmonized Schedule.
- ▶ **Agreement on Rules of Origin.** GCNet's conformity to this standard was not determined.



### Comparison 3: Technology and Implementation

The technical and implementation aspects of the two systems were also considered.

Criterion	ASYCUDAWorld	GCNet
Architecture	<ul style="list-style-type: none"> <li>▶ Java-based, n-tier and fully web-enabled (i.e. no client software required)</li> <li>▶ Resilient to telecommunications and electricity breakdown</li> </ul>	<ul style="list-style-type: none"> <li>▶ Unknown</li> </ul>
Flexibility / Configurability	<ul style="list-style-type: none"> <li>▶ System changes and updates are done without programming</li> <li>▶ Flexibility in configuration (business rules can be added without source code changes, allowing for easy modification to support different national requirements)</li> <li>▶ Supports multiple languages and alphabets</li> </ul>	<ul style="list-style-type: none"> <li>▶ Unknown</li> </ul>
Security	<ul style="list-style-type: none"> <li>▶ Employs several levels and types of encryption algorithms</li> <li>▶ Electronic signature</li> <li>▶ User authentication</li> </ul>	<ul style="list-style-type: none"> <li>▶ User authentication</li> <li>▶ Restricted user access</li> </ul>
Scalability	<ul style="list-style-type: none"> <li>▶ Scalable</li> </ul>	<ul style="list-style-type: none"> <li>▶ Unknown</li> </ul>
Platform Flexibility	<ul style="list-style-type: none"> <li>▶ Independent of hardware, operating system, or database</li> </ul>	<ul style="list-style-type: none"> <li>▶ Oracle database, Unix platform</li> </ul>
Installed user base	<ul style="list-style-type: none"> <li>▶ Three ASYCUDAWorld projects are in preparatory phases</li> <li>▶ ASYCUDA operational in 80+ countries (29 in Africa)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Both Ghanaian seaports, the international airport, three land border posts</li> <li>▶ 400 clearing agents in 625 locations</li> <li>▶ 65 shipping agents</li> <li>▶ Six private freight terminals</li> <li>▶ 10 government ministries and agencies</li> </ul>
Support and Maintenance	<ul style="list-style-type: none"> <li>▶ ASYCUDA has three regional support centers in Africa</li> </ul>	<ul style="list-style-type: none"> <li>▶ GCNet operates a call center for taking enquiries and provides on-site support engineers</li> </ul>
Initial Cost (est.)	<ul style="list-style-type: none"> <li>▶ No licensing fees</li> <li>▶ Implementation fees range widely</li> </ul>	<ul style="list-style-type: none"> <li>▶ \$7 million</li> </ul>
Ongoing costs (est.)	<ul style="list-style-type: none"> <li>▶ Maintenance and support centers fees</li> </ul>	<ul style="list-style-type: none"> <li>▶ Network and systems maintenance fees, call center and support fees, training fees.</li> </ul>

### Conclusions

During this assessment, all known public records, reports, and other materials were researched, and where possible, persons either directly involved with these two systems as administrators or users were interviewed.

Analysis suggests that the best choice for Customs processing purposes is ASYCUDA because the system:

- ▶ has been in existence for over 25 years and been successfully implemented in over 80 countries at reasonable cost;
- ▶ has been upgraded four times to meet hardware and application software state-of-the-art advancements;
- ▶ has a wide variety of specifically definable Customs functional processes that can be selected by module and customized by each user nation;
- ▶ has a well developed implementation, training and maintenance support network including the deployment of regional centers.

The Ghana GCNet system has a modern front end or “single window” communication capability that provides the capability for direct electronic data exchange with multiple government agencies and members of the trading business community. However, this capacity does not outweigh basic Customs processing weaknesses that appear to exist. Most important of these is the GCNet risk assessment process that operates without evaluating the detail of each transaction. A well-developed and maintained system of criteria that can be rapidly adjusted to assess each declaration for trade policy, revenue and security concerns is essential for any modern Customs operation. Likewise, the absence of essential cost, implementation, training and maintenance information suggests that these are not well developed. Claims are made that Ghana has increased its Customs revenues since the GCNet system was deployed but no evidence exists that these improvements are directly related to the implementation of the system.

In order to achieve secure, facilitated, integrated, and transparent Customs operations among developing countries, systems that are capable of being operated directly by national Customs administrators and that first and foremost provide basic Customs functions should be the primary consideration.



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