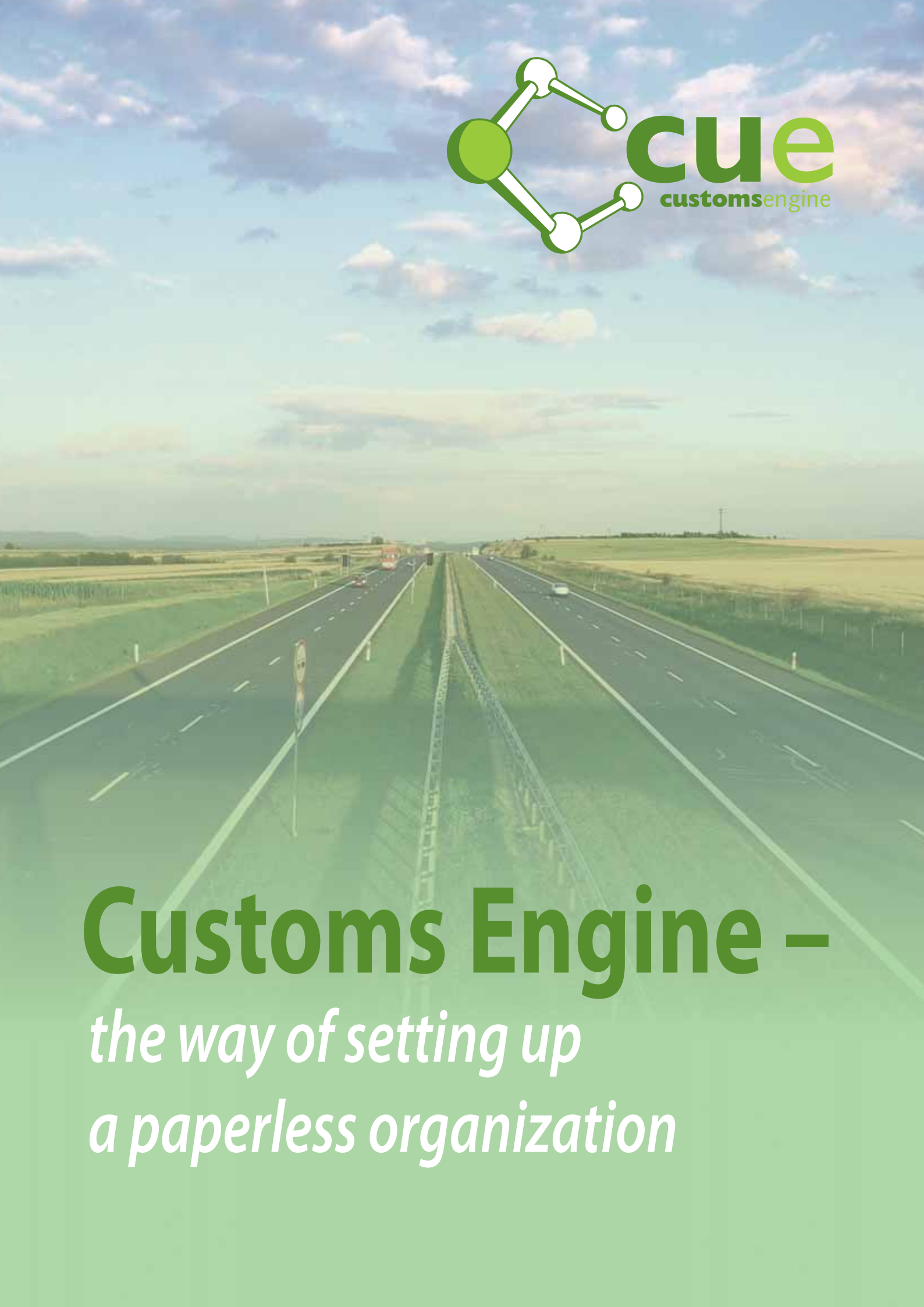


cue
customsengine

Customs Engine –

the way of setting up a paperless organization

WHAT IS CUSTOMS ENGINE (CUE)?

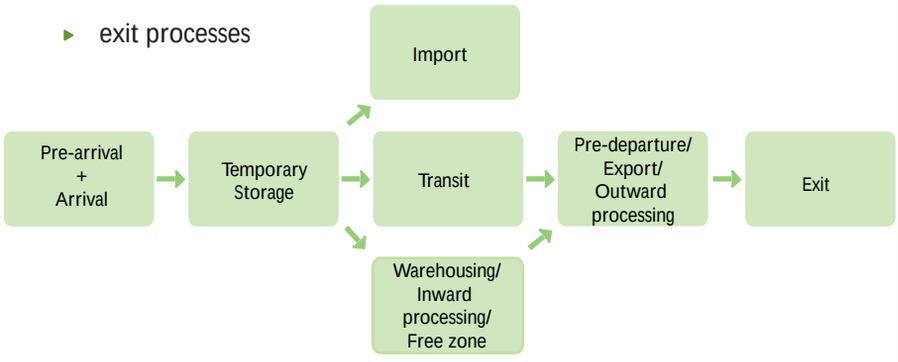
Customs Engine™ (CuE) is a **software-based e-Customs framework** that keeps the economy competitive by **facilitating trade, reducing fraud, and increasing duty collection.**

Customs Engine coordinates the business processes related to all essential customs documents such as customs declarations, summary declarations, manifests, TIR carnets, transit declarations, etc. In addition CuE also contains the full implementation of European Union common customs systems: New Computerized Transit System (NCTS), Export Control System (ECS) and Import Control System (ICS).

WHAT BUSINESS PROCESSES ARE SUPPORTED BY CUE?

CuE covers all primary customs processes, namely

- pre-arrival processes
- arrival processes
- temporary storage processes
- transit processes
- import processes
- warehousing, inward processing, temporary admission, free zone processes
- export, re-export, outward processing procedures
- pre-departure processes
- exit processes



CuE addresses the following challenges facing customs authorities

- *Reducing costs and paperwork*
- *Improving supply chain security and risk management*
- *Preventing, targeting, and investigating fraud*
- *Ensuring uniform, harmonized, and proper function of national customs legislation*
- *Integrating with customs offices in the European Union*

CuE supports all primary customs business processes

To foster international trade, enhance clearance process and keep balance between facilitation and control CuE offers

- ***machine-to-machine*** *and* ***web-based interfaces*** *for lodging and amending of customs documents in electronic form*
- ***automatic validation of data and instant feedback to traders*** *about warnings, errors and possible loading restrictions to certain goods*
- ***automatic*** *and optional manual* ***risk-analysis of information*** *and the assignment of controls by the customs authorities*
- ***integration of data provided by different parties to help customs officers to make decisions quickly and efficiently***
- ***calculation of taxes and duties and checking of non-tariff measures***
- ***tax accounting, payment and management of guarantees***
- ***checking the electronic permits and licenses***
- ***handling of simplified and supplementary declarations***
- ***management of notifications and local clearance***
- ***handling of simplified permit requests***
- ***notifying about expiration of temporary storage time limits***
- *and much more…*

HOW CUE SUPPORTS MY BUSINESS PROCESSES?

PRE-ARRIVAL PROCESSES

Pre-arrival processes are quickly gaining importance, as several initiatives to improve the security and safety of the trade are being entered into the execution phase. Most prominent of those are the **security and safety amendments to European Community Customs Code** and **WCO SAFE Framework** that prescribe the mandatory electronic lodgment of pre-arrival information for risk analysis purposes.

Efficient handling of the pre-arrival processes possesses challenges for both customs administrations and trade. New kind of information must be exchanged prior the arrival of goods. This requires the customs administrations to establish new electronic ways for exchanging the information between themselves and the traders.

CuE implements the pre-arrival processes by offering

- **machine-to-machine** and **web-based interfaces** for lodging and amending of electronic entry summary declarations
- **automatic** and optional manual **risk-analysis** of the pre-arrival information and the assignment of controls by the customs authorities
- **automatic validation** of entry summary declarations and **instant feedback to traders** about warnings, errors and possible loading restrictions to certain goods

ARRIVAL PROCESSES

Arrival processes deal with actual arrival of consignments to the customs territory. It is one of the most important process areas, both from security and safety viewpoint and from fiscal viewpoint. There are several issues that complicate the arrival processes and therefore the streamlining of the processes is very important.

- **Arrival processes tend to be time-critical** – ensuring the fast unloading is a must
- **Arrival processes tend to involve many parties** – a carrier, handling agent, customs, other governmental agencies, etc
- The **data set** describing the consignments is usually **very small** and sometimes **lacks in quality**
- Different parties possess different **information about the consignment that must be matched at the time of arrival**
- **Different modes of transport have very different arrival procedures.** There is no ‘one-procedure-fits-all-transport-modes’ solution

It is important to make the best use of the available information within a very short timeframe during when the customs has a sufficient control over the goods.

CuE supports fast unloading of goods by

- **integrating data provided by different parties** using different documents and results of risk analysis of these documents together to help customs officers to make decisions quickly and efficiently
- automatic validation of arrival notifications and instant feedback to traders about warnings and errors
- **handling the arrival of the road transport without requiring the electronic arrival notification**
- assigning the controls based on the results of risk analysis of the arrival and pre-arrival information
- **managing the status of consignments** based on the results of controls

TEMPORARY STORAGE PROCESSES

Temporary storage processes deal with temporary storage of goods before applying the customs procedure. Goods are normally placed in the temporary storage after their arrival on board of a transport vehicle.

CuE helps to implement the temporary storage processes by

- **preparing the temporary storage notifications based on the previous customs documents** (e.g. cargo manifest, entry summary declaration, transit declaration)
- **managing the status of consignments** based on the results of controls
- **notifying about expiration of temporary storage time limits**

CuE supports the processes that are required for Export Control System Phase 2 (ECS) and Import Control System (ICS) compliance

- *forwarding entry summary declaration data and risk analysis results to the subsequent office on entry*
- *forwarding exit summary declaration data and risk analysis results to office of exit*
- *diverting entry and exit summary declaration from one EU Member State to another*
- *notifying the Authorized Economic Operators about planned controls*

CuE has full support to both, electronic and paper-based transit documents

- ***Some of the transit document are primarily paper based (TIR carnets)***
- *In those cases* ***CuE supports processing of the secondary electronic version of the document*** *in order to speed up the movement of information and to reduce the fraud* ***by making the up-to-date information available to customs officers***
- ***Other transit documents are primarily electronic (e.g. NCTS)***
- *In those cases* ***CuE supports generation of the secondary paper copies of the documents for fallback purposes.*** *However, the main processing is fully electronic and ensures the timeliness and correctness of the information*

TRANSIT PROCESSES

Transit processes deal with transporting of the goods through customs territory without paying the import duties and other charges. The transit processes have always been important in order to ensure the fast and efficient delivery of goods, and are even more important nowadays as the volume of the international trades increases due to the globalization.

CuE supports the main transit processes by

- **preparing the transit declaration based on the previous customs documents** (e.g. cargo manifest, entry summary declaration)
- offering machine-to-machine and web-based interfaces for lodging transit declarations
- **automatic validation** of transit declarations and **instant feedback** to traders about warnings and errors
- assigning the controls based on the results of risk analysis, performing the controls and acting upon the results of control
- **enabling guarantee management** during the transit processes if necessary

In addition to generic processes that are applicable to different transit systems, both national and international CuE fully supports two main international transit systems: TIR and NCTS.

CuE implements the following TIR specific processes

- handling of TIR carnets
- generation of SAFETIR information at discharge of a carnet and sending the information to IRU
- downloading and checking of the lists of stolen and invalid carnets distributed by IRU
- receiving of electronic pre-declaration messages sent from the IRU electronic pre-declaration system

CuE supports the following NCTS specific processes

- checking and booking the transit guarantee at the office of departure
- releasing of the transit guarantee at the office of destination
- handling the guarantees at the office of guarantee
- processing the NCTS/TIR information

IMPORT PROCESSES

Import processes deal with putting the goods into free circulation. In this case the focus is on the fiscal aspects of the customs declaration.

CuE supports the import processes

- **lodgment of import declarations based on the previous customs documents** (e.g. cargo manifest, entry summary declaration, transit declaration)
- **automatic validation** of import declarations and instant feedback to traders about warnings and errors, checking the permits and licenses
- **calculation of taxes** and **duties and checking of non-tariff measures**
- **tax accounting** and **payment**
- handling of **simplified** and **supplementary declarations**
- management of **notifications** and **local clearance**

WAREHOUSING, INWARD PROCESSING, TEMPORARY ADMISSION, FREE ZONE PROCESSES

Warehousing, inward processing, temporary admission and free zone processes are commonly referred as procedures with economic impact. The biggest difference with import procedure is that the duties and taxes are not collected when the goods are put on the procedure, but are postponed to some later time. The procedures with economic impact usually involve the following:

- presentation of a guarantee by trader
- customs supervision during the procedure
- time limits for the procedure
- customs issued permits
- regular reporting by the trader

CuE will provide customs administrations with the following:

- ***A balance between facilitation and control** in a paperless customs and trade environment*
- ***Quicker clearance process** and reduced number of manual operations*
- ***High availability of information exchange** with EU and/or neighbouring countries*
- *Integration with other government agencies, thus **implementing Single Window***
- *Simple implementation of **disaster recovery and business continuity procedures***
- ***Interfacing with EU systems** (integrated tariff environment (ITE), Transit, ECS/AES, ICS/AIS)*

CuE implements all required functionality of EU systems

- ***CuE implements the full NCTS Phase 4 specification and passes the NCTS Conformance Tests***
- *Unlike many other NCTS implementations,* ***the NCTS functionality in CuE is integrated with the rest of the system*** *in all aspects. It means the process level* ***integration between the transit, pre-arrival, arrival, temporary storage, import, export, and exit procedures***
- *This integration* ***allows to reduce the workload*** *of customs officers and traders and also* ***to decrease the possibility of fraud***
- ***CuE implements full Import Control System (ICS) and Export Control System (ECS) functionality and passes ECS/ICS Conformance Tests***
- ***CuE supports all EU systems that are related to import and export processes***
- *Most importantly it* ***supports TARIC which contains all the tariff and non-tariff measures*** *and is used to calculate the taxes and verify the prohibitions*
- ***CuE also supports Quota and Surveillance systems***

Procedures with economic impact require usually two customs declarations - one that starts the procedure and second one that stops it (e.g. a declaration for temporary admission and a declaration for re-export). **Those two declarations must be correlated with each other and checked for consistency and possible violations.**

CuE helps to implement the procedures with economic impact by

- validating of the lodged declarations, including checking for permits and **validating the declarations against previous declarations**
- handling of **simplified permit requests**
- calculation of the taxes and duties and checking of non-tariff measures
- **guarantee management** for postponed taxes
- management of the **procedure time limits**
- handling of **simplified** and **supplementary declarations**
- management of **notifications** and **local clearance**

EXPORT, RE-EXPORT, OUTWARD PROCESSING PROCEDURES

Export processes deal with sending the goods outside the customs territory. The fiscal aspects are important, when there are export duties or VAT refund.

CuE supports the export processes

- **validating customs declarations**, checking the permits and licenses
- **automatic** and optional manual **risk analysis** of the export declaration and assignment of controls
- **managing the status of declarations** based on the results of controls
- calculation of taxes and duties (if applicable) and checking of non-tariff measures
- tax accounting and payment (if applicable)
- handling of **simplified** and **supplementary declarations**
- management of **notifications** and **local clearance**

PRE-DEPARTURE PROCESSES

Pre-departure processes are quickly gaining importance as several initiatives to improve the security and safety of trade are being entered into the execution phase. Unlike the pre-arrival processes where completely new information flows must be put in place the pre-departure process can be thought as an improvement of the existing export processes.

For the most part the pre-departure security information can be lodged together with an export declaration. Only in those cases where the export declaration is not needed, new processes must be put in place.

CuE helps the customs authorities and traders to implement the pre-departure processes:

- **lodgments** and **validation** of electronic **exit summary declarations**
- **amendment** of electronic **exit summary declarations** by traders
- **automatic** and optional manual **risk-analysis of pre-departure information** and assignment of controls by customs authorities

EXIT PROCESSES

Exit processes deal with the actual exit of consignments from the customs territory. It can be thought as a counterpart to arrival processes. Unlike the arrival processes the information availability or quality is rarely a problem. Most of the consignments are covered by the export declarations that contain the detailed data.

CuE helps to implement the exit processes

- **lodgment** and **validation of departure notification** in the form of cargo manifest
- **amendment of departure notifications** based on the actual results of loading
- **handling the departure of road transport without requiring electronic departure notification**

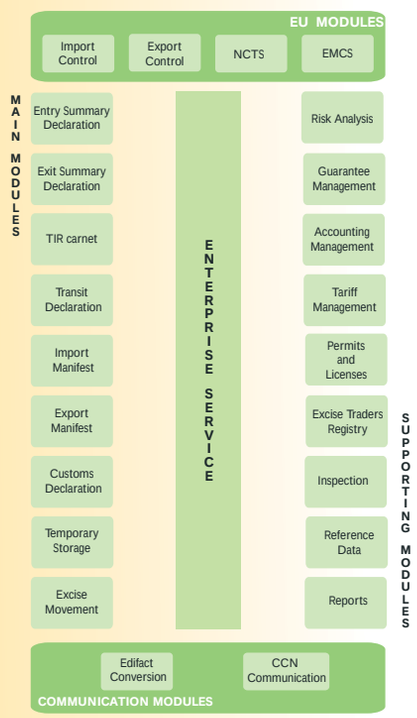
CuE is compliant with following international standards

- *WCO Revised Kyoto Convention*
- *WCO SAFE Framework of Standards*
- *European Union AIS phase 1, NCTS phase 4, NCTS-TIR and ECS phase 2 specifications*
- *WCO Harmonized System*
- *WCO Data Model version 3*
- *European Union Modernized Community Customs Code*

HOW CUE IS BUILT?

CuE is designed to assist legitimate trade, foster compliance, and improve communication with the trade community through on-line services. CuE helps customs authorities to fulfil their policy of offering e customs services and setting up a paperless organization.

The system architecture on the CuE follows the l**atest information system design trends**



- **Multi-tier architecture**, to logically and physically distribute functionality, and to separate concerns
- **Component-based architecture**, to increase and ease the reuse of code and services
- **Service-oriented architecture**, to ease the integration and to enable the deployment of value-added services
- **Modular architecture**, to increase fault-tolerance and performance, ease the management of the system and enable selective deployment of the system
- **Web-based architecture**, to reduce the costs of system deployment, maintenance and support

DOCUMENT-CENTRIC MODULAR DESIGN

CuE is comprised of several independent modules where each module encapsulates the complete processing logic of a particular type of document (e.g. entry summary declaration, customs declaration ...). Each of those modules is an authoritative source of information when it comes to processing of particular type of documents.

This functionality is not duplicated in other modules. Instead, the services provided by the appropriate module are used. This approach **ensures the reuse** of the existing functionality and **uniform treatment** of documents throughout the system.

XML BASED DESIGN

All documents are expressed in terms of XML Schema (XSD). XML Schema is used to define all document fields, data types etc. CuE modules communicate with each other and with the rest of the world using XML documents and messages.
In addition, all the internal document processing is done on XML formatted documents.

DYNAMIC CONFIGURABILITY

CuE allows configuration of **all the main components** of document-processing modules:

- state machines that encapsulate the life-cycle of a document
- document validation rules that determine whether documents are correct
- well-formed user interface that is used for entering, viewing and modifying documents

AUTOMATION

CuE modules **automate all the routine tasks** that do not require human interven-

- document checks – correctness of the document is automatically checked by the system
- checks against other documents – if possible, document is compared against other electronic data, such as permits (authorizations), guarantees, previous documents, data from other information systems etc. The checks are delegated to customs officers only if the electronic data is not available
- document state transitions – if possible, document state transitions are performed automatically. For example, if an import declaration is lodged and successfully passes risk analysis, and import duties are correctly paid, then goods can be released without requiring any actions from customs officers

Customs Engine is

- ***Comprehensive*** *– CuE implements the processing of all the customs specific documents providing a unique opportunity for process integration*
- ***Focused*** *– CuE implements only customs specific functionality and reuses the existing systems and infrastructure for common tasks like authentication and accounting, therefore avoiding duplication*
- ***Modern*** *– CuE is implemented on a modern, industry standard IT platform, ensuring its viability and long service life*
- ***Modular*** *– CuE has the modular architecture which allows to mix-and-match its subsystems with the existing ones and provides the performance, serviceability and reliability advantages over a monolithic system*
- ***Integrated*** *– CuE modules are seamlessly integrated to create the most powerful and user-friendly customs information system*
- ***Automated*** *– CuE is designed to automate as many customs processes as possible by taking full advantage of the integration between its modules*
- ***Flexible*** *– CuE is designed to easily accommodate the changes in business processes, rules of operation and the technical infrastructure*
- ***Coherent*** *– CuE provides the similar features and interfaces to process all of the customs documents*
- ***Evolving*** *– CuE is constantly evolving, bringing in the new capabilities and implementing new features*

Customs Engine is compliant with following technologies

- *Oracle database*
- *BEA Weblogic Application Server*
- *IBM DB2 database*
- *IBM Websphere Application Server*
- *All major internet browsers including Internet Explorer, Mozilla, Opera etc.*

EXTENSIBILITY

CuE is designed to be extensible. Simple customizations, such as setting which document fields are displayed on different occasions, which fields are mandatory and changing document verification rules, can be done while the system is in operation.

By using those customization options, it is possible to extend a CuE module **to process several kinds of documents**, assuming that all these documents have similar data model and processing logic. An example of this kind of customization is declaration module which supports both import and export declarations, although they have quite a different contents.

INTERNATIONALIZATION

CuE is designed from the ground up as **an internationally usable system**; it is flexible and configurable. The currently implemented processing rules are mostly common to all EU member states and can be used as the baseline for analysis.

CuE supports **multi-language user interfaces** and provides **simple and standard interfaces** for communicating with other (supporting) systems.

CuE integration capabilities are built around **the usage of Enterprise Service Bus (ESB)**. CuE modules use ESB in order to communicate with each other. This makes it easy to mix and match CuE modules with other systems. CuE also uses ESB to communicate with external parties, i.e. traders and other agencies, which makes it easy to adapt the external interfaces to national needs.

WEB APPLICATION

Web applications are becoming increasingly popular. The very lightweight nature of the client, universal accessibility via web browsers and mobile devices is pushing the software industry towards the web based applications.

CuE is pure a web application. It **reduces the total cost of ownership**, by minimizing the support and maintenance costs. CuE is designed to leverage the advantages of the web application approach also to traders. The customs information systems are traditionally communicating with traders by exchanging electronic messages. Whilst this approach is fine for bigger traders, it is unsuitable for smaller companies without big IT budget.

CuE offers to the traders a customs hosted **web based application** for carrying out all the customs related tasks. External users (customers) are provided with a Web interface for creating or uploading documents, submitting documents to customs, and viewing their own documents and document history.

By providing traders with immediately usable solution, customs will be able **to speed up the adoption** of new applications and reduce the time to carry out changes.

SERVICE-ORIENTED ARCHITECTURE

CuE is built from **independent** and **interconnected modules**, each of which encapsulates the complete processing logic of a particular type of document. Every module can be **used independently**; for example, the transit module can be used with other declaration processing systems besides Customs Engines declaration module.

The modules are connected through **the enterprise service bus (ESB)**, which helps to decouple service providers and service consumers and provides a flexible way to implement various supporting services. Additionally, the ESB can be leveraged to implement Business Process Management features.

The modules communicate by calling services and sending messages using standard interfaces, such as JMS, EJB, and SOAP. All CuE modules publish information about document-related events (such as state changes) to the ESB and implement services that can be called by the ESB. This enables **process orchestration** – meaning that events can trigger business processes that call different services in different modules.

Modern, state-of-the-art IT integration requires the implementation of Service-Oriented Architectures (SOAs). More recently, the concept of Enterprise Service Bus (ESB) has been expressed as a key component of the SOA infrastructure. ESB is a set of infrastructure capabilities implemented by middleware technology that enable an SOA.

Customs Engine uses **SOA principles for creating synergy** between CuE modules. All CuE modules offer coarse-grained document services. Each module itself is responsible for enforcing the correct processing rules concerning a single type of document.
Business events and services can be used by **Business Process Management (BPM) tools** for automating business processes and coordinating actions between several CuE modules.

UNIFIED USER INTERFACE

All the CuE modules are implemented as independent Java applications. However, on the user interface level, they offer **seamless user experience.** The user sees “Official’s desktop” or “Declarant’s desktop”, which is the entry point for all CuE modules. Additionally, user can navigate between modules using links between documents.

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Customs Engine offers

- ***Personal Workspace*** *–using CuE, each user has his own workspace where he is able to customize his working environment, including internationalization (support of various languages)*
- ***Rich and intuitive user interface*** *– CuE is designed to have a user-friendly look and feel so the users can quickly familiarize themselves with the application without going through a steep learning curve*
- ***Zero installation*** *– CuE is designed to be easy to use right from the start. There are no hardware requirements besides an Internet-enabled desktop or laptop computer, no software to install (all operating systems come with a browser installed), and no version upgrades to perform. No technical expertise is required from the user*
- ***Access anytime, anywhere*** *– Since no information is stored on user's computer, the users need only an Internet-enabled computer to access their information any day and any time*
- ***Security*** *– CuE is secured by session/transport-level security technologies (such as SSL, X.509 certificate authentication, HTTP Basic Authentication, and HTTP Digest)*

For example, an import declaration in Declaration module can reference entry summary declaration in Entry Summary Declaration module. When user views such declaration, the reference number is displayed as link. When user clicks on link, she is redirected to Entry Summary Declaration module and can view the entry summary declaration. When the user clicks the "Back" button, she is redirected back to the Declaration module and can continue viewing or editing the import declaration. In this manner, user can **navigate the documents seamlessly** without having to manually switch between different applications and separately search for specific documents.

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HOW CAN I GET MORE INFORMATION?

More information about Customs Engine is available www.customsengine.eu.

Or you can contact us directly
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About Cybernetica

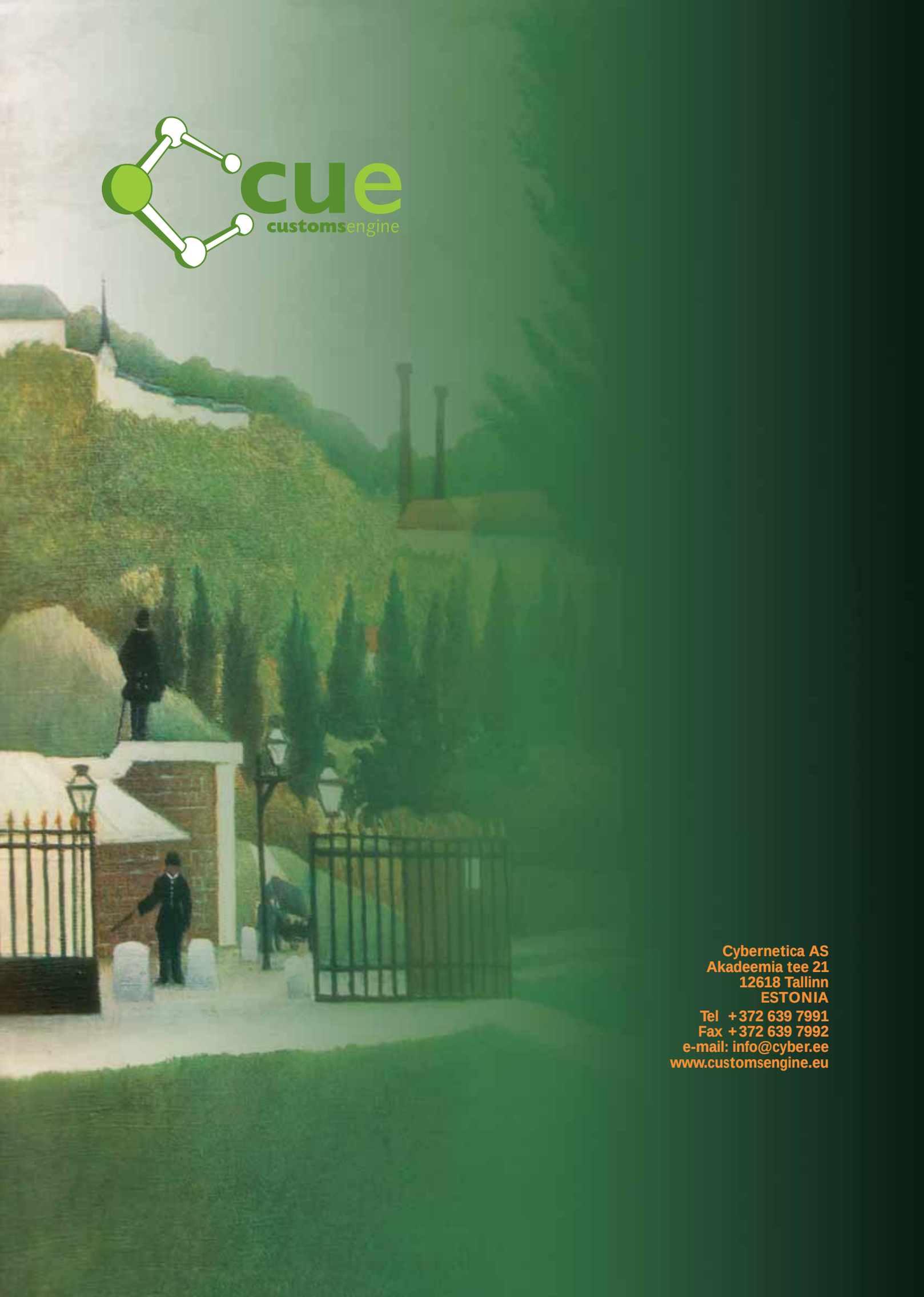
As an ICT R&D company and solutions provider, Cybernetica has had the privilege to be a witness of, and contribute to, several remarkable achievements in the area of eGovernment, culminating with the deployment of an Internet-based e-voting solution that was used in the elections of the Parliament of the Republic of Estonia in March 2007.

E-voting became possible only because several critical enabling technologies were in place, such as the nationwide Public Key Infrastructure for providing voter authentication through the national ID card, and X-Road, a secure information exchange layer seamlessly binding all governmental databases; all of which were created in cooperation with Cybernetica. The unique and sophisticated e-voting software had to comply with strict data protection and data integrity requirements to safeguard the anonymity of voters while verifying their identity beyond any doubt and leaving behind an audit trail. The result was an international success.

What Cybernetica has achieved comes from years of original research in information security, and the commitment to perfecting our software engineering processes.

During the last five years, Cybernetica has worked closely with the Estonian Tax and Customs Board (ETCB), helping them to build a modern Customs organization. Cybernetica's knowledge in Customs and eGovernment in general has helped the ETCB to achieve the highest satisfaction rates among clients and the public. In fact, according to latest surveys, the ETCB has become one of the three most trusted organizations among Estonian citizens, and in this, Cybernetica's Customs Engine platform has played an integral part.

Cybernetica has earned the reputation as a dependable provider of innovative eGovernment solutions, often outclassing recognized international players in the tendering process. We are confident that our deep knowledge of eGovernment and Customs systems and the capability to build mission-critical software to the highest security standards would benefit anybody creating or improving systems or services in relevant domains, anywhere in the world.



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