Declaration management system

An import and export solution for customs administrations

Over the past several years, the role of customs in Europe and in the world has been changing. Initially, its primary focus was on revenue collection and import taxes aimed at protection of economic interests and society. Then it shifted to trade facilitation and reduction of administrative burden towards a significantly increased role today in safety and security. In addition, the increasing connectivity of countries caused by globalization makes the customs business more open and collaborative. This globalization causes a rapid change of the business and IT environment, which leads to several challenges. Customs administrations are faced with increasing volumes of international trade, new business models, fraud and increasing security threats. At the same time, customs administrations can make use of a rich portfolio of data sources. However, what is needed is more efficient supervision of cargo movement across end-to-end trade chains, effective evaluation of risks across trade patterns and the creation of trusted networks.

The declaration management system (DMS) from IBM and INTRASOFT International is a core component of customs transformation. It's responsible for automated support of the management of customs declarations and to support human tasks within the process. The DMS is designed to manage trade transactions and monitor compliance with legal requirements for goods placed under customs procedures. At the same time, it allows an optimal balance between the need for customs control and the goals of facilitating trade and reducing administrative burden.

The transformation of customs business operations started several years ago by creating and improving customs-to-business interfaces—the eCustoms initiative—and continued with establishing a customs-to-customs exchange of information for cross-border movements. The effects of this vision influence the business and IT operations of every individual customs administration. Current processes and systems will need to continuously be adapted to support the

Figure 1: The customs lifecycle

various phases through which increased integration is expected to take place, supported by changing legislation and international collaboration agreements. In this process, the DMS enables customs administrations to shift operations away from today's regulation-centric, silo-based and country-centric processing patterns and towards the integrated processing of trade. This transformation will continue with the introduction of secure trade lanes. Eventually full new forms of processing support will be necessary, moving towards integrated risk management and authorized economic operator audits that introduce business model innovations to today's movement-based declaration processing.

For European clients, the product is kept up to date and compliant with the European Union's (EU´s) Union Customs Code (UCC), following the rhythm of the EU´s Multi-annual Strategic Program (MASP). The many mandatory changes that are foreseen, as a result of the new UCC, lead Member States to decide on two options. They can either choose a heavy maintenance trajectory, with a risk of a collapsing IT legacy system, or aim for a new system. In light of these UCC-driven developments, the DMS is now implemented and fully operational in the Netherlands. Already one other major European Member State is in the process of implementing the DMS. And several other Member States are in a selection process, considering to buy and implement it instead of building their own solution.

Managing declarations with intelligence and automated processing

The primary goal of many automated systems is to speed up process execution and reduce costs by minimizing human intervention where possible. The DMS takes this a step further by anticipating automated processing. Several decision points are contained in the DMS process that allow the customs administration to make its own choices about the desired level of employee empowerment. Optimal automation is possible for tasks that are still largely dominated by human involvement in current practices. All declarations are fully verified for completeness and the validity of their data element contents. Subsequently, the decision about required control of a valid declaration—for example, to detect fraud, health or safety hazards—is taken by the system based on risk assessment results. Because every customs administration has its own preferences and national requirements, flexibility has been a key principle in the design and implementation of the DMS. Settings that are highly configurable and designed for ease of use allow customs administrations to follow the standard process or easily realize national variations in declaration processing.

Which processes are supported?

The DMS supports declarations for placing goods under customs procedures: import, export, customs warehousing, inward and outward processing, processing under customs control and temporary import. The DMS is designed to manage the entire process of:

- Acceptance and validation of declarations
- Control and inspection of goods
- Duty calculation and collection
- Goods release and clearance

Thanks to the underlying integration platform and the flexibility of the process, the system can adjust to different national requirements.
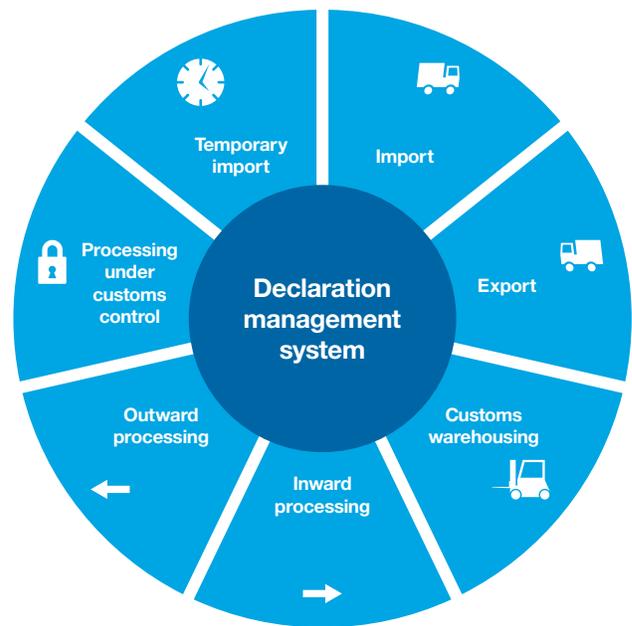

Figure 2: *The* declaration management system

"…Globalization, fast-growing trade and ever-increasing traffic volumes force customs to harmonize regulations and procedures…"[1]

- Laszlo Kovacs, former European Commissioner for Taxation and Customs Union

The declaration management process in a nutshell

When a declaration is received from a declarant it's directly entered in the DMS database and a validation takes place. If applicable, a quota request is issued by the DMS to the responsible authorities on behalf of the trader, and the result is received and captured in the system. At the same time an external risk system analyzes the risk related to the whole declaration and to each of the goods items.

If risks are identified by the risk system, one or more control tasks are created. Physical controls are performed outside the system and the results are fed back into the system. When results have been registered, they are categorized.

Discrepancies can be handled either automatically by the system or through a human task. Unless major discrepancies result in a decision that clearance is not possible, the next step is to handle the financial obligations ensuing from the declaration.

In the customs debt process, duties are calculated and payment is received or guarantee/security is reserved. The goods are released as soon as possible, and clearance is provided when physical and, if applicable, administrative control is terminated, and all administrative procedures have been completed. Finally, if the declaration requires it, goods will be monitored after their release.
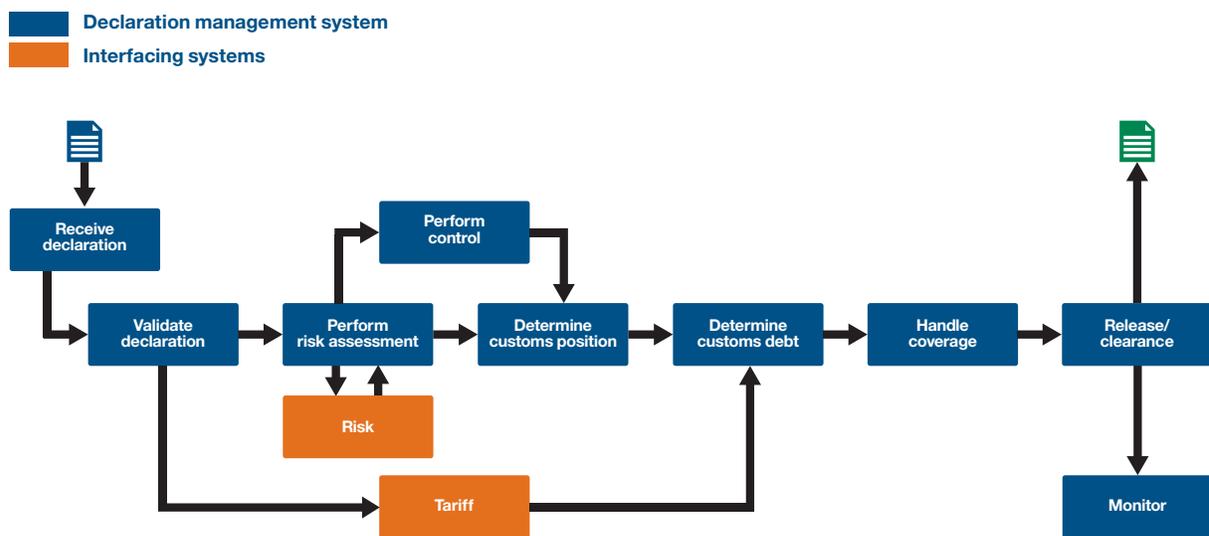
Declaration management system
Interfacing systems

Figure 3: The declaration management process

With the DMS you can achieve:

- Maximum trade facilitation by releasing goods as soon as they are no longer required for inspection. This way the supply chain processes can progress while the administrative customs operations continue in parallel to minimize trade delay.
- Flexible support for national requirements through highly configurable business rules and *national deviation decision points* in the DMS process to cater to national variations in declaration processing.
- Automated and streamlined interaction between customs and traders to speed the clearance process and reduce the administrative burden on the customs process for traders.

How is the DMS constructed?

To meet the individual needs of each customs administration, the DMS is constructed modularly. The primary parts consist of the automated process, manual processing functionality, and business services that are invoked from the automated process and call the external systems.

The DMS is based on a service-oriented architecture (SOA) and can be delivered as an on-premises solution, as well as a cloud-based solution as a service (SaaS). The architecture is based on the following relevant standards:

- Service component architecture (SCA)
- Service data objects (SDO)
- Business process execution language (BPEL)
- Web services, such as simple object access protocol (SOAP) and representational state transfer (REST)
- Supporting industry standard databases IBM® DB2® and Oracle RDMBS
- Utilizing a Java® J2EE cluster and standard database solutions to achieve high availability and high scalability
- Browser-based AJAX user interface

The core business logic is implemented by the business services, while the information services contain the data logic. The DMS is configured to use metadata, which are segmented into the following categories:

- Configured during runtime:
  – Parameters are used to specify settings that can be discretely set, for example timer values and contingency calculations.
  – Business rules are applied to implement business logic, for example rules that determine the actions that apply for specific events.
- Defined during development time:
  – Flow definitions are applied where dependencies between components must be configured.
  – Object definitions are applied for the contents of basic objects, for example messages and services.

The management of the parameters and business rules is available to users, such as system administrators, through a simple web interface. All system components and services are designed to be easily modified and processed using standard tools. One of the core values of the IBM approach is the DMS is completely *white boxed*. This term implies that the user can exercise complete control over the DMS within their own development environment. There are no *black boxes*.

The DMS services are exposed as SOAP web services and RESTful application programming interfaces (APIs), supporting access to declaration data from external systems, as well as mobile applications. The services include additional supporting functions to search for and view declarations, create operational reports, manually create a declaration and start its processing. For example, the latter is necessary in the case of a traveler at an airport who does a verbal declaration of imported goods at the customs desk. These services can be made available for customs employees, as well as trade parties.
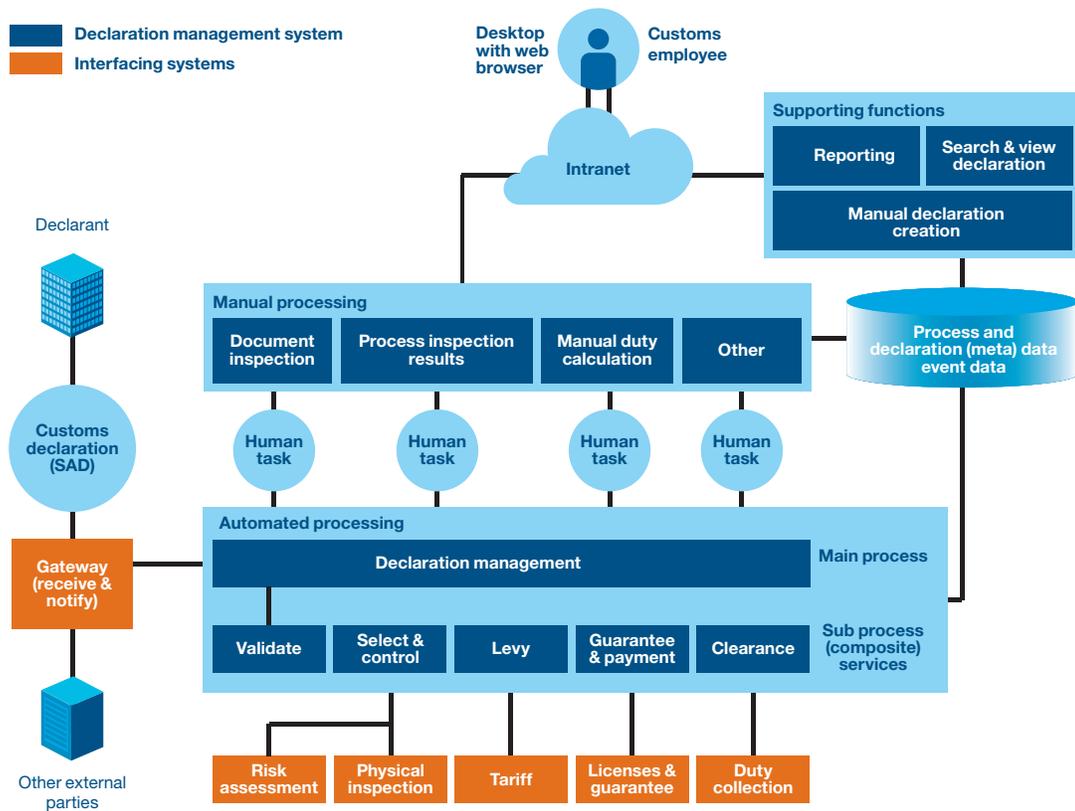
Figure 4: The declaration management system architecture

The DMS is a core component in the eCustoms Integration Suite

The DMS is a core component in the eCustoms Integration Suite (eCIS), with a portfolio offering of end-to-end eCustoms solutions. The eCIS offers focused, commercial off-the-shelf (COTS) solutions to cover the scope of the eCustoms Framework (eCF), IBM's enterprise architecture for customs. The DMS brings you the following benefits:

- A high level of flexibility in adapting to changing requirements
- Configurable business rules and parameters
- Modern technology and open standards

- No required development cycle when changing business rules settings
- Usage of World Customs Organisation (WCO) data model v3.2
- Robust architecture
- On-premises or cloud service availability
- Easily extendable, adjustable and maintainable
- User-friendly graphical user interface (GUI)
- Access through web services and mobile apps
- Standardized processes
- Achievable compliance with EU customs legislation
- Extensive support for trade facilitation
- Reduction of administrative burden
- Attractive total cost of ownership (TCO)

Key concepts and design principles

Business process management: Business process flow and services are separated.

Business rules to achieve flexibility: Configure the process according to national needs.

Service-oriented architecture: Usability by service interfaces that hide the internal construction details.

Open standards: Usage of WCO data model v3.2, BPEL, SDO, SCA, JSF, J2EE/EJB.

Layered architecture: Based on SOA and the modular set of isolated components.

A strong partnership

IBM has joined forces with IBM Business Partner INTRASOFT International. The combination of these two companies will provide you with a tight, efficient and commitment-driven delivery team and governance model. INTRASOFT's competitive advantages include:

- In-depth knowledge of the customs business and technical details
- Recognition by numerous EU Member States' customs administrations as a reliable and reputable contractor
- Efficient operations with the European Commission's DG TAXUD (Taxation and Customs Union) and with the numerous Member State administrations in the context of consulting activities and training
- The execution of projects for the development of other national systems, such as transit systems and export control systems

As a market-leading customs solutions architect, integrator and service provider, IBM and INTRASOFT have the capabilities necessary to help implement eCustoms solutions. They also provide services necessary to transform current systems and architectures, and to support and guide your organization through change and transformation. This approach is incremental, introducing solutions that can be integrated seamlessly with existing systems.

IBM and INTRASOFT have the global experience, comprehensive instrumentation and technology expertise, and cost-effective methodologies to help customs administrations improve asset management and optimize their supply operations to realize business value. We bring together sophisticated analytics, technical expertise and a strong partner ecosystem to develop and deliver innovative customs solutions. Our highly skilled consultants have a long track record in planning, building and deploying complex incremental global solutions for customs agencies of all sizes and complexities. They have the added ability to customize solutions to meet local requirements if needed, and guide clients through large-scale transformation programs in all industries.

IBM Centers of Excellence, proof-of-concept engagements, and research *first-of-a-kind* projects conducted with clients demonstrate innovation and a strong ability in solution implementation. Our customs solution portfolio has been developed and continuously refined with clients around the world.

For more information

To learn more about the IBM declaration management system, please contact:

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You can also visit the following website:
ibm.com/smarterplanet/us/en/government/ideas

1 European Commission, Taxation and Customs Union, "Customs blueprints: pathways to better Customs," http://ec.europa.eu/taxation_customs/resources/documents/common/publications/info_docs/customs/customs_blueprint_en.pdf

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