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# 1. Introduction

The goal of this part of the document is to gather in one place short descriptions of the architecture of all the applications that are supported by XXX. As the applications were developed in the course of many years and by several providers there is no available single uniform view of their architecture.

The current document is based on the information contained in the documents that were available to XXX during the elaboration. These documents prepared so far summarize the information on the architectures which was extracted from those materials.

In some cases the system's documentation was very sparse or totally absent. In such case it has been marked that the specification is missing in the place where the descriptions should be placed.

## 1.1 Approach

Even though the source information concerning the applications is very diverse we tried to present the description of all the applications in a uniform way.

The **first section** of each of the descriptions contains a table in which we have listed all the documents which proved to be useful in the preparation of the description and which could be of interest to the reader in case he wants to study in more detail some aspects of the application.

The **second section** called “Functional perspective” contains the general description of the purpose of the application, its role in the overall DG TAXUD IT systems infrastructure and its relation to other applications. Further this section contains two subsections:

- “Domain vocabulary” which lists the main objects that are the subject of processing by the application. When possible this is documented in the form of UML class diagrams. The goal of the diagrams is not to present the detailed object model but only to identify main entities and their main properties as that can be useful for overall application architecture understanding.
- “Use cases view” which lists and shortly describes the main functionalities of the application. When possible this is done in the form of a list of main use cases listed together with short descriptions.

The **third section** called “Application perspective” is devoted to the description of the architecture of the application itself. This is done in two subsections:

- “Application structure” which shortly lists and describes the role of the main components from which the application is constructed. When possible we illustrated the description with UML component diagram.
- “Application dynamics” completes the application perspective description giving the overview of the dynamics of the application, by describing the main interaction between the application building blocks. When possible the dynamics description is illustrated with UML activity or sequence diagram.

The **fourth section** “Technical perspective” contains the short categorization of the application in the technical perspective. We have decided to categorize the application by describing:

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- “Service access and delivery” which clarifies the way the services provided by the application can be accessed and used
- “Service platform” which summarizes what kind of software and infrastructure is needed to run the service,
- “Component framework” which summarizes what kind of technologies were used to build the application.

Several applications mainly from the customs business thread are built using common architecture framework. For these applications there is no specific technical documentation or design specification. They all refer to one common document which describes in detail the common architecture framework used to implement them. In our description of application and technical perspective we have followed the same pattern. We have placed the description of the “Tariff Applications Architecture Framework” in the separate chapter and all the applications in their application and technical perspective descriptions refer to it.

## 1.2 Structure of this document

In the previous part of the document the detailed classification of the systems and application has been provided together with the metamodels which address the diversity of DG TAXUD applications. As it was shown there is no single taxonomy which can be applied to those applications as:

- Some of the applications are used in several systems,
- Some of the applications are used in several business threads,
- There are several technologies used to implement DG TAXUD applications.

As a consequence the order in which we present the descriptions of the applications was prepared in an arbitrary manner, where we tried to put related descriptions close together to ease the reading of the specifications.

We start with the description of the Tariff Applications Architecture Framework and several supportive modules and applications which are used in connection with the framework.

- [Tariff Applications Architecture Framework](#);
- [CCN/CSI Bridge](#);
- [HTTP CCN Proxy Bridge](#);
- [HTTP Internet Proxy Bridge](#);
- [User Management Module \(UM\)](#).

Then we move to a set of applications which are based on the described earlier architecture framework and which are mainly supporting customs business thread.

These are:

- [AEO Authorized Economic Operators](#),
- [ART Activity Reporting Tool](#),
- [CN Combined Nomenclature](#),
- [EBTI Binding Tariff Information](#),
- [ECICS](#),
- [ISPP](#),
- [RIF Risk Information Forms](#),
- [SMS Specimen Management System](#),
- [Surveillance](#),

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- [Suspensions](#),
- [TQS Tariff Quota System](#).

Next come two applications which support the maintenance of the core tariff information.

- [TARIC](#),
- [Taric reports](#).

Next group of applications is connected with two systems built using the same paradigm and using the same technology. We start with a short description of the systems themselves:

- [NCTS](#),
- [ECS](#),

next there are descriptions of the “client” applications:

- [MCC](#),
- [GMS](#),
- [ECN+](#),

description of centrally deployed reference data and monitoring applications:

- [CS/MIS](#),
- [CS/RD](#),
- [SMART](#),

and testing and supportive applications:

- [STTA](#),
- [TTA](#),
- [ECN](#).

Other application described are 3 applications from the excise business thread:

- [MVS](#),
- [EWSE](#),
- [SEEDv0](#),

and 2 application which are used for information dissemination:

- [DDS](#),
- [Web2000](#)

The last part of document constitutes description of systems and applications in the Taxation thread. At the beginning we present outlines of functioning systems:

- [VIES](#),
- [VAT-on-e-Services](#),
- [Taxation of Savings](#),
- [Exchange of Forms](#),

next there are described centrally operated testing applications:

- [VIES Test Application](#),
- [VAT-on-e-Services Remote Test Application](#),
- [Generic Test Tool](#),
- [Taxation of Savings Test Tool](#)
- [Exchange of Forms Test Tool](#)

and also centrally operated supportive and monitoring applications:

- [VIES Monitoring](#),

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- [VIES-on-the-WEB Monitoring](#),
- [VIES-on-the-WEB Configuration Tool](#),
- [VIES & VIES-on-the-WEB Statistics](#)

There is also provided description of two applications used for information dissemination in the Taxation thread:

- [VIES-on-the-Web](#),
- [Taxes in Europe](#)

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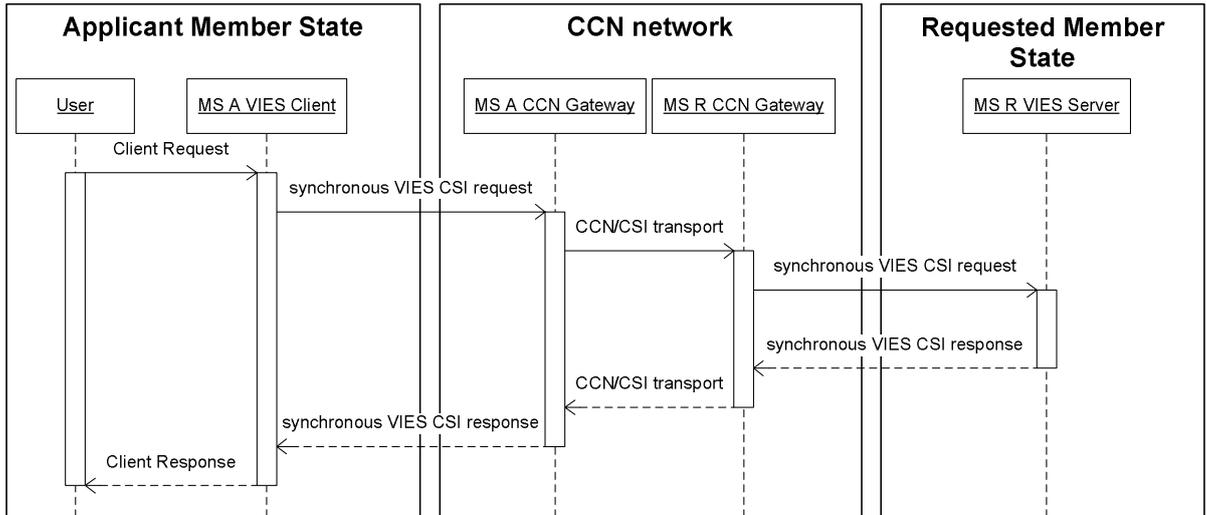


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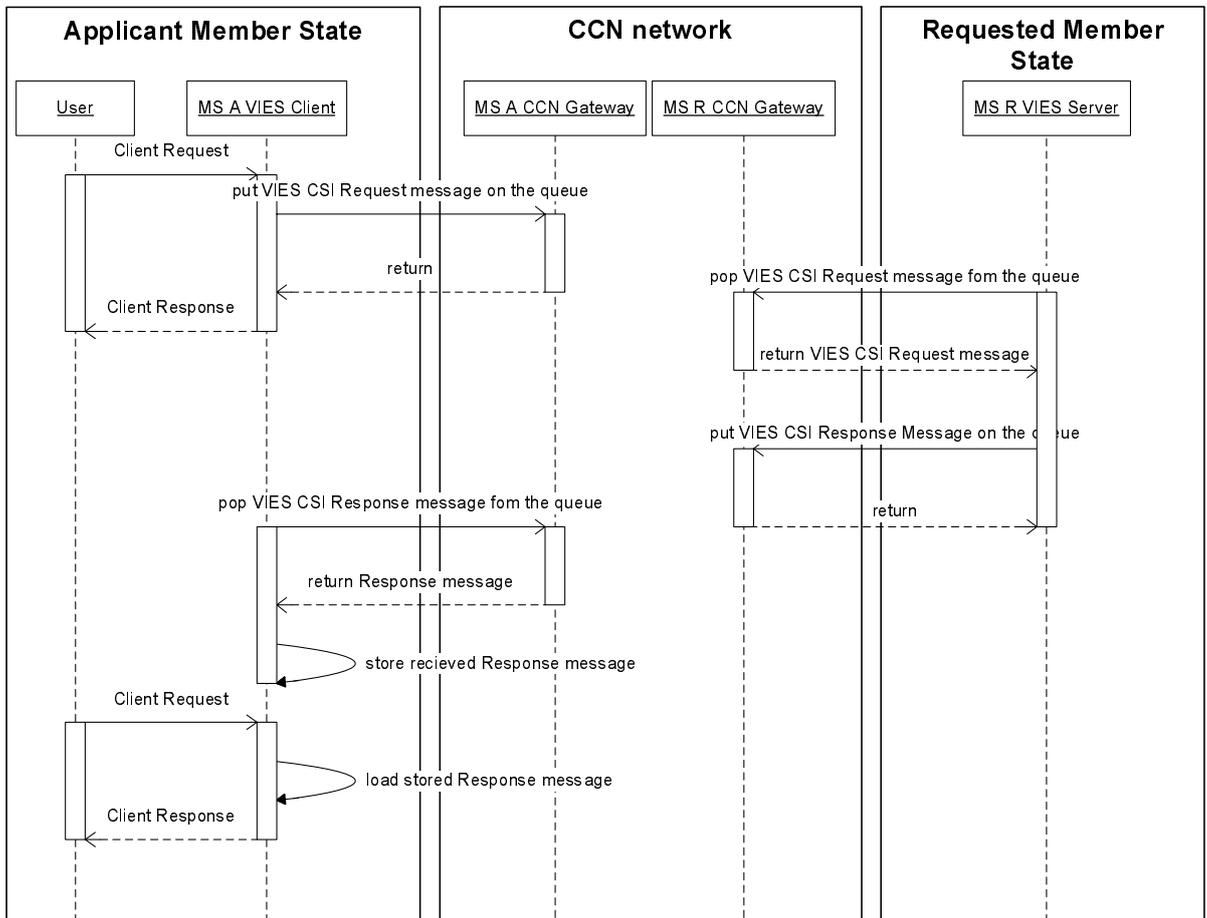


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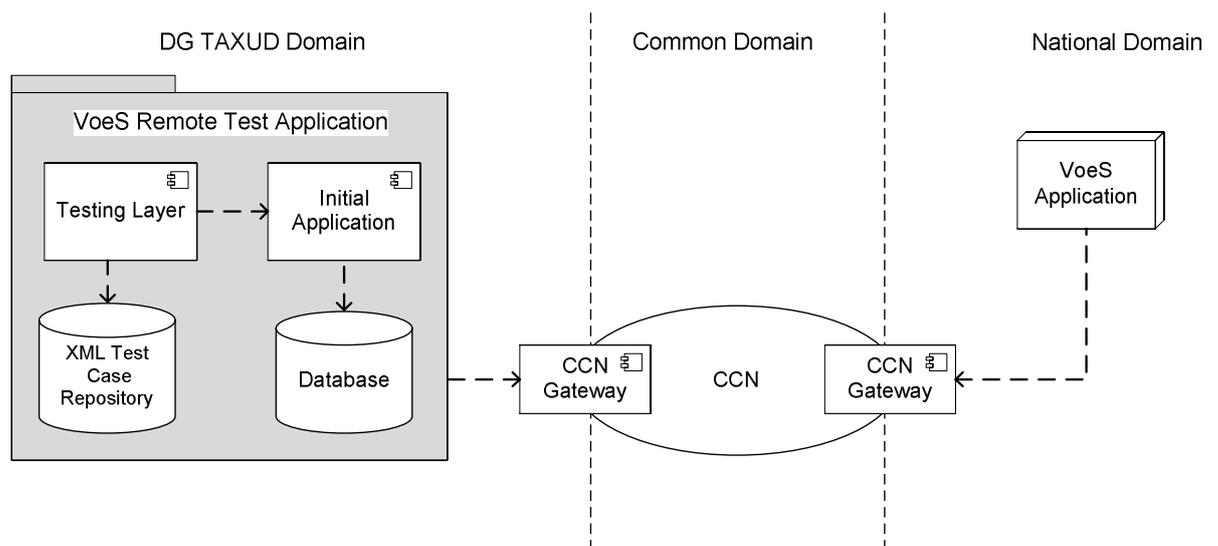


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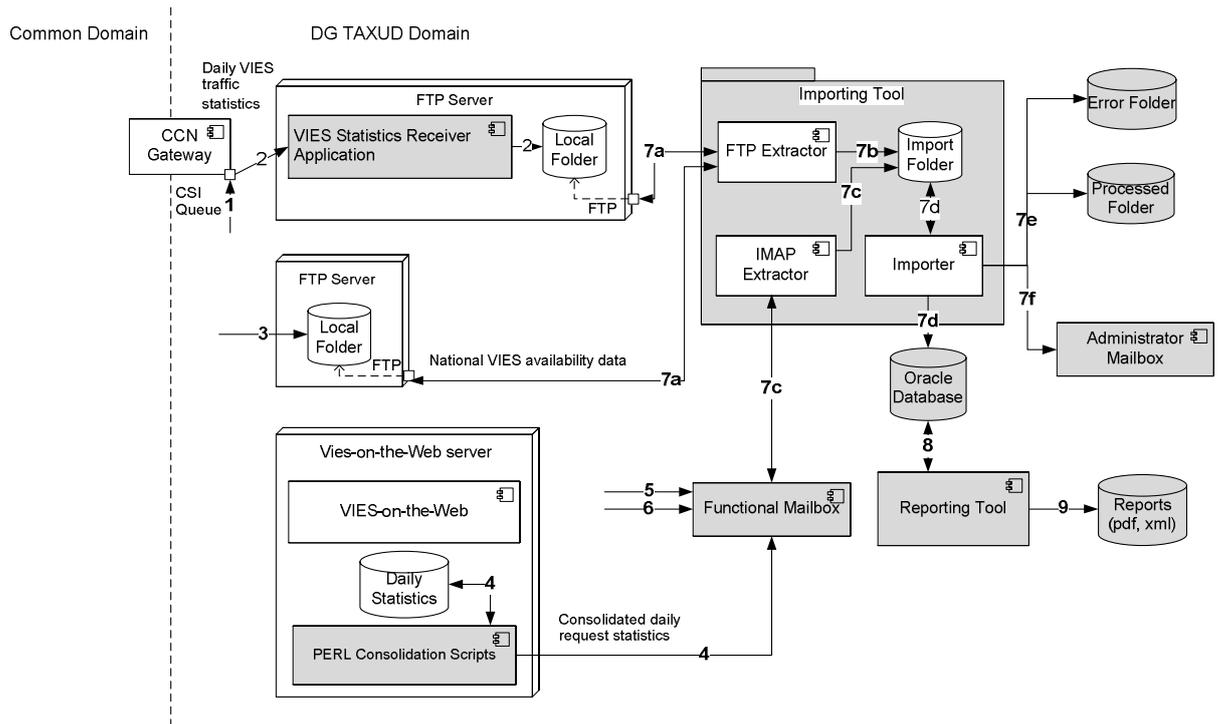


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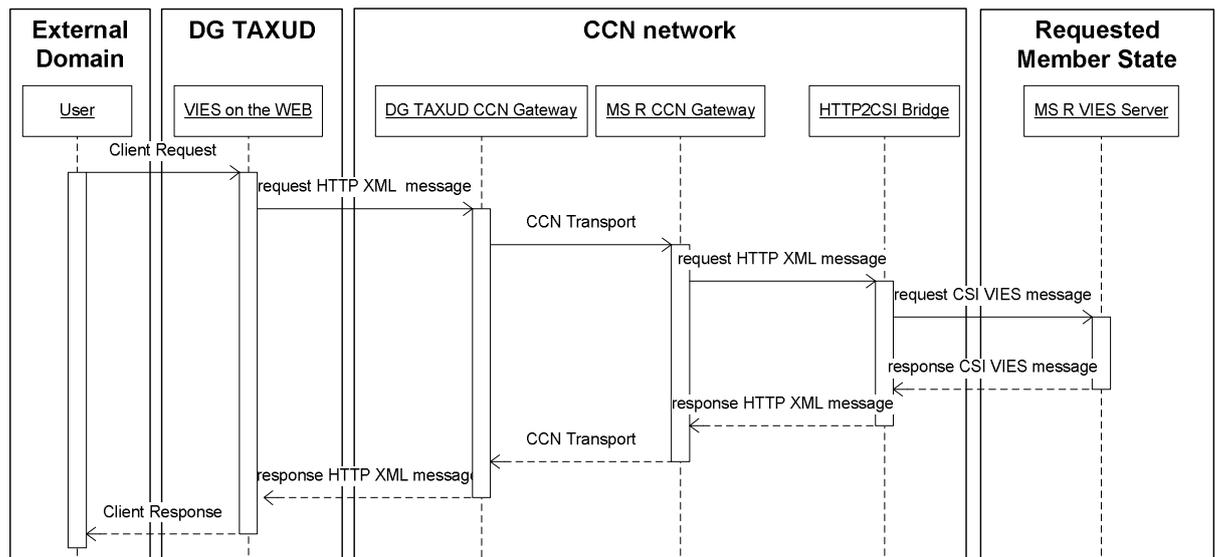


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## 1.5 Abbreviations and Acronyms

A list of the principal abbreviations and acronyms used is provided here for a better understanding of this document.

<b>Abbreviation / Acronym</b>	<b>Description</b>
ADE	Acquisition of Data Extractions
AEO	Authorized Economic Operators
API	Application Programming Interface
ART	Activity Reporting Tool
CCN	Common Communication Network
CCN/TC	Common Communication Network/Technical Center
CD	Common Domain
CDCO	Centrally Developed Centrally Operated
CIT	Company Income Tax
CN	Combined Nomenclature
COL	Customs Offices List
CSI	Common System Interface
DDS	Data Dissemination System
DIGIT	Directorate General Informatics
DOM	Document Object Model
EBTI	European Binding Tariff Information
ECS	Export Control System
EFTA	The European Free Trade Association
EJB	Enterprise Java Bean
ESIS	European Space Information System
EU	European Union
Formex v4	Formalized Exchange of Electronic Publications
FTP	File Transfer Protocol
G2C	Government to Citizen
G2G	Government to Government
GDP	Gross Domestic Product
GTT	Generic Test Tool
HS	Harmonized System
HTTP	Hypertext Transfer Protocol
HTTPS	HyperText Transfer Protocol Secure
HVATR	Historical VAT Registration
IE	Information Exchange
IMAP	Internet Message Access Protocol
InChI	International Chemical Identifier
IRF	Internal Representation Format
IUPAC	International Union of Pure and Applied Chemistry
J2EE	Java 2 Platform, Enterprise Edition

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<b>Abbreviation / Acronym</b>	<b>Description</b>
JavaBeans	JavaBeans technology is the component architecture for the Java 2 Platform, Standard Edition (J2SE). Components (JavaBeans) are reusable software programs that you can develop and assemble easily to create sophisticated applications.
JDK	Java Development Kit
JFC	Java Foundation Classes
JMS	Java Message Service
JNDI	Java Naming and Directory Interface
JSP	Java Server Pages
MIME	Internet media type
MQ SERIES	IBM system for messaging across multiple platforms
MS	Member State
MS-A	Applicant Member State
MS-C	Member State of Consumption
MSCON	Member State of Consumption
MSID	Member State of Identification
MS-P	Member State of Production
MS-R	Requested Member State
MS-T	tested Member State
MVC	Model-View-Controller
NA	National Administration
NCTS	New Computerized Transit System
ND	National Domain
NES	National Export System
NETP	non-established taxable persons
NTA	National Transit Application
OPOCE	Office for Official Publications of the European Communities
PIT	Personal Income Tax
RFC-1867	Form-based File Upload in HTML
RIF	Risk Information Forms
RTA	Remote Test Application
SAD	Single Administrative Document
SCAC	Standing Committee on Administrative Cooperation
SDR	Single Declaration Record
SMS	Specimen Management System
SMTP	Simple Mail Transfer Protocol
SOAP	Simple Object Access Protocol
TAAF	Tariff Applications Architecture Framework
TiE	Taxes in Europe
TIN	Tax Identification Number
TIP	Technical Infrastructure Plan
TMG	Tariff Management Group
TQS	Tariff Quota System

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<b>Abbreviation / Acronym</b>	<b>Description</b>
UI	User Interface
URL	Uniform Resource Locator
V4 countries	A name for four central European post-communist countries - the Czech Republic, the Republic of Hungary, the Republic of Poland and the Slovak Republic.
VAT	Value Added Tax
VATR	VAT Registration
VIIES	VAT Information Exchange System
VoeS	VAT-on-e-Services
VoW	VIIES ON THE WEB
VQL	Visual Query Language
Web application	It is an application that is accessed via Web browser over a network such as the Internet or an intranet.
WHO	World Health Organization
WLS	Web Logic Server
XML	Extensible Markup Language

Table 1-1 Abbreviations and Acronyms

<b>Architecture Reference: Annex A</b>	<b>REF.: ITS-IRPT-ARD-001A</b>
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<b>1.6 – Consolidated List of reference documents</b>	<b>ISSUE DATE: 13/01/2009</b>

## 1.6 Consolidated List of reference documents

A Consolidated List of reference documents used in the document.

<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
AEO1	AEO Phase 1 Functional Specifications	AEO-FS-Ph1 - Functional Specifications - 3.00.doc	3.00
AEO2	AEO Phase 1 Data Model	AEO-DM-Ph1 - Data Model - 2.00.doc	2.00
AEO3	AEO Phase 1 Process Model	AEO-PM-Ph1 - Process Model - 2.00.doc	2.00
AEO4	AEO Phase 1 User Interface Specification	AEO-UIS-Ph1 - User Interface Specification - 2.00.doc	2.00
AEO5	Guidelines For Technical Message Exchange Specifications	STDEV-TMES-Guidelines For Technical Message Exchange Specifications.doc	1.40
AEO6	AEO Phase 1 Functional Message Exchange Specifications	AEO-FMES-Ph1 - Functional Message Exchange Specifications - 4.00.doc	4.00
ART1	ART User Requirements	ART-USREQ-v1.08-EN.doc	1.08
ART2	ART Functional Specifications	ART-FS-v1.12-EN.doc	1.12
ART3	ART Data model	ART-TEC-Data Model_1.07.doc	1.07
ART4	ART Process model	ART-TEC-Process Model_1.09.doc	1.09
CN1	CN Management Functional Specification	CN-FS- CN_Management_Functional_Specification_1.13.doc	1.13
CN2	CN Management Process Model	CN-Process_Model_1.09.doc	1.09
CN3	CN Management Data Model	CN-Data_Model_1.06.doc	1.06
CSIB1	DG TAXUD Information Systems	GEN-RNO - CSIBridge Release 1.1.4.doc	1.1.4
CSIB2	CCN Monitoring and Reporting System Functional Specification	GEN-CMR-FS- Functional_Specification- EN.doc	1.11

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<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
CSIB3	DG TAXUD Information Systems	GEN-CMR-Data Model.doc	1.11
CSIB4	CSIBridge: CSI – JMS header properties mapping	CSI-TEC-NOTE-001.doc	1.11
CSIB5	DG TAXUD Information Systems	GEN-CMR-UI - User Interface Specification.doc	1.11
CSIB6	DG TAXUD Information Systems	DEMCO_CSI-INS-001 - Installation Guide.doc	1.11
CSIB7	Key architectural elements of the future TAXUD infrastructure platform	DEMCO-NOTE-0002 - v 1.00 - Architectural Elements.doc	1.0
CSRD1	System Requirements Definition for CS/RD for NCTS Phase 3.2 and ECS	TCE-SRD-L1CSR-P32.zip	3.10
DDS1	DDS Data Model	DDS_Data_Model_V1.14.doc	1.14
DDS2	DDS Data Model & Bridge Design	DDS-DSG-BRI v1-0.doc	1.00
DDS3	Data Dissemination System web site	<a href="http://ec.europa.eu/taxation_customs/dds/home_en.htm">http://ec.europa.eu/taxation_customs/dds/home_en.htm</a>	
EBTI1	EBTI-3 User Requirements	EBTI-3-USREQ-EN_1.02.doc	1.02
EBTI1	EBTI-3 Functional Specifications	EBTI-3-FS-EN_1.09.doc	1.09
EBTI1	EBTI-3 Data Model	EBTI-3-TEC-Data Model_1.05.doc	1.05
EBTI1	EBTI-3 Process model	EBTI-3-TEC-Process Model.doc	1.11
ECICS1	ECICS-2 Functional Specifications	ECICS2-FS-001-EN.doc	2.01
ECICS2	ECICS-2 Process model	ECICS2-TEC-PM.doc	1.01
ECICS3	ECICS-2 Data model	ECICS2-TEC-DM.doc	1.01
ECN+1	System Requirements Definition for ECN+	TCE-SRD-ECN+.zip	1.60
ECN1	ECN System Requirements Definition for NCTS Phase 3.2 and ECS	TCE-SRD-L1ECN-P32-v4.00-EN.doc	4.00
ECN2	ECN Detailed Design for NCTS Phase 3.2 and ECS	TCE-DTD-L1ECN-P32-v2.50-EN.doc	2.50
ECS1	FTSS AES	FTSS_AES_Addendum_1-2006_final.zip	

<b>Architecture Reference: Annex A</b>	<b>REF.: ITS-IRPT-ARD-001A</b>
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<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
EOF_FS	E-Forms - Functional Specification	FITSDEV-SC10-FS-E-Forms-v1.07.doc	1.07
EOF_TS	VIES2 - e-Forms - Technical Specifications	FITSDEV-TS-VIES2-E-FORMS-v1.05.doc	1.05
EOF_TT_FS	e-Forms Test Tool Functional Specifications	FITSDEV-FS-E-FormTestTool-V1.01.doc	1.01
EWSE 2	Early Warning System for Excise - Functional System Specifications	ECP0-FITSDEV-SA02-STEP2.2-EWSE-FSS-V2.00.doc	2.00
EWSE 3	Early Warning System for Excise - Technical System Specifications	ECP0-FITSDEV-SA02-STEP2.2-EWSE-TSS-V2.00.doc	2.00
EWSE1	Early Warning System for Excise - System Requirement Definition	ECP0-FITSDEV-SA02-STEP2.2-EWSE-SRD-V2.00.doc	2.00
GMS 2	System Requirements Definition for MCC for Phase 3.2	TCE-SRD-L1MCC-P32-v3.90-EN_PART02.doc TCE-SRD-L1MCC-P32-APPA-v3.90-EN.doc TCE-SRD-L1MCC-P32-APPB-v3.90-EN.doc TCE-SRD-L1MCC-P32-APPC-v3.90-EN.doc	3.90-EN
GMS 3	MCC Phase 3.2: User Manual	TCE-UMN-L1MCC-P32-v3.40-EN_PART06.doc	3.40
GMS1	Functional Transit System Specification	0ftss-4.0-e.pdf, 1ftss-4.0-e.pdf, 2ftss-4.0-e.pdf, 3ftss-4.0-e.pdf, 4ftss-4.0-e.pdf, 5ftss-4.0-e.pdf, 6ftss-4.0-e.pdf, 7ftss-4.0-e.pdf, 8ftss-4.0-e.pdf, 9ftss-4.0-e.pdf	4.0
GTT_EOF	GTT Exchange of Forms System Manual	FITSDEV-SM-GTT-EoF-V1.00.doc	1.00
GTT_FS	Generic Test Tool Functional Specifications	FITSDEV-FS-GenericTestTool-V2.01.doc	2.01
GTT_TS	Generic Test Tool Technical Specification	FITSDEV-TS-GenericTestTool-V2.01.doc	2.01
HTTPB_1	Internet integration for Weblogic hosted application	DEMCO-GEN-NOTE-0004 - internet weblogic integration.doc	1.0.1

<b>Architecture Reference: Annex A</b>	<b>REF.: ITS-IRPT-ARD-001A</b>
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<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
HTTPB_2	Key architectural elements of the future DG TAXUD infrastructure platform	DEMCO-NOTE-0002 - v 1.00 - Architectural Elements.doc	1.00
INTB_1	Internet integration for Weblogic hosted application	DEMCO-GEN-NOTE-0004 - internet weblogic integration.doc	1.0.1
INTB_2	Key architectural elements of the future TAXUD infrastructure platform	DEMCO-NOTE-0002 - v 1.00 - Architectural Elements.doc	1.00
INTB_3	Key architectural elements of the future TAXUD infrastructure platform	DEMCO_INT-INS-001 - Installation Guide	1.11
ISPP1	IPR data model	IPR-TEC-Data Model_1.03.doc	1.03
ISPP2	IPR Process model	IPR-TEC-Process Model.doc	1.02
MCC1	System Requirements Definition for MCC for Phase 3.2 part 1	TCE-SRD-L1MCC-P32_PART01.zip	4.10
MCC2	System Requirements Definition for MCC for Phase 3.2 part 2	TCE-SRD-L1MCC-P32_PART02.zip	4.10
MCC3	System Requirements Definition for MCC for Phase 3.2 part 3	TCE-SRD-L1MCC-P32-APP.zip	4.10
MIS1	System Requirements Definition	TCE-SRD-L1CSM-P32.zip	3.00
MONIT_FS	VIES Monitoring Functional Specification Document	FITSDDT-FS-MONIT (3.1).doc	3.1
MONIT_TS	VIES Monitoring, Technical Specifications Document	FITSDDT-TS-MONIT (2.1).doc	2.1
MONIT_VIS	VIES Monitoring visualization Technical Specifications	FITSDEV-TS-VIES-MONIT-VIS-V1.02.doc	1.02
MVS1	Movement Verification System - System Requirement Definition	ECP0-FITSDEV-SA02-STEP2.2-MVS-SRD-V2.00.doc	2.00

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<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
MVS2	Movement Verification System - Functional System Specifications	ECP0-FITSDEV-SA02-STEP2.2-MVS-FSS-V2.00.doc	2.00
MVS3	Movement Verification System - Technical System Specifications	ECP0-FITSDEV-SA02-STEP2.2-MVS-TSS-V2.00.doc	2.00
NCTS1	FTSS 2008 (CORR) FINAL	FTSS-2008-(CORR)-FINAL.zip	
RIF1	RIF Problem Statement and User Requirements	RIF-PS-UR-v2.30-EN.doc	2.30
RIF2	RIF Data Model	RIF-TEC-001 - Data Model_2.01.doc	2.01
RIF3	RIF Functional Specifications	RIF-FS-v2.02-EN.doc	2.02
SEED1	System Requirements Definition for SEEDv0	ECP0-FITSDEV-SA02-SEEDv0-SRD-SEED-v1.04.doc	1.04
SEED2	Functional Excise System Specification for SEEDv0	ECP0-FITSDEV-SA02-SEEDv0-FSS-v1.04.doc	1.04
SMART1	System requirements definition for SMART	TCE-SRD-L1SMRT-P32.zip	1.80
SMS1	Specimen Management System Pre-study Report	ED-SM-Pre-study Report.pdf	1.0.1
SMS2	Specimen Management System Process Model	SMS-TEC-Process Model_1.03.doc	1.03
SMS3	Specimen Management System Data Model	SMS-TEC-Data Model_3.03.doc	3.03
SRV1	Surveillance2 Requirements	SURV2-REQ_3.02.doc	3.02
SRV2	Surveillance2 Functional Message Exchange Specifications	SURV2-FMES-EN_2.02.doc	2.02
STT1	System requirement definition for STTA for NCTS phase 3.2 and ECS	TCE-SRD-L1STT-P32.zip	v2.00
SUSP1	Suspensions Functional Specifications	SUSP-FS_1.25.doc	1.25
SUSP2	Suspensions Data Model	SUSP-TEC-Data Model.doc	
SUSP3	User Guide for the Suspensions Application	SUS-STRA-USG01-EN0.20.doc	0.20

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<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
TAAF1	Key architectural elements of the future TAXUD infrastructure platform	DEMCO-NOTE-0002 - Architectural Elements_1.00.doc	1.00
TAAF2	DG TAXUD Information Systems	DEMCO-TEC-Technical Design Justification.doc	1.00-EN
TAAF3	DG TAXUD Information Systems	DEMCO-TEC-001 - Technical Architecture v2.00 QTMA10-SfA-accepted1.doc	2.00-EN
TAR17	TARIC 2 DFS Administration	ADMIN.DOC	3.0
TAR18	TARIC 2 DFS Batch subsystem	BATSSYS.DOC	1.4
TAR19	TARIC 2 DFS Mailbox subsystem	MAILSSYS.DOC	1.4
TAR20	TARIC 2 DFS Transmission subsystem	TRASSYS.DOC	3.0
TIE_FS	Tax Inventory Functional Specifications	FITSDEV-FS-TAXINVENTORY-V2.05.doc	2.05
TIE_FS	Tax Inventory Functional Specifications	FITSDEV-FS-TAXINVENTORY-V2.08.doc	2.08
TIE_TS	Tax Inventory Technical Specifications	FITSDEV-TS-TAXINVENTORY-V2.06.doc	2.06
TIE_TS	Tax Inventory Technical Specifications	FITSDEV-TS-TAXINVENTORY-V2.08.doc	2.08
TOS_FS	Taxation of Savings - Functional Specifications	FITSDEV-SC04-FS-TaxSavings-v2.03.doc	2.03
TOS_TS	Taxation of Savings - Technical Specifications	FITSDEV-TS-TaxSavings-v2.01.doc	2.01
TOS_TT_FS	Taxation of Savings Test Tool Functional Specifications	FITSDEV-FS-ToS-TestTool-V1.00.doc	1.00
TOS_TT_TS	Taxation of Savings Test Tool Technical Specification	FITSDEV-TS-ToS-TestTool-V1.01.doc	1.01
TQS1	Movement Verification System - System Requirement Definition	TQS-FS-001	2.00

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<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
TQS2	Customs Community Code: Implementing Provisions	CUSTOMS COMMUNITY CODE: IMPLEMENTING PROVISIONS - REG2454/93	
TTA1	System requirement definition for TTA for NCTS phase 3.2 and ECS	TCE-SRD-L1TTA-P32.zip	v2.20
UM1	User Management Module Functional Specifications	UM-FS-EN_1.00.doc	1.00
UML1	OMG Unified Modelling Language Specification	<a href="http://www.omg.org/cgi-bin/doc?formal/2000-03-01">http://www.omg.org/cgi-bin/doc?formal/2000-03-01</a>	1.5
VIES	Functional Specifications for VIES applications (VIES-FS-030)	VIES-FS-030 v1.9.doc	1.9
VIES_ATS	Test VIES Phase V/Unicode Acceptance Test Specification	VIES-ATS-030 (1.11)_TC.doc	1.11
VIES_ATS_SPEC	VIES - 3rd MS Request - Specific Acceptance Test Specifications	FITSDEV-ATS-3rdMSRequest-v1.01.doc	1.01
VIES_INIT	Initial VIES Phase V/Unicode Technical Specification	FITSDEV-TS-VIES-ViesInitApp-V3.01.doc	3.01
VIES_TA_FS	Test VIES Phase V/Unicode - Functional Specification	FITSDEV-FS-VIES-ViesTestApp-V3.01.doc	3.01
VIES_TA_TS	Test VIES Phase V/Unicode Technical Specification	FITSDEV-TS-VIES-ViesTestApp-V3.01.doc	3.01
VIES-STAT_FS	Functional Specifications for VIES Statistics System	FITSTC-VIES-STAT-FS.doc	8.01
VIES-STAT_TS	Technical Specifications for VIES Statistics System	FITSTC-VIES-STAT-TS.doc	7.01
VIESWEB_FS	DG TAXUD Information Systems	FITSDEV-FS-VIESWEB-V6.05.doc	6.05
VIESWEB_TS	DG TAXUD Information Systems	FITSDEV-TS-VIESWEB-V3.05.doc	3.05
VIESWEB-CONFIG_FS	VIES-on-the-Web - Web based configuration - Functional Specifications	FITSDEV-FS-VIESWEB-CONFIG-V2.05.doc	2.05

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<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
VIESWEB-CONFIG_T S	VIES on the Web - Web based configuration - Technical Specification	FITSDEV-TS-VIESWEB-CONFIG-V2.05.doc	2.05
VIESWEB-MONIT_FS	VIES-on-the-Web Monitoring application Functional Specifications	FITSDEV-FS-VIESWEB-MONIT-V1 06.doc	1.06
VIESWEB-MONIT_TS	VIES-on-the-Web Monitoring Technical Specifications	FITSDEV-TS-VIESWEB-MONIT-V1 05.doc	1.05
VOES_FS	VAT on e-Services Functional Specifications (VER. 6.1)	VAT on e-services - FS_v6.1.doc	6.1
VOES_TS	VAT on e-services Technical Specifications	VAT on e-services - TS_v5.2.doc	5.2
VOES_UG	VAT ON E-COMMERCE User Guide	VAT on e-Commerce - UG_v1.0.doc	1.0
WEB1	NCTS WEB 2000 Specification	TCI-LA2-WEB_v100.doc	1.00
WEB2	ITSM WEB portal documentation	ITSM_Portal_Documentation.pdf	05/03/2008

Table 1-2 Consolidated List of Reference documents

Architecture Reference: Annex A	REF.: ITS-IRPT-ARD-001A
DG TAXUD Information Systems	VERSION: 1.11
1.7 – Data model	ISSUE DATE: 13/01/2009

## 1.7 Data Model

### 1.7.1 Reference and Applicable Documents

Id	Title	Reference	Version
UML1	OMG Unified Modelling Language Specification	<a href="http://www.omg.org/cgi-bin/doc?formal/2000-03-01">http://www.omg.org/cgi-bin/doc?formal/2000-03-01</a>	1.5

Table 1-3 UML Reference documents

### 1.7.2 Syntax conventions

The data model defines all the functional data elements, which are managed by the system, as well as the relationships between them. The data model is depicted using the class diagram notation of the Unified Modelling Language (UML) syntax, which is specified in [UML specification](#). Note, however, that we don't define any classes as such. We merely use the UML class to represent a data element.

Because of this we only need a small subset of the syntax with respect to relationships between data elements. Associations, compositions, aggregations and generalisations are the only syntax elements we use.

With an association one can express the existence of a relationship between data elements in general. For each side of the association, the cardinality should be specified. Looking from one side, this says something about the way the data element at the other side of the association refers to this one. Figure 1, for example, says that an element of type B always refers to exactly one element of type A and that an element of type A can refer to several elements of type B. This also expresses a data integrity aspect, namely that a B element cannot exist without a corresponding A element. In other words, an A element can't simply cease to exist. There will have to be rules for this.



Figure 1-1 UML syntax example 1

The following cardinality specifications are used in the data model:

1: a data element refers to exactly one data element of the type carrying this cardinality in the association.

0..1: a data element refers to at most one data element of the type carrying this cardinality in the association.

1..n: a data element refers to at least one data element of the type carrying this cardinality in the association.

0..n: a data element refers to any number of data elements of the type carrying this cardinality in the association.

The composition has the same properties as the general association, but it adds some meaning to it. In Figure 2 data elements of type C are composed of data elements of

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type D. In other words, D elements are contained by C elements. This puts a data integrity constraint on the life cycle of data elements of type D. Whenever an element of type C is deleted, contained elements of type D are also deleted.



Figure 1-2 UML syntax example 2

A less stringent variant of composition is aggregation. This is also a part-of relationship, but the parts can be shared, i.e. their lifecycle does not have to coincide with their containers. Figure 3 shows an example.



Figure 1-3 UML syntax example 3

The fourth kind of relationship, the generalisation, is different. It expresses the fact that some data element represents a more specific subset of a general concept, which is represented by some other data element. In Figure 4 elements of type F and G are specific subsets of elements of type E. E could for example represent vehicles, while F and G would represent cars and bicycles respectively. Both cars and bicycles are vehicles.

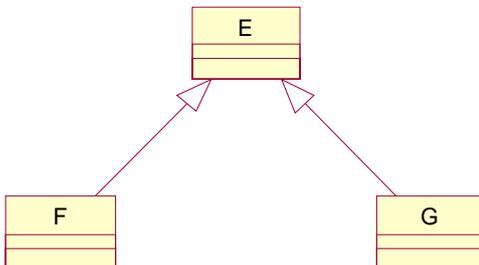


Figure 1-4 UML syntax example 3

Sometimes a role name is placed on one or both sides of an association (preceded by a “+” sign). It expresses what a certain data element means to another in the context of the association.

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## 2. TAXUD systems and applications

### 2.1 Tariff Applications Architecture Framework

#### 2.1.1 Reference and Applicable Documents

Id	Title	Reference	Version
TAAF1	Key architectural elements of the future TAXUD infrastructure platform	DEMCO-NOTE-0002 - Architectural Elements_1.00.doc	1.00
TAAF2	DG TAXUD Information Systems	DEMCO-TEC-Technical Design Justification.doc	1.00-EN
TAAF3	DG TAXUD Information Systems	DEMCO-TEC-001 - Technical Architecture v2.00 QTMA10-SfA-accepted1.doc	2.00-EN

Table 2-1: Tariff Applications Architecture Framework Reference documents

#### 2.1.2 Functional perspective

Tariff Applications Architecture Framework provides general services which are used by most of the central applications implemented in DG TAXUD. The services facilitate the implementation of the consistent set of functionalities and consistent user experience through all the applications using the framework.

The main functionalities which are inherited from the framework by the applications are:

- access to the application business services both through Web based user interface and asynchronous messaging based interface,
- set of reporting facilities with the mechanism to schedule the reports and deliver them in asynchronous manner via mail or fax,
- concept of multiple data modifications applied “at once” in the context of work packages.

#### **Data version management and work packages.**

In most tariff applications there are requirements with respect to the management of older versions of information. In addition there is in many cases the requirement that a user (or a set of users) can prepare work over a longer period without being visible to users not involved in this work. To implement these requirements, this chapter introduces the concept of a “work package”. A work package allows the user to have work in progress in isolation from the “current” public information. It is a user decision

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when his work in progress is made available as public information by applying the work package.

The main concept is that all manipulations of the business data (insertions, updates, or deletions) are done in the context of a work package. These manipulations only become visible to non-involved users at the moment the work package is applied. In order to manipulate business data one must have selected a work package in which this manipulation will occur.

A work package provides the required infrastructure to maintain historical versions of business data. Each work package consolidates a single version of the manipulated business items in the package. The version applied by the last work package becomes the “current” version for public access while all other applied versions are maintained in a historical storage area.

## 2.1.3 Application perspective

### 2.1.3.1 Application structure

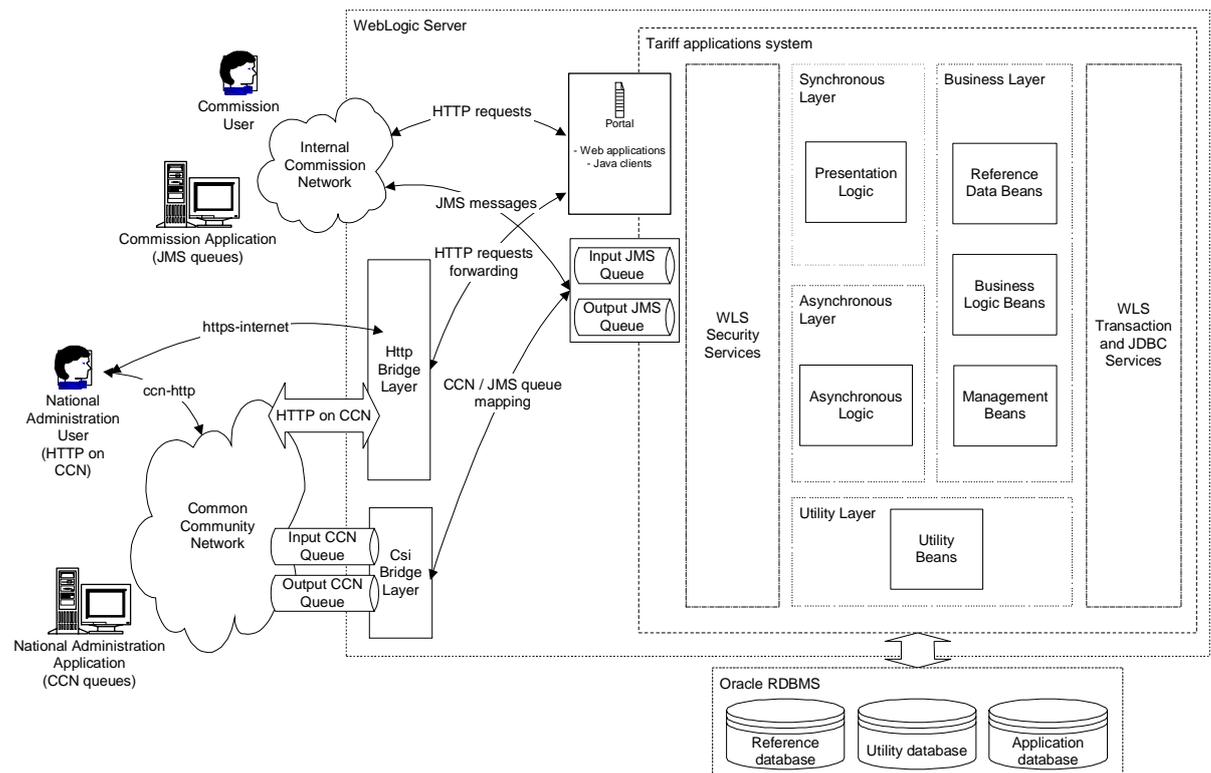


Figure 2-1 Application structure

The main components of the Tariff Applications Framework Architecture are:

- **Business Layer** providing the Business Logic, Reference Data and Management components,
- **Synchronous Layer** providing Presentation Logic used by the client applications, in particular the logic needed by the Web application,

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- Asynchronous Layer providing the services needed for the implementation of the asynchronous or message based interface to the application,
- Utility layer containing a set of utility components providing common services used by other components of the application.

Users interactively access the system by a web application based on HTML and Java Server Pages (JSP) or a full-featured Swing-based Java client. Web interface and business logic are deployed in Weblogic Application Server which supports the whole tariff applications system. Weblogic Server is an implementation of Java 2 Enterprise Edition (J2EE) by BEA. Interactive users access the system via Common Community Network CCN. The CCN infrastructure encrypts every data exchanged on the network.

### **Synchronous and asynchronous layer**

The tariff applications system is subdivided in several logical layers that interact with each other. TAAF provides two different access paths to application functionality. The first is a web application, which is actually the entry point for each tariff application. The second access path is JMS queue, which is the entry point for system to system asynchronous applications. The synchronous and the asynchronous layers use the synchronous message-oriented interface provided by the business logic to manage the business entities. Both layers interact with the business layer through the XML message to process the messages coming from the users. An XML fragment representing business data is sent to the business logic stateless session EJB invoking their methods. On return, the interface receives an XML fragment, and presents the information to the end user. The asynchronous layer is responsible for the handling of messages exchanged in the context of the system-to-system interface. In this context, an XML message is produced by a client application. Whenever messages have to be exchanged asynchronously the Java Message Services (JMS) queuing mechanism provided by the Weblogic Server is used.

### **Business layer**

The business layer hosts all of the application logic. This includes the implementation of the business logic specific to each tariff application, and the implementation of some management services. The business logic interface provides messages to insert, update, delete, and query each kind of business entity, and to determine what kinds of entities have been updated. The business logic relies on the work package mechanism of the versioning and the publication of information. When a work package is applied, all versioned information related to it is published. The work package mechanism also ensures that only the user responsible of a work package can see or update information related to this work package.

Each business data type is managed by a stateless session enterprise Java bean, which is part of the business logic layer. Such a bean is responsible for parsing an XML (DOM parser is used to parse the XML fragment) representing an application message, applying the required operation on it, and producing an XML fragment in response.

### **Utility layer**

The utility layer provides a set of common services shared by the applications and by the different layers. The utility services logic is accessible by all applications using the Architecture Framework. Currently, the following services are provided:

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- A mail/fax sending service allowing sending a mail or a fax to a correspondent,
- A document storage service allowing storing of information on behalf of the user for a preconfigured period of time; the document can be later fetched by the user,
- A mechanism allowing a user to perform a query, possibly generate a report from the result, and to download the result or the report later on,
- Batch jobs scheduling and execution services, used to perform asynchronous tasks which are run on the fixed schedule (eg. once a day),
- Work package services, which is a framework that aids in the implementation of the work package concept with the minimal impact on the code produced by the developer.

### 2.1.3.2 Application dynamics

#### Synchronous access to the application

The synchronous layer is composed of interactive interfaces, which can be web interfaces based on JSP, or Swing Java client applications.

They communicate with the business logic through the XML message based interface. Actually, it builds an XML fragment representing business data (an application message), and sends this fragment to the business logic stateless session EJB by invoking their methods (insert, update, etc). On return, the interface receives an XML fragment, and presents the information to the end user.

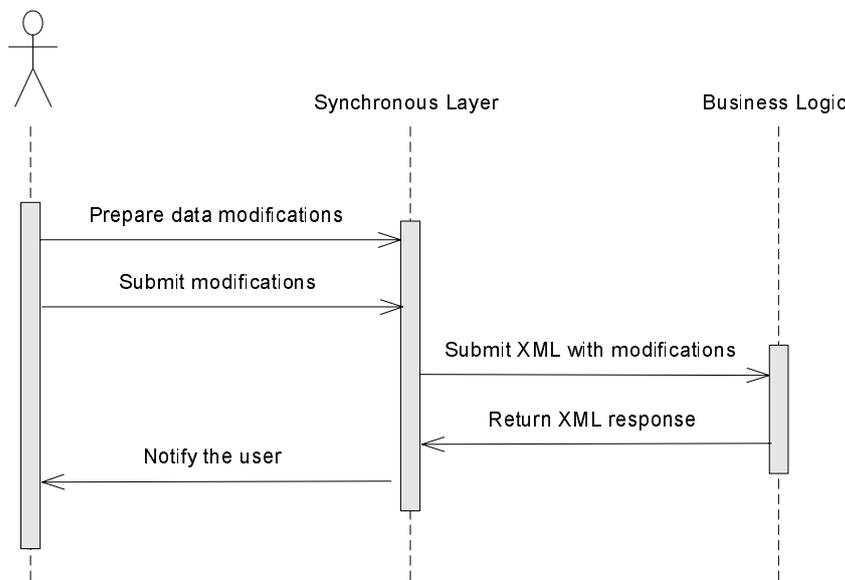


Figure 2-2 Synchronous access to the application

#### Asynchronous access to the application

The asynchronous layer is responsible for the handling of messages exchanged in the context of the system-to-system interface. In this context, an XML message is produced

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by a client application, which is located in a national administration or at the Commission. The tariff applications system replies with another XML message.

The national administration sends messages to the system by putting them in a CCN queue on the Commission's gateway. The [CCN/CSI Bridge](#) application fetches the message from CCN queue and puts this message on a configured JMS queue. This queue will be referred as the envelope input queue. The response message is put on another JMS queue, which will be referred as the envelope output queue, with a routing property, which identifies the destination CCN queue.

An authenticated user must perform every operation on the business data of an application. This way the business logic can ensure that this authenticated user has the right security role assigned to perform the required operation.

This is an issue that must be solved to allow the asynchronous handling of messages. An asynchronous handler (in our case it will be a message-driven bean) will process a message put on a queue. Although, the user that has put the message on the queue is not the one who executes the handler. So, before processing a message, the asynchronous handler must switch its security context to the user who put the message on the queue. However, the system knows the name of this user (it is put in a property of the message) but it does not know its credentials.

To solve the problem, the asynchronous handler will switch to an impersonated user who has the same role assignments as the original user.

The messages exchanged through the system-to-system interface may be composed of several transactions, which, in turn, may be composed of several application messages. The semantic is that all application messages within a single transaction must be applied as a whole on the database or not applied at all. The purpose of the asynchronous layer is to manage the transactions composing a single message. To handle the application messages nested within a transaction, it relies on the business layer.

The details of the asynchronous layer processing can be found in TAAF3 document.

## **2.1.4 Technical perspective**

### **2.1.4.1 Service access and delivery**

#### **Access Channels**

The applications using TAAF can be accessed from the internet browser or have a dedicated thick client Java Swing application prepared.

The applications can be usually also accessed via CSI messaging.

#### **Delivery Channels**

The applications based on TAAF are usually delivered either over CCN network or DG TAXUD internal network.

#### **Service transport**

Thin client applications use HTTP and HTTPS protocols to access the web application.

Thick clients connect to the tariff application using RMI protocol.

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The messages are exchanged between the application and the [CCN/CSI Bridge](#) using JMS.

#### **2.1.4.2 Service platform**

##### **General platforms**

Applications based on TAAF require Java Development Environment (JDE) to run.

##### **Delivery servers**

The framework is ready to be deployed on the BEA Weblogic Application Server.

##### **Database**

All persistent data is stored in the Oracle relational database.

#### **2.1.4.3 Component framework**

##### **Security**

An application prepared using TAAF and deployed on the Weblogic Server uses the security infrastructure of the Weblogic Server.

The standard J2EE security facilities are used:

- Application developers define a number of security role references associated with certain actions in the application code,
- On assembly of the program modules, these references are mapped to one or more roles,
- At deployment time, roles are mapped to one or more groups, and individual users are assigned to zero or more groups,
- At login, the authentication procedure (username/password) assigns an identity to a user in the proper application domain,
- Access to functions are accepted or denied according to the security roles assigned to the identity.

##### **User presentation**

TAAF delivers two kinds of interactive interface. The first is a web interface (JSP), second Swing based Java client.

Multi-lingual aspects are managed using the standard mechanism provided by the Java programming language (*java.util.ResourceBundle*).

For the preparation of print-outs the standard reporting mechanism is used. The business logic returns the information in the form of XML which is then processed by XSL style sheet to produce HTML output.

##### **Business logic**

TAAF business logic is realised on Enterprise Java Beans (EJB) technology. The Client sends XML messages which are validated and passed to those EJB components. The deployment descriptor of those EJB specifies the roles that can call the different

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methods. As a consequence, a user must be in the right role to perform certain operations on business data.

### **Data management**

Java Database Connectivity API (JDBC) is used to manage the database access.

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## 2.2 CCN/CSI bridge

### 2.2.1 Reference and Applicable Documents

Id	Title	Reference	Version
CSIB1	DG TAXUD Information Systems	GEN-RNO - CSIBridge Release 1.1.4.doc	1.1.4
CSIB2	CCN Monitoring and Reporting System Functional Specification	GEN-CMR-FS-Functional_Specification-EN.doc	1.11
CSIB3	DG TAXUD Information Systems	GEN-CMR-Data Model.doc	1.11
CSIB4	CSIBridge: CSI – JMS header properties mapping	CSI-TEC-NOTE-001.doc	1.11
CSIB5	DG TAXUD Information Systems	GEN-CMR-UI - User Interface Specification.doc	1.11
CSIB6	DG TAXUD Information Systems	DEMCO_CSI-INS-001 - Installation Guide.doc	1.11
CSIB7	Key architectural elements of the future TAXUD infrastructure platform	DEMCO-NOTE-0002 - v 1.00 - Architectural Elements.doc	1.0

Table 2-2: CCN/CSI bridge Reference documents

### 2.2.2 Functional perspective

CCN\CSI plays a main role in the DG TAXUD technical architecture, as it provides secure message exchange among Taxud Domain applications and National Domain applications of different National Administrations. For example between Directorate Generals and Member State Administrations, the CCN/CSI Bridge is the link between CCN network queues and the BEA Weblogic application servers, where different applications used by DG TAXUD or MSA are deployed. CCN/CSI Bridge is a J2EE application, which contains two Message Driven EJB. Each of them is triggered when one of the incoming queues contains new messages. When it happens a simple mapping is made, and the messages are forwarded to the outgoing queue.

#### 2.2.2.1 Use cases view

Two simple use cases may be described. One when an incoming message is found on the Weblogic side in a JMS queue. The second one is in the other direction, when a message is found on the triggering queue, messages are retrieved from the CCN incoming queue. In both cases the actors are external system that put messages in queues and the CCN/CSI Bridge.

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## 2.2.3 Application perspective

### 2.2.3.1 Application structure

The CCN/CSI Bridge is a J2EE application, deployed on an application server. This module is responsible for the replication of the messages from the JMS to CSI queues and *vice versa*. It is implemented as two message driven EJB. They use a component called Resource Connector to acquire connections to specific resources and encapsulate the mediating logic in a transaction. The resource connector has the following interfaces:

- Connection interface - the interface contract with the J2EE container. The application logic will request a connection to the resource connector using the JNDI. This request is intercepted by the container, which will create a new connection to the resource if required
- Functional CSI queue interface - the interface contract with the application logic using the resource connector. The application logic is using this interface to put a message on a CSI queue or to get a message from a CSI queue.
- XA resource interface - the interface contract between the transaction coordinator and the connector. Through the usage of this interface, the connector will participate in the two-phase commit protocol initiated by the transaction coordinator

Each queue defined on the applications side (JMS queue) has a corresponding queue on the CCN side (CSI queue). The whole concept is presented below.

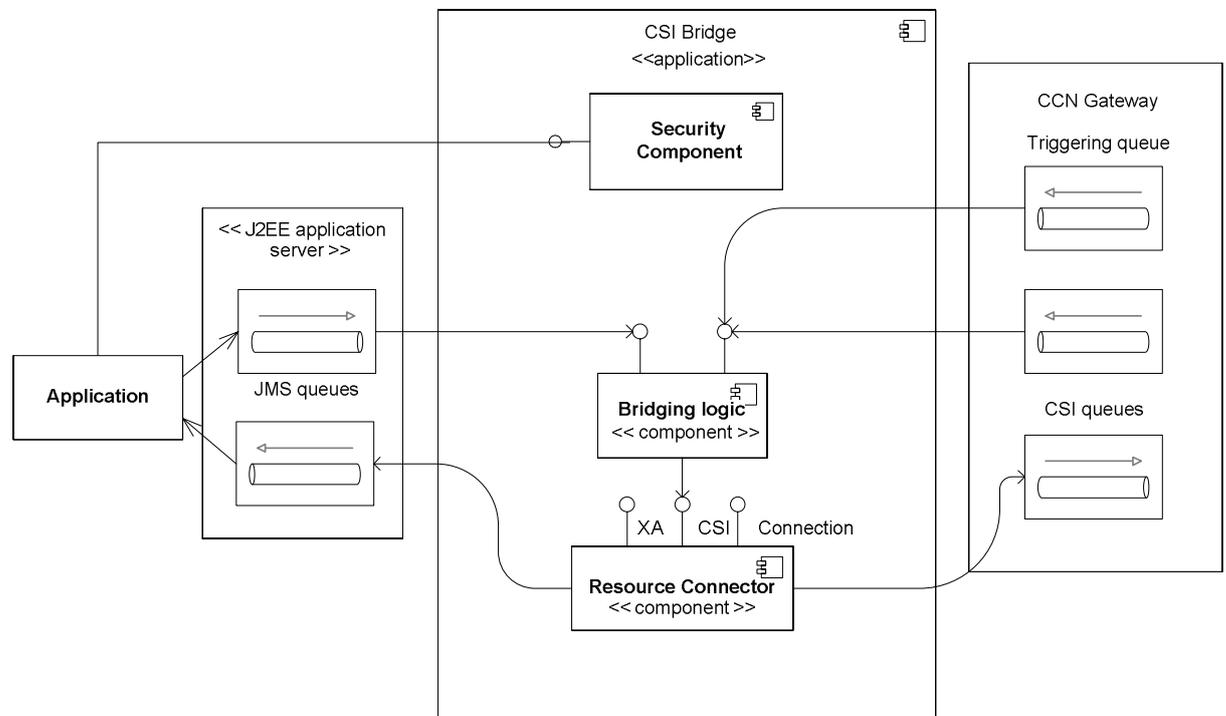


Figure 2-3 CCN/CSI Bridge application structure

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### 2.2.3.2 Application dynamics

There are two main dynamic cases related with the application – putting a message in the CSI queue and getting a message from that queue. Both are modelled on activity diagrams below.

#### Put message on CSI queue

The TAAF application, as a result of its application logic, sends a message to a specified JMS queue. A message driven bean is triggered at the CCN/CSI Bridge at the moment a message is committed on that queue. The bean acquires a connection from the resource connector using the JNDI entry and uses this connection to put a message on the proper CSI queue.

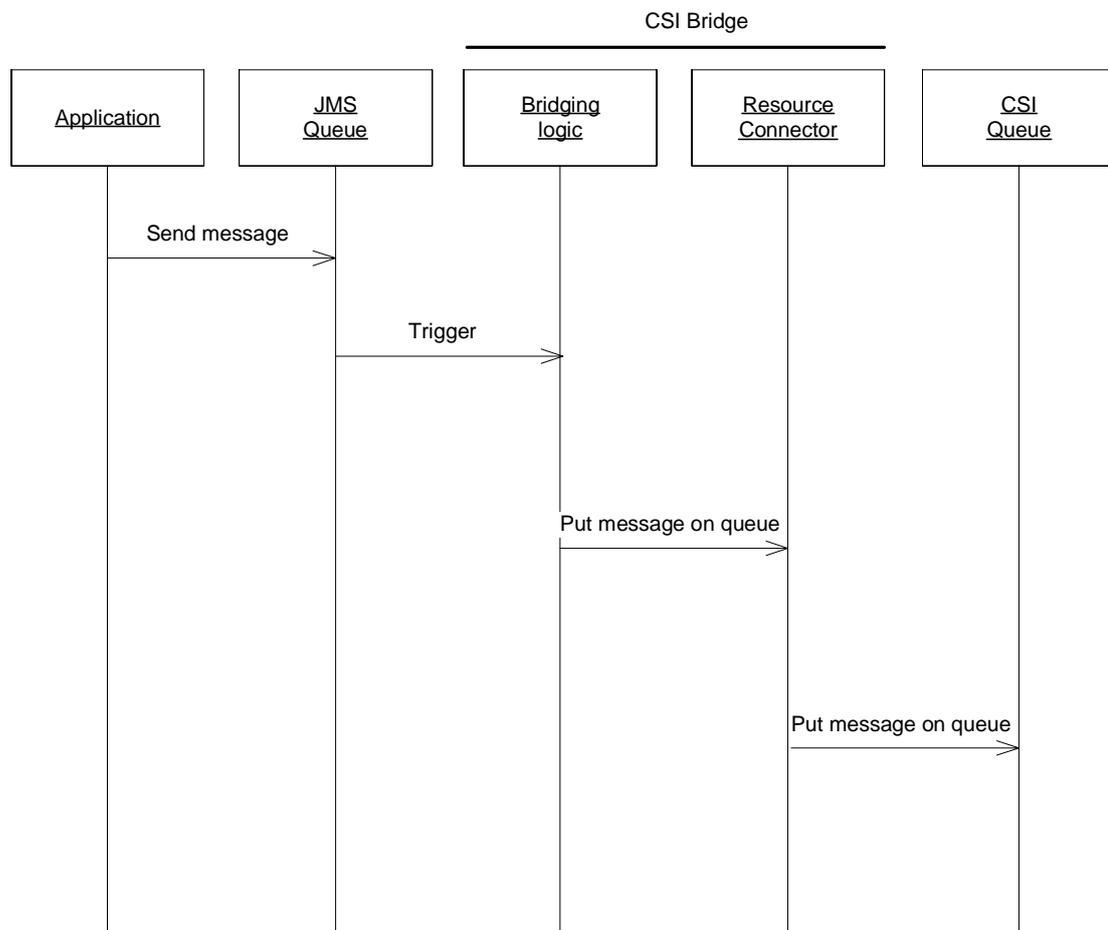


Figure 2-4 Put message on CSI queue

#### Getting a message from a CSI queue

In the other case, where the CCN/CSI Bridge gets a message from the CSI queue, another message driven bean is triggered by an external event committed on the triggering queue. The triggering queue is a communication supporting unit, which only notifies the EJB component when messages should be extracted from the main CSI incoming queue. This external event can be a scheduled request to get all messages from a CSI queue or can be the result of a CCN gateway triggering action whenever a message is put on the CSI queue. The message driven component, when triggered, acquires a connection from the resource connector using a JNDI entry. This connection

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is used by the bean to get a message from the CSI queue and pass it to the proper JMS queue. The JMS queue is handled with the use of a JNDI entry.

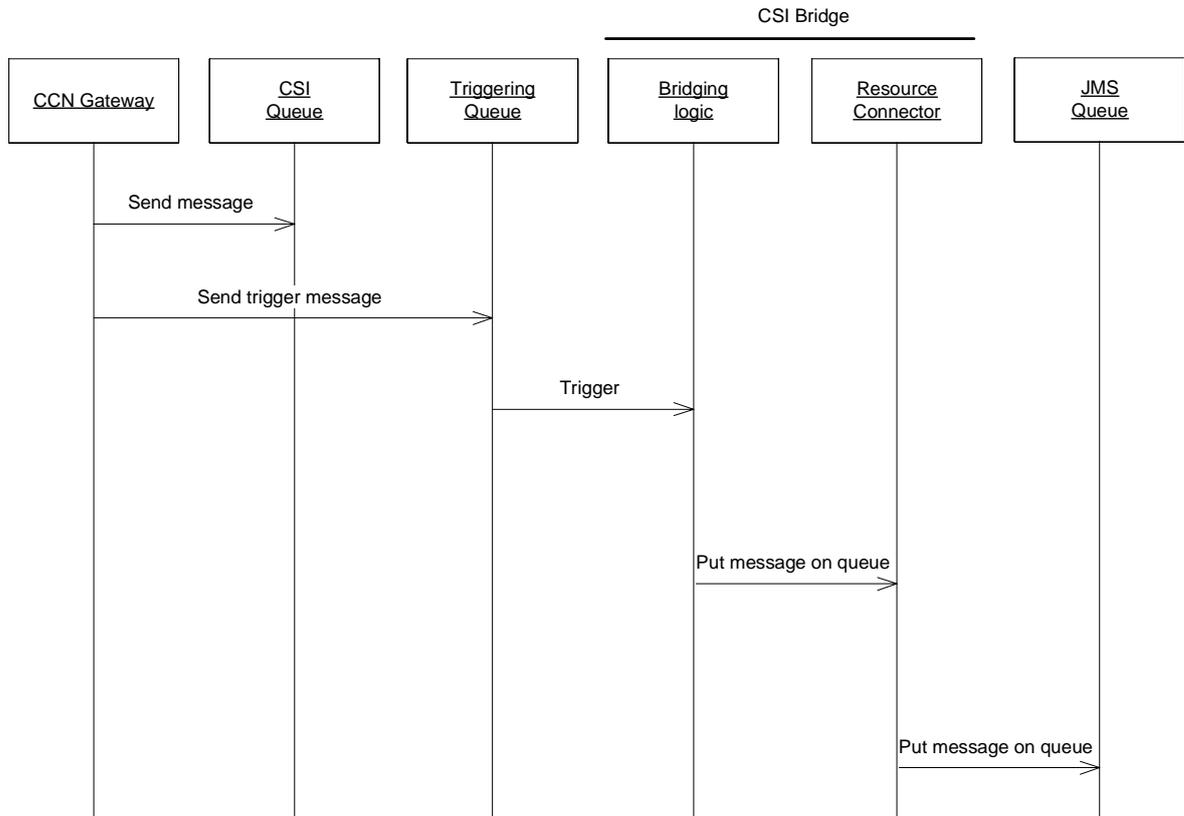


Figure 2-5 Getting a message from a CSI queue

## 2.2.4 Technical perspective

### 2.2.4.1 Service access and delivery

#### Access Channels

The CCN/CSI Bridge application is delivered with dedicated application the “CCN Monitoring and Reporting” tool (CMR). This tool is a web application allowing direct monitoring of the message exchange between the applications running on the Weblogic AS and the CCN queues. It also gives the possibility to view the processing of these messages by the TAAF applications. It is accessible by a web browser - by an internal network browser, VPN connection to internal browser or external browser access through PROXY SSL. The applications archives (WAR, EJB) are deployed with the CCN/CSI Bridge elements.

#### Delivery Channels

The delivery channel of the CCN/CSI Bridge is the CCN network and JMS on the WLS side.

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### **Service transport**

Protocols used in the CSI-WLS communication, in the CCN/CSI Bridge neighbourhood, are CCN/CSI specific protocols. This internal standard consists of a set of predefined message types, which are used in a message request/reply paradigm communication. The standard describes the messages structure and their functional usability. Listed below are the valid message types:

- CCN Message;
- CCN Data Message;
- CCN Report Message;
- CCN Peer.

The messages on the applications side are also defined – as JMS messages.

#### **2.2.4.2 Service platform**

##### **General platforms**

CCN/CSI Bridge is a J2EE application, so it needs the Java Enterprise environment, and Application Server as container. It also needs the CSI Stack environment. The operating system may be an UNIX or Linux type. It is deployed on the Sun OS 5.9

##### **Delivery servers**

The application is deployed on the BEA Weblogic Application Server 8.1 SP3 version.

##### **Database**

The database is an Oracle 10g for Unix.

#### **2.2.4.3 Component framework**

##### **Security**

The CMR tool allows only authorized users to query the data transfer storage (database), verify the content of the queues and manage the messages in those queues. The CCN/CSI Bridge security is managed by the CCN\TC LDAP connection.

##### **User presentation**

The CMR tool is a Java based web application, its visualization of security module for applications deployed on Weblogic TARIFF domain. It is deployed as a standard Web Servlet package (war archive). The presentation is prepared using the Jsp, Servlet, taglibs and java webapp framework solutions.

The UI is by default available in English, but the TAAF framework supports different EU languages – 11 from the old EU languages (before the 2005 EU extension states).

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### **Business logic**

The business logic is realised by the EJB components (Message Driven EJB).

### **Data management**

The CCN/CSI Bridge application plays the role of a combined mediator and translator. That is why the applications persisting model differentiates the messages onto two criteria. The first is whether the messages have been ‘get’ from a queue or ‘put’ on a queue. The second is the type of the queue: JMS or CSI. Those information are stored in the database, so each time there is an in or out operation on the queues, the application is storing information about that event in the database.

The whole solution, with technical details may be found in the [[CSIB3](#)] document. The application persists the data using JDBC custom Data Access Objects

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2.3 - HTTP CCN Proxy Bridge	ISSUE DATE: 13/01/2009

## 2.3 HTTP CCN Proxy Bridge

### 2.3.1 Reference and Applicable Documents

Id	Title	Reference	Version
HTTPB_1	Internet integration for Weblogic hosted application	DEMCO-GEN-NOTE-0004 - internet weblogic integration.doc	1.0.1
HTTPB_2	Key architectural elements of the future DG TAXUD infrastructure platform	DEMCO-NOTE-0002 - v 1.00 - Architectural Elements.doc	1.00

Table 2-3: HTTP CCN Proxy Bridge Reference documents

### 2.3.2 Functional perspective

The CCN Proxy bridge layer is responsible for the mapping between the CCN system and the WLS system. It authenticates CCN users on the WLS infrastructure, forwards HTTP requests, and maps CCN queues on JMS queues and vice-versa. These facilities are used by all tariff applications of the Directorate General Taxation and Customs Union (DG TAXUD) and the member states that require access through the CCN network to the CCN-CSI queues.

### 2.3.3 Application perspective

#### 2.3.3.1 Application structure

The HTTP CCN Proxy Bridge is the second phase of user HTTP authentication process. This application is a single Java web application.

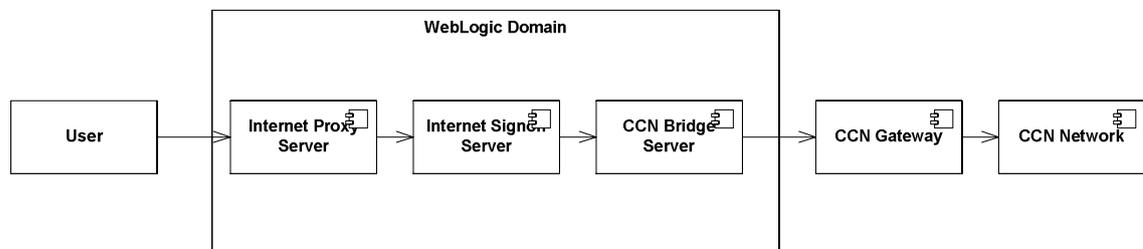


Figure 2-6 HTTP CCN Proxy Bridge application structure

#### 2.3.3.2 Application dynamics

The Weblogic Server which is hosting the CCN Proxy forwards request to CCN Gateway. This Weblogic Server must not contain any other application than this one.

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The HTTP CCN Proxy Bridge forwards any HTTP request originating from the CCN gateway to the configured HTTP listener. This includes the dispatching of the HTTP request from CCN direct access and Internet access.

## **2.3.4 Technical perspective**

### **2.3.4.1 Service access and delivery**

#### **Access Channels**

The application is not accessible directly for the users. It is only replicating and validating HTTP request sent from the user's browser.

#### **Delivery Channels**

The effects of the HTTP Proxy Bridge's work – replicated HTTP Requests and Responses are delivered through the Internet or CCN network.

#### **Service transport**

The protocol used in information exchange is HTTPS, HTTP and CCN/CSI specific protocols.

### **2.3.4.2 Service platform**

#### **General platforms**

The application is prepared for an UNIX/Linux based OS. For client compilation and runtime a Java 2 SDK 1.4.2 should be installed (is delivered with WLS). For client and server compilation and packaging an Apache Ant 1.4.1 is required.

Compiling the application requires the use of the Sun Workshop 6 C compiler. In addition, it requires the CCN/CSI C libraries and associated C header files.

#### **Delivery servers**

HTTP Proxy Bridge is running on BEA Weblogic Application Server.

#### **Database**

An empty schema is required to store persistently the incoming and outgoing messages.

### **2.3.4.3 The required database tables will be automatically created by the JMS Server.Component framework**

#### **Security**

On the Internet communication stage, HTTPS (SSL) protocol is used. Validation of user sessions is achieved by the Cookie mechanism.

#### **User presentation**

The application may be monitored using the CMR tool, where specific information are delivered as JSP page.

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### **Business logic**

The main logic is implemented by the use of Servlets.

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## 2.4 HTTP Internet Proxy Bridge

### 2.4.1 Reference and Applicable Documents

Id	Title	Reference	Version
INTB_1	Internet integration for Weblogic hosted application	DEMCO-GEN-NOTE-0004 - internet weblogic integration.doc	1.0.1
INTB_2	Key architectural elements of the future TAXUD infrastructure platform	DEMCO-NOTE-0002 - v 1.00 - Architectural Elements.doc	1.00
INTB_3	Key architectural elements of the future TAXUD infrastructure platform	DEMCO_INT-INS-001 - Installation Guide	1.11

Table 2-4: HTTP Internet Proxy Bridge Reference documents

### 2.4.2 Functional perspective

The HTTP Internet Proxy Bridge is a dedicated application deployed in the Weblogic domain. This application is used to provide access over the internet to the Weblogic hosted applications. Like the [HTTP CCN Proxy Bridge](#) it is a nexus in the chain of user authentication over the Internet. In other words it finishes the work started by the [HTTP CCN Proxy Bridge](#). It adds an authentication key to the user session and forwards to an URL which gives the user access to a specific application.

#### 2.4.2.1 Use cases view

Adding a user authentication key and forwarding is the main purpose of HTTP Internet Proxy Bridge. This is how this use case looks step by step:

- One module of the HTTP Internet Proxy Bridge is configured to handle all requests starting with “/internet”. This module will generate a random authentication key, which will remain valid for a limited time (e.g. 90 seconds) and which is secure.
- Once the random authentication key is generated, the user is redirected to an url accessible over the internet which will give the user access to the requested application. The redirected url contains the random authentication key which will be validated by the Internet Proxy Bridge when the first request over the Internet is received. The purpose of the random authentication key is to transfer the authentication user session to a user session over the Internet. All details about this transfer are explained in a later section.

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- Once the user session has been transferred to the Internet, the user has access to the application deployed in the Weblogic domain. The user identity is known at all moments, and will be member of all the Weblogic groups equivalent to the ccn profiles registered for the user by the National ccn administrator.

## 2.4.3 Application perspective

### 2.4.3.1 Application structure

INTERNET HTTP Proxy bridge forwards any HTTP request originating from the Internet to the configured HTTP listener.

This module implements the first phase of the Weblogic login.

This module implements the second phase of the Weblogic login. It receives all required information of the first phase implemented by the `g_intbridge_internet` module.

The HTTP Internet Proxy Bridge is similar to the HTTP Proxy Bridge application. Its purpose is to process the second stage user HTTP authentication, started by the [HTTP CCN Proxy Bridge](#), because it's the second phase of that process. For more information see [HTTP CCN Proxy Bridge Application Perspective](#). This application is also a single Java web application, shown below as a single module.

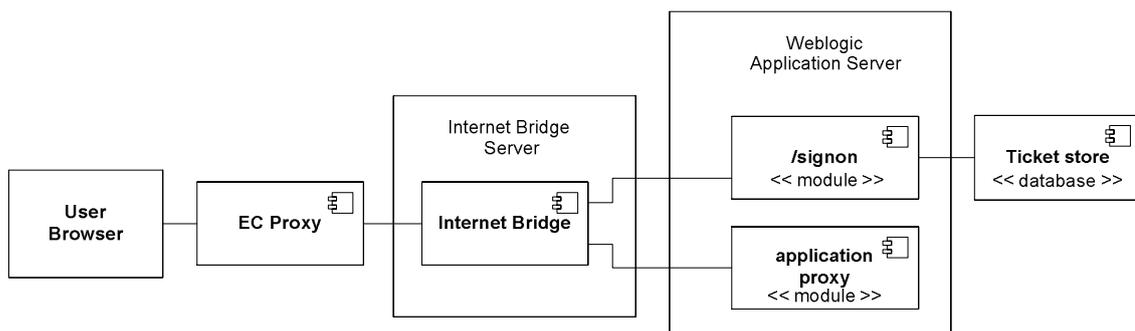


Figure 2-7 HTTP Internet Proxy Bridge application structure

### 2.4.3.2 Application dynamics

As the HTTP Internet Proxy Bridge is the user HTTP authentication phase 2 executor, it is important to understand the first phase, described as mentioned in the [HTTP CCN Proxy Bridge Application Perspective](#). We assume that the first phase has been accomplished, and there is a valid ticket associated with the user, the user is redirected to the CCN Internet Proxy Bridge with a proper `/signon` URL. This url is prepared when the `/internet` module ends user CCN authentication. The Internet Proxy Bridge detects that the incoming url is a `/signon` one. If true, checks if the URL has a `__intbridgeTicket` parameter added, if it has one the whole request is forwarded to the `/signon` module.

The `/signon` receives the redirected request and will perform a second level validation on the `__intbridgeTicket`. If the ticket is valid, it will try to retrieve the persistent information in the ticket store. If the information is found, the module will verify that the ticket has not expired. Note that the expiration interval is small (60 seconds) but sufficient for a normal session authentication as the redirect is occurring automatically. Once the persistent information is retrieved, it is deleted. Therefore, this information can only be used once. If the information identified with the `__intbridgeTicket` is not found in the persistent ticket store, it can mean one of two

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things. Either a user is issuing a new request which reuses the ticket received in a previous request or, very unlikely, a user managed to produce a ticket with a valid structure by guessing. Note however that in both cases the request will be refused as no information is found in the ticket store. Assuming that a valid and non-expired ticket is present, the user is re-authenticated in the Weblogic domain based on the information stored in the ticket store. Therefore a new Weblogic session is initiated that is accessible over the Internet. In addition to the normal Weblogic session information an additional session cookie is added to the session and later on used by the “*proxy*” module. The “*/signon*” module will redirect the browser to the final URL representing the actual application.

The user browser requests the redirected url. This url will initiate a connection with the “*proxy*” module at the Http Internet Proxy Bridge server. The “*proxy*” module will validate the session cookie before forwarding the request to the final application. The application performs a normal reply and the user can use the application over the Internet

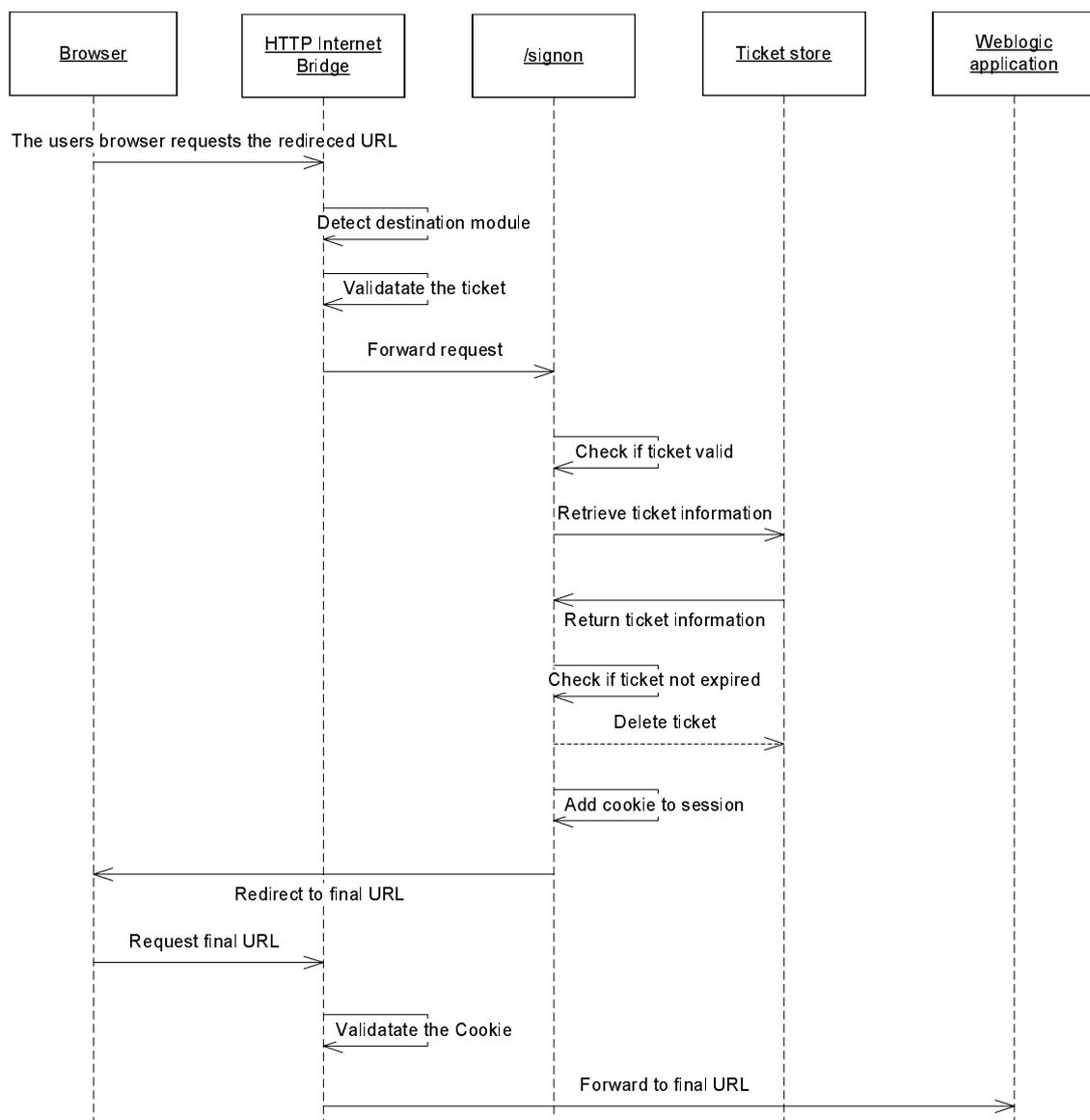


Figure 2-8 HTTP Internet Proxy Bridge communication example

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## 2.4.4 Technical perspective

### 2.4.4.1 Service access and delivery

#### Access Channels

The application is not accessible directly for the users. It is only replicating and validating HTTP request sent from the user's browser.

#### Delivery Channels

The effects of the HTTP Proxy Bridge's work – replicated HTTP Requests and Responses are delivered through the Internet or CCN network.

#### Service transport

The protocol used in information exchange is HTTPS, HTTP and CCN\CSI specific protocols.

### 2.4.4.2 Service platform

#### General platforms

HTTP Internet Proxy Bridge is delivered on BEA Weblogic Application Server 6.1 SP2. The Internet Proxy Bridge must be deployed in its own managed server.

#### Delivery servers

HTTP Proxy Bridge is delivered on BEA Weblogic Application Server 8.1 SP3

#### Database

There is no database used by the HTTP Internet Proxy Bridge.

### 2.4.4.3 Component framework

#### Security

On the Internet communication stage, HTTPS (SSL) protocol is used. Validation of user sessions is achieved by the Cookie mechanism.

#### User presentation

The application may be checked through the CMR tool, where specific information is delivered as a JSP page.

#### Business logic

The main logic is implemented by the use of Servlets.

#### Data management

As mentioned, the application does not store any data persistently.

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## 2.5 User Management Module

### 2.5.1 Reference and Applicable Documents

Id	Title	Reference	Version
UM1	User Management Module Functional Specifications	UM-FS-EN_1.00.doc	1.00

Table 2-5: User Management Module Reference documents

### 2.5.2 Functional perspective

The User Management Module (UM) is responsible for the management of users for a number of applications, and the security of those applications.

#### 2.5.2.1 Use cases view

The User Management Module operates at the functional level. This means it encapsulates the Weblogic security infrastructure with its groups and group memberships (for more information see paragraph below - 2.5.2.2). Individual users can be assigned the right to execute a specific business functionality defined for specific applications by associating them with the security policy of that functionality. The User Management Module will translate this in order to allow the Weblogic Server Security Infrastructure to take care of the authorization. Specifically, using a mapping between the business functionality and the Weblogic groups, the system will add the user as a member to the mapped Weblogic Server groups. Before a user can execute one of the functionalities of the application included in the business functionality, the Weblogic Server Security Infrastructure will check if the user is a member of (a combination of) the mapped groups, and allow the execution only if that check is successful.

The system functionality can be divided into several groups:

- Configuration of applications;
- Management of users;
- Management of security policies;
- Consultation of security policies.

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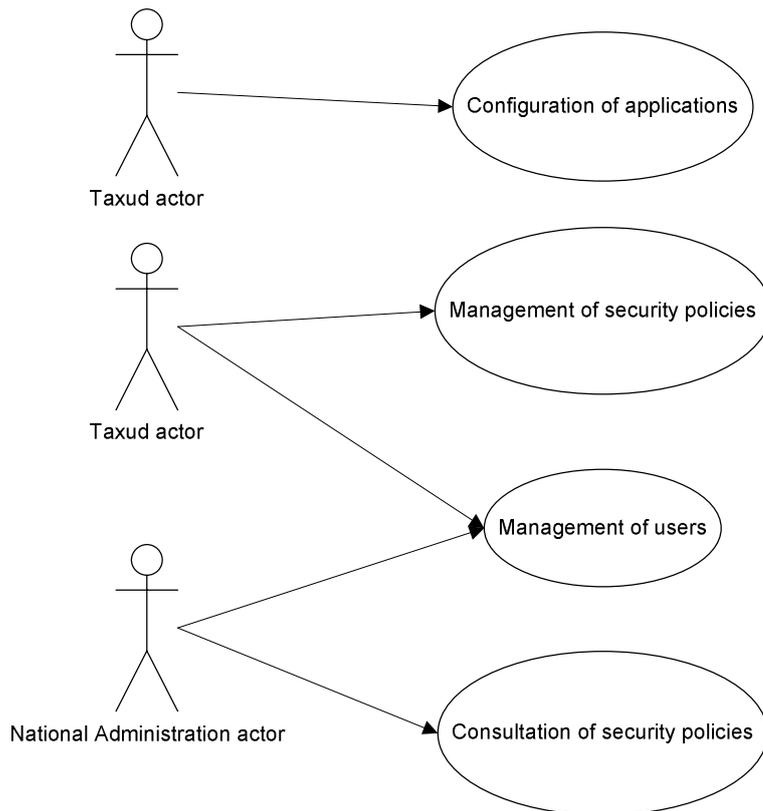


Figure 2-9 User Management Module use case

### **Configuration of applications**

An administrator is able to configure a new Weblogic Server application. This includes the configuration of the necessary Weblogic Server groups and group memberships, and the configuration of the business functionalities.

It is possible to insert a number of Weblogic Server groups into the Weblogic Server security framework and assign some groups as a member of other groups.

The administrator is also able to configure the business functionalities. The configuration consists in a mapping between the right to execute high level business functionality and the membership of a Weblogic Server group.

### **Management of users**

A security manager is able to manage users: to insert and delete users and to change the password of existing user. A user corresponds to a Weblogic server user, and deleting an existing user is translated into deleting the user from the Weblogic Server security realm. Changing the password of an existing user is translated into changing the password of users of the Weblogic Server security realm.

### **Management of security policies**

A security manager is able to manage the security policies. He can edit the security policy of business functionality by assigning or withdrawing the execution right of a user. The security manager is only entitled to manage the security policies for users of his administrations.

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### **Consultation of security policies**

A regular user and the security manager are both able to query the security policies. A security manager can query and view the users who have the right to execute a certain business functionality for his administrations. A security manager can also query and view the business functionalities which a certain user has the right to execute. A regular user can view only its own business functionalities.

A security manager can get a report which contains statistics concerning the number of users per application per administration.

### 2.5.2.2 Domain vocabulary

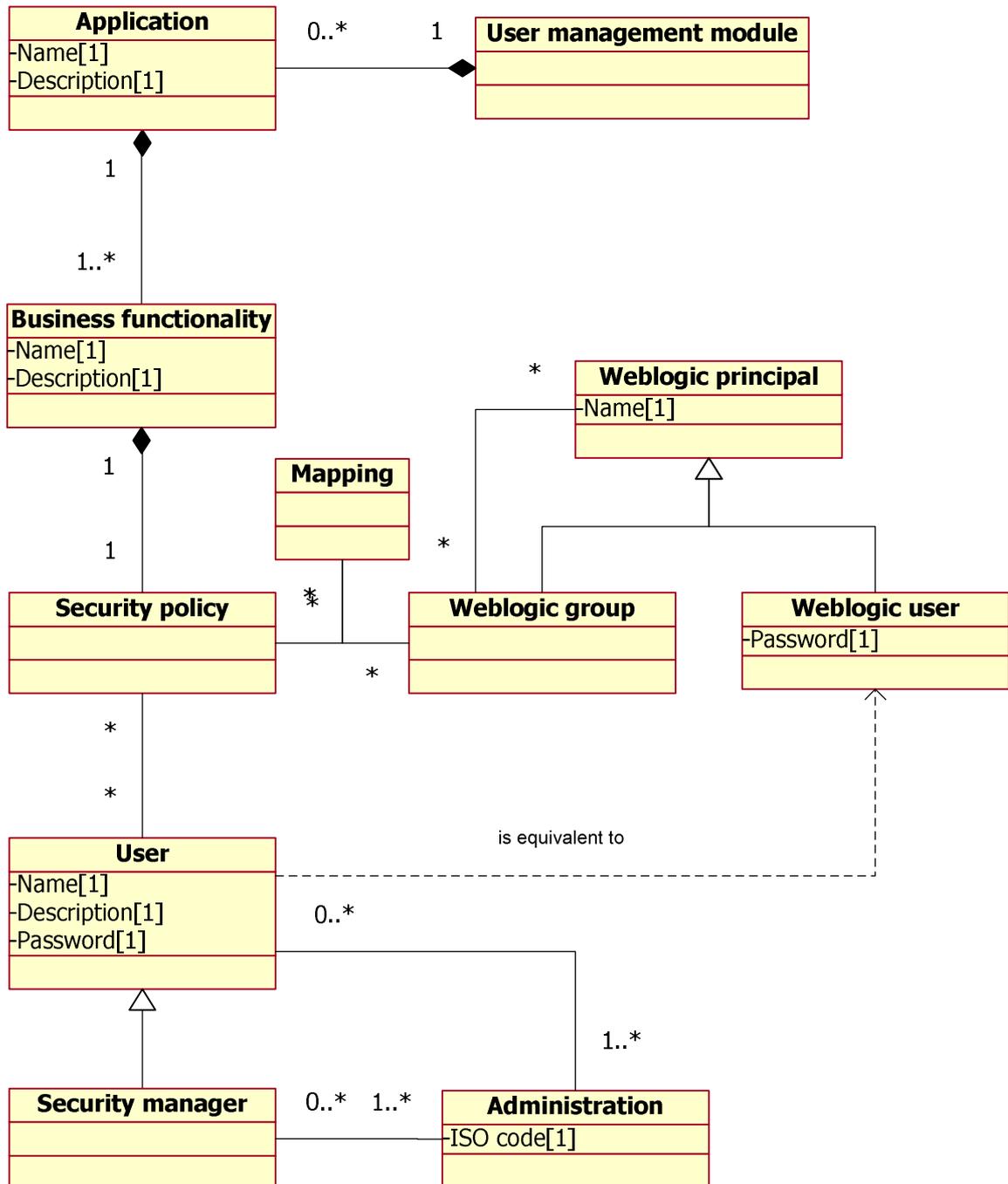


Figure 2-10 User Management Module domain vocabulary

Major data objects are stored:

- Application
- Business functionality and security policy
- User, Weblogic user, Weblogic group
- Administration

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### **Application**

The user management module manages the users, groups and group memberships for a number of applications. An application deployed on Weblogic Server uses the security infrastructure of Weblogic Server. Adding the application to the User Management Module allows for a correct and simple management of the users of an application and the security of the application.

### **Business functionality and security policy**

The application could be split into a number of high-level business functionalities (answering the question “What does the application do?”) with a security policy (answering the question “Who is allowed to do it?”).

Managing the security of an application consists then only of managing the security policy of the high-level business functionalities. A security manager can assign to a user the right to execute a business functionality or detach it.

The Weblogic Server security architecture uses the membership of groups as the authorization mechanism. A user is allowed to execute some low-level, technical functionalities when he is a member of one of a set of specific groups. Instead of using the security infrastructure of the Weblogic Server directly, giving users of an application the right to execute low-level functionalities of an application by adding them as a member of a technical elements (Weblogic groups), the User Management module encapsulates this. The high-level business functionalities are mapped on a number of Weblogic Server groups. Having the right to execute a business functionality translates then to being a member of (a combination of) such (a) group(s).

### **User, Weblogic user, Weblogic group**

A user can be a person, such as application end user, or a software entity, such as a client application. A user corresponds to a Weblogic Server user belonging to a security realm. In a WebLogic Server, a security realm contains the users and groups, and the mechanisms for protecting low-level functionalities.

The security manager is a user who manages the users of a given administration (initially DG TAXUD, but in the future possible other national administrations). He also manages the security policies of the business functionalities, assigning and withdrawing the right of users to execute them.

### **Administration**

An administration limits the working domain of a security manager. Only users who are part of his administration could be managed by him. This makes it possible to delegate the user and access management to the local administration.

## **2.5.3 Application perspective**

### **2.5.3.1 Application structure**

The User Management Module is the container that is responsible for the management of the users of a number of applications, and the security of those applications. This module manages the users, groups and group memberships for a number of applications deployed on a Weblogic Server.

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The User Management Module operates at the functional level. This means it encapsulates the Weblogic security infrastructure with its groups and group memberships. Individual users can be assigned the right to execute a specific business functionality defined for specific applications by associating them with the security policy of that functionality. The User Management Module will translate this to allow the Weblogic Server Security Infrastructure to take care of the authorization. The high-level business functionalities will be mapped on a number of Weblogic Server groups. Such groups are part of the Weblogic security infrastructure, and membership of a group allows a user to execute some low-level functionalities.

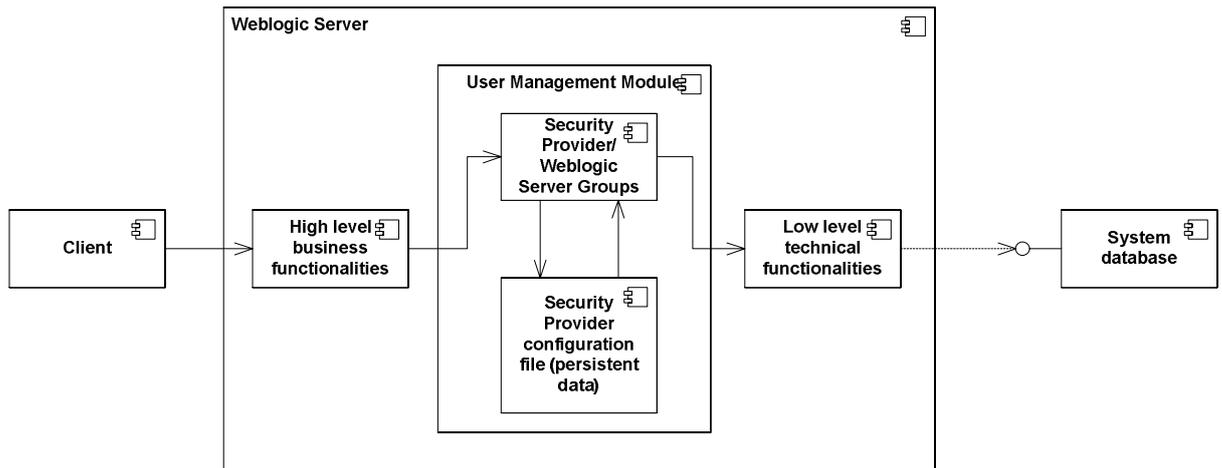


Figure 2-11 User Management Module application structure

### 2.5.3.2 Application dynamics

The User Management Module is accessed by 3 types of users (actors): administrators, security managers and regular users. An administrator must be able to configure a new Weblogic Server application. This includes the configuration of the necessary Weblogic Server groups and group memberships, and the configuration of the business functionalities. A security manager must be able to manage users and manage the security policies. A security manager can assign to a user the right to execute business functionality. This means he associates the user with the security policy of the functionality. A regular user must be able to query his own security policies, viewing all the business functionalities which he has the right to execute.

The User Management pages are displayed in a single browser window. On the top of each page, there is the main menu and user guide hyperlinks.

The main page is the starting point of the User Management application. The user page allows to edit user information and manage the security polices of users. The application page allows the user to browse the applications. The function browse page allows the user to browse the functions. The group page allows the user to browse the groups.

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## 2.6 AEO

### 2.6.1 Reference and Applicable Documents

Id	Title	Reference	Version
AEO1	AEO Phase 1 Functional Specifications	AEO-FS-Ph1 - Functional Specifications - 3.00.doc	3.00
AEO2	AEO Phase 1 Data Model	AEO-DM-Ph1 - Data Model - 2.00.doc	2.00
AEO3	AEO Phase 1 Process Model	AEO-PM-Ph1 - Process Model - 2.00.doc	2.00
AEO4	AEO Phase 1 User Interface Specification	AEO-UIS-Ph1 - User Interface Specification - 2.00.doc	2.00
AEO5	Guidelines For Technical Message Exchange Specifications	STDEV-TMES-Guidelines For Technical Message Exchange Specifications.doc	1.40
AEO6	AEO Phase 1 Functional Message Exchange Specifications	AEO-FMES-Ph1 - Functional Message Exchange Specifications - 4.00.doc	4.00

Table 2-6: AEO Reference documents

### 2.6.2 Functional perspective

The main goal of the AEO system is to facilitate the management of certificates for the authorized economic operators (AEO). The system provides the facilities for the management of “AEO applications” submitted to a competent customs authority by an economic operator. The entire maintenance of AEO certificates is also performed in the system. It enables the registration of AEO certificates issued by the competent customs authorities when an “AEO application” is accepted as well as the suspension and the revocation of the AEO certificate.

#### 2.6.2.1 Use cases view

The system functionality can be divided into several main groups:

- Reference data maintenance;
- “AEO Application” management;
- AEO Certificate management;
- AEO Certificate usage;
- Interface to [DDS](#);

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- Reference data management;
- Download Services;
- Upload Services.

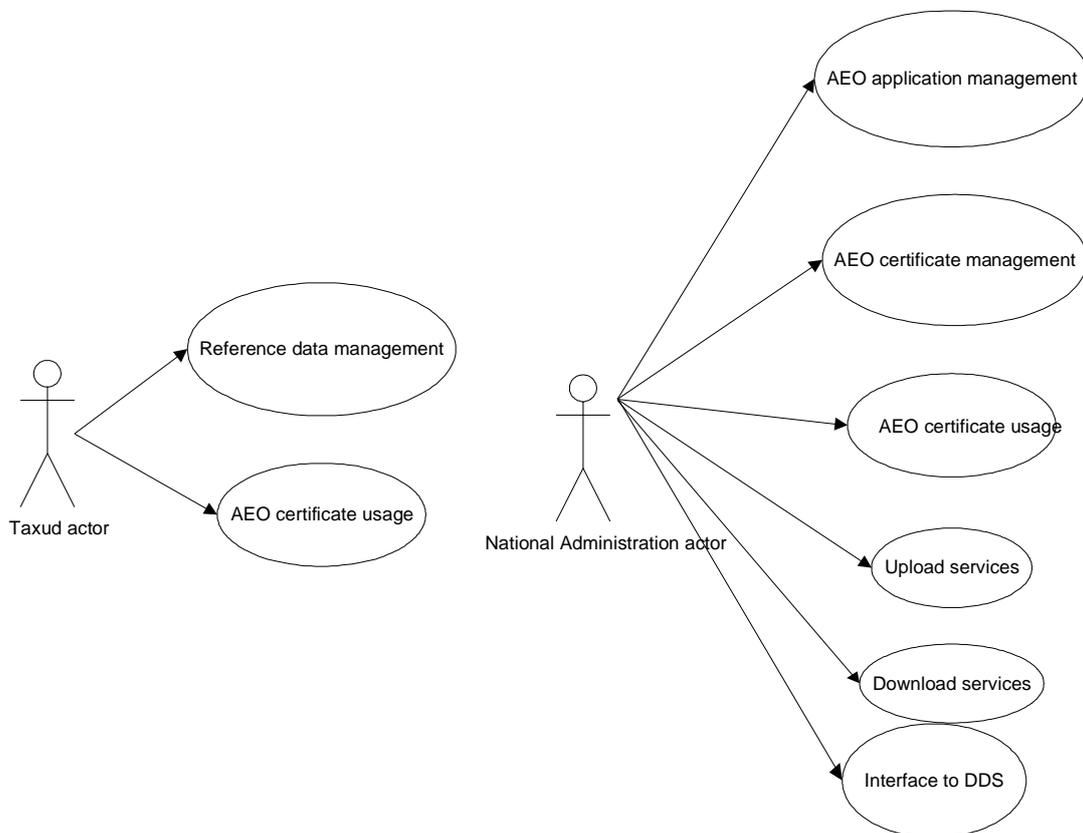


Figure 2-12 AEO use case

### **Reference data management**

All reference data, except Member States, countries and languages are maintained in the context of the application. Member States, countries and languages are maintained outside of the AEO system. They are available in the [TARIC](#) system and accessed through an interface at this system.

Standard data manipulation facilities, such as insertion and updating are available for the reference data. Deletion is not allowed. Reference data can be selected and printed.

### **“AEO application” management**

Standard data manipulation facilities, such as insertion, updating and deletion are available for the “AEO application” data. The information is versioned; the new version is stored and is made public through publishing it. The “AEO applications” can be selected according to any set of available criteria. The list of corresponding “AEO applications” is presented. The “AEO applications” list or single item can be printed.

The VIES validation information is not specified during insertion or during update. After an “AEO application” is inserted or updated, the system automatically triggers the VAT ID number validation.

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Except for the application number that cannot be amended, all data of an “AEO application” can be updated. If a certificate is issued based on the application, the requested AEO certificate type code cannot be amended and the application itself can not be deleted.

After update changes to the applicant full name, VAT ID numbers, TINs, and legal registration number are replicated to the related AEO certificate(s) if existing. When an “AEO application” is published on the AEO CDCO system, all associated VAT ID numbers should be valid in VIES on the Web. The validation of VAT ID numbers associated to an “AEO application” is implemented via the batch mechanism provided by the TAAF framework.

The batch can be executed immediately during the insertion or the update of an “AEO application” if some VAT ID numbers have been added or updated. It also can be scheduled for later execution if the validation of some VAT ID numbers resulted in non ‘Valid’ VIES validation status codes, or resulted in errors.

An “AEO application” can be rejected. That is done by insertion and maintenance of rejection. The rejection can be updated. It can be annulled inserting the date of annulment. Later it is allowed to insert a new rejection. An “AEO application” cannot be rejected if there is a certificate issued for the application.

The information of rejection is versioned; the new version is stored and is made public through publishing it. The rejections can be selected according to any set of available criteria. The list of corresponding rejections is presented. The rejection list or single item can be printed.

All events of maintenance of “AEO application” are automatically stored in the database.

### **AEO certificate management**

Standard data manipulation facilities, such as insertion, updating and deletion are available for the AEO certificate. The information is versioned; the new version is stored and is made public through publishing it. The AEO certificates can be selected according to any set of available criteria. The list of corresponding AEO certificates is presented. AEO certificate list or single item can be printed.

An AEO certificate can be issued only for an “AEO application” which is not rejected. During insertion the certificate holder name, VAT ID numbers, TINs, and legal registration number are copied from the “AEO application”. The AEO certificate type code must be equal to the AEO certificate type code of the related “AEO application” if the AEO certificate is not a “substitute”.

The certificate can be updated, but the AEO certificate number, the application reference and the AEO certificate parent id cannot be amended.

An AEO certificate can be suspended or revoked. The AEO certificate revocation can be suspended and the suspensions of the AEO certificate or its revocation can be withdrawn. All these actions are done by insertion and maintenance of suspension, revocation of AEO certificate suspension withdrawal of the suspension or suspension of the revocation. The revocation and suspensions of both types can be updated. The revocation can be annulled inserting the date of annulment, or suspended; the suspensions of both types are valid for a certain period. The set of validation rules ensures the coherence and consistency of various dates and periods of revocations and

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suspensions. It is always possible to unambiguously identify the validity of the certificate at certain moment of the time and the states of suspensions and revocations.

The suspension or revocation of AEO certificates are complex operations that implies the execution of several operations that must be performed in a single business transaction.

The information of suspension is versioned; the new version is stored and is made public through publishing it. The suspensions and revocations can be selected according to any set of available criteria. The list of corresponding suspensions or revocations is presented. The suspension or revocation list or single item can be printed.

All events of maintenance of AEO certificate are automatically stored in the database.

### **Interface to DDS**

The interface to [DDS](#) is implemented by the interfaces described in below. The full and differential extractions are sent to [DDS](#) via the [CCN/CSI Bridge](#).

### **Reference data Management**

The AEO system validates the country codes and the language codes using an interface to the [TARIC](#) system. The list of country codes and the list of language codes are also retrieved from the [TARIC](#) system. Therefore, the TAAF framework provides a gateway to the [TARIC](#) database.

### **Download services**

The interface consists of the extraction mechanism. The management of extraction-related information is a part of AEO functionality. It is possible to define full and differential extractions their filters and destinations. Several facilities are implemented via the batch mechanism provided by the TAAF framework.

- Generate a full extraction
- Generate a differential extraction
- Filter an extraction
- Send an extraction
- Automatic differential extraction
- Regenerate an extraction
- Save an extraction

Before sending an extraction message to a destination, the filters defined for this destination must be applied on the extraction message.

Automatic differential extraction generates a differential extraction, filters it for each destination and sends the filtered extractions to the destinations.

All batches except automatic differential extraction are not automatically executed. It is executed on request. The batch of automatic differential extraction is executed every working day in the evening.

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### Upload services

The information upload function is implemented by calling the basic functions of AEO application rejection, insertion or update. Request for update scenario defined in [AEO5].

In this scenario, the AEO information is updated in the MS system by the users of the MS. Then, the MS system requests the update of this modified information in the central repository.

When receiving such a request, the central system validates it. This consists of:

- Verifying the syntax of the message sent by the MS. This mainly consists of verifying that the message conforms to the syntax defined by the relevant XML schemas;
- Verifying if the sender of the message has the authorisation to manage the particular type of information (AEO applications, etc.) modified in the message;
- Verifying the semantic of the information contained in the message sent by the MS. This mainly consists of verifying that the business rules expressed in [AEO6] are respected.

If the validation fails, the processing of the message stops and the central system sends a message to inform the MS about the reasons why the message could not be processed.

If all validations succeed, the central system updates the information in the central repository and sends a message to inform the MS that the message has been successfully processed.

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### 2.6.2.2 Domain vocabulary

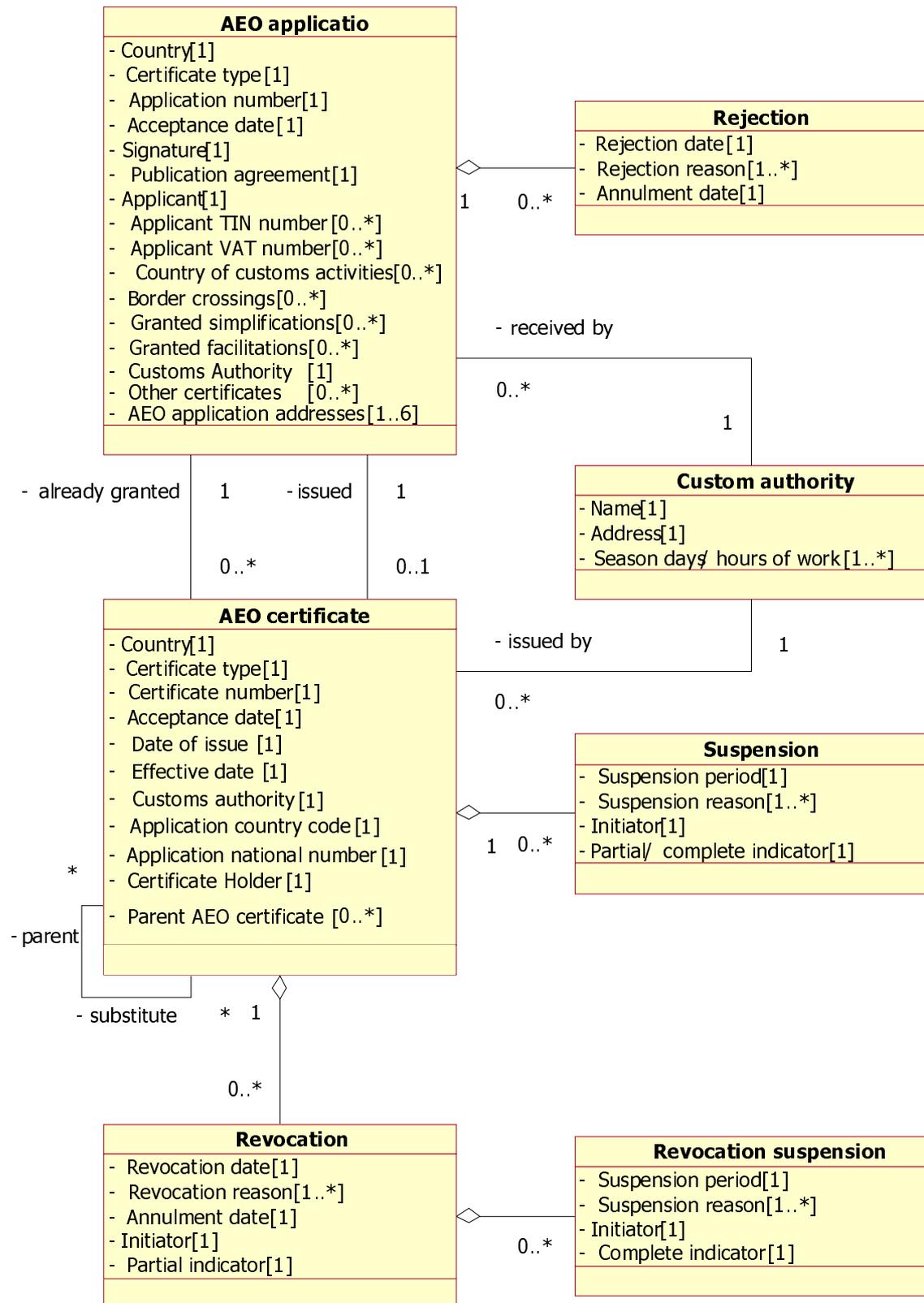


Figure 2-13 AEO domain vocabulary

Major data objects are stored:

- “AEO application”

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- AEO certificate

Main reference data are used:

- Customs authority;
- AEO certificate type;
- Customs procedure;
- Rejection reason;
- Suspension reason;
- Revocation reason;
- Initiator;
- VIES validation status;
- Country;
- Language code.

### **AEO application**

The AEO application and the AEO certificate are the core objects of the AEO system.

“AEO applications” are submitted to a competent customs authority by an economic operator (the applicant). The “AEO application” includes essential information about the applicant and its customs activities. Legal registration numbers such as the number of Value Added Tax payer (VAT) or Trader Identification Number (TIN) must be provided.

If the AEO certificate has not been granted, an “AEO application” is rejected. The date and reason of rejection indicates that the AEO certificate has not been granted. The rejection can be annulled.

### **AEO certificate**

Granted AEO certificate is registered in the system. After it has been granted, an AEO certificate can be suspended or revoked. The suspension can be withdrawn. Resulting from possible appeal procedures, a revocation can be suspended during several given periods. Such a revocation suspension can be withdrawn. A revocation can be annulled. All possible states of a certificate are expressed through the existence of suspension or revocation associations and data elements such as date of end of suspension, complete withdrawal indicator, date of annulment, or revocation suspension period.

When a “combined” certificate is partially suspended, a replacing certificate can be issued. When a “combined” certificate is revoked, a replacing certificate is issued. The original “combined” certificate is called “parent” certificate; the replacing certificate is called “substitute” certificate.

When a partial suspension of a “parent” certificate is withdrawn, the “substitute” certificate (if issued) must be revoked. When a partial revocation of a “parent” certificate is suspended, the “substitute” certificate must be suspended. When a partial revocation of a “parent” certificate is annulled, the “substitute” certificate must be revoked.

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For a given application, there is only one “parent” certificate and from zero to many “substitutes”. Indeed, there may be as many “substitutes” as the number of possible partial suspensions or revocations.

The competent customs authority is the member state institution which receives “AEO applications” and issues AEO certificates. The opening periods, i.e. working days and hours during different seasons of the year are stored besides the name and address of the authority. The authority is opened during a given time period during a set of working days during a given season.

The relations between major data objects together with their most important attributes are presented in the diagram. There are some technical tables in the system, which are not presented in the diagram.

The AEO system notifies a number of events that occur on “AEO applications” and AEO certificates to competent customs authorities. For this purpose, these events are stored in dedicated tables. For an “AEO application”, the following event types can occur: acceptance, amendment, rejection and its annulment, issue of the certificate. For an AEO certificate, the following event types can occur: issue, amendment, suspension, revocation, withdrawal of the suspension, suspension or annulment of the revocation.

When an “AEO application” is created or updated, the VAT ID numbers of the applicant are validated using the VIES on the Web system.

### **2.6.3 Application perspective**

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework](#)

### **2.6.4 Technical perspective**

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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## 2.7 ART

### 2.7.1 Reference and Applicable Documents

Id	Title	Reference	Version
ART1	ART User Requirements	ART-USREQ-v1.08-EN.doc	1.08
ART2	ART Functional Specifications	ART-FS-v1.12-EN.doc	1.12
ART3	ART Data model	ART-TEC-Data Model_1.07.doc	1.07
ART4	ART Process model	ART-TEC-Process Model_1.09.doc	1.09

Table 2-7: ART Reference documents

### 2.7.2 Functional perspective

The Activity Reporting Tool (ART) is the system for the exchange and consultation of information on expenses made by Member States and Candidate Countries in the framework of the Customs and Fiscalis programs. ART covers all activities that have been developed under the programs Fiscalis and Customs and supports a number of reporting obligations.

The information to be gathered concerns both the follow-up of activities and the management of the financial data. The Commission and the participating countries both enter data into the database. The Commission enters a number of “proposals” leading to “actions” and “events”, while Member States enter “participant” information. ART supports the evaluation of the achievement of the set objectives and the expected results on action, event and participant level. The financial and follow up reports are produced directly from the ART.

#### 2.7.2.1 Use cases view

The ART functionality can be divided into two groups:

- Data maintenance
- Reporting

##### Data maintenance

The set of data maintenance facilities implemented in ART:

- Reference data maintenance;
- Proposal maintenance;
- Action maintenance;
- Event maintenance;

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- Participant maintenance;
- Program maintenance;
- Program team maintenance;
- Objective maintenance;
- Budget maintenance;
- Commitment maintenance;
- Advance maintenance;
- Costs maintenance;
- Mass update for archiving actions and events.

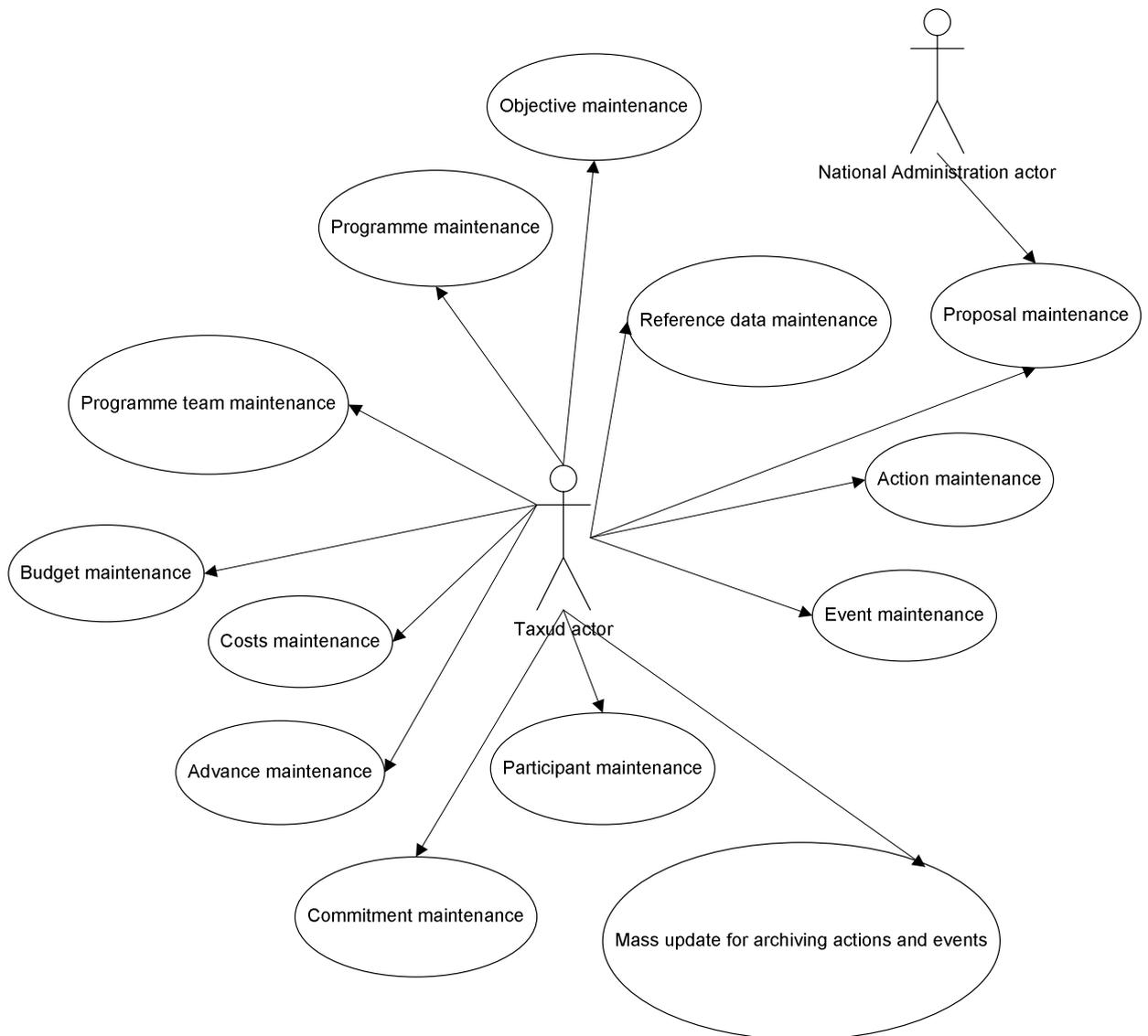


Figure 2-14 ART use case

The management of both ART data objects and reference data can be divided into several different processes.

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- Insertion: Creates draft version of the data;
- Update: In most cases both draft and published data can be updated, but archived data cannot be modified;
- Deletion: In most cases only non-published and/or non archived data can be deleted;
- Publication: Makes the draft data available to the public;
- Approval: Applied only to proposals;
- Archiving: It is not possible to modify any archived data. Applied only to the actions and events;
- Recall: Archived actions and events can be recalled to the operational state;

Main data objects can obtain certain status during the business process. Proposals can be approved, rejected or under consideration. Actions can be operational, cancelled or archived. Events can be planned, operational, cancelled or archived.

It is necessary to be able to make a selection of the complete set of versioned proposals, actions, events, participants and other data, according to several criteria's in any combination. The criteria pertain to the information captured in any of the data objects, as well as to the version timestamp.

One of the objectives of the ART is the production of monitoring reports by the system. They are subdivided in reports which can be produced using the general or advanced query facilities and predefined reports which are made available on request.

### **Reporting**

The set of reports that can be produced using the general query facility: are the following:

- all proposals under a program;
- all proposals by status;
- all approved actions under a program;
- all actions that are still planned under a program;
- all actions under a program, ranked by action type;
- participants per event and per action;
- actions/events under a program, sorted per priority area (= action plan);
- actions/events under a program, sorted per host country (= venue);
- actions/events under a program, sorted per operational unit involved.;
- Overview of actions/events organized jointly under both programs;

The set of reports that can be produced using advanced queries, allowing selection criteria on different types of data elements are listed here below:

- Program team participants;
- Participants to events in a MS;
- Participants of a program team;

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- Overview of changes in event information;

The ART also provides the set of predefined reports made on request.

- Action plan by priority/activity area;
- Activity table;
- actual seminar expenses by country;
- actual organizational costs seminars by country;
- expenses by country and by event status;
- Summary of estimated and actual expenses and payments by program team;
- actual expenses by program and by action and event;
- expenses by event;
- Actual costs by objective;
- Hotel ceiling excess report;
- planned, used and available budget by program and event type;
- spent amount per program, per type of action, per type of event and per participating country;
- Budget summary report;
- statistical information on exchanges under a certain program;
- Exchange annual evaluation report.

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### 2.7.2.2 Domain vocabulary

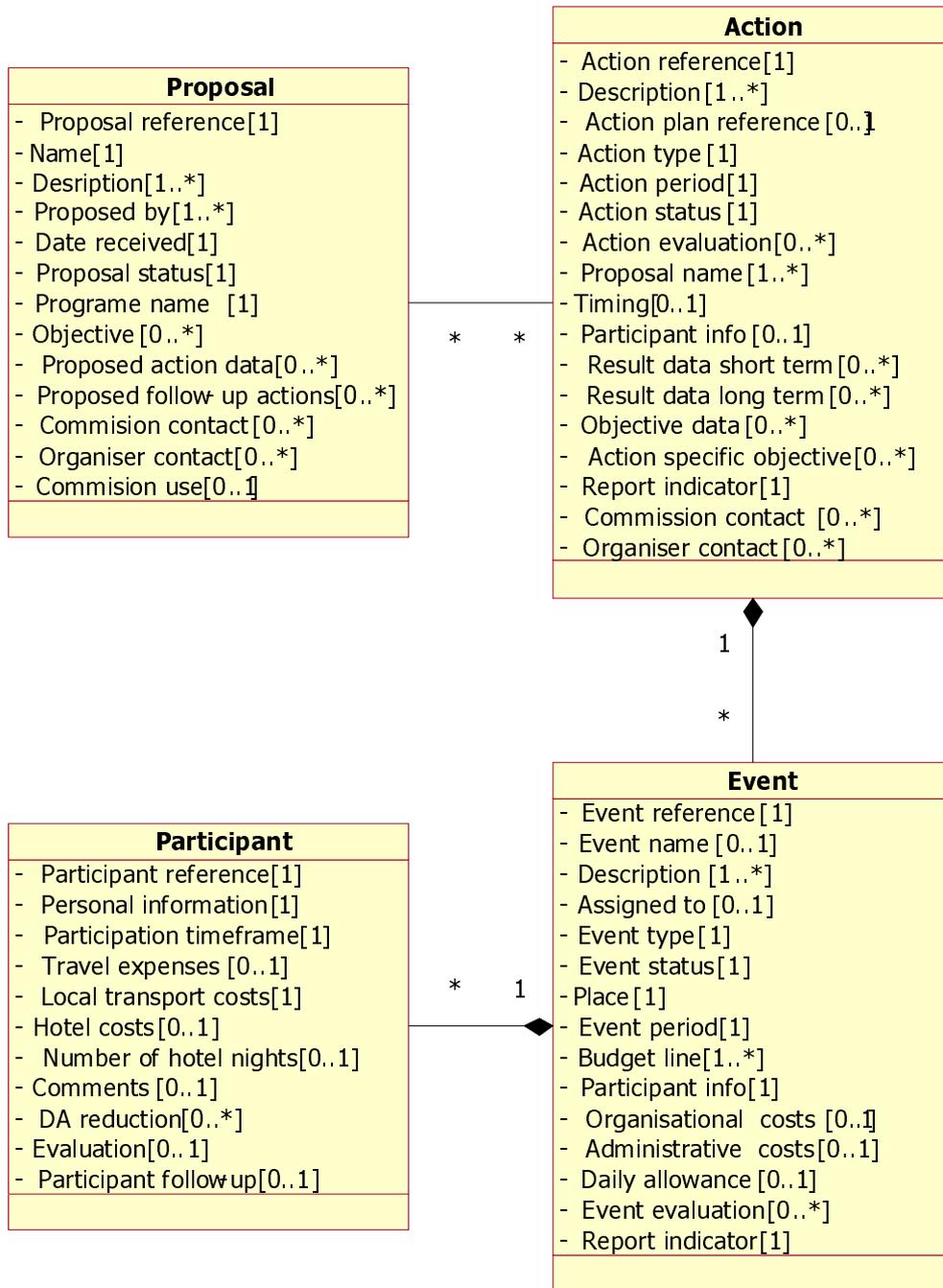


Figure 2-15 ART domain vocabulary

Major data objects stored are:

- Proposal;
- Action;
- Event;
- Participant.

Main reference data used are:

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- program teams;
- objectives;
- budgets;
- budgets by action type;
- budget allocations;
- budget allocation components;
- commitments;
- advances;
- country dependent costs;
- estimated event type costs.

### **Proposal**

Proposals are entered by the national coordinator or his representative or by the Commission Head of Unit or his representative. They are then maintained by the Commission. A proposal is identified by a proposal name.

### **Action**

Actions and events data are entered by the Commission (D1). Some of the data may be generated automatically by the system based on the proposal. An action is usually linked to one or more proposals, identified by an action name.

### **Event**

An event is linked to a certain action, identified by an event reference.

### **Participant**

Participant data is entered by the program team in the participating country. It is linked to a certain event and contains information such as country, personal data, period, travel expenses, daily allowance and evaluation. The program teams are created by the Commission who assigns a team administrator in the participating country. The administrator is responsible for the management of the team members, who are users from the same participating country.

## **2.7.3 Application perspective**

The application structure and dynamics follow the Tariff Applications Architecture Framework.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework.](#)

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#### 2.7.4 Technical perspective

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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## 2.8 CN

### 2.8.1 Reference and Applicable Documents

Id	Title	Reference	Version
CN1	CN Management Functional Specification	CN-FS-CN_Management_Functional_Specification_1.13.doc	1.13
CN2	CN Management Process Model	CN-Process_Model_1.09.doc	1.09
CN3	CN Management Data Model	CN-Data_Model_1.06.doc	1.06

Table 2-8: CN Reference documents

### 2.8.2 Functional perspective

In order to monitor the flow of goods into and out of the European Union, the goods are identified with reference to a nomenclature for tariff and statistical purposes, the Combined Nomenclature. The CN consists of a table of goods descriptions with related codes together with rules and notes for its interpretation.

The main purpose of the system is to maintain the whole publication cycle of certain legislation. The CN management system supports the publication process of the CN regulation and explanatory notes and solves potential inconsistencies between linguistic versions.

The system facilities allow the management of the set of modifications to the document, starting from its initial version as a manuscript in electronic form up to the new publication version. The system supports versioning and translation processes. It also generates report of the impact of a set of changes, proposed or already approved, on the regulation as a whole. It is possible to export all/updated CN descriptions to [TARIC](#).

#### 2.8.2.1 Use cases view

The system functionality is grouped according to the following data objects:

- Document maintenance;
- Entity maintenance;
- Version maintenance;
- Externalized entity maintenance;
- Reference data maintenance.

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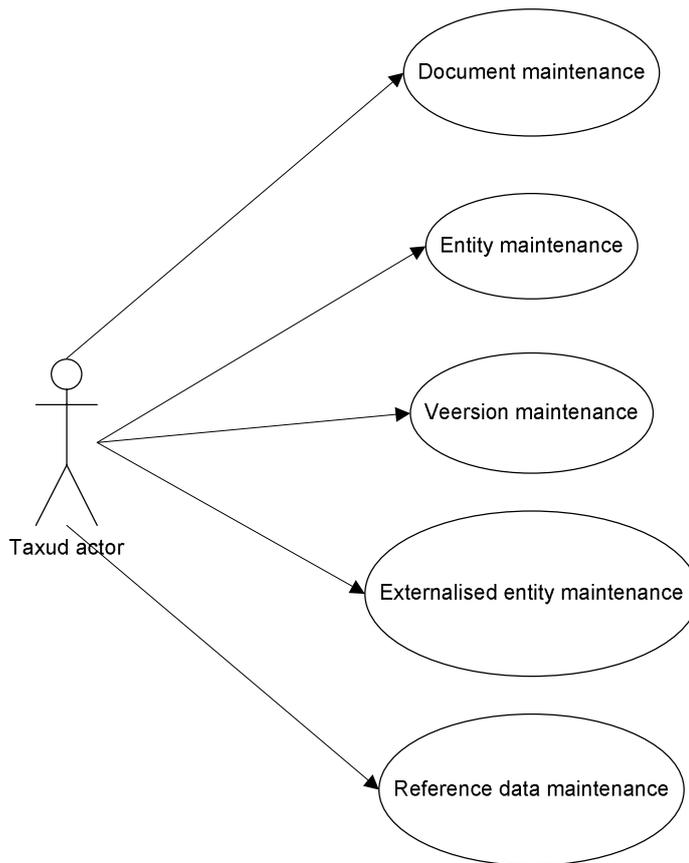


Figure 2-16 CN use case

### **Document maintenance**

The result of a query gives a list of documents according to the query criteria.

The insertion of a document is used when a completely new regulation is set up. The document will have an initial regulation version and no entities.

The update of a document allows changing properties and the set of available regulation versions of a document.

The loading of a document initializes the very first publication cycle of the regulation. This creates a document, containing a number of entities. For each entity the initial version is created with the provided entity information in all the languages. An initial regulation version is created and all initial entity versions are made to refer to it.

Copying a document initializes the next publication cycle with the outcome of the previous cycle.

The assembling of a document produces an externalized entity, which is the collection of all entities in a given language based on a given regulation version. This function is used to generate a manuscript or a publication file for the OPOCE.

The comparing of publications allows a comparison of the publication data in the database with the given Formex V4 final publication files in a given language coming from OPOCE. The file is split into entities and compared with the most recent versions of the entities in the database.

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### **Entity maintenance**

The result of a query gives a list of entities according to the query criteria.

The insertion of an entity creates an empty initial version of an entity and creates a reference to the initial regulation version.

The updating allows changing the properties of an entity.

The deleting allows deleting an entity if it has no version other than the initial.

The check out and check in functionality enables to maintain the chain of versions of an entity. Either a semantic version or a linguistic version of an entity can be checked out. A new version is created with the contents of the previous version and the contents update functions are enabled for the user performing the check out. If the semantic version is being checked out, the chosen language will become the new master language. The check-out of an entity can be reverted and the last checked out version will be deleted. A checked out entity can be checked in within the same branch.

The production of a voting document allows comparing different versions of an entity. The system produces a voting document, which is an externalized entity, showing the differences between the initial and selected versions of a given entity in a given language.

### **Version maintenance**

The querying gives the timestamp, name, creator, version number, description, language and regulation version of a given entity version.

The updating allows users to set or to change the content, description and regulation version of a checked out version of an entity. If the selected version is a linguistic version, only the language-dependent elements may be updated.

The deleting allows deleting the last semantic version of an entity or the last linguistic version pertaining to a semantic version.

It is possible to get the list of languages for which there are missing translations in a semantic version. as it is also possible to obtain an externalized entity of a specified entity version in a given format. If the selected version is a linguistic version, missing translations are substituted with the corresponding master language text.

It is possible to compare any two given versions of the same entity. The system produces an externalized entity, which reflects the differences.

### **Externalized entity maintenance**

This section presents the functions that must be available for externalized entities. Some will be covered by external tools such an editor, while others are part of the business logic of the system itself. System allows generating externalized entity in different formats.

It is possible to obtain an editable or printable externalized entity from a given version of an entity in a certain format (in practice this will be Formex V4).

It is possible to obtain a read-only externalized entity. It can't be modified, or for which it is possible to detect and reject modifications when it is applied to the system.

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## Reference data maintenance

The system manages the list of supported languages.

### 2.8.2.2 Domain vocabulary

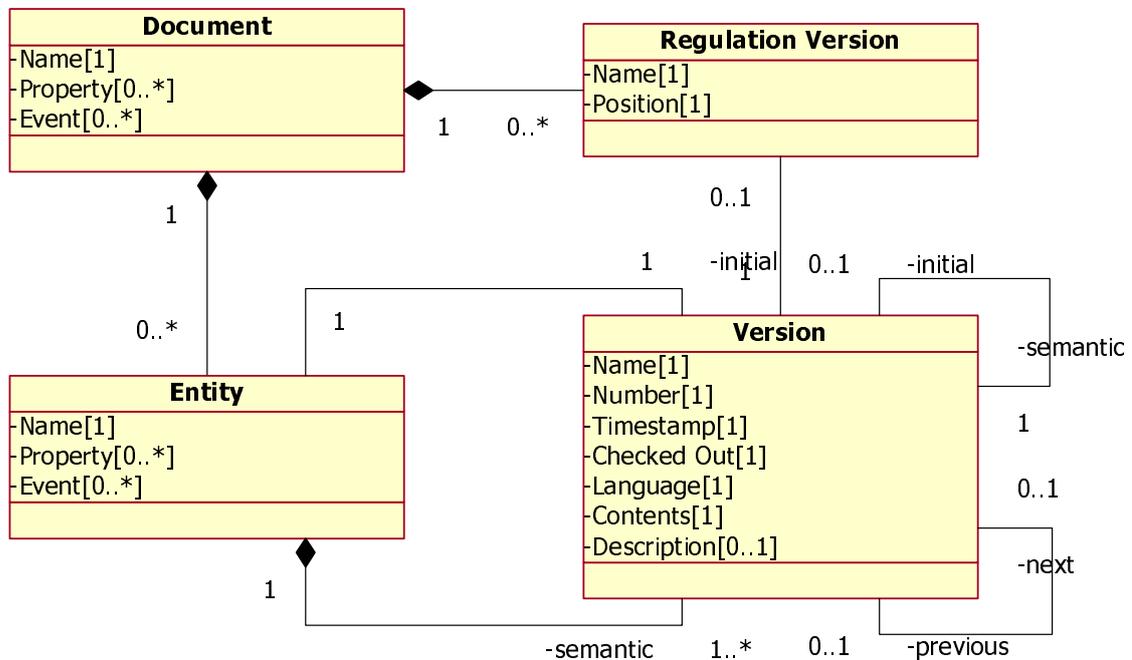


Figure 2-17 CN domain vocabulary

Major data objects stored are:

- Document
- Entity
- Version
- Regulation version

Main reference data used are:

- Language

### Document

A document represents in fact the publication, which is the subject of the publication cycle of certain legislation. When a cycle is started, there are no entities yet.

### Entity

An entity represents a part of the complete document. All entities are versioned. The contents of a version could be in any format and the system provides an indication of the format.

### Version

The semantic versions of the entities contain the actual document information. They can be assembled to constitute the actual document for various purposes, e.g. the production

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of the manuscript. The linguistic versions contain the same semantic meaning but in various languages.

An initial version is created when the system is loaded with the publication of the previous cycle. All subsequent versions are created when the user checks in the entity after having checked it out previously. A chain of versions is completely linear. A version can only have one next version and one previous version. A version can be associated with zero or more initial linguistic versions, at most one per language. Each linguistic version corresponds to exactly one semantic version.

However the linguistic versions form a sort of special language branch. For a semantic version there is one language branch for each supported language. A language branch is a sequence of linguistic versions, which cannot differ in structure. The language component in the version model should be interpreted in two ways. For a semantic version it represents the master language and for a linguistic version it is the language which is the subject of translation.

When a linguistic version is updated, its translations are automatically available to all the subsequent semantic versions. As soon as a new semantic version touches language-dependent elements, translations in the context of previous semantic versions are no longer visible in the new semantic version. The translation should be redone. The diagram below shows the branches semantic and linguistic versions of one entity. The code of a version includes the number of semantic version, then the language code and the number of linguistic version of the certain semantic version.

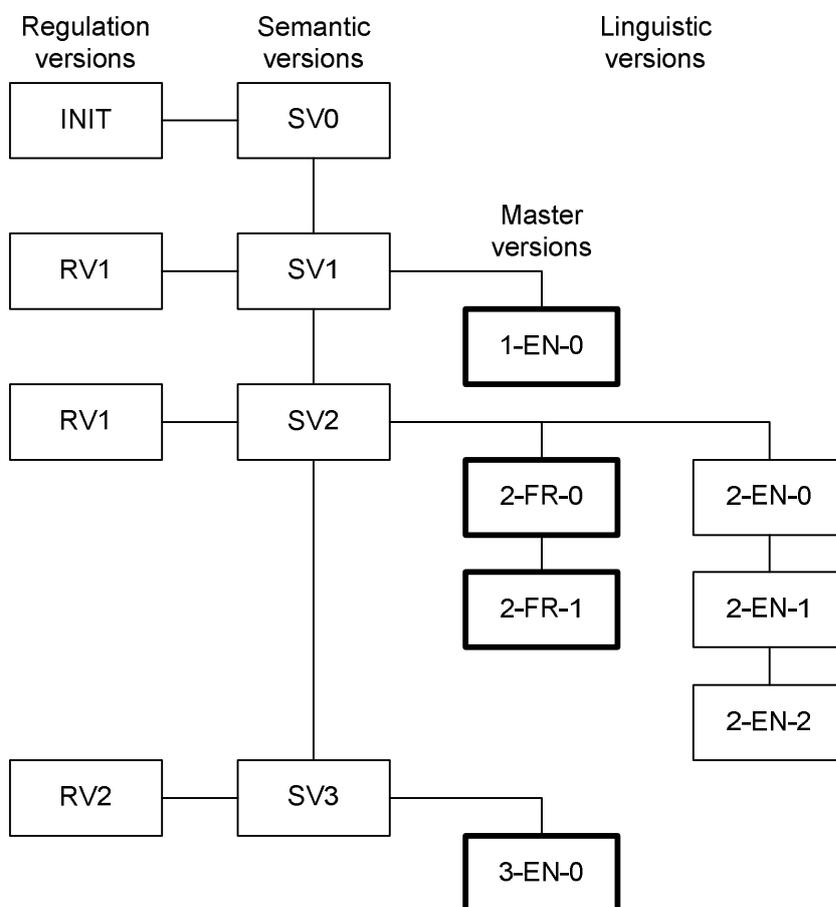


Figure 2-18 Example of the branches semantic and linguistic version of one entity

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### **Regulation version**

A regulation version is a user-defined name with which entity versions can be tagged. The position of a regulation version in a document expresses a chronological order. This is important for the assembly process. This way the user can express that a particular entity version is part of some version of the complete regulation. It is up to the user to decide whether a new entity version is still part of the old regulation version, or becomes part of a new regulation version. This way, an entity can have a number of versions that are part of the same regulation version.

A data object of an externalized entity represents an entity outside of the system. Examples of externalized entities are a Word file or a PDF file. The system can use the identification of an external entity. The identification conveys the entity name and a version of it, which can be semantic as well as linguistic.

Some general data elements are used in the system. Properties are used to express various facts about general data objects. Properties consist of a name and value. Events are used to keep track of the changes made by the user. Events consist of an author, action, timestamp and description.

The relations between major data objects, also attributes are presented in the diagram.

### **2.8.3 Application perspective**

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework](#)

### **2.8.4 Technical perspective**

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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## 2.9 EBTI

### 2.9.1 Reference and Applicable Documents

Id	Title	Reference	Version
EBTI1	EBTI-3 User Requirements	EBTI-3-USREQ-EN_1.02.doc	1.02
EBTI1	EBTI-3 Functional Specifications	EBTI-3-FS-EN_1.09.doc	1.09
EBTI1	EBTI-3 Data Model	EBTI-3-TEC-Data Model_1.05.doc	1.05
EBTI1	EBTI-3 Process model	EBTI-3-TEC-Process Model.doc	1.11

Table 2-9: EBTI Reference documents

### 2.9.2 Functional perspective

The Commission has established a Binding Tariff Information (BTI) procedure for information on the tariff classification of goods, provided by the European customs authorities, in order to ensure the uniformity of the application and to eliminate the differences of the tariff classification rules within the European Union, in order to guarantee the equality and the legal protection of the economic operators in terms of decisions taken by the different customs authorities.

The European Binding Tariff Information system ensures effective management of the procedure. The system ensures the transparency of customs information and provides a guarantee of equality for the economic operators. It facilitates and verifies the classification of a good and ensures coherence of classification of the different national authorities, by searching for divergent or incorrect classifications. The system also allows users to look for attempted fraudulent practice by economic operators.

#### 2.9.2.1 Use cases view

The system functionality can be divided into several main groups:

- Reference data maintenance;
- “BTI application” maintenance;
- BTI maintenance;
- BTI invalidation warning maintenance.

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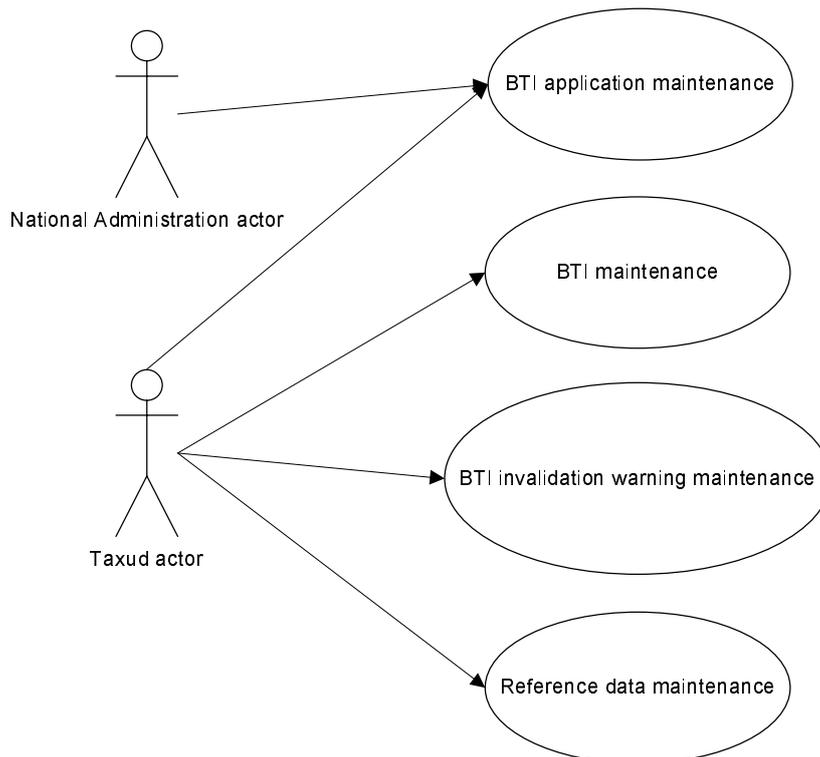


Figure 2-19 EBTI use case

### **Reference data maintenance**

All reference data, except Goods Nomenclature are maintained in the context of the application. Goods Nomenclature codes are available in the [TARIC](#) system and accessed through an interface to this system.

Standard data manipulation facilities, such as insertion, updating and deletion are available for the reference data. Reference data can be selected and printed. Some reference data is version-able; the new version is stored and is made public through publishing it. Only non-published versions can be deleted.

### **“BTI application” maintenance;**

Standard data manipulation facilities, such as insertion, updating and deleting are available for the “BTI application”. The information is versioned; the new version is stored and is made public through publishing it. The “BTI applications” can be selected according to any set of available criteria. The list of corresponding BTI application is presented. “BTI application” list or single item can be printed.

It is possible to update everything, except for the identifying information. Only non-published versions of a “BTI application” can be deleted.

### **BTI maintenance**

Standard data manipulation facilities, such as insertion, updating and deleting are available for the BTI. The information is versioned; the new version is stored and is made public through publishing it. The BTIs can be selected according to any set of available criteria. The list of corresponding BTIs is presented. BTI list or single item can be printed.

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The newly created BTI can not contain any European keywords. European keywords can be only added during update of BTI and only by Commission users, not by the Member State administration. The majority of data in the BTI cannot be updated. Beyond the already mentioned European keywords, only the reason for invalidation, the date of end of validity can be updated. Only non-published versions of a BTI can be deleted.

### **BTI invalidation warning maintenance**

The Commission sends a warning to the customs authority that a certain BTI must be invalidated by the user (e.g. legal decision) or will be invalidated by the system (invalid nomenclature code). Warnings will be created and sent manually, except for the invalidation of certain nomenclature codes, in which case the warning will be sent automatically. It is configurable for which customs nomenclatures such automatic warning should be sent (e.g. Taric and Export Refund Nomenclature).

Standard data manipulation facilities, such as insertion, updating and deleting are available for the manual invalidation warnings. The information is versioned; the new version is stored and is made public through publishing it. BTI invalidation warning list or single item can be printed.

In the case of automatic invalidation, when a nomenclature code becomes invalid, corresponding BTIs are invalidated automatically and invalidation warnings are sent out with a specific invalidation warning category and a specific invalidation reason.

The invalidation warnings can be selected according to any set of available criteria. The list of corresponding invalidation warnings is presented.

Member States must be notified of the publication of new BTI invalidation warnings about their BTIs. A batch job implements the notification.

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### 2.9.2.2 Domain vocabulary

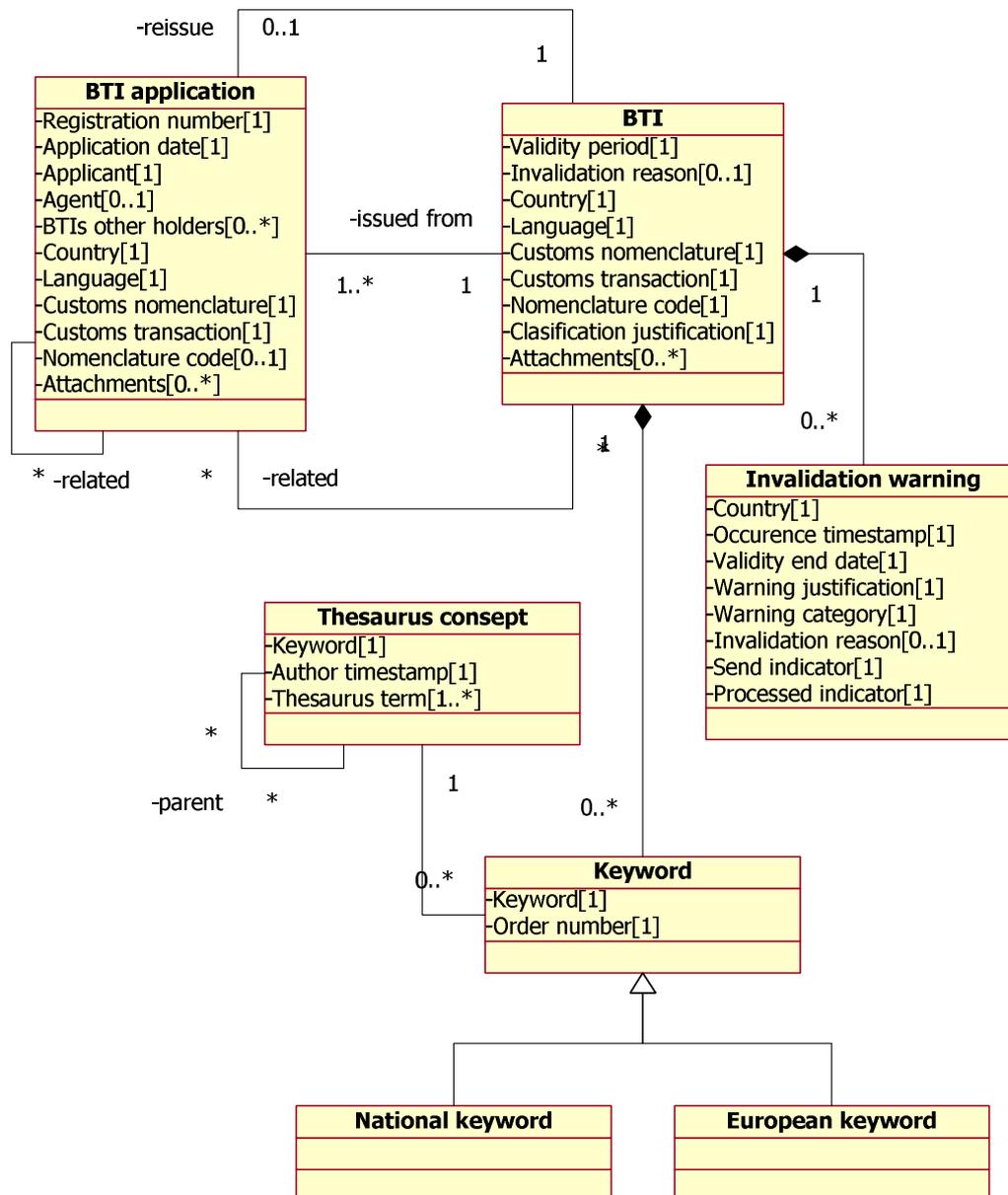


Figure 2-20 EBTI domain vocabulary

Major data objects maintained by the system are:

- “BTI application”;
- BTI;
- Invalidation warning.

Main reference data used are:

- Invalidation reasons;
- Invalidation warning categories;
- Thesaurus concepts;
- Languages;

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- Countries Member States;
- Customs nomenclatures;
- Image MIME types;
- Goods nomenclature.

### **BTI application**

The BTI application and the BTI itself are the core data objects of the EBTI system.

The BTI application represents an application to a customs authority for binding tariff information made by an applicant on behalf of a holder. The application form contains the principle information contained in a BTI form including the request for the product information. It is optionally accompanied by additional information, such as brochures, photographs, samples or other documents, which may assist the customs authorities in considering the application.

### **BTI**

BTI represents a Binding Tariff Information (BTI) issued by a competent customs authority of a Member State. This information is notified to the holder by means of the BTI forms. Upon reception of an application, the customs authority may issue one or more BTIs. It complements the information on the application form with a BTI reference number, the start date of validity, a justification of the classification and a number of keywords. The keyword can be either national or European. The index of keywords attached to the BTI supports the searching for BTIs of which the contents is related. This information is notified to the holder by means of the BTI form.

### **Invalidation warning**

None or several invalidation warnings can be issued for a given BTI. Warnings can be issued automatically due to an invalidation of a customs nomenclature code, or manually when a warning is sent on the decision of the Commission.

A BTI may be invalidated for a number of reasons: inconsistencies, changes in the legislation concerning tariff information, the conditions laid down for their issues are no longer fulfilled. The holder has the right to appeal against a BTI decision. This can also lead to invalidation of the BTI. The customs authority must notify the holder and the Commission when a BTI ceases to be valid in these circumstances.

## **2.9.3 Application perspective**

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework](#)

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## 2.9.4 Technical perspective

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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2.10 - ECICS	ISSUE DATE: 13/01/2009

## 2.10 ECICS

### 2.10.1 Reference and Applicable Documents

Id	Title	Reference	Version
ECICS1	ECICS-2 Functional Specifications	ECICS2-FS-001-EN.doc	2.01
ECICS2	ECICS-2 Process model	ECICS2-TEC-PM.doc	1.01
ECICS3	ECICS-2 Data model	ECICS2-TEC-DM.doc	1.01

Table 2-10: ECICS Reference documents

### 2.10.2 Functional perspective

The main goal of the European Customs Inventory of Chemical Substances system (ECICS) is to provide a central repository with information on chemical substances, relevant to the customs departments in order to ascertain proper control over their movements (import, export, transit). The ECICS facilitates the maintenance and consultation of the classification of chemical products, described by chemical names and synonyms in all official languages, CAS (Chemical Abstract System) references and chemical structure drawings and references to documents on the classification decision.

#### 2.10.2.1 Use cases view

The system functionality can be divided into several main groups:

- Maintenance of reference data;
- [TARIC](#) interface;
- Maintenance of chemical substance;
- Reporting;
- Mass update;
- Input bridges;
- Output bridges.

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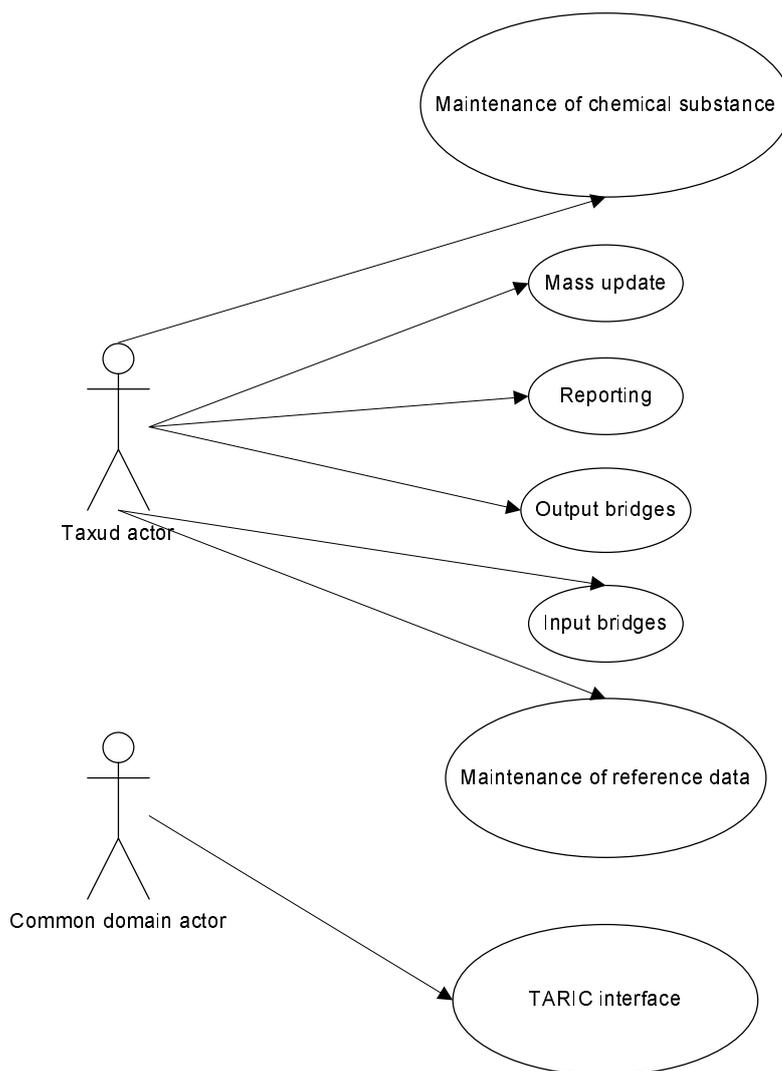


Figure 2-21 ECICS use case

### **Maintenance of reference data**

Almost all reference data are maintained in the context of the application. Standard data manipulation facilities, such as insertion, updating and deletion are available for the reference data. Reference data can be queried and printed. All reference data is versionable; the new version is stored and is made public through publishing it. Only non-published and non referenced versions can be deleted.

Few reference data such as Goods Nomenclature, Languages are available in the [TARIC](#) system and accessed through an interface to this system.

### **TARIC interface**

The [TARIC](#) interface is used in order to access ECICS reference data maintained in the [TARIC](#) database. Its main purpose is to obtain a list of values, for reference data elements and to validate the value of a reference data element. Several reference data elements are available via [TARIC](#) interface such as:

- Language codes;
- The tariff classification consisting of a classification code and a validity period;

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- European legal references of chemical substances consisting of a regulation number, which is a name;
- Licenses and certificates consisting of a type code identifier and a reference number.

### **Maintenance of chemical substance**

Standard data manipulation facilities, such as insertion, updating and deleting are available for the chemical substance. The new chemical substance can also be created as a copy from an existing chemical substance. The information is versioned; the new version is stored and is made public through publishing it. The chemical substances can be selected according to any set of available criteria. The list of corresponding chemical substances is presented. The list of chemical substances or single item can be printed.

The CUS number is being assigned by the system at the moment the chemical substance is created and cannot be changed during an update. It is possible to visualize an image of the structure of the chemical substance.

Both an external user and a user from DG TAXUD (internal user) can create a draft version of new information. The internal draft follows the normal lifecycle. It can be cancelled or published. Once published it can be modified by taking a copy as internal draft and this draft version can subsequently either be cancelled or the modification published as a new version. The scenario followed when data is created or modified by an external user is slightly different as they are not allowed to directly publish data. The external draft version is either cancelled or proposed for publishing. Once proposed the version can either be taken back by the external user or taken over by a DG TAXUD user. Then it will be evaluated to be published. From here it will either be published or cancelled. Furthermore, the external user can modify the published information by taking a copy as external draft, modify it and either cancel the modification or propose the modification for publishing. The further lifecycle of this modified information is as described for information newly created by the external user. A last transition supported in this external user state diagram is a DG TAXUD user taking non-proposed external draft date. This bypass operation is exceptional and only to be used to gain access to the modified data in case the external user is not available to perform the proposal step.

There are some additional functions and restrictions related to the state of chemical substance. A chemical substance can only be proposed, withdrawn and taken.

Depending on the user type (internal or external) and function a data element can obtain several states:

- Internal draft;
- External draft;
- Proposed;
- Under evaluation;
- Published.

### **Reporting**

The system is able to generate the list of reports. They can be subdivided in reports which can be produced using the general query facility (information reports) and predefined reports which will be made available on request (statistical reports and control reports). Except for the import verification reports, all reports will be available in all required languages through the use of tags that must be already translated in these languages. Reports are being generated asynchronously.

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The set of predefined reports are available in the system

Information reports are the following:

- Current classification;
- Chemical substances;
- Chemical substances by classification code;
- Classification codes;
- Classification history of a chemical substance;
- Classification changes;
- New classifications;
- Invalid classifications;
- CAS registry numbers;
- InChI identifiers.

Statistical reports are:

- Global statistics;
- Chemical substance by HS or [CN](#) classification code;
- Consultations of CAS database extracts.

Control reports are:

- Chemical substances without CAS registry number;
- Chemical substances with the same CAS registry numbers;
- Chemical substances with the same InChI;
- Chemical substances publication activity;
- Classification user changes;
- Input bridge mapping;
- Input bridge CSV generation.

### **Mass update**

The system supports several mass update functions:

- Mass insertion/update/replacement of classification of chemical substance
- Mass replacement of specified text segment

The system performs a mass update of the classification data for a set of products to the user provided values. This function adds a new classification or updates an existing one as well as the related validity period and status of any selected substance of the list to the provided values. As the result of the update a report is being produced detailing the results of the update for each record updated.

The system can also perform mass replacement of specified text segment. For each element that is a description or multi-lingual description. The occurrence of certain search text is being replaced by the provided replacement text. As the result of the update a report will be produced detailing the results of the update for each record updated.

### **Input bridges**

The ECICS chemical substance data import functionality provides means to feed external data about chemical substances into ECICS. Two input bridges are supported to import chemical substance data into ECICS:

- Import from WHO data
- Import from ESIS data.

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The function of data file import allows specifying an input file and associated origin (i.e. “WHO” or “ESIS”) through the appropriate user interface and performs the upload. During import the content of the data file is being validated according to the business rules which are applied during manual data management. The imported data can be published or deleted. When the import is completed the report on the results is produced.

### **Output bridges**

The ECICS chemical substance data export functionality provides means of data export. Four output bridges are supported:

- Generic XML export
- ACD/Labs software export
- Export to [DDS](#)
- Export for the [CN](#) publication

The generic export function allows the export of public, published data of a set of chemical substances resulting from a query in an XML format. The export file contains tags for all information that can be exported but only selected information will be present as determined by a choice of filters that operates on the full export data set. For this, the user can select one or more filters from a predefined set, such as one or more languages for all multilingual data elements or the identity of the data elements for which data will be included.

The purpose of the ACD/Labs software export is to export certain data elements in a standard format supported by specific software products (ACD/Name or related products from ACD labs) in order to verify the correctness of a IUPAC name as well as generate or change a InChI or chemical structure in Molfile format

The ECICS system is able to generate and send a file containing the relevant information on all chemical substances for [DDS](#) at a requested point in time. Only the information of published chemical substances that have at least one classification whose status is “released” and whose validity period starts on or is before the certain date and time are being exported. Two options of full and differential export are available. Conditions of the differential export are the same as specified for the full export with the added condition that only chemical substances that have been newly created or with exported data elements that have been modified during a given period are exported.

The ECICS system is able to produce an export file for the [CN](#) application in the FORMEX format, containing the data for the “Pharmaceutical Annexes”, whose [CN](#) classification is valid. As a result of this export a report will be produced containing the number of chemical substances exported.

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### 2.10.2.2 Domain vocabulary

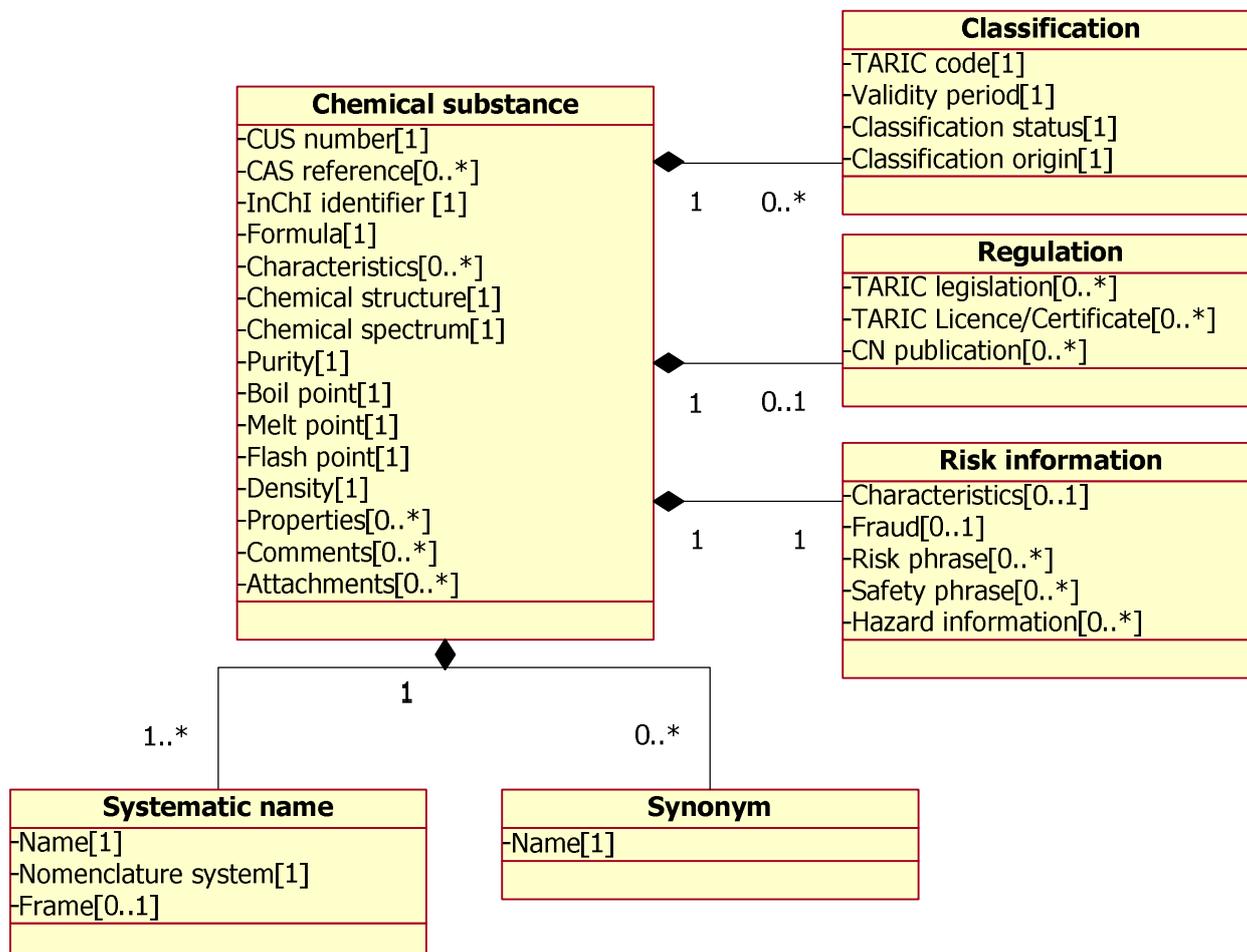


Figure 2-22 ECICS domain vocabulary

Major data objects maintained by the system are:

- Chemical substance

Main reference data used are the following:

- CAS registry numbers;
- Nomenclature systems;
- Origins;
- Name segments;
- Classification origin;
- Physical characteristics;
- General characteristics;
- Risk related characteristics;
- Classification document references;
- Risk phrases;
- Safety phrases;
- Hazard information;
- Spectrum types;
- Property;

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- Classification statuses;
- Authorization levels;
- MIME types.

### Chemical substances

The main data object of the ECICS is the chemical substance. Substances are defined by their chemical names along with their tariff classification in the European Community's Combined Nomenclature. Systematic names always belong to a certain nomenclature system, i.e. IUPAC, INN or ISO. A chemical substance can only have one name in a given nomenclature system. A synonym is a kind of name that does not belong to an "official" nomenclature system. The frame is used to construct the translation of the systematic name. The appropriate algorithm uses the frame, consisting of segments, separated by markup characters, together with the set of translations for each segment, i.e. structural components of the name.

Each substance also has a CUS number, assigned by DG Taxation and Customs Union, which is an easy identifier to search the database and to communicate with Customs, and a Chemical Abstracts Service Registry Number (CAS), a system used to identify chemical products the world over. The IUPAC International Chemical Identifier (InChI) identifies a chemical substance. It is assigned according to a set of rules defined by the IUPAC. Therefore its format is subject to certain syntax rules (e.g. the InChI identifier of "ethanol" is "1/C2H6O/c1-2-3/h3H, 2H2, 1H3") but format validation is beyond the scope of the ECICS application.

Several attributes are used to define various chemical and other characteristics of substance. The typical values of physical characteristics are "white powder", "colourless liquid", etc.

Each substance is associated with several eight-digit [CN](#) codes of the Combined Nomenclature. The classification origin identifies the origin of a classification, e.g. WCO, European Court of Justice, Customs Code Committee or DG TAXUD.

The chemical substance regulation information is related to European legislation. It includes regulations concerning the movements of a chemical substance in the European Union: import, export and transit.

The risk related information is associated with the chemical substance. It can contain some descriptive attributes. The examples of risk characteristics are "health hazard", "drug", "chemical weapons precursor", etc. Risk and safety phrases contain information about the consequences and prevention.

The origin of information, i.e. organization that provided the information for a given data element is stored in the database for the certain elements. Some elements, as well as their origin, have an associated authorization level. This is used to flag whether the element or its origin can be disclosed. For products that have certain "risks" associated with them this is often not the case.

### **2.10.3 Application perspective**

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous

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access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework](#)

#### **2.10.4 Technical perspective**

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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## 2.11 ISPP

### 2.11.1 Reference and Applicable Documents

Id	Title	Reference	Version
ISPP1	IPR data model	IPR-TEC-Data Model_1.03.doc	1.03
ISPP2	IPR Process model	IPR-TEC-Process Model.doc	1.02

Table 2-11: ISPP Reference documents

### 2.11.2 Functional perspective

The inward processing arrangements allow Community operators to be relieved from import duties for components imported from third countries with a view to being processed in the Community and subsequently re-exported. Inward processing is categorized as a customs procedure with economic impact. Therefore the use of this regime is conditional upon granting an authorization by the customs authorities. This authorization contains all particulars and conditions in relation to the use of the procedure.

Main objective of the application is to manage information concerning the IPR (Inward Processing Relief) authorizations. The system facilities allow registering applications for import with a view to being processed and re-exported (inward processing) and decisions regarding granting, rejection, annulment, revocation.

#### 2.11.2.1 Use cases view

The system functionality can be divided into several main groups:

- Reference data maintenance;
- IPR case maintenance.

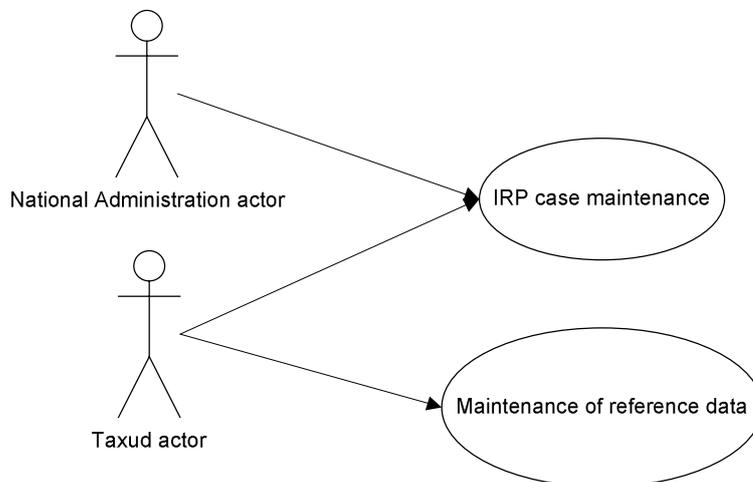


Figure 2-23 ISPP use case

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### Reference data maintenance

All reference data, except Goods Nomenclature are maintained in the context of the application. Goods Nomenclature codes are available in the [TARIC](#) system and accessed through an interface to this system.

Standard data manipulation facilities, such as insertion, updating and deletion are available for the reference data.

Economic condition and reason of import are versioned. The maintenance of the later reference data includes the publishing beyond the insertion, updating and deletion. These data can also be printed.

### IPR case maintenance

Standard data manipulation facilities, such as insertion, updating and deletion are available for the IPR cases.

Insertion of an IPR case is only the result of a granting, rejection or renewal or any combination of these business actions for the import goods. Update of an IPR case is only the result of a cancellation, a revocation or a correction or any combination of these business actions for the import goods. Only non-published IPR cases may be deleted.

After the publishing the new version of the IPR case becomes accessible to all users. Non-published information is only available to the users that have authority over the update process, so the IPR request function will not include non-published IPR cases for other users.

IPR cases can be printed both the document including the entire data of IPR case and the list of query results. All query results are also be downloadable.

#### 2.11.2.2 Domain vocabulary

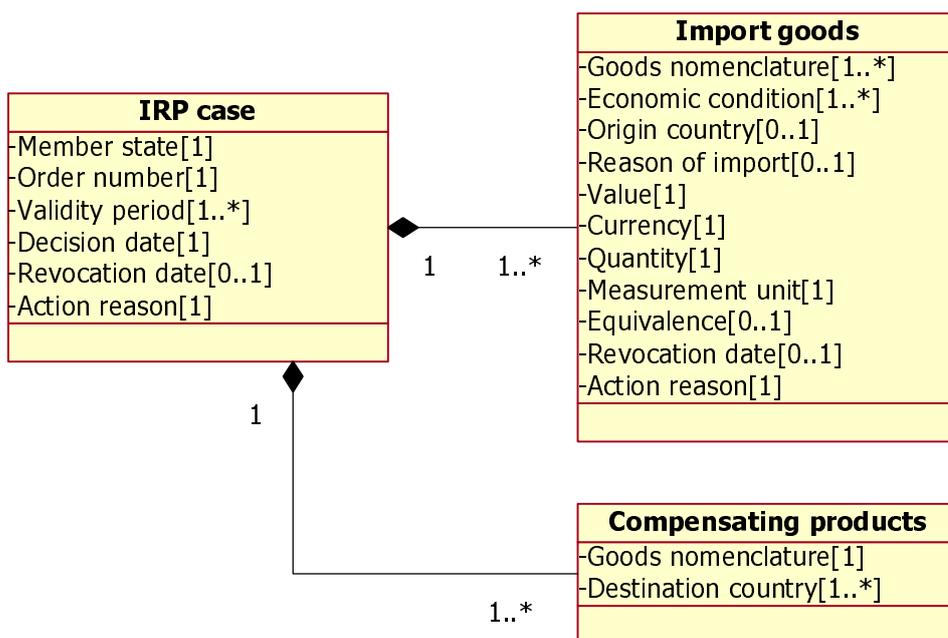


Figure 2-24 ISPP domain vocabulary

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Major data objects stored are:

- IPR case;
- Import goods;
- Compensating products.

Main reference data used are:

- Reason;
- Economical condition and sub condition;
- Currency;
- Measurement unit;
- Country;
- Member State;
- Language;
- Goods Nomenclature.

### **IPR case**

IPR case is the core of the application. It represents a decision on an authorization to import goods without duty tax. It may consist of a granting or a rejection of an authorization. The granting may concern a new case, be a renewal, a cancellation or a revocation of an existing case.

An IPR case is composed of one or more actions on authorization concerning a good to be imported. The action may be granting, rejection, annulment, revocation; the reason of action is also classified and set. The codes, values quantities of goods are stored.

### **Import goods**

Import good must be exported after a gain of value in the member state.

### **Compensating products**

The compensating product defines which transformed products have to be exported. The codes, values quantities of goods are stored.

## **2.11.3 Application perspective**

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework](#)

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#### 2.11.4 Technical perspective

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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## 2.12 RIF

### 2.12.1 Reference and Applicable Documents

Id	Title	Reference	Version
RIF1	RIF Problem Statement and User Requirements	RIF-PS-UR-v2.30-EN.doc	2.30
RIF2	RIF Data Model	RIF-TEC-001 - Data Model_2.01.doc	2.01
RIF3	RIF Functional Specifications	RIF-FS-v2.02-EN.doc	2.02

Table 2-12: RIF Reference documents

### 2.12.2 Functional perspective

The RIF is an essential element in the strategic development and implementation of a standard Risk Management Framework in the customs services of the European Union. The purpose of RIF is to ensure the management of risk information and the exchange of risk information between National Risk Analysis Centers (NRACs - including DG TAXUD) and Customs Offices (COs, i.e. ports, airports...) in the Member States.

Simple and easy to use forms dealing with routine control concerns must be exchanged rapidly between NRACs and COs. NRACs and COs are able to create risk information forms and feedbacks. It's possible for all addressees of risk information forms and feedbacks to be notified by the central system that there is information awaiting their attention.

A risk information form should raise the awareness of the concerned parties with regard to goods which could pose a threat to health or safety of citizens and other potential irregularities (e.g. false declaration, counterfeit goods). Beside the risk information form, a feedback function is available in order to evaluate the action taken by either a CO or a NRAC on receipt of a risk information form.

#### 2.12.2.1 Use cases view

The system functionality can be divided into several groups:

- Risk information form maintenance;
- Feedback maintenance;
- Topological data maintenance;
- Reference data maintenance;
- Change management;
- Data consultation;
- Reporting;
- Data Export.

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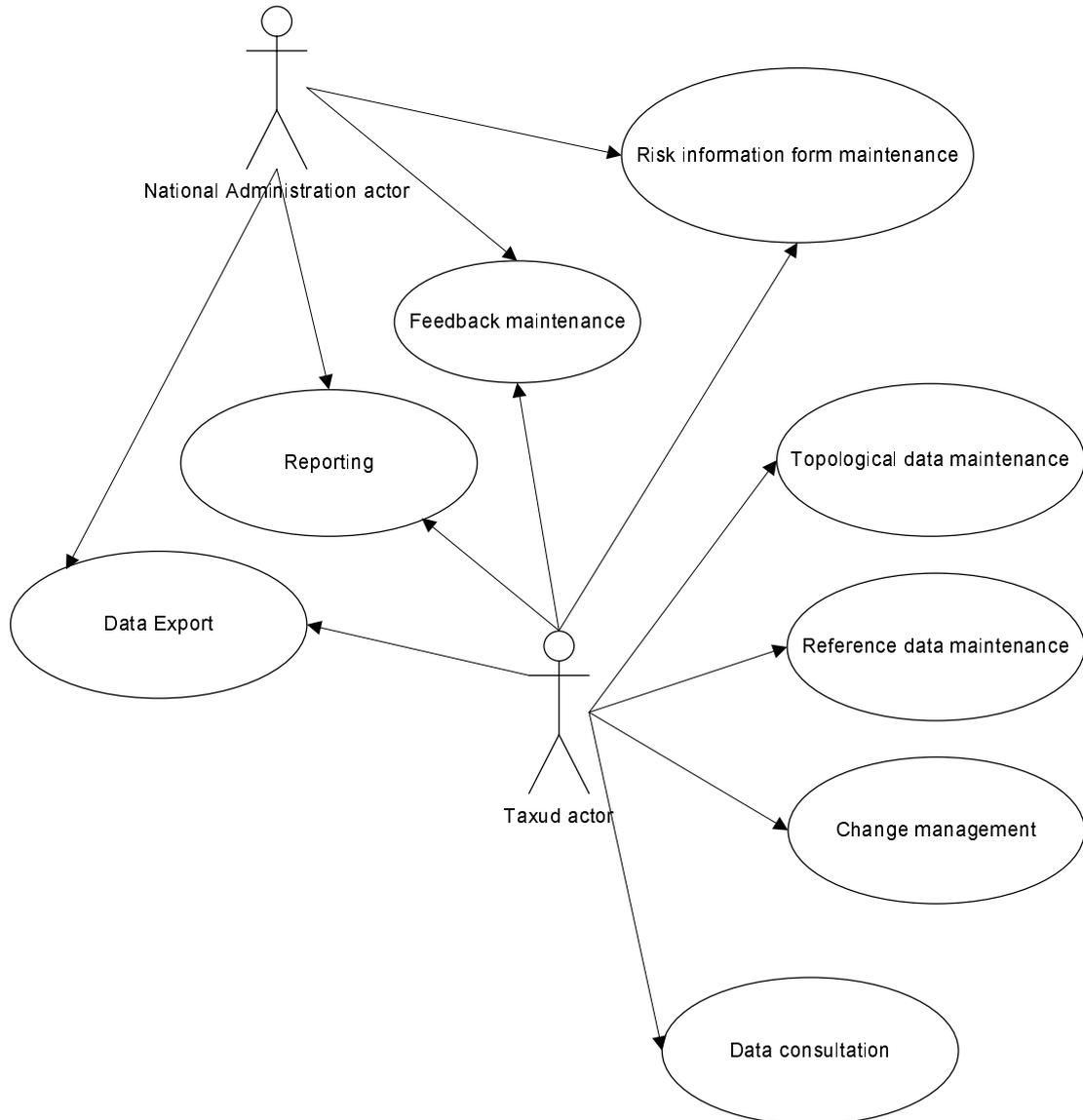


Figure 2-25 RIF use case

### **Risk information form maintenance**

Standard data manipulation facilities, such as insertion, updating and deletion are available for the risk information forms. A new form can be created copying an existing one. Risk information form can also be based on a parent risk information form.

It is possible to register any operation performed on a risk information form. After the registration the new version of the form becomes accessible to all allowed users. The registration is logged for audit purposes. Non-registered information is only available to the authors.

The registration of the risk information form is notified by normal email sent by RIF application automatically. The destination email addresses of designated organizations are collected according to the user role within the process.

The state of a risk information form is expressed using one of three possible values: “live”, “archived” and “un-archived”. Archiving function leads to the “archived” state. However, this archiving has no effect on the accessibility – the archived risk

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information form is still accessible to any other function of the system. Un-archiving function leads to the “un-archived” state. There is certain distinction between “un-archived” form and “live” form.

A risk information form is always owned by one organization. Usually the owning organization is set automatically, but in some cases it can be set or changed manually. The confidentiality data elements are used to characterize the association between a certain organization and a certain risk information form; it extends the concept of ownership and refines the accessibility of a risk information form. This association defines the framework in which a risk information form is maintained, specifying if users have restricted access or not. This way risk information form can obtain the mode “closed” or “opened”. A risk information form is considered as “closed” if it has a valid confidentiality element characterizing its ownership. Otherwise the risk information form is considered as “open”. After the registration of risk information form, the confidentiality element cannot be updated or deleted via direct editing. But the user can manually open an already registered form in order to change “closed” mode to “opened” mode.

A risk information form is accessible to a user if it is in the “open” mode, or it is in “closed” mode and the user is currently active in an active organization, which has the active membership in an active target group associated to the risk information form. Otherwise the risk information form is not accessible to the user.

Any data maintenance operation (update, copy, delete, archive, un-archive and open) can only be performed on accessible risk information form.

### **Feedback maintenance**

The functionality of local feedback and consolidated feedback is similar, but still has some differences.

Standard data manipulation facilities, such as insertion, updating and deletion are available for feedbacks of both types.

It is possible to register any operation performed on a feedback of both types. After the registration the new version of the feedback becomes accessible to all allowed users. The registration of a consolidated feedback validates the consolidated feedback. The consequence is that the consolidated feedback and all local feedbacks referred by this consolidated feedback become available to all users of the system who can access them. While creating or modifying a consolidated feedback, it is also allowed to modify data elements in the referred local feedbacks. In such a case, the related local feedback must be registered with a new version during the registration of the consolidated feedback. The registration is logged for audit purposes. Non-registered information is only available to the authors.

The registration of the local feedback is notified by email. The destination email addresses of designated organizations are collected automatically for the local feedback according to the accessibility and can not be set manually. For the consolidated feedback the user must specify the priority. The Addressees of the notification are selected by the user manually. In case of consolidated feedback, the list of notified organizations is automatically filtered according to the accessibility of risk information form if the form is in “closed” mode.

Feedbacks of both types are associated to one certain risk information form and they are always owned by one organization. Usually the owning organization is set

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automatically, but in some cases it can be set or changed manually. It is assumed that users of COs submit local feedbacks. Users of NRACs can also submit local feedbacks and assign the ownership to any CO of the same country. And only users of NRACs can submit consolidated feedbacks. The feedbacks of both types are accessible to the owning organization or to a NRAC of the same country. The accessibility of the associated risk information form is also considered. Any data maintenance operation (update, copy, delete, archive, un-archive and open) can only be performed on accessible feedback.

### **Topological data maintenance**

Standard data manipulation facilities, such as insertion and updating are available for user groups, targeted groups, notification groups, users and organizations, i.e. customs offices and national risk analysis centers. The deletion is not available.

After the registration the new version of the topological data becomes accessible to all allowed users. The registration is logged for audit purposes.

The authorization to maintain the topological data is limited to the data of user's own country.

### **Reference data maintenance**

Standard data manipulation facilities, such as insertion and updating are available for the reference data. The deletion is not available.

After the registration the new version of the reference data becomes accessible to all allowed users. The registration is logged for audit purposes.

The country, area and language codes are obtained from an external system.

### **Change management**

It is possible to get the last registered risk information forms and last registered consolidated feedbacks. The list includes all forms or feedbacks, registered within the last n days.

### **Data consultation**

It is possible to make a selection of the complete set of versioned risk information forms, local and consolidated feedbacks, also topological and reference data according to several criteria in any combination. The logical operators AND and OR are available to combine selection criteria. The accessibility of data objects is automatically taken into account during the execution of the selection.

Whenever a query is made, there is an option to save the query selection criteria for later use.

The results of queries, which are presented to the user, are the basis for further operations. User is able to perform other functions such as sort, update, delete or notify in the list of query results.

### **Reporting**

Predefined reports are available on request:

- Report of risk information forms each on a separate chapter;

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- Evaluation Report presenting a synthesis of the Consolidated Feedbacks issued by a specified NRAC;
- Evaluation Report presenting a synthesis of the Consolidated Feedbacks issued for a specified RIF;
- Statistical Report specified year, containing total of risk information forms and total of expected duty and goods value amounts per country, NRACs, UG, TG, risk category etc. also various ratios.

All reports are generated asynchronously. Their output is a PDF file.

The user is able to obtain a printable page for all kinds of data objects.

### **Data Export**

It is possible to export selected risk information forms and consolidated feedbacks. All exports are generated asynchronously. Their output is a CSV file.

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### 2.12.2.2 Domain vocabulary

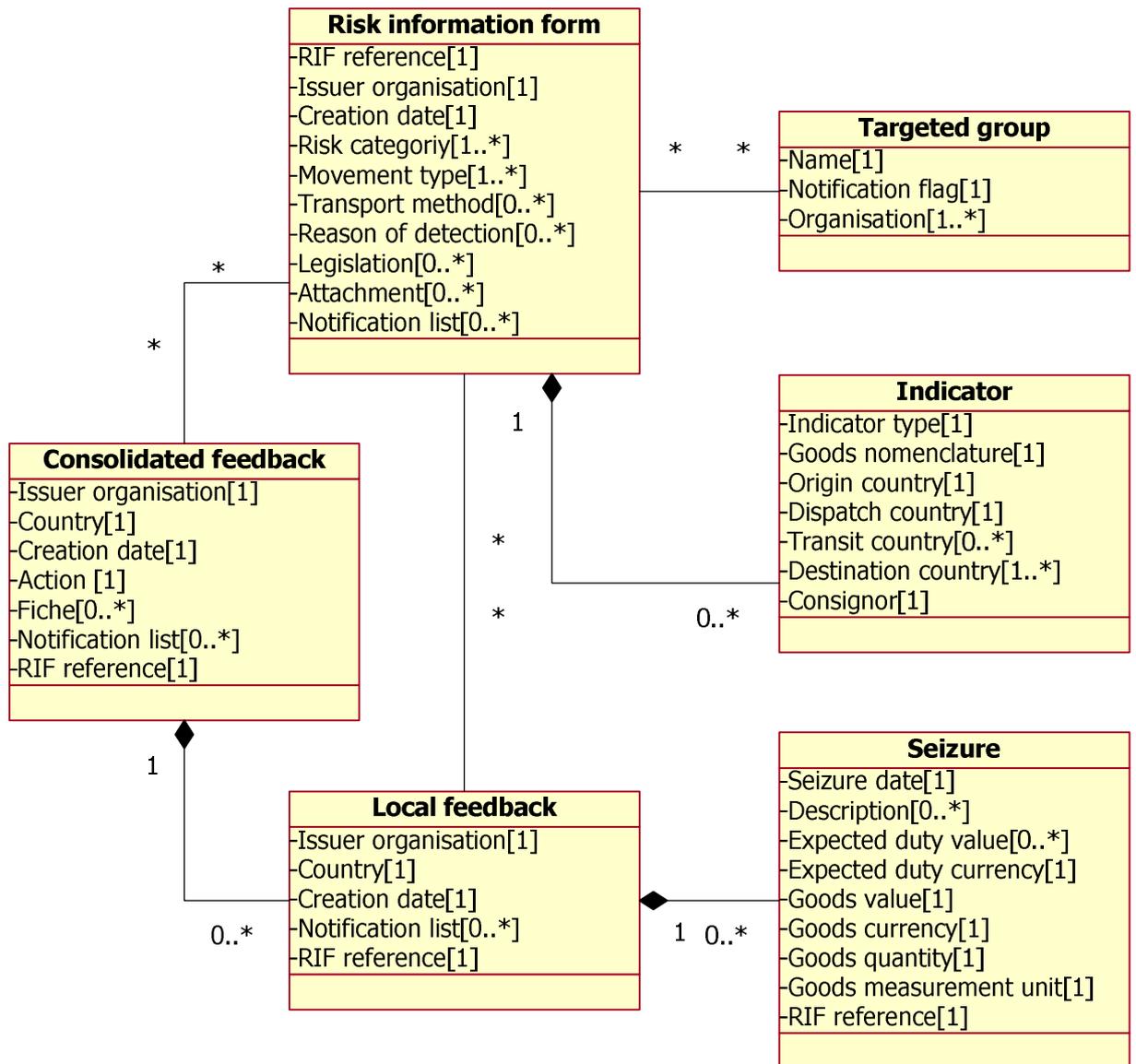


Figure 2-26 RIF domain vocabulary

Major data objects are stored:

- Risk information;
- Local feedback;
- Consolidated feedback;

Main reference data are used:

- Risk categories, i.e. financial, non-financial;
- Movement types, i.e. import, export, transit, transshipment, contraband;
- Reasons for selection/detection, i.e. random, suspect documentation, unusual routing, unknown company, uneconomic transaction;
- Transport methods;

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- Legislations;
- Actions taken, i.e. no action taken, other, national profile, local profile and dissemination of risk information forms.
- Measurement units;
- Monetary units and conversion rates;

Some data objects belong to the so called topological data group and used mostly for the data access management and notifying functions:

- Organizations, i.e. national risk analysis centers (NRACs) and customs offices (COs), including the list of pertaining users;
- Targeted groups (TGs), including the list of members, i.e. pertaining organizations;
- Notification groups (NGs) created for the purpose of notification of new or updated data, including the list of members, i.e. pertaining organizations;
- User groups, i.e. port, airport, land frontier, specific sector e.g. counterfeiting;
- Users.

### **Risk information**

Risk information form contains the risk related information for the concerned parties with regard to goods which could pose a threat to health or safety of citizens and potential irregularities related to customs activities (e.g. misdeclaration, counterfeit goods). Besides the core elements, such as risk category, movement type, transport method a risk information form includes the list of risk indicators. A risk indicator is related to a certain commodity, country of origin, dispatch, transit or destination or consignor.

### **Local feedback**

Authorized users in COs can submit local feedbacks regarding risk information forms. The local feedback has the list of seizures - duties expected to be recovered, quantity and estimated value of the goods.

### **Consolidated feedback**

Authorized users in NRACs (including DG TAXUD) can create consolidated feedbacks.

The consolidated feedback includes information of what kind of action has been taken and is composed of a list of several local feedbacks issued in the same country and evaluating the same risk information form. There can only be one consolidated feedback evaluating a given form per country. The feedback approval imposes to the owner of a consolidated feedback to effectively revalidate the association with a local feedback, each time that a new version of the local feedback is registered

Both feedbacks contain the generic information such as issuing office and certain risk information form reference, as they evaluate only one registered form.

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### 2.12.3 Application perspective

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework](#)

### 2.12.4 Technical perspective

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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## 2.13 SMS

### 2.13.1 Reference and Applicable Documents

Id	Title	Reference	Version
SMS1	Specimen Management System Pre-study Report	ED-SM-Pre-study Report.pdf	1.0.1
SMS2	Specimen Management System Process Model	SMS-TEC-Process Model_1.03.doc	1.03
SMS3	Specimen Management System Data Model	SMS-TEC-Data Model_3.03.doc	3.03

Table 2-13: SMS Reference documents

### 2.13.2 Functional perspective

The issuing bodies of the stamps, seals and certificates in the various countries must provide the Commission with the specimen information. The Commission itself provides the Member States and other co-operating countries with the specimens of stamps, seals and certificates in the context of several administrative co-operation procedures. With these they can perform probes of shipments and documents.

The purpose of the specimen management system is to disseminate specimen information quickly and accurately throughout the Community and its partner countries. Issuing bodies send their data on paper which are handled by the Commission staff, validated and the information are entered into the system. Various information about the specimen such as name, image, validity period, incident reports etc. is stored in the database. Inquiries can be performed on the information according to various criteria, both by the Commission staff and the National Administrations.

#### 2.13.2.1 Use cases view

The set of data maintenance facilities implemented in SMS are the following:

- Specimen maintenance;
- Reference data maintenance.

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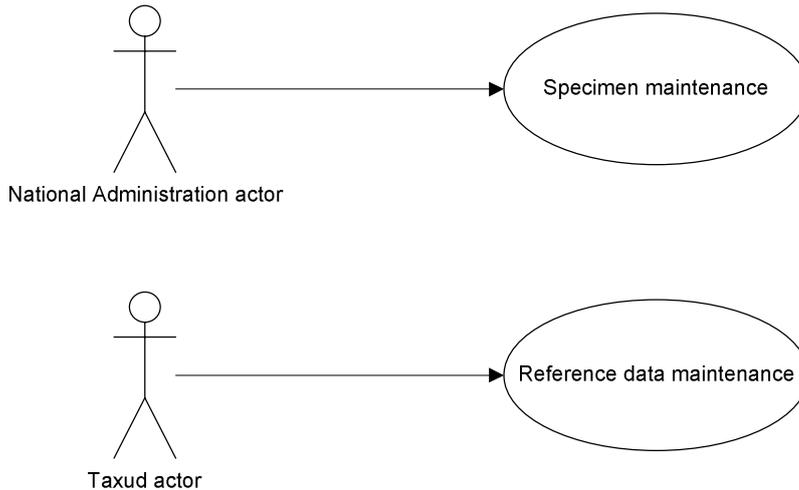


Figure 2-27 SMS use case

### **Specimen maintenance**

The management of SMS data objects can be divided into several different processes:

- Insertion: Creates draft version of the data, which is non-published yet;
- Update: Both draft non-published and published data can be updated, revoked specimen data can not be updated or deleted. In case identifying information can be updated, the fields referring to it are being updated automatically;
- Deletion: Only draft non-published and non-referenced data can be deleted;
- Publication: Makes the draft non-published data available to the public;
- Notifying;
- Printing.

The major data objects can be viewed using the general query facility. All queries defined in SMS are also downloadable.

When the identifying information of an issuing body is updated, all published specimens it has issued are being copied along, including their incidents and possible revocations.

Different validation rules for the specimens of various types are applied during insertion or update processes

### **Reference data maintenance**

Standard data manipulation facilities, such as insertion, updating and deletion are available for the reference data, specific for the system. Publication, notifying and printing functions are applied to few reference data – issuing bodies, origin verification addresses. General reference data as country and language, domains, supported MIME types definitions are out of the scope of the application.

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### 2.13.2.2 Domain vocabulary

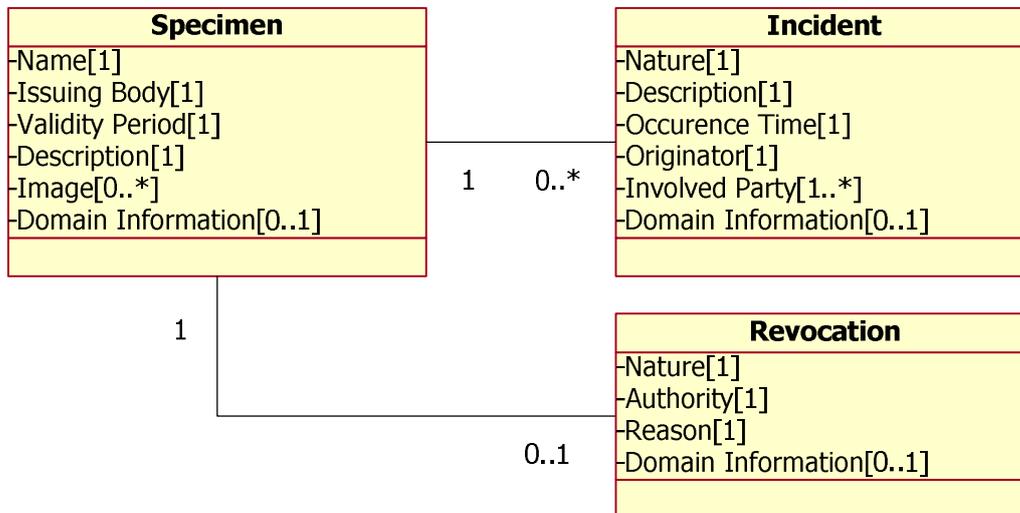


Figure 2-28 SMS domain vocabulary

Major data objects stored are:

- Specimen;
- Revocation;
- Incident.

Main reference data used are:

- Organizations;
- Issuing bodies;
- National administrations;
- Origin verification addresses;
- Administrative Country;
- Proof of Origin Arrangement;
- Pre-authenticated Transit Document Type;
- Transit Specimen Type;
- Transit Stamp Or Seal Usage;
- Incident Nature;
- Transit Stamp Or Seal Incident Nature;
- Pre-authenticated Transit Document Incident Nature;
- Transit Certificate Incident Nature;
- Notification address.

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### **Specimens**

In the context of the application specimens are various official stamps, seals and certificates within the context of the customs procedures. The targeted domains are proof of origin of imported goods, goods in transit, tariff classification and tariff quotas, etc. A specimen is characterized by unique name, validity period, visual examples, description of what the specimen actually is and what it is used for, organization, usually the administration of a country, which issues and delivers a specimen.

### **Incidents**

An incident concerning specimen information can be reported by any partner country. It is an aggregation of an indication of the nature of the incident, the time of occurrence and domain specific information. Besides the originator, who signaled the incident, a number of parties, such as a trader or a transporter, are involved.

### **Revocation**

The specimen information can be invalidated prematurely. The revocation of an incident aggregates the reason, the time of occurrence and specific domain information.

## **2.13.3 Application perspective**

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework](#)

## **2.13.4 Technical perspective**

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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2.14 - Surveillance	ISSUE DATE: 13/01/2009

## 2.14 Surveillance

### 2.14.1 Reference and Applicable Documents

Id	Title	Reference	Version
SRV1	Surveillance2 Requirements	SURV2-REQ_3.02.doc	3.02
SRV2	Surveillance2 Functional Message Exchange Specifications	SURV2-FMES-EN_2.02.doc	2.02

Table 2-14: Surveillance Reference documents

### 2.14.2 Functional perspective

The SURVEILLANCE application enables European Commission to supervise the imports and exports for particular products. The Member States are able to send directly statistical information coming from an import or export transaction after the declaration has been finalized for the goods under surveillance.

#### 2.14.2.1 Use cases view

The system functionality can be divided into several main groups:

- Reference data maintenance;
- Submission of declaration data;
- Ceiling warning;
- Consultation of declaration data;
- Reporting.

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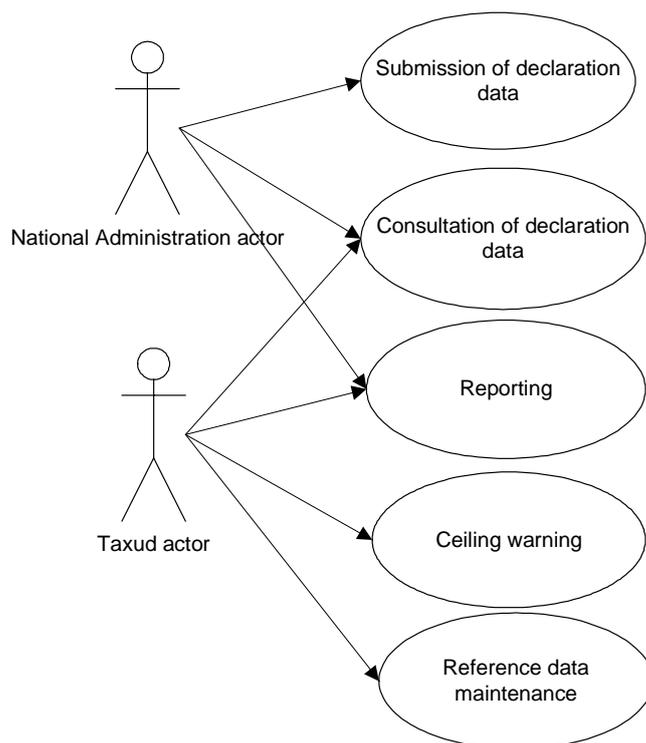


Figure 2-29 Surveillance use case

### **Reference data maintenance**

TAXUD [TARIC](#) section input reference data into the [TARIC](#) database. Member States receive and store reference data sent via the [TARIC](#) interface on a daily basis over CCN/CSI.

The surveillances and commodity thresholds are managed by the facilities of the Surveillance application.

### **Submission of declaration data**

Declaration, in other words single declaration record (SDR) information, is derived from the single administrative document (SAD). The essential statistical data of an import or export declarations are collected from the declaration processing systems of the Member states. The declaration can be included only after the transaction has been finalized and the declaration is accepted.

Member States transfer a message containing declaration data as frequently as possible, usually once a day. Declaration data is based on the reference data and is submitted in the correct format in accordance with the agreed specifications and content. This submission can consist of different inserts, updates and deletes of SDRs.

The DG TAXUD Surveillance application validates declaration data replies with an acknowledgement message. In the case that all the declarations within the message are processed successfully, the Member State receives a positive acknowledgement. When errors are detected, a negative acknowledgement is sent. In that case the response message contains a record representing each defective item and error description.

All submissions of declaration data to DG TAXUD will be made in several ways:

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- Declaration processing system automatically selects all new eligible declarations and send them in a single message via the system-to-system interface over CCN network; users can schedule tasks and monitor the status of batch upload;
- The customs officer uploads the data file in XML format through the web interface;
- The customs officer inserts a new declaration, also can update or delete declaration submitted in the past manually through the web interface.

### **Ceiling warning**

A ceiling is based on the declarations sent by the Member States. When a ceiling measure has reached its prescribed ceiling volume the Commission sends a ceiling warning notification to all Member States. Member States receive, interpret and accept a ceiling notification message and act upon it. This ceiling warning notification message will be sent through the [TARIC](#) interface.

### **Consultation of declaration data**

Through the web interface Member States can consult detailed and consolidated declaration information.

### **Reporting**

Member States have access to their own data and can also view a consolidated statistical data at the product, individual Member State and Community levels.

The result sets are accessible by means of the screen, reports of a predefined format and in a downloadable electronic format.

Taxud users have privileges to view and also to define new reports.

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### 2.14.2.2 Domain vocabulary

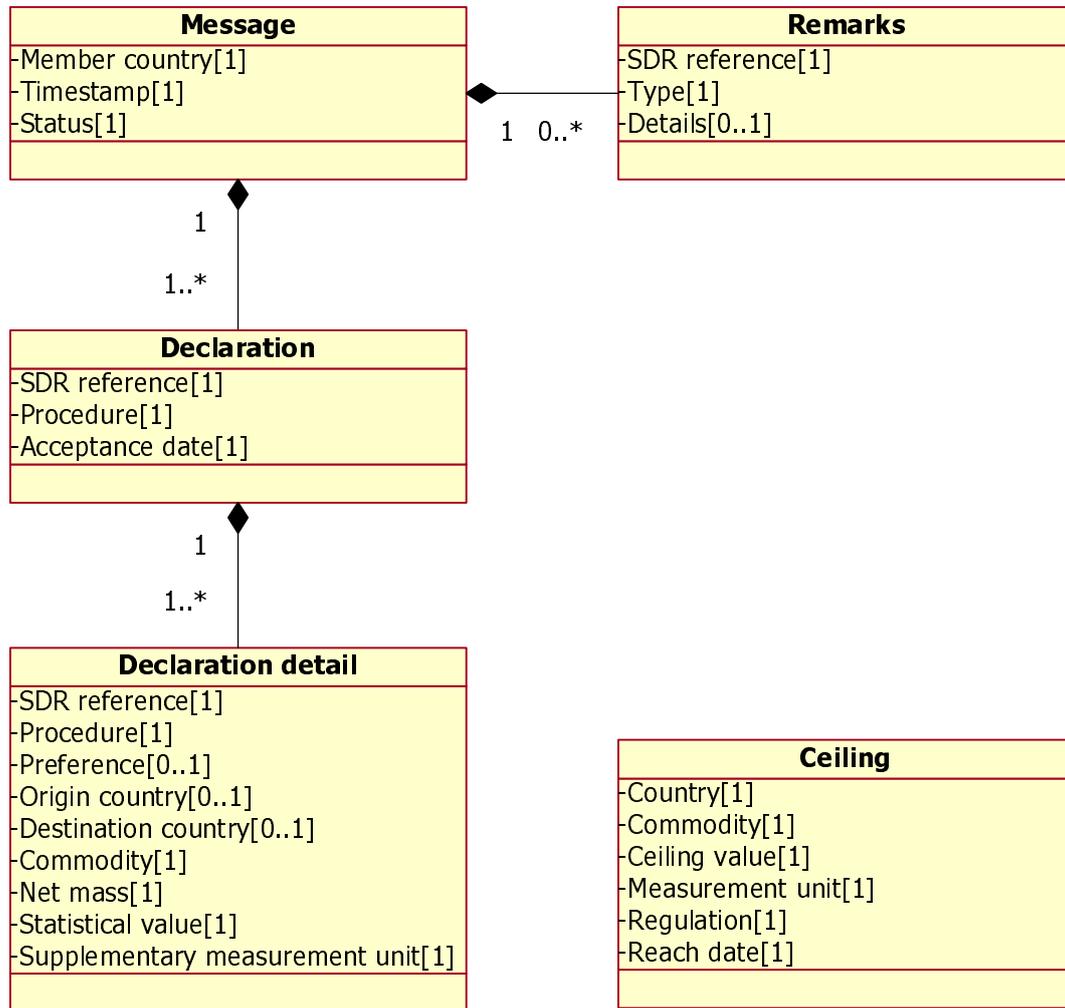


Figure 2-30 Surveillance domain vocabulary

Major data objects maintained by this application are:

- Message;
- Declaration;
- Ceiling.

Main reference data used are:

- Country;
- Commodity;
- Procedure;
- Preference;
- Measurement unit.

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### Message

Each message is composed of a list of declaration and contains information that shows when and which Member State sent the SDRs. This information is needed to identify the transaction when the acknowledgement message is sent. The status information indicates whether a message was processed successfully or not, and if not for which reason. In this last case list of errors contains the SDR references of the SDRs that did not get processed successfully, the type and a description of errors.

### Declaration

One declaration can produce only one information record to be sent to DG TAXUD. Each declaration is associated with a unique identifier within the Member State. Single Declaration Record (SDR) is a document that represents an import or an export for a particular product. It is used to declare only one import or one export procedure.

SDR details represent the list of declaration items and include the essential data, such as commodity code from goods nomenclature, country of origin, mass, value etc. The Member States not belonging to the euro-zone send the declaration data using their national currency unit. The system takes care of the conversion to EUR.

### Ceiling

A ceiling is based on the declarations sent by the Member States. A ceiling data contain a list of commodities and countries and the prescribed ceiling volume. The ceiling message includes the date when a ceiling measure of a certain commodity has reached the prescribed volume in a certain country.

## **2.14.3 Application perspective**

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework](#)

## **2.14.4 Technical perspective**

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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## 2.15 Suspensions

### 2.15.1 Reference and Applicable Documents

Id	Title	Reference	Version
SUSP1	Suspensions Functional Specifications	SUSP-FS_1.25.doc	1.25
SUSP2	Suspensions Data Model	SUSP-TEC-Data Model.doc	
SUSP3	User Guide for the Suspensions Application	SUS-STRA-USG01-EN0.20.doc	0.20

Table 2-15: Suspensions Reference documents

### 2.15.2 Functional perspective

The Suspensions system supports the legislative work for regulations covering the suspensions of autonomous tariff duties and quotas for certain products. The Suspensions system facilitates the management and consultation of suspensions and provides a tool for the publication of the suspension regulation in the official journal. It also generates working documents, which are discussed with Members States administrations during the preparation of such a regulation.

#### 2.15.2.1 Use cases view

The system functionality can be divided into several main groups or subsystems:

- Reference data maintenance;
- Dossier maintenance;
- Measure maintenance;
- Legislation maintenance and publication;
- Mass updates;
- Reporting;
- Interfaces.

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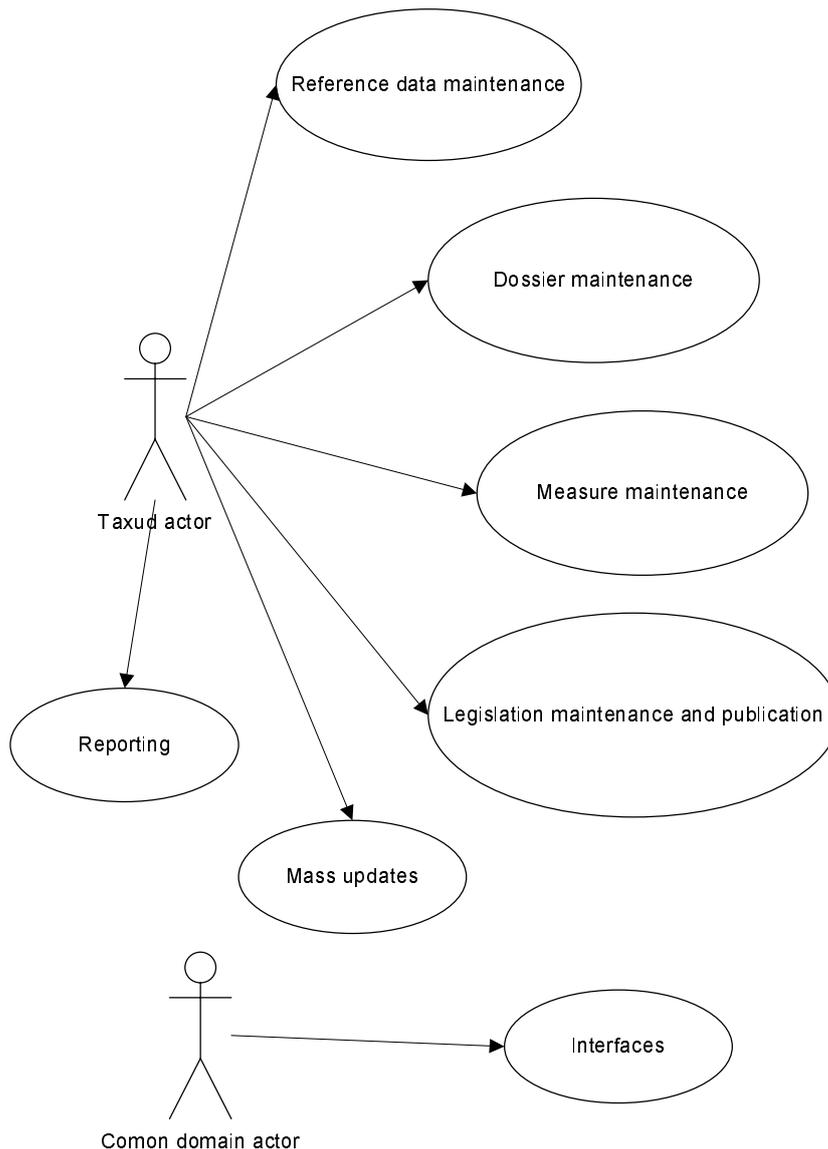


Figure 2-31 Suspensions use case

### **Reference data maintenance**

Reference data objects are maintained within the application. Only insertion and consulting functions are available for the most of reference data. Countries and languages can also be updated.

### **Dossier maintenance**

Standard data manipulation facilities, such as insertion, updating and deleting are available for the dossier. The information is versioned; the new version is stored and is made public through registering it. The dossiers can be selected according to any set of available criteria. The list of corresponding dossiers is presented.

Beyond standard insertion, the new dossier can be created using special functions, such as copy, merge and split.

When a dossier is created as a copy of an existing dossier, the last measure version of the latest related regulation is copied at the same time. All other attributes of the

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original dossier are duplicated. No matter what way the new dossier is created, the status of it is always set to “active”.

Two or more dossiers can be merged into a new single dossier. A related measure is created at the same time. The multiple attributes of the new dossier and new related measure, such as attachments or product [TARIC](#) codes, are the concatenation of corresponding attributes of the merged dossiers. Duplicates values are being filtered out.

A dossier can be split into two or more dossiers. A copy of the last measure version of the last regulation related to the original dossier is created to each of the new dossiers, and to the same regulation as the original measure. All other attributes of the original dossier are duplicated. After merging the split dossier becomes closed.

The merge and split of dossiers can be undone. A dossier resulting from a merge can be unmerged and is set to active again. Also dossiers resulting from a split can be removed and split dossier can be unsplit.

There are some functions and restrictions related to the state of dossiers and related measures and regulations. For example both the dossiers to be merged and the dossier to be split must be active in the beginning; after merging or splitting the initial dossiers become closed. A dossier can only be deleted if there is exactly one measure related to it and if the regulation to which this measure is related is not published. A closed dossier cannot have any further version. Using special function the selected closed dossier can be reopened and its status in that case is set to active.

### **Measure maintenance**

Standard data manipulation facilities, such as insertion, updating and deleting are available for the measure. The information is versioned; the new version is stored and is made public through registering it. The measures can be selected according to any set of available criteria. The list of corresponding measures is presented.

During insertion of measure the related dossier and regulation, at least one country with a partner position and at least one product [TARIC](#) code must be specified. The type of the measure, i.e. suspension or quota is automatically selected correspondingly to the measure type of the related regulation domain. Depending on the measure type, the quota or suspension information should be entered.

Beyond standard insertion, the new dossier can be created using special functions, such as duplicate or copy. When a new measure is doubled, the newly created measure is related to the same regulation. When a measure is created as a copy of an existing measure, the regulation distinct from the regulation related to the original measure, should be selected manually. All other attributes of the original measure are duplicated in both cases. No matter what way the new measure is created, the status of it is always set to “under examination”.

The availability of update of a measure in general depends on its status and on the relationship to the pair of dossier and regulation. The measure status attribute itself can be updated. The relationship of the measure to a regulation can also be changed. The new related regulation should not necessarily be associated to the same measure type. In that case quota is converted into a suspension, or vice versa.

### **Legislation maintenance and publication**

Standard data manipulation facilities, such as insertion and updating are available for the regulation domain, and all types of legislation – base regulation, modification

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regulation and corrigenda, also for the publication cycles and meetings. Deletion is not available. The information is versioned; the new version is stored and is made public through registering it. The regulations can be selected according to any set of available criteria. The list of corresponding regulations is presented.

When inserting a base regulation the legislation, regulation domain should be selected also validity period should be set. If there is a regulation annex, a master language that will apply to all multilingual texts, must be specified. When inserting a modification regulation the regulation to be modified should be selected amongst all base regulations of the legislation.

Beyond standard insertion, the new regulation can be created as a copy of an existing regulation.

A regulation can be published only if all of the "relevant" elements are ready according to the set of validation rules.

A regulation is published, when it is selected for the publication cycle. Once set, the relationship between a publication cycle and a regulation cannot be changed or unset. However, nothing prevents the regulation from becoming published after the relationship has been set.

During publication cycle several meetings can be registered. When inserting a meeting the related publication cycle and the meeting date must be specified.

### **Mass updates**

Several mass update facilities are available in the system.

The measure versions related to a source regulation can be copied and related to a target regulation. The copying is available when the set of certain rules related to the measure status are satisfied.

The selected measures can be duplicated amongst the measures for the same pair (specified regulation, dossier).

A sequence of working numbers can be generated and attributed to the set of all "under examination" measure versions of all non-published regulations related to a specified publication cycle.

Text fragments with an unset text attribute are created for the specified fragment language, and related to all internationalized text attributes (i.e. multilingual texts and footnotes) of all entities where a text fragment for this language does not exist.

Textual descriptions in a specified language can be imported from [TARIC](#) based on the [CN](#) codes associated with the measure.

### **Reporting**

These functions are asynchronous. It should be specified whether the control report is output to file or printer.

The set of information quality control facilities are available. The results are presented in the control reports.

- The product [TARIC](#) codes of the measure versions of a specified legislation can be checked vs. the [TARIC](#) database.

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- The product [TARIC](#) codes of the measure versions of a specified legislation can be checked for duplicates.
- The product [TARIC](#) codes of the measure versions of a specified legislation can be checked for pure [CN](#) codes.
- The measure statuses of the measure versions of a specified legislation can be checked for consistency.
- The textual descriptions of the measure versions of a specified legislation can be checked for completeness of the translations.

The set of information analyzing facilities are available. The results are presented in the information reports.

- Meeting fiches including dossier, regulation identifiers, lists of [TARIC](#) code, partner positions and other relevant information, are printed in the meeting report for a set of measure versions of the non-published regulations related to the specified publication cycle.
- A regulation report is produced for a regulation only if this regulation has a regulation annex. The annexes of a regulation for autonomous suspensions or for autonomous quotas can be generated and printed in a report for measures. This function applies to a regulation belonging to a regulation domain with a measure type indicator set to “suspensions” or “quotas” respectively.
- The product [TARIC](#) codes of measure versions related to a specified regulation can be output in ascending order in a [TARIC](#) codes report.
- A table with information from measure versions related to a specified regulation is output in a duty rates report.
- A publication cycle summary report is generated for a specified publication cycle with the following consolidated information: number of suspensions and quotas related to the regulations of the publication cycle per measure status and total for the regulation, also the loss of duties from ms and Eurostat related to the regulations of the publication cycle.

### **Interfaces**

The interfaces with [TARIC](#), [DDS](#), also Secretariat-General and OPOCE are implemented. These functions are asynchronous.

Product [TARIC](#) codes and text fragments of the textual descriptions of measure versions of the specified regulation can be output to a [TARIC](#) input bridge file. The text mark-ups are converted into the [TARIC](#) equivalent elements (if available). The character sequences that are not allowed in [TARIC](#) are also converted to valid ones. When [TARIC](#) input bridge files are generated, a human-readable report about the updates is produced as well.

Public attributes of measure versions related to regulations of the specified publication cycle can be output to a file to be imported into [DDS](#). This file also contains the cycle identifier. The measure version subtype (suspension or quota), the working number, the measure status the [TARIC](#) code and other relevant information are included.

The interface with the secretariat-general and OPOCE is implemented by the report facilities: a regulation report for autonomous suspensions and for quotas. The

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information for the secretariat-general is output in Legiswrite format. The information for the OPOCE is output in both Formex v4 and PDF formats.

### 2.15.2.2 Domain vocabulary

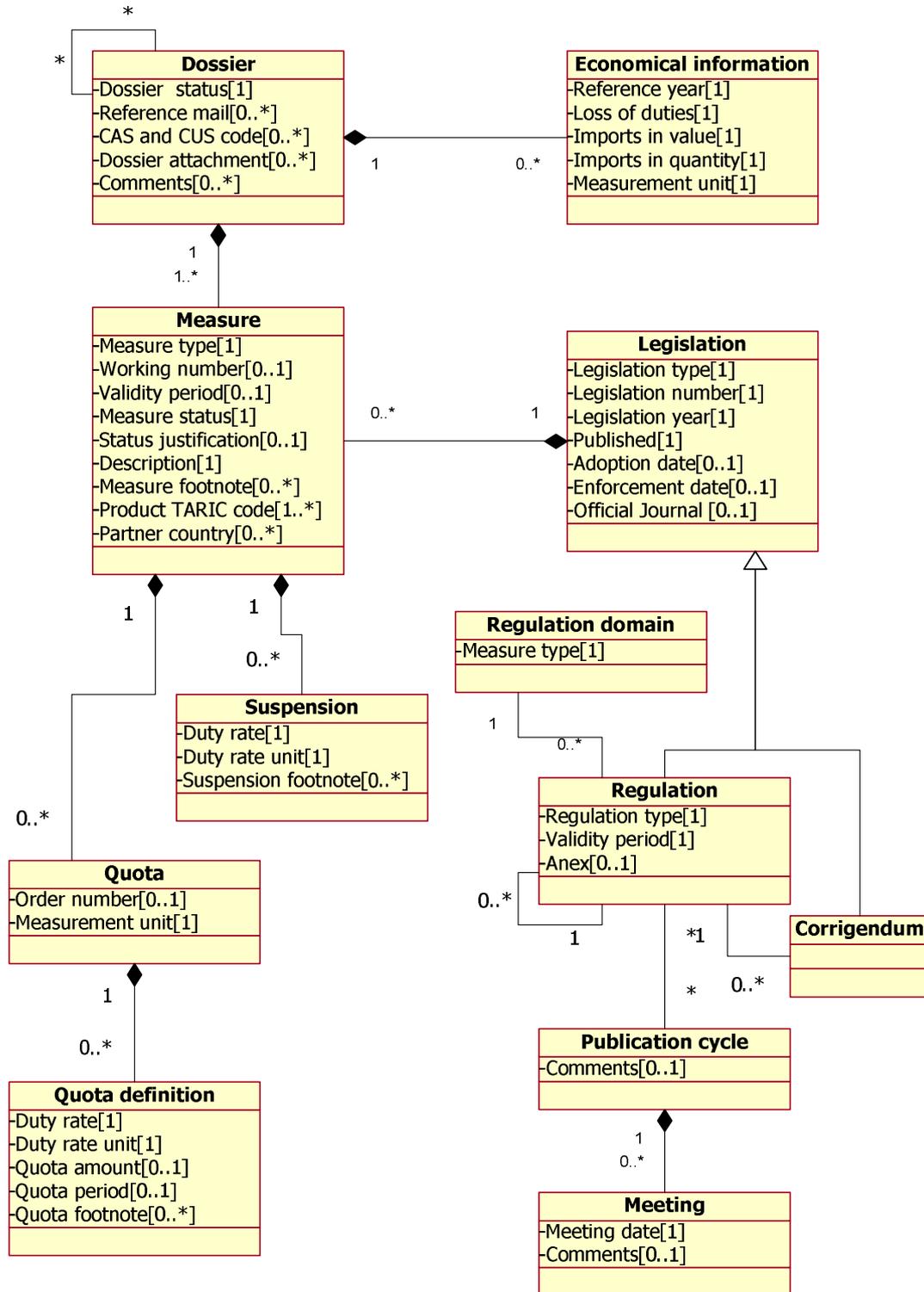


Figure 2-32 Suspensions domain vocabulary

Major data objects maintained by the system are:

- Dossier;

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- Measure;
- Legislation.

Main reference data used are:

- Country;
- Language;
- Duty unit;
- Status justification;
- Measurement unit;

### **Dossier**

Dossier is one of the core objects of the Suspensions system. A value of the measure type attribute can be either “suspension” or “quota”. The measure type attribute indicates whether the dossier stores the suspension or quota information. It contains available economical information, such as the loss of duties, imports in value and quantity both from Members States and Eurostat, attached documents, reference mail and comments of different confidentiality level. Dossiers can be merged or split and the relationship between the pertained dossiers tells which one was absorbed and which one was derived. The dossier can obtain status “active” or “closed” status.

### **Measure**

The type of measure can be a suspension of autonomous tariff duties or quota for certain product. The measures are created in the context of a dossier and published in legislations. Measures are related to the set of products, defined by a [TARIC](#) code and partner countries, including their positions regarding the measure. The partner position is confidential and can be applicant, co-applicant, opposed, reserved or withdrawn. There are no restrictions on the number or nature of the partner positions by a single country. Measures can obtain certain status; they can be applicable, under examination, accepted, deleted, rejected, merged, split or transferred. The measure can obtain status “under examination”, “applicable”, “accepted”, “deleted”, “rejected”, “merged”, “split” or “transferred” status.

### **Legislation**

The measures are announced via including them into the legislation. The legislation can be the regulation or corrigendum. The regulation is being prepared for publication during publication cycle. Some meetings can be held in order to discuss the regulation and included measures.

## **2.15.3 Application perspective**

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

The application uses related high-level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

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[Tariff Applications Architecture Framework](#)

#### **2.15.4 Technical perspective**

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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2.16 - TQS	ISSUE DATE: 13/01/2009

## 2.16 TQS

### 2.16.1 Reference and Applicable Documents

Id	Title	Reference	Version
TQS1	Movement Verification System - System Requirement Definition	TQS-FS-001	2.00
TQS2	Customs Community Code: Implementing Provisions	CUSTOMS COMMUNITY CODE: IMPLEMENTING PROVISIONS - REG2454/93	

Table 2-16: TQS Reference documents

### 2.16.2 Functional perspective

According to Article 20 of the Community Customs Code, established by the REG2454/93 regulation, the Customs Tariff of the EC includes conventional and autonomous preferential tariff measures and autonomous suspensive measures. These measures take the form of customs duty reductions or exemptions on release for free circulation. Some of these measures are limited by quantity, in the form of tariff quotas or tariff ceilings. TQS application focuses on tariff quotas.

The tariff quotas are always defined in terms of:

- A defined product or category of goods;
- A limited period of time - in other words, they always have an opening date and a closing date;
- A given origin, that can be either a country or a group of countries or a territory, defined as the "beneficiary" of the preferential arrangement;
- A volume or amount fixing the maximum quantity that can be imported using the preferential arrangement;
- A preferential rate of customs duty that can be claimed. The rate can be viewed as a function of the first four parameters.

Tariff quota therefore establishes a special rate of customs duty that can be claimed by an importer for a given product.

As the benefit of these measures is not automatic, it is granted only to importers submitting a request for the benefit of it in their customs declaration, supported, in the case of preferential measures, by valid evidence of origin. In some cases, the eligible origin is not restricted to a single country, or to a specific customs area (e.g. Mediterranean countries), and the measure applies to imports coming from any country outside the EU.

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These requests are normally presented on a standard form, called the *Single Administrative Document (SAD)*, used as customs declaration for release for free circulation of the imported goods. If the preferential tariff measure in question is confined to a particular country, it is necessary for the importer to prove that the country declared as origin in the submitted SAD is really the origin of the importation and that the relevant rules of origin are respected. To do this, the importer must provide to the customs office a *duly authenticated certification of origin* issued by a governmental authorised authority in the beneficiary country and supplied to the EU importer by the foreign exporter.

The application of a tariff quota is strictly confined to a certain volume of imports for a defined period and origin, including all third countries as a single group. Preferential benefit cannot be granted beyond this tariff quota volume or outside the application period. The whole process is thus very strict for the importers, who cannot be sure in advance, whether or not they will be granted the preferential benefit.

All tariff quotas also carry a "critical" status, according to which Member States may waive the general requirement to lodge security for duty whilst the answer to a drawing request is still awaited. This status is determined by reference to past performance of the tariff quota in question, its validity period and the balance compared with the quota volume.

The main aspect of the quota management, without taking into account the definition of the quota itself, is therefore, firstly, to receive and validate requests coming from EU importers via their national customs administration. Secondly, to answer to them according to the current balance of the tariff quota at Community level. Finally, it must provide whenever necessary means to produce statistics and reports based on various parameters.

DG TAXUD also has to require Member States to return to the Community balances, for possible further use, any quantities wrongly drawn and to allow the initial volume to be increased during the validity period if so required by legal act.

Here is a short description of the global process of the tariff quota management in the form of an example:

An EU importer of an amount of goods for which a Community tariff quota exists, can claim the benefit of the associated preferential rate of duty. To do so, he must claim this benefit on the *customs declaration for release for free circulation* which he submits to the customs office where the goods enter the Community. The claim is accepted if this declaration is submitted to the customs within the validity period of the tariff quota and if the origin of the goods is a country eligible for that tariff quota. This accepted request is forwarded to DG TAXUD through the central customs administration of the Member State of that customs office. Upon the reception of the drawing request, DG TAXUD must provide an answer to the originator Member State customs administration, on the basis of the balance of usage of the tariff quota. The possible answers are:

- the benefit is fully granted,
- it is partially granted or
- it is rejected.

Then the relevant administration will apply this decision for the importer's request.

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The processing of the importers' drawing requests is the responsibility of DG TAXUD as part of the tariff quota management. Consequently the TMG performs every working day an allocation operation, in which all the drawing requests received from the Member State customs administrations are answered and the resulting decisions are immediately sent to the originator administrations.

The basic mechanism for the allocation of the drawing request is the following:

At the opening of a tariff quota, the quota balance is the volume defined in the measure. Each time an amount is drawn from the tariff quota (allocated to an importer), the balance of this tariff quota is decreased by this amount. When the drawing requests are processed by DG TAXUD, they are accepted as long as this balance is positive. When it becomes zero, the tariff quota is said to be *exhausted* and all subsequent drawing requests will be refused. In other words, the full benefit will be granted to the claiming importers as long as the total imported amount, cumulated at the Community level, does not reach the maximum volume defined for the tariff quota. Each day, DG TAXUD manages the drawing requests according to this principle. In each successive allocation operation, the drawing requests are processed on a first-come first-served basis in a chronological order of dates of acceptance of customs declarations for release for free circulation. When the balance is insufficient to fully satisfy all requests having the same priority in a given allocation, the balance is shared *pro rata* between each of these requests.

Besides distributing the answer to the respective originator administration of each processed drawing request, DG TAXUD also makes regular reports on the evolution of the tariff quota balances, to interested Member State administrations and Commission services. Among the main reports supported, there are the allocation report and the report of the current status of the tariff quotas in force. Both are made after each allocation operation and present the evolution of all tariff quotas affected by the performed allocation. The report of the current status of the tariff quotas presents the balances of all currently open tariff quotas.

A further section of the allocation report draws the attention of the MSA to significant events, such as the opening, re-opening, blocking or exhaustion of particular tariff quotas. Where a quota is re-opened, the MSA are invited to present new requests; where one is exhausted, the MSA are asked to stop sending further requests.

DG TAXUD is responsible for distributing the following information to the MS Customs Administrations:

- Acknowledgement of the receipt of drawing requests and returns. This includes either a confirmation of the correctness of the requests or a list of formatting and validation errors detected.
- Results of the allocation procedure applied to the drawing requests and returns received.
- Information on the new balance of all treated tariff quotas during the last allocation.

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- Messages regarding the status of different quotas. This includes information regarding critical status, exhaustions, blocking of quotas, re-openings, new definitions of tariff quotas and other related issues.

### 2.16.2.1 Domain vocabulary

#### Regulated Goods or Order Number

Preferential tariff measures apply on goods. The first core data element consists of the definition of goods subject to preferential tariff measures. This is also referred as 'Order Number' definition.

A regulated goods is composed of one 'Order Number'. The other data element is a list of 'Regulation Period'. Basically, eligibility for preferential rate of customs duty is always subject to regulation. Such regulation establishes the quotas and their preferential rates that can be attributed to goods. To simplify reference to the complete category of goods that is subject to preferential rate, those are classified using a short code named 'Order Number'.

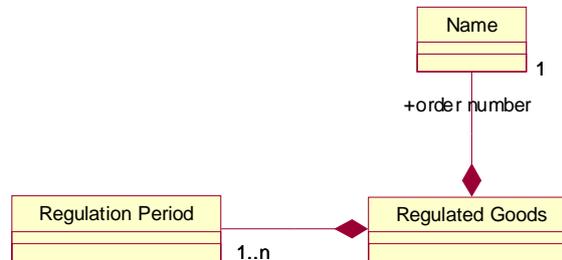


Figure 2-33 TQS Regulated Goods

#### Regulation period

A regulation period defines the period during which a regulation applies. It extends a period with a regulation number, the description of the applicable goods during that period and a list of nomenclature item used to classify the goods.

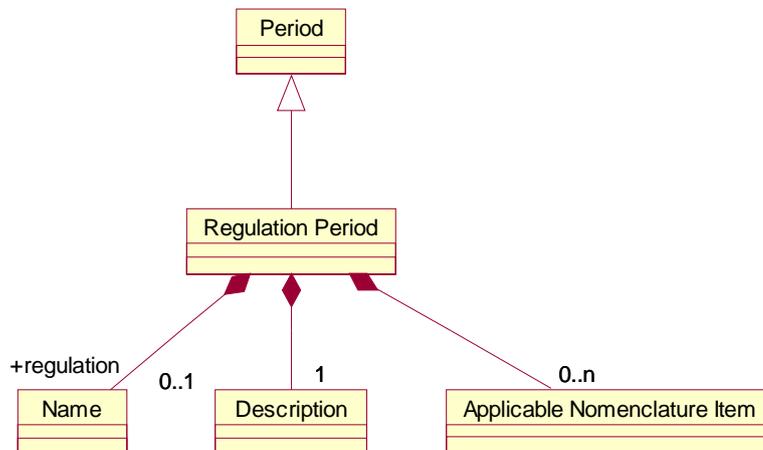


Figure 2-34 TQS Regulation period

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An applicable nomenclature item element is composed of a code and of a period providing the period during which this code can be used to classify the goods within this regulation.

During the period of application of a regulation, this last one generally provides a list of nomenclature codes. Such goods nomenclature is established via different official systems described later on.

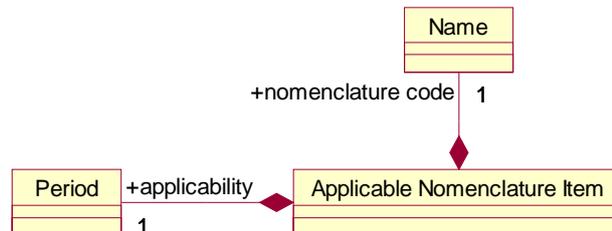


Figure 2-35 TQS Regulation period 2

### Quota

A quota is always defined for a given origin, which can be a country, group of countries or sub-region of country. The quota has also a given period of validity during which the importer may use it to claim eligibility for a preferential duty rate. It has also a quantity defining the maximum amount that can be imported within the EU using the preferential duty rate. A ‘critical state’ attribute provides additional information to Member State Administrations (MSA) to refine handling of incoming drawing requests.

A quota is also composed of a list of possible blocking periods. Such a period prevents the processing of drawings, applying on the quota, during a given time. This period is mainly used to allow propagation of a modification of the quota to MSAs and to allow them to react accordingly (e.g.: modification of critical state of the quota). Note that drawing requests must still be accepted by the system during such period.

Another element of quota definition is a list of suspension periods. These ones are more restrictive and prevent the system to accept drawing requests issued during the specified periods.

Finally, a quota contains a management information element. This element provides additional information used during the lifecycle of the quota concentrated mainly on credibility thresholds.

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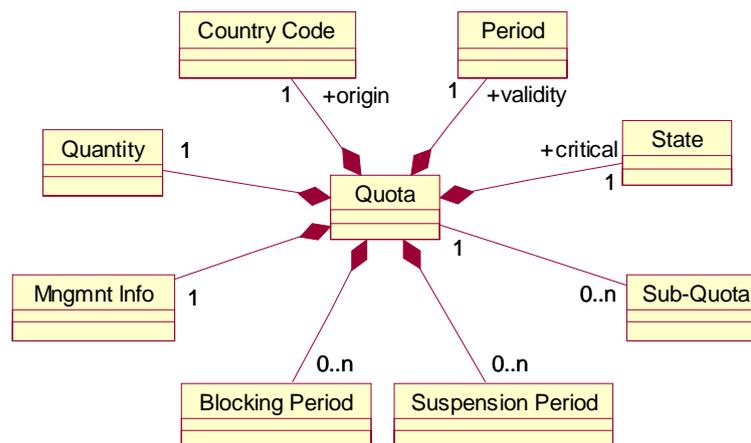


Figure 2-36 TQS Quota

A regulated goods definition (referred by its order number) can be used to produce multiple quota definitions. A quota is always associated with only one regulated goods definition.

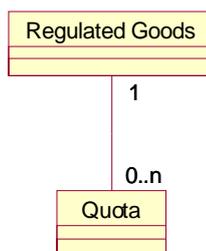


Figure 2-37 TQS Quota 2

### Sub-quota

A sub-quota is a quota that is defined in the framework of another quota to refine or to restrict its utilisation in some circumstances.

Parameters that can be used to refine a quota can be:

- Origin. When a main quota is defined for a group of countries, sub-quota may restrict the quota for a given country part of this group (e.g. a quota defined for product coming from Mediterranean countries may receive another preferential rate if the product comes from Morocco);
- Period. When a quota covers a large period of time, sub-quota may restrict the quota during part of this period (e.g. a quota defined for a year may receive another duty rate during summer);
- Goods. A quota may be defined to cover a large category of goods; sub-quota may put a restriction for a sub-set of such goods (e.g. a quota defined for orange juice may be restricted for bottles of orange juice having a content lower than 2 litres).

Based on one or multiple of those parameters, sub-quota can be defined.

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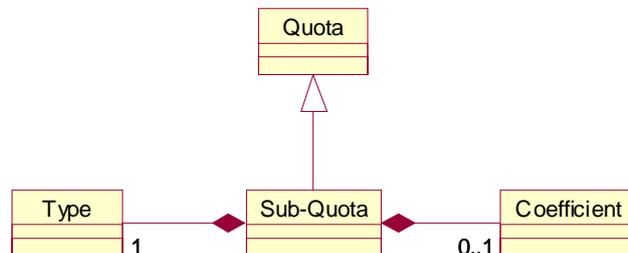


Figure 2-38 TQS Sub-quota

### Requests, Results and Events

A quota element is also associated with some other elements. First it can be linked to a list of drawing request elements. It can also be linked to a list of return request elements. Finally a list of Event elements is also associated with the quota definition.

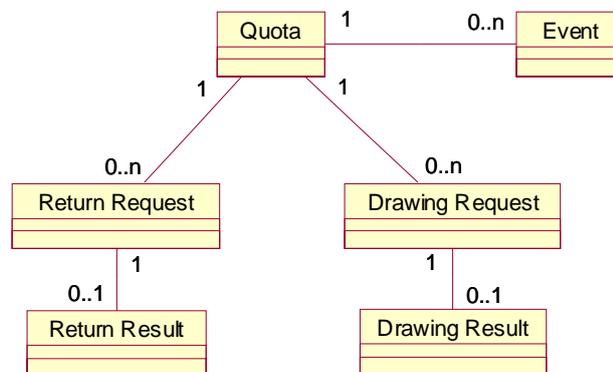


Figure 2-39 TQS Request, Result and Event

To claim eligibility for reduced duty rate, the importer has to produce a customs declaration to the Member State Administration. From that customs declaration, the MSA can extract information that is mandatory to define its attribution to a specific quota. This information is submitted to the system via structured request. Note that it is up to the MSA to decide if a request represents a specific customs declaration or an aggregate of all customs declarations received for a given quota at a given date. To keep track of requests applied on a quota and to be able to perform statistical queries and to generate reports, all those requests have to be kept within the system. An additional element describes the result associated with the request.

Whenever MSA found that a drawing request has been applied erroneously, it must be able to notify the system of such error. This allows the wrongly attributed amount to be made available again for other drawing requests issued by other importers.

In essence a quota evolves over time. This can take place at two levels:

- Definition level: one of the elements defining the quota is modified (i.e. volume is increased);

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- MSA Interaction level: drawing/return requests are received and modify the balance of the quota.

Those two levels of evolution may interact together, making it more difficult to re-compute at any time specific information such as “when was the quota reopened?” or “what was the balance of the quota one month ago?”

It is important to clearly define the terms *balance* and *imported amount*. The term *balance* refers to the global balance; meaning that if the quota has sub-quotas, its balance also reflects importation performed on those sub-quotas; on the other hand, the balance of the sub-quotas is always adjusted to never exceed the one of the main quota. The *imported amount* is defined as the sum of drawing amounts for the quota in question, taking into account all possible sub-quotas’ drawing amounts.

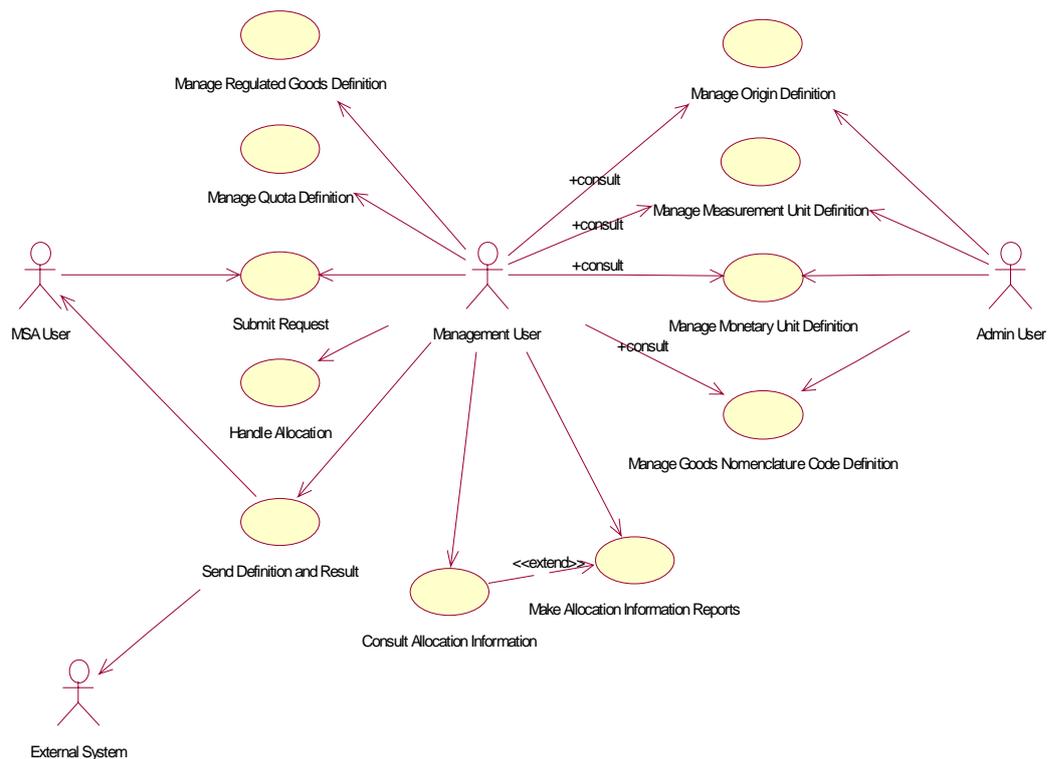
The Event element is used to summarise major events applying on quota. The possible types are:

- Total imported amount reached critical threshold;
- Quota blocked;
- Quota unblocked;
- Quota suspended;
- Quota unsuspending;
- Quota exhausted;
- Quota reopened (it may be useful to use another specific type specifying a reopen due to a large amount of return);
- Quota quantity modified;
- Allocation performed;
- Allocation performed only on sub-quota(s) (balance modified).

### 2.16.2.2 Use cases view

The TQS functionality can be summarised by the following business-level use cases:

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Major part of these use cases includes standard Insert/Update/Delete/Consult operations. Beneath are described only the complex ones, performing non-trivial operations.

### **Handle allocation**

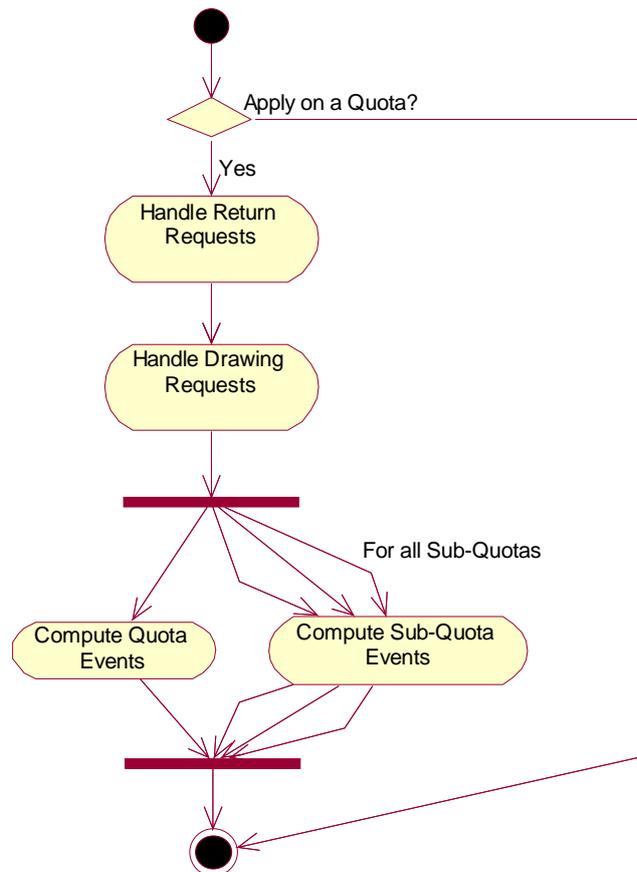
The allocation procedure is the real core business functionality of the quota application. The procedure itself is subject to official regulation [TQS2].

It consists of the analysis of all valid drawing requests coming from Member States Administration for each involved quota. Based on this analysis the procedure decides to allocate the requested amount, to only allocate a computed percentage of it or to postpone the allocation.

Another important aspect added to the allocation procedure is the handling of return requests. Note that the processing of those returns is not directly part of the procedure definition itself in the sense that they are not subject to an allocation. Moreover returns have to be treated as soon as possible and therefore can in theory be handled when they are received and validated by the system. On the other hand the only direct impact of such returns is during the allocation procedure or during the notification to the Member States of the new quota state. Assuming the notification is always sent after an allocation, handling of the returns during the allocation has no real functional impact. The positive aspect is to unify the way drawings and returns are handled.

The allocation procedure can be illustrated in the following way:

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### **Send Definition and Result**

Allocation results consists of:

- The list of drawing results, generated at a specified date by the allocation procedure, associated with requests emitted by the correspondents;
- The list of quotas balances that has been modified during the allocation procedure at specified date.

### **Consult Allocation Information & Make Reports**

First aspect of this use case is the consultation of drawing and return requests and associated results. The second aspect is the consultation of quota events. And the last aspect is consultation of some statistics. Statistics can be retrieved at three levels: Member State, Quota and Allocation date.

This includes:

- Number of quotas opened retroactively (created with a start date of validity in the past);
- Number of re-openings of exhausted quota;
- Number of re-openings of exhausted quota by more than 10%;
- Number of quotas with more than one reopening.

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### 2.16.3 Application perspective

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follows what is defined by the architecture.

The application uses related high -level functions provided by the framework such as retrieving and processing transactions, messages, the synchronous and asynchronous access, exceptions management, version, reporting, security, user management and administrative functions, backups and restores, archiving mechanisms, application state and function monitoring.

[Tariff Applications Architecture Framework](#)

### 2.16.4 Technical perspective

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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## 2.17 TARIC

### 2.17.1 Reference and Applicable Documents

<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
TAR1	Taric Release Notes	TAR-RNO-001-TARIC2_Release_4.0.4.doc	4.0.4
TAR2	Taric3 feasibility study	Taric3 – Feasibility study.doc	1.02
TAR3	TARIC 2 DFS Introduction	INTRO.DOC	3.0
TAR4	TARIC 2 DFS Logical data analysis	LOGDTANA.DOC	3.0
TAR5	TARIC 2 DFS Unstable data processing	STABLE.DOC	5.0
TAR6	TARIC 2 DFS General system functions	GENSYSFN.DOC	6.0
TAR7	TARIC 2 DFS On-line data capture	ONLINDC.DOC	8.03
TAR8	TARIC 2 DFS On-line inquiry	ONLINENQ.DOC	8.00
TAR9	TARIC 2 DFS Control reports	CONTREP.DOC	7.0
TAR10	TARIC 2 DFS Information reports	INFREP.DOC	7.1
TAR11	TARIC 2 DFS Management reports	MANREP.DOC	3.0
TAR12	TARIC 2 DFS Input bridges	INPBRI.DOC	6.0
TAR13	TARIC 2 DFS Database update extractions output bridge	DBUPDEXT.DOC	8.0
TAR14	TARIC 2 DFS Database full extractions output bridge	DBFULEXT.DOC	8.0
TAR15	TARIC 2 DFS Publications output bridge	PUBLEXTR.DOC	3.0

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<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
TAR16	TARIC 2 DFS Mass updates	MASSUPD.DOC	8.02
TAR17	TARIC 2 DFS Administration	ADMIN.DOC	3.0
TAR18	TARIC 2 DFS Batch subsystem	BATSSYS.DOC	1.4
TAR19	TARIC 2 DFS Mailbox subsystem	MAILSSYS.DOC	1.4
TAR20	TARIC 2 DFS Transmission subsystem	TRASSYS.DOC	3.0

Table 2-17: TARIC Reference documents

## 2.17.2 Functional perspective

TARIC (TARif Intégré Communautaire) is the integrated customs tariff of the European Community (EC). TARIC includes customs measures for the European Economic Community (EEC), the European Atomic Energy Community (EURATOM), and the European Coal and Steel Community (ECSC), and a supporting goods classification maintained in all nine Community languages. Most of the TARIC measures are tariff or non-tariff customs measures to support the import of goods.

### 2.17.2.1 Use cases view

The functionality of TARIC application can be divided into several functional areas:

- On-line data capture;
- On-line inquiry;
- Mass updates;
- Control reports;
- Information reports;
- Management reports;
- Input bridge;
- Database update extractions output bridge;
- Database full extractions output bridge;
- Publications output bridge;
- Batch subsystem;
- Transmission subsystem;
- Mailbox subsystem;
- Administration.

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Figure 2-40 TARIC use case

### **On-line data capture**

The on-line data capture facility allows users to enter data into the database. The data capture or in other words data management for every data object includes three main data entry operations – insertion, update and deletion, in many cases it also provides data copying feature. Beyond these general facilities the specific functions are developed for particular objects. Each data capture facility includes a query facility to enable users to locate the database records they wish to work with. The data capture functions are also used, in 'read-only' mode, for the on-line inquiry purposes. The overview of data capture functionality is presented below.

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### Goods Nomenclature management

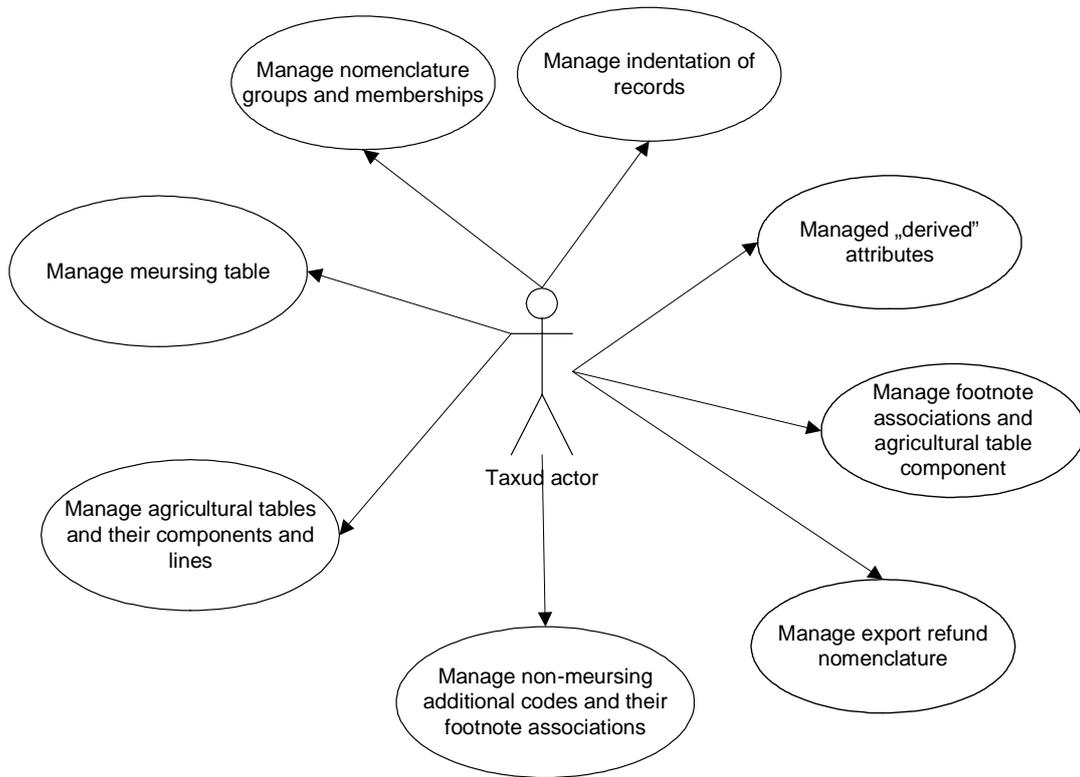


Figure 2-41 TARIC Goods Nomenclature management

- Manage nomenclature groups and memberships
- Manage indentation of records
- Manage "derived from" code and "absorbed by" code attributes
- Manage footnote associations and agricultural table component
- Manage export refund nomenclature (ERN)
- Manage non-meursing additional codes and their footnote associations
- Manage agricultural tables and their components and lines
- Manage meursing table plan, headings, and their footnote associations, meursing additional codes and meursing table cell components

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### Measures management

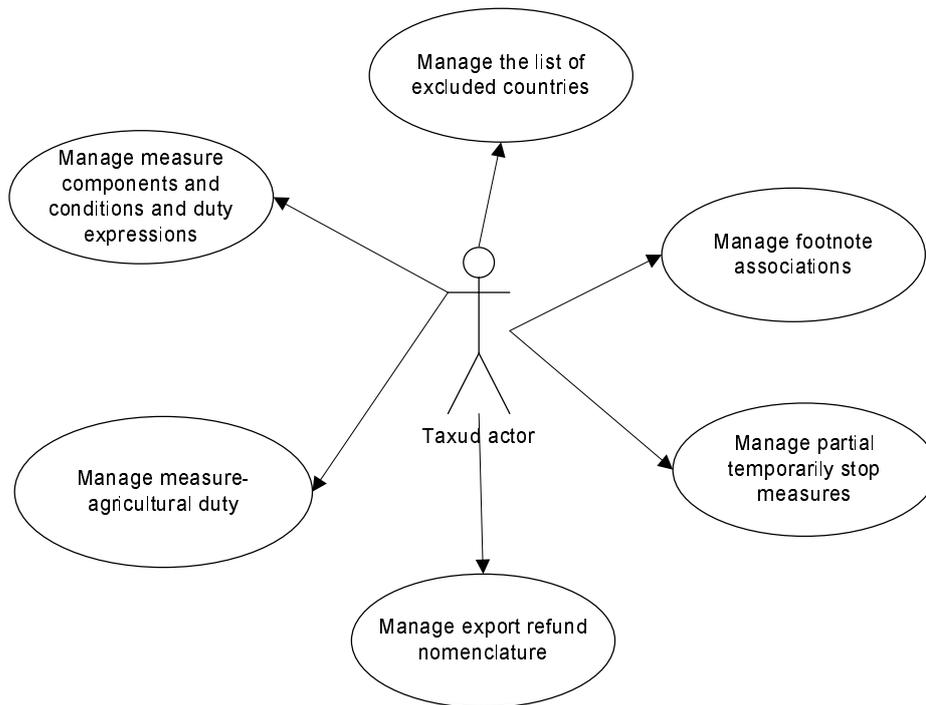


Figure 2-42 TARIC Measures management

- Manage measure components and conditions and duty expressions
- Manage the list of excluded countries
- Manage footnote associations
- Manage partial temporarily stop (PTS) measures
- Manage measure-agricultural duty expressions rules, agricultural measures validation rules and agricultural duty expressions

### Regulations management

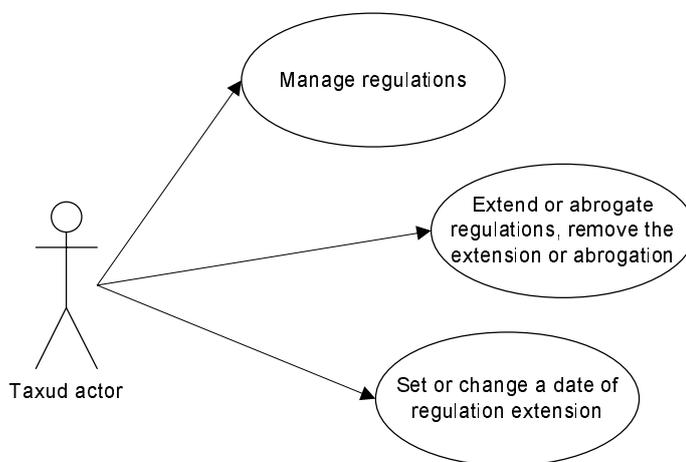


Figure 2-43 TARIC Regulations management

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- Manage base regulations, modification regulations, extension regulations, complete or explicit abrogation regulations, full temporarily stop (FTS) regulation
- Extend or abrogate regulations or remove the extension or abrogation
- Set or change the date of extension further back or forward in time for a base or modification regulations, FTS regulation

### Reference data

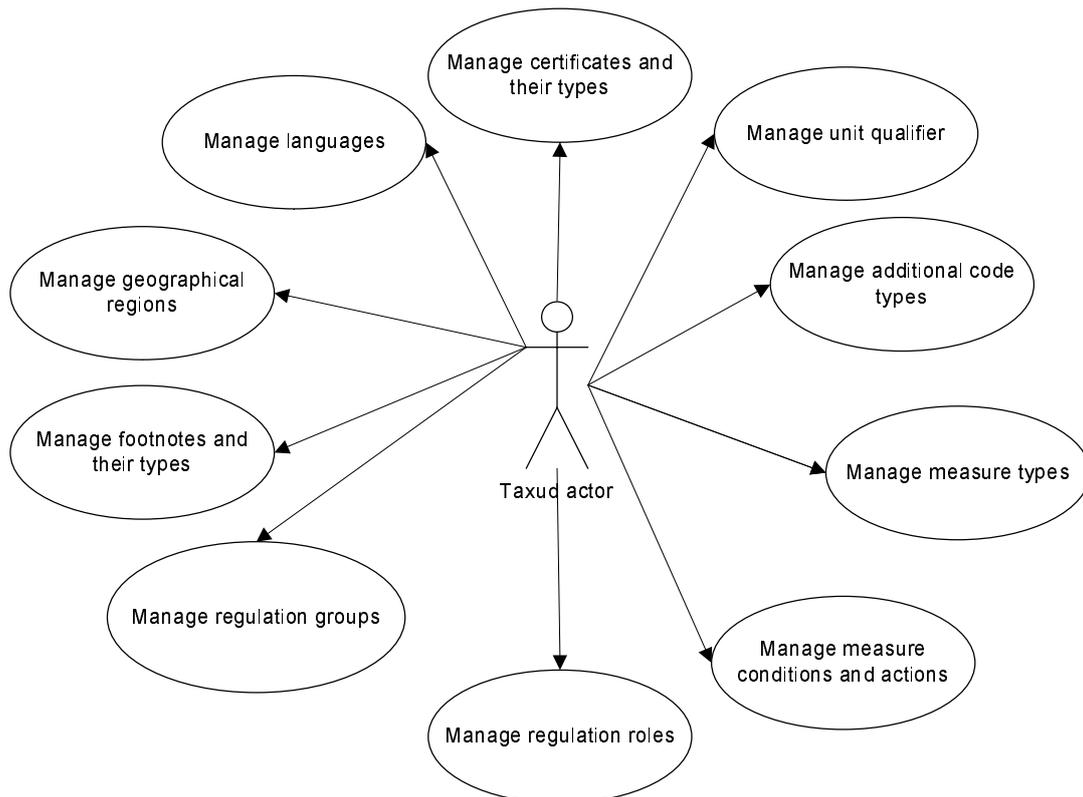


Figure 2-44 TARIC Reference data

- Manage additional code types for goods nomenclature
- Manage measure type series, measure types and their associations with additional code types
- Manage measure conditions and measure actions
- Manage regulation roles and their combinations
- Manage regulation groups and regulation group-measure type links
- Manage footnotes and their types
- Manage countries, country groups and the country memberships in the group and geonomenclature code associations
- Manage languages
- Manage certificates and their type
- Measurement unit qualifier and association with Measurement unit

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- Monetary Units and monetary exchange rates

### **On-line inquiry**

The system provides the set of on-line query facilities for business objects such as goods nomenclature, additional codes, measures, regulations, footnotes, countries and reference tables.

The on-line inquiry is a facility to enable users to view records on the database. Several types of questions may be answered with this function:

- What is the database like now?
- Given the information currently in the database what should have been the applicable data at any given date in the past?
- Given the information currently in the database what will be the applicable data at any given date in the future?
- What the database was physically like on a particular day in the past? To satisfy this requirement the user needs to look at a historical view of the database.

The on-line query functionality enables users to define query parameters, to view the summary details from a selection list and subsequently select the desired record for detailed viewing.

The Working Database (WDB) holds all stable and unstable records. Previous versions of corrected records and deleted records will only be found in the Log Database (LDB). All queries have common query parameters: the type of records (stable, unstable or all), and the period of viewing (range, defined by the start and end dates or simulation date).

As already stated, looking at the WDB cannot show what the database physically looked like on a particular date in the past. The system does however maintain a full log of all database activity in the LDB and so it is possible to re-create a snapshot of the database for any date in the past. As LDB is a "past" WDB, the system enables the users to use all the standard inquiry functions for viewing it. User has to choose from the existing snapshots or create a new one and then enter the query parameters in the same way as in WDB.

### **Mass updates**

The mass updates are a powerful set of functions, which operate on a whole group of records rather than the individual logical records that the on-line data capture functions work on. The overview of mass update functionality is presented below.

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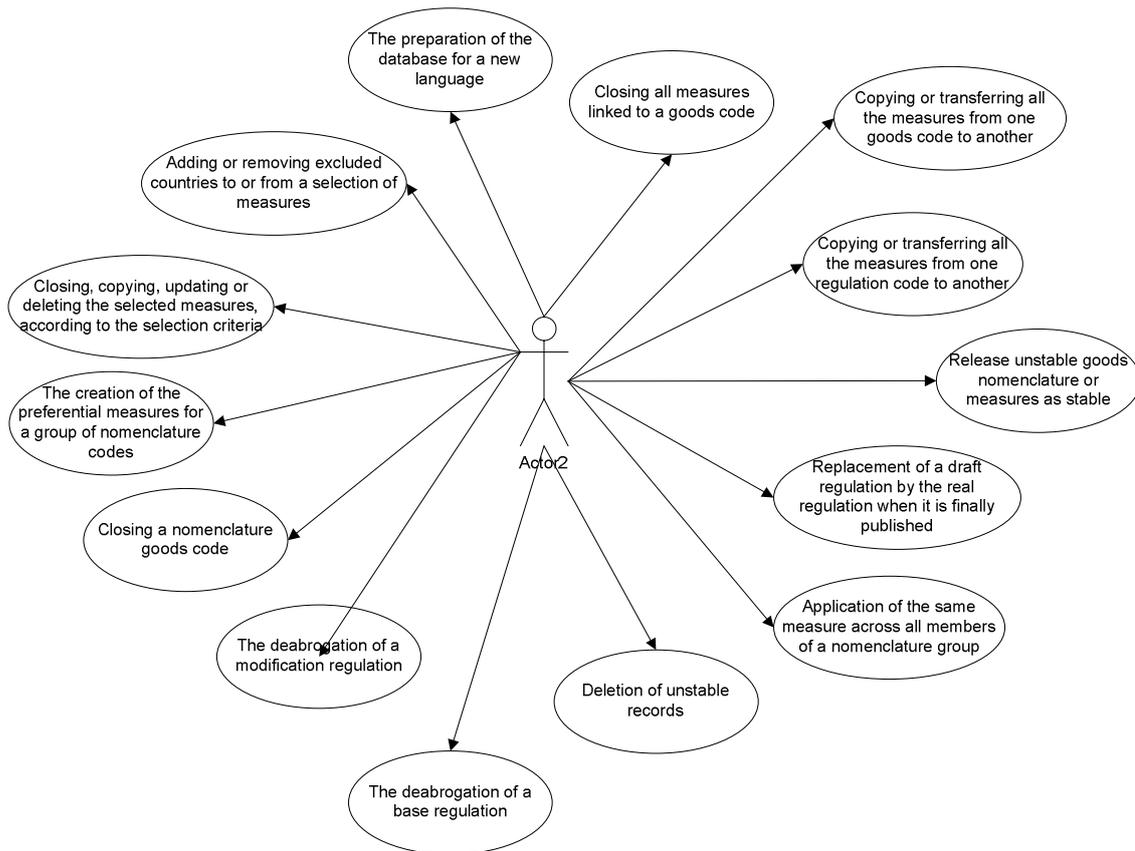


Figure 2-45 TARIC mass update

- Closing all measures linked to a goods code;
- Copying or transferring all the measures from one goods code to another;
- Copying or transferring all measures from one regulation to another;
- Release unstable goods nomenclature or measures as stable; i.e. unstable records are globally validated and become stable;
- Replacement of a draft regulation by the real regulation when it is finally published;
- Application of the same measure across all members of a nomenclature group;
- Deletion of unstable records;
- The deabrogation of a base regulation, i.e. the cancellation of the abrogation, when the link between the abrogation and the base regulation is broken;
- The deabrogation of a modification regulation, i.e. the cancellation of the abrogation, when the link between the abrogation and the modification regulation is broken;
- Closing a nomenclature goods code; all underlying goods codes and all related measures linked are closed too;
- The creation of the preferential measures for a group of nomenclature codes; their duty rates are calculated as a percentage of the applicable rates;
- Closing, copying, updating or deleting the selected measures, according to the selection criteria;

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- Adding or removing excluded countries to or from a selection of measures;
- The preparation of the database for a new language; the language dependant text fields will be introduced for all data entities.

These functions usually process big amount of data and can cause much database activity thus they are being initiated on-line but run as a background process. The batch scheduler maintains the integrity of the processing queue and automatically restarts processes that have been interrupted during execution.

All mass updates share the functionality of warnings, data validations, also summary and error reports.

A warning, that is an impact report, presents the user the potential impact of running the function with the given parameters, with an option to cancel the run. Before each run, all mass updates attempt to calculate the impact on the database of running the function with the chosen parameters and delivers the count of affected records.

The data validations similar to the on-line data capture validations are applied during the mass updates. If the validations are successful then the database will be updated, otherwise the validation stops on the first validation failure detected, a message identifying the failure is written to an error log, current record remains unchanged and processing proceeds to the next record. The validation is repeated for all related rows, so that no changes to the database can occur. In particular, some actions can be accepted or rejected according to [CN](#) privileges of the user who requested the mass update.

The summary report contains all of the selection parameters for the run and a count of the various database activity generated by the run.

Where errors are detected, such as records failing validation, these will be written to the error report with the associated reason as to why they failed.

### **Control reports**

The system provides the set of reports which helps to supervise the data quality and handle the inconsistencies.

Manual Data Capture report lists the various data such as goods nomenclature, additional codes, measures, regulations, footnotes, countries etc. manually inserted into the database in a given period of time.

Validity date reached report is used to control records which are about to become active and those which are about to cease to be active.

Several reports are designed to discover data records which are not correct: the report about missing descriptions; the report about the goods nomenclature codes which do not have the statistical indicator set and yet, have no measures attached; the report lists unstable records, some of which may have been extracted for Member States, where the start date is missing; the report about nomenclature hierarchy inconsistencies.

Several reports are designed to discover data records which are not completed yet: the report about all types of unstable data; the report about draft regulations which have not yet been fully replaced; the report about the reference data which are not referenced in the principle entities; nomenclature groups with only one member; country groups with only one member; the report about the goods nomenclature codes which are not 'covered' by a measure of a given type and origin.

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The member state extractions report shows the data extracted for the Member States and services of the Commission. Data will be extracted in the format defined in the Interface Data Specifications. The publications output bridge report shows history of the extraction dates and times for all publications.

### **Information reports**

The system provides the set of information reports presenting the data of the object which is needed. The reports can be executed on current information in WDB or on historical information in LDB. This process is the same as that used in 'On-line Inquiry'.

The group of reports give a list of selected objects such as goods nomenclature, additional codes, measures, regulations, footnotes, country groups and countries, measure types by series, business codes such as measure type, regulation group monetary units etc.

Several reports present the goods nomenclature information. The nomenclature by group report lists the Goods codes which belong to a selected group or to all groups. The nomenclature code changes report lists new Nomenclature Codes and the codes from which they have been derived and the Nomenclature Codes which have been closed and those codes which have absorbed the closed codes. The other report gives the multi-lingual nomenclature descriptions. The other report is designed to show Nomenclature Codes which have been updated within a given period, optionally restricted to a given update type. The selected nomenclature report lists either the nomenclature codes and descriptions linked to a nomenclature group or the nomenclature codes and descriptions linked, via measures, to a regulation and/or a geographical area.

There are some cross-reference reports, showing the associations between different information objects. The footnotes cross-reference report lists, for a given range of footnotes, measure types, geographical areas, or nomenclature codes the links between those footnotes and other entities such as nomenclature codes and measures, at a given date. The additional codes cross-reference report lists, for a given range of additional codes, the links between those additional codes and measures, at a given date. The certificates cross-reference report lists, for a given range of certificates, their links with measure condition components at a given date.

Some reports present the information related to measures: nomenclature/measures by measure type, measures which have been temporarily stopped, measures applicable to a goods code range,

The export refund nomenclature report has a format similar to the publication, i.e. it lists the ERN codes and (on simulation date only) the hierarchy of goods codes above, and the associated footnotes.

The publications extract report allows running an extract from the database in the format of any of the three official publications: The Integrated Tariff (TARIC), The Combined Nomenclature ([CN](#)) or The Harmonized System (HS). The detailed description of those publications is presented below in the paragraphs of Publications Output Bridges.

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### **Management reports**

Some management information reports are designed: member state extractions; data capture statistics; system availability statistics; update statistics; job statistics; nomenclature statistics; measure statistics; regulation statistics.

### **Input bridge**

The input bridge is the area where the system receives data from other systems. The idea is a flexible subsystem in order that new issuers of data can be integrated with minimum programming effort. The input bridge includes three main processes:

- Input bridge monitor;
- Input File Handler;
- Data Handler.

The input bridge monitor starts at regular intervals and checks for incoming files. When a file is found it is passed to the Input File Handler directory.

The Input File Handler processes and validates the arriving file in a global way. It performs EDIFACT syntax verification and input structure and format validation. After verification the Input File Handler passes the output file ready to update the TARIC database to Data Handler directory and puts a request in the batch queue in order to start the TARIC Data Handler.

The Data Handler applies all validation rules as in the online system and updates the TARIC database. The TARIC Data Handler ensures that input files for the same issuer are processed in the correct order and in a non-concurrent way.

Both Input File Handler and Data Handler generates a control reports with management information such as an issuer, filename, date/time of arrival, number of records, processing time etc. The error reports show all errors which occurred during the validation.

During the input file processing some relevant information is being inserted in the Input Management table in order that users or systems people can monitor the process.

There are some on-line data capture functions for data issuer registering and input management table monitoring.

### **Database update extractions output bridge**

All amendments to the TARIC data are kept in the log database tables. These records can be extracted, processed and transmitted to the member states and other services of the Commission in order to feed their local databases.

The extraction can be scheduled to run automatically at regular intervals or started by an operator. An operator has the possibility to start a new extraction interactively or to rerun a previous extraction by selecting an existing one.

The update extractions process is related to a certain period of time. The extraction process scans all the log database tables. It ignores all unstable records that are not marked as "information only". All records with an update date and time which fall into the period of extraction, are being extracted, sorted and stored in a file.

Separate transmission files are created for each selected destination defined in the subsystem. Destinations are either selected explicitly when submitting the extraction

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request, or implicitly all destinations marked ‘for update extract’ are selected. Separate data filters can be defined for each destination. These filters can act on different subjects what the receivers want or do not want to receive. The transmission files are supplemented with additional information according to the EDIFACT syntax rules.

For each generated transmission file, a request is normally put in the batch request queue to start the transmission request process. The transmission request will consist of a call to CDTS, which will submit the generated file for transmission through CCN/CSI. The automatic generation of a batch request for transmission may be suppressed.

There are some on-line data capture functions for the maintenance of the management information - registering the transmission items, destination filters, extraction periods, also the query of extraction file details.

### **Database full extractions output bridge**

All systems using TARIC as a front-system need global files to feed their database at startup time. From time to time there is a need to apply a global consistency check in order to make sure that both systems keep the same information. The full extraction will be done in 2 steps:

- The extraction of all applicable data from the database, from a given date onto the disk;
- The production of a tape for the destination following some selection criteria.

Both the extraction of the database and the production of the tape processes are initiated manually by means of a user interface. The processes create entries in the batch request queue. It is possible to schedule the start of extraction process.

The filtering mechanism applicable to the Update Extractions Output Bridge can also be applied to the Full Extractions Output Bridge. It is also possible to limit the amount of information according to a certain period. It is necessary to point out the active date and it's possible to set the archive date, languages and destination.

Based on the extraction parameters, several files are being produced: archive language independent data, archive language dependent data, static data (data without validity period) + active language independent data, active language dependent data file (1 file per language):

Once all data is extracted, processes have to be started to put the data on tape(s), depending on the data the destination wants. Depending on the options entered for that destination, a tape or tapes will be produced with one or several files on it.

There are some on-line data capture functions for the maintenance of the management information - registering the tape catalogue and tape updates, also to view extracts.

### **Publications output bridge**

An important aspect of the system is that data is extracted to produce three main publications:

- The Integrated Tariff (TARIC);
- The Combined Nomenclature ([CN](#));
- The Harmonized System (HS);

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Several publication criteria such as simulation date, language etc. can be set. The extracted data sets are formatted according to the SGML formatting standards. SGML is a standard that is recognized within the publishing industry. Each language version is put onto a separate magnetic tape and is then dispatched to the Office for Official Publications of the European Community (OOPEC) for publication.

A history of the extraction dates and times for all publications is kept and that enables reprinting of a given publication, if necessary. The data extracted from the database for sending to the OOPEC on magnetic tape can be printed as a control report of what has been sent.

The TARIC is extracted as a complete publication, which can stand alone. The content of the TARIC publication is the list of the goods nomenclature codes (positions 1 to 10), descriptions, measurement units and the measures applicable to that nomenclature code on a given date including geographical areas. The nomenclature is extracted together with all reference data – footnotes, the measuring additional nomenclature tables, the wine, fish reference tables, the codes and nomenclature for anti-dumping, export restrictions, the additional nomenclature for accession compensatory amounts, monetary compensatory amounts, export refund nomenclature, the VAT and excise rates, certificates. These appear at the end of each chapter in which they are referenced. Additional reference data such as the list of geographical areas, measurement and monetary units and their descriptions currently appear in the Introduction to TARIC.

The content of the [CN](#) publication is the list of the goods nomenclature codes (positions 1 to 8), descriptions, measurement units and the autonomous and conventional duties. The [CN](#) is extracted as updates to the previous publication, and that means that only modifications i.e. only those records which have changed since the last extraction are included into the publication.

The content of the HC publication is the list of the goods nomenclature codes (positions 1 to 6) and descriptions. It has not yet been specified whether this will be required as a full file or as updates to the HS previously publication. However, the resulting output file corresponds to the principles for either the TARIC or [CN](#) output files.

### **Batch subsystem**

The batch subsystem should allow execution of processes in the background, thereby reducing the need for operator intervention and eliminating repetitive and tedious manual tasks. It also should increase the reliability and security of batch processes.

The batch subsystem is intended for general use. The subsystem will have to control batch requests belonging to different application groups:

- Mass updates;
- Reports;
- input bridges;
- output bridges;
- TARIC publication.

The batch subsystem provides facilities to submit batch requests of recurring or once-only tasks in advance. A group of tasks which should run sequentially forms a single working entity, that is to say if a batch request within a group aborts for any reason, then the entire group has to be aborted.

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After having been submitted, the request will be started automatically. The subsystem is able to run and monitor several requests simultaneously. Job scheduling puts jobs into a queue according to concurrency and sequence factors, also takes into account the machine load.

Some on-line functions allow to monitor and to manage the execution of batch requests manually. It is possible to display requests and their status. The user can postpone or delete requests which are not yet executing. The system sets a flag to notify the user if a problem has occurred during execution. When a problem is detected, the batch system provides facilities to restart a request or group of requests either manually or automatically.

Output of batch processes can either be sent directly to a printer or kept in a temporary storage area. In the latter case, the user is able to view the output and decide on its destination.

### **Transmission subsystem**

The transmission subsystem is intended for general use, providing a mechanism through which applications may transmit files to local and remote systems.

The transmission subsystem provides an interface between on-line or batch applications and communications services. As such it acts as a server for applications and as a client for communications interfaces to network partners. It provides automatic routing, management and monitoring of transmission requests and associated files. This does not normally require operator intervention but manual procedures are provided as backup.

The transmission subsystem does not directly link to any communications protocol or service. Instead, it uses of a protocol handler which connects to the communications systems. So it does not need to know what form of connection is required or the address of a remote system. It only needs to know that a remote destination or "network partner" exists and which protocol handler is needed to connect to that partner.

In order to make the transmission subsystem as simple and flexible as possible the idea of an alias has been used. If the method of connection or address changes, the alias remains unchanged and the client is unaffected. It is up to the protocol handler to interpret the alias so that the physical network address, network characteristics and protocol may be established.

The client application sends a message to the transmission subsystem providing essential information and thus initiates the transmission subsystem to create a transmission request. When data is extracted from the database for transmission the batch subsystem is used to schedule transmission task

The transmission subsystem verifies the formal structure of message, existence and availability of "network partner". If verifications are negative, the process is stopped and an error is put into the log of the batch subsystem.

If all validations are positive, the transmission request handler processes the message and starts the handler of an appropriate file transfer protocol associated with the selected partner alias.

The transmission subsystem provides flexibility to interface several file transfer protocols. The protocol handler invokes a file transfer protocol, passes it the command file to start the file transfer and gets the transfer results back.

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The transmission result handler runs continuously and periodically scans the associated directories. If an acknowledgement file exists, it gets the result code back and saves it.

During the file transfer process certain entries and updates are done in the Transmission File and Transmission Request tables.

The on-line manager transmission interface provides the possibilities to create a new transmission request or restart an existing transmission request manually. There is also a facility to manage network partners including their aliases, addresses, login details, protocols, timetables and calendar events

### **Mailbox subsystem**

The mailbox subsystem provides a user interface to manipulate files generated by on-line or batch processes. The mailbox subsystem is intended for general use and controls several file types:

- Reports;
- Application logs;
- TARIC publication.

The mailbox subsystem accept files from any process, whether batch or on-line. Any file belonging to the file types previously mentioned can be submitted to the mailbox subsystem.

The mailbox subsystem provides a user interface to perform a defined set of operations on the files in the mailbox:

- Display the content of a file;
- Print one file or a set of files;
- Delete one file or a set of files;
- Download one file or a set of files.

The subsystem is able to archive files when they are deleted from the mailbox, this dependent on an archive-flag.

### **Administration**

The set of functions allows the management of the structure of the TARIC itself. Various technical tables used by the system, such as subsystems, application groups, applications, menu options, also titles, literals and languages, can be set up and maintained.

The purpose of other set of functions is the administration of end users. It includes such user profile and membership maintenance, functional user roles maintenance.

The help system maintenance allows the multi-lingual help and on-line documentation system to be set up and edited. The help system consists of help topics, each with associated multi-lingual text, grouped into help types, and linked to other related help topics.

The Message Maintenance allows multi-lingual message text to be set up and edited.

This technical code maintenance allows the administration of the domain values used for data validation and their multi-language descriptions.

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### 2.17.2.2 Domain vocabulary

Major data objects maintained by the Taric2 application are:

- Geographical area
- Nomenclature
- Measure
- Regulation
- Footnote

#### Nomenclature

The nomenclature provides goods classification and thereby offer a mechanism allowing the association of measures with particular goods. The current nomenclature coding system is based on the Harmonized System (HS), developed by the Customs Co-operation Council (CCC). The nomenclature code is a structured 10-digit code:

- Chapter (digits 1-2);
- HS heading (1-4);
- HS sub-heading (1-6);
- [CN](#) (1-8);
- TARIC (1-10).

Goods nomenclature contains an internal hierarchical structure which is supported by the goods code numbering system. The structure is controlled by pairs of digits up to the tenth, thus code n1n2 n3n4 00 00 00 is within the structure of code n1n2 00 00 00 00 etc. Goods nomenclature lines provide an exhaustive coverage of all possible goods at any period in time. Thus new lines must come from existing lines and closed lines must return to remaining lines:

- when creating a goods nomenclature code, at least one "derived from" code must be created.
- when an explicit end date exists for the nomenclature goods code, at least one "absorbed by" code must be created.

In some cases, EC legislation cannot be handled by the 10-digit nomenclature alone. In these cases, the nomenclature is supplemented either by a footnote, or by an additional code. The additional code types are grouped into areas of additional code applicability:

- non-Meursing additional code
- Meursing additional code
- Export Refund code
- Wine Reference code

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### **Geographical area**

A geographical area may be a country, country group or country area. A country (through its country code) may be associated with one or more geonomenclature codes.

### **Footnote**

Footnotes can be associated with the following data: measures, goods nomenclature, Export Refund nomenclature, Wine Reference nomenclature, non-Meursing additional codes, Meursing table headings.

### **Regulation**

A regulation has one or several roles: base, modification, complete abrogation, explicit abrogation, extension or Full Temporary Stopped. The regulation id is composed of four elements:

- Prefix, which means daft of regulation or recommendations, decisions and agreements
- the year of publication (two digits);
- the regulation number (four digits);
- the regulation number suffix, which is used to split regulations logically.

### **Measures**

The measure occurrence defines the validity period in which a particular measure type is applicable to particular nomenclature for a particular geographical area. A measure component must have a duty expression, and may have a monetary unit and/or a measurement unit, and/or an amount. The application of a measure can depend on one or more conditions: minimum prices, reference prices, certificates, etc. The order of presentation of measure elements is important and will be controlled by the nature of the duty expression. Multiple definitions of a measure must not have overlapping validity periods - there must never be any explicit overlap of measure occurrences and in many cases implicit overlap will not be allowed either. A measure can be stopped for a given period or periods. This is called a Partial Temporary Stop.

### **Reference data**

Main reference data maintained in Taric2 system are:

- Additional code types
- Measure Types
- Measure type series
- Measure Conditions
- Measure Actions
- Regulation roles
- Regulation Groups
- Footnote types
- Measurement units

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- Measurement unit qualifiers
- Monetary Units
- Monetary exchange rates
- Certificates
- Certificate type
- Countries
- Country Groups
- Language

## 2.17.3 Application perspective

### 2.17.3.1 Application structure

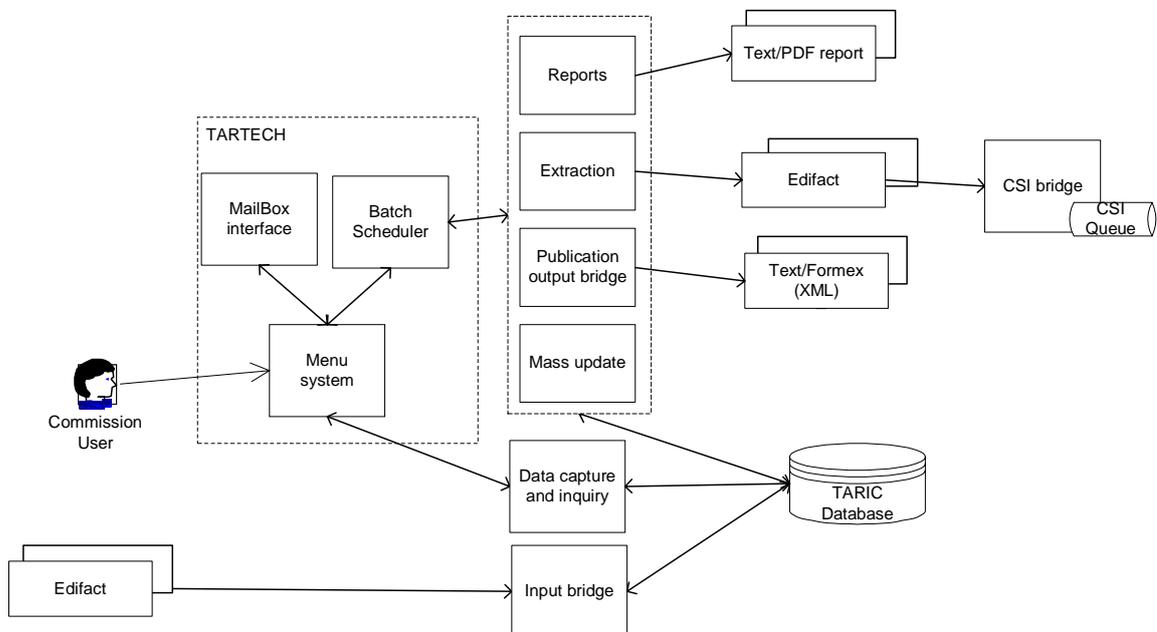


Figure 2-46 TARIC Application structure

Taric2 application is built as a 2 tier database application, based on Oracle Forms technology. The data is stored in the Oracle database. Users interact with the system via an Oracle Forms interface. Users may interact synchronously with the database (online data capture, online inquiry) or with the scheduler to program batch execution of predefined jobs. Other systems exchange data to/from TARIC using the Bridge interface.

### Tartech application framework

Taric2 application uses a set of services which are provided by the application framework TARTECH. The framework offers services such as internationalisation (of interface and report labels, error messages, help items), security management, integration and data exchange with subsystems (batch scheduler/mailbox interface, menu system, bridges).

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### **Batch scheduler**

The batch scheduler module is used to schedule the execution of batch jobs on the system. It is accessed through Oracle Forms and manages the different TARIC batch jobs (mass update, reporting, data extraction).

### **Mailbox interface**

The mailbox interface allows the user to access, manage, and print reports generated by a batch job.

### **Menu system and internationalization**

The TARTECH infrastructure provides services to manage internationalised resources for the user interface (labels, help entries, error messages).

Furthermore, it enables the management of:

- the menu structure and navigation,
- the help screens and their association to context (at the level of the form, block or field).

### **Authentication, authorization and audit services**

Authentication, authorisation and access control are also managed by TARTECH, which provides a common set of functions to authorize the user access to certain application functions (menus) and to log the database updates.

### **Input bridges**

The input bridges handle EDIFACT messages coming from external applications like [Suspensions](#) or Quota.

### **Output bridge**

The output bridges is the modules which prepare and formats the data before it is sent to member states to synchronize their local Taric databases.

### **Publication bridge**

This module extracts data from the TARIC database to produce Formex v4 (XML) files containing data to be published by OPOCE (for the TARIC publication) or a Text file report.

The Formex version is now obsolete as TARIC is not published anymore in the Official Journal

### **Reporting**

The users may request the production of reports about information in the system. Reports are PDF or text files about TARIC information, inconsistencies or usage.

A new version of TARIC reports is already available as [Taric reports](#) application and do generate PDF reports. This migration was performed in the context of the migration to Unicode.

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### 2.17.3.2 Application dynamics

#### Online data capture/inquiry

The online data capture/inquiry interface is best suited to visualise and change a limited number of objects. This is a keyboard-centric menu-driven application used to insert, retrieve, update and delete TARIC data.

The user selects a menu option either using the up and down keys or by typing the menu option number, followed by <ENTER>. <EXIT> allows the user to go back to the parent menu. Each menu option gives access to a submenu or to a form. Forms represent a logical group of data. They are composed of individual fields (single item of data) usually representing a database table column. Fields are grouped in records, usually corresponding to a table row. A block is a section of a form containing one or more records representing rows of the same database table.

In addition to the system transactions managed by the Oracle database, a concept of logical transactions is introduced. Logical transactions are identified by transaction number present in all database tables. The strictly increasing sequence of these logical transaction numbers is defining the ordering of the modifications sent to the Member State Administrations by the extraction output bridge. In the online data capture client, the number is incremented each time an Oracle Forms block is committed to the database. Therefore, the sequence of the blocks present on the Form defines the sequence of the logical transactions.

Oracle Forms locks rows for update when data is edited in a data capture screen. When two users try to update the same data concurrently, the second user gets a message saying that the data is locked when (s)he tries to modify the data.

In general, validation is handled by the database when data is sent. In some cases it is handled by the form (triggered when the cursor leaves a field or a block). Some rules are verified in the database and in the form. The validation stops whenever an error is found.

The error message is shown in the user preferred language at the bottom of the screen or in a popup window if the message cannot be displayed on one line.

Internal TARIC specific mark-up may be used in the text fields to indicate how text should be formatted (superscript, subscript).

#### Mass update

Mass updates are best suited to apply standard operations to a large group of objects. They are triggered asynchronously via the Scheduler.

When a user requests a mass update, he/she is prompted with the estimated impact of the update and has the possibility to cancel the update. After the execution of the mass update a text report listing the count of the various database activities and a text report listing all detected errors are generated.

The mass update defines the physical transactions (typically one transaction by record or one transaction by related records). In case of system failure during a mass update, the user may submit the same job, the mass update generally makes sure only non committed transactions are executed.

Whenever updating a record, the mass update locks explicitly the record for update to avoid that the record is updated by concurrent processes.

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An important constraint in the mass updates is that while updating the data, it must ensure that it generates a correct sequence of logical transaction numbers for the complete set of data it is updating. This is done in such a way that a correct and consistent sequence of operations is sent to the MSA by usage of the extraction output bridge.

### **Input of data through the input bridge**

The message accepted by the input bridge contains a set of transactions consisting of one or more record operations (operations on fine-grained objects). A single line in a message consists of the transaction identifier, the record identifier, the record sequence number, the update type (insert, update or delete) and the data.

The bridge validates the message according to EDIFACT format and possibly supplements the data. It applies validation rules on the record data. If validation succeeds, it sends the data to the database that validates the operation and, if validation succeeds, updates the data. Records are grouped in logical transactions by sharing the same transaction identifier. The sequence of operations contained in the file must be such that all business rule validations are honoured at the end of each logical transaction. The system will generate a new logical transaction number for each of the transaction identifiers present in the input message.

To avoid that data is modified via two concurrent processes, the input bridge explicitly locks database records before any update operation.

A text information report is generated and includes information about job execution and the number of records touched for each record type. If errors were detected, they are consolidated in a text error report listing the record id, the record data, error message, and the position of the erroneous field in the data. Maximum one error is reported on each record.

Messages to the input bridge and reports produced by the input bridge are managed by TARTECH framework

### **Extraction of data using output bridge**

Full and update extraction jobs extract data from the TARIC database in EDIFACT format. Extraction files are sent to the Member States administrations on a daily basis to feed their local TARIC databases.

Communication with the Member State Administrations is done via CSI queues. Extraction files are also used to update the Data Dissemination System ([DDS](#)) and systems of other services of the Commission, e.g. Eurostat.

Extraction files contain an EDIFACT message composed of records grouped in transactions (the structure of the records is similar to the Input bridges message format)

### **Full extraction**

The full extraction job extracts all TARIC data applicable at a given date. It is aimed to feed a local TARIC database at start-up time or synchronise an existing one. The process extracts all data valid at a given date from the working database. Destination Filters might be applied to the extracted data.

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### **Update extraction**

The Update extraction job extracts data that has changed during a given period. It is aimed to periodically update the local TARIC databases. The process extracts all data that was touched (inserted, updated or deleted) during the period by selecting data with a transaction timestamp in the given period from the log database. The selection of the extracted data is done with Special Destination Filters. Records are ordered by transaction id (growing with time), then by record code and sub-code.

### **Unique keys**

To allow Member States Administration to maintain their local TARIC database, data must be identified in a non-ambiguous way. Data in TARIC is identified either by a set of business data or by system generated identifier (SID). SIDs are helpful when part of the logical primary key needs to be changed dynamically. The system generates the SIDs and attributes one to each record occurrence. A drawback of SIDs is that it has no meaning for a user and that an external system must keep the SIDs in its table and cannot assign new SIDs freely.

The records containing SIDs are documented to allow the recipients of the extractions to take them into account.

### **Records sequencing and transaction**

Records are grouped by logical unit of work in transactions. A transaction is composed of one or more records. An extraction file contains one or more transactions that must be handled in sequence. Records inside a transaction are ordered by record code and sub-code. The specified order will guarantee a consistent order of the records present in the extraction file assuming that the generation of the logical transaction numbers is correctly implemented in the different modules updating information in the system (e.g. online data capture, mass updates, input bridge).

No validation rule may be violated after each transaction. Between the processing of individual records inside a transaction, the validation of certain rules could fail.

### **Filters**

Filters may be applied for each extraction to limit the exported information. The different filter types are :

- Filters on transmission items (record types), defining the transmission items that must be extracted;
- Filters on languages, defining which descriptions must be extracted;
- Filters on measure types, defining measure types for which data must not be extracted;
- Filters on chapters, defining chapters that must not be extracted.

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## 2.18 Taric reports

Because of lack of documentation concerning the application XXX was not able to provide a more detailed description in this release of the Architecture Reference document.

### 2.18.1 Reference and Applicable Documents

No documents were available which would provide information on the application functionality or its internal architecture.

Id	Title	Reference	Version

Table 2-18: Taric reports Reference documents

### 2.18.2 Functional perspective

Taric reports application replaces and expands the reporting capabilities provided originally by Taric application.

### 2.18.3 Application perspective

The application is built using Tariff Applications Architecture Framework. Both structure and dynamics of the application follow what is defined by the architecture.

[Tariff Applications Architecture Framework](#)

### 2.18.4 Technical perspective

The technical perspective characteristic of the application is derivative of [Tariff Applications Architecture Framework](#).

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## 2.19 NCTS

### 2.19.1 Reference and Applicable Documents

Id	Title	Reference	Version
NCTS1	FTSS 2008 (CORR) FINAL	FTSS-2008-(CORR)- FINAL.zip	

Table 2-19: NCTS Reference documents

### 2.19.2 Functional perspective

The New Computerised Transit System (NCTS) is a European wide system, based upon electronic declaration and processing and designed to provide better management and control of Community and Common Transit. It involves all EU Member States, the EFTA countries, Andorra and San Marino.

The NCTS in each country is connected through CCN/CSI network to all other countries. It provides links between approximately 3000 Customs Offices and replaces completely the old transit paper based system.

The NCTS system, compared with the previous Old Transit System (OTS) has a number of decisive advantages, most notably:

- It increases the efficiency and effectiveness of transit procedures;
- It improves the prevention and detection of fraud;
- It accelerates transactions carried out under a transit procedure and it increases security for them;
- It guarantees a streamlined management and administration of transit system.

NCTS encloses several the Transit process threads corresponding to the various activities which are performed in the NCTS:

- Core business, dealing with the main Transit activities performed at Office of Departure, Office of Transit, Office of Destination or at Trader's premises;
- Guarantee management, covering the activities related to guarantee, wherever they take place;
- Central services, including the management of reference databases and the provision of common services to the various NCTS users;
- System administration, providing services needed to administer an IT system such as the NCTS.

Unless human intervention is specifically required by national policy, NCTS allows fully automated processing of:

- departure operations (from declaration reception to departure of the movement);
- arrival operations (from presentation to release of the goods);
- write-off operations which close transit movements.

The transit movement is initiated by the Trader's transit declaration. Thereafter, the Trader receives the NCTS Accompanying Document, identified by a Movement Reference Number (MRN), and the vehicle with the consignment covered by this

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document goes to the first Office of Transit (if any) [NB. It may happen not at all or several times]. The consignment arrives at an Office of Transit where the processing of crossing of a frontier occurs. Afterwards, the consignment leaves either to the next Office of Transit, or to its final destination.

Normally, the consignment arrives at destination. The goods are presented to the Office of Destination which processes the arrival. Once the arrival processing is complete, the Office of Departure writes-off the movement. In case the Office of Departure does not receive any feed-back about the arrival of the movement within the expected period, an enquiry procedure is started. Depending on the result of the enquiry, taxes and duties might be collected. In all cases, sooner or later, the movement is written-off.

During the transit movement the concerned Customs Offices and Traders exchange data through standard messages. The NCTS messages are assigned identification numbers which all start with IE and then a two or three digit number (e.g. a transit declaration is identified by message IE15). Within these IE messages there are 'data groups' consisting of various fields of data. Each data group and each field has certain characteristics, for example, whether it is alpha or numeric, number of characters, whether its completion is mandatory (M), optional (O) or dependent (D).

The automated NCTS processing, occurs for most movements of Traders (i.e. Consignors and Consignees), but it can only happen under the strict fulfillment of the following conditions:

· ***at departure:***

- the declaration is formally valid and;
- the declaration is submitted within the hours agreed for that purpose and;
- the guarantee is valid and;
- the risk analysis does not propose to control the goods and / or documents and;
- the verification of data indicates no problems.

· ***at destination:***

- the notification is submitted within the hours agreed for that purpose and;
- the risk analysis does not propose to control the consignment and;
- the unloading remarks indicate no problems.

· ***write-off:***

- no discrepancies are reported.

The transit movement processes are represented on the following diagram:

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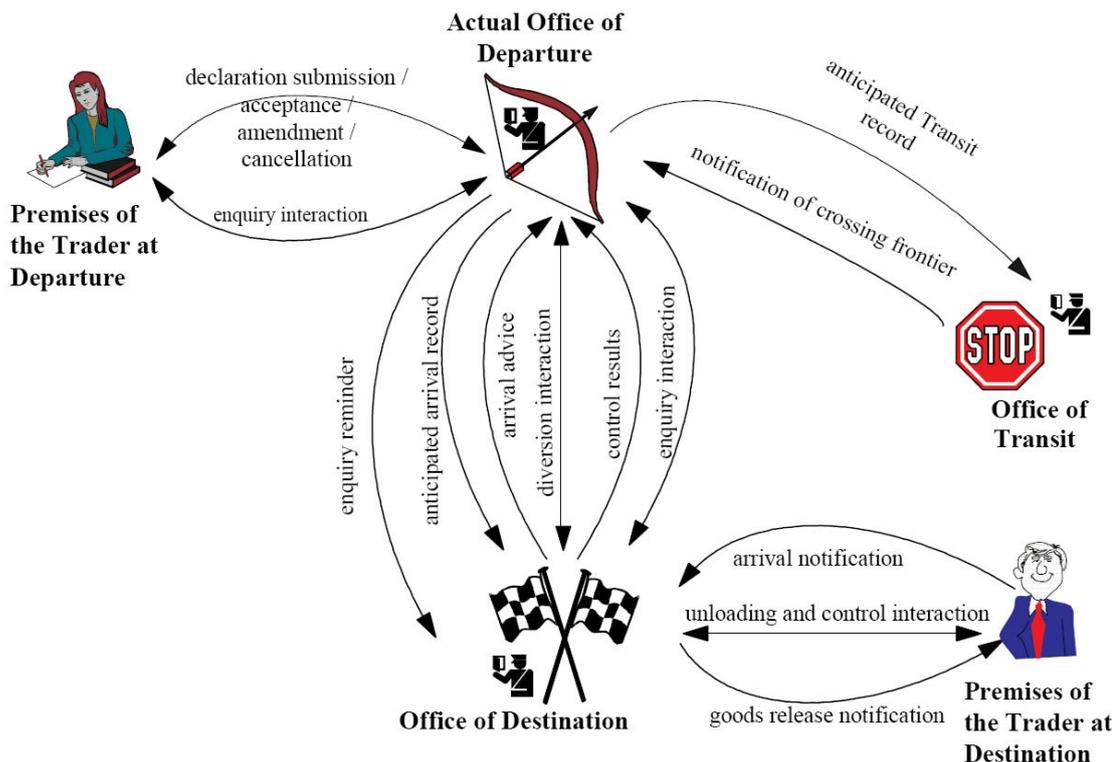


Figure 2-47 NCTS Normal Procedure

NCTS, in the frame of *Simplified Procedure*, allows approved traders to move goods under customs control from or to their premises, ports/airports or other approved places such as warehouses, and other temporary storage facilities without the need to present the goods and corresponding documents to the Office of Departure or destination. Authorised traders will, depending upon the conditions of their authorisation, enjoy the benefits of printing the TAD at their premises (authorised consignors) and time out release to move (authorised consignors) or unload (authorised consignees) the goods.

NCTS includes also *Guarantee Management System (GMS)* where guarantee data are recorded, i.e.:

- the guarantee management subsystem, at the Office of Guarantee, where the data related to comprehensive guarantees, individual guarantee with multiple usage, guarantee waivers, flat-rate guarantees and associated vouchers are recorded;
- the Office of Departure subsystem where the other guarantees are recorded.

The Office of Departure initiates such operations as:

- Check guarantee integrity ;
- Register guarantee usage;
- Release guarantee;
- Cancel guarantee usage.

The guarantee management processes are represented on the following diagram:

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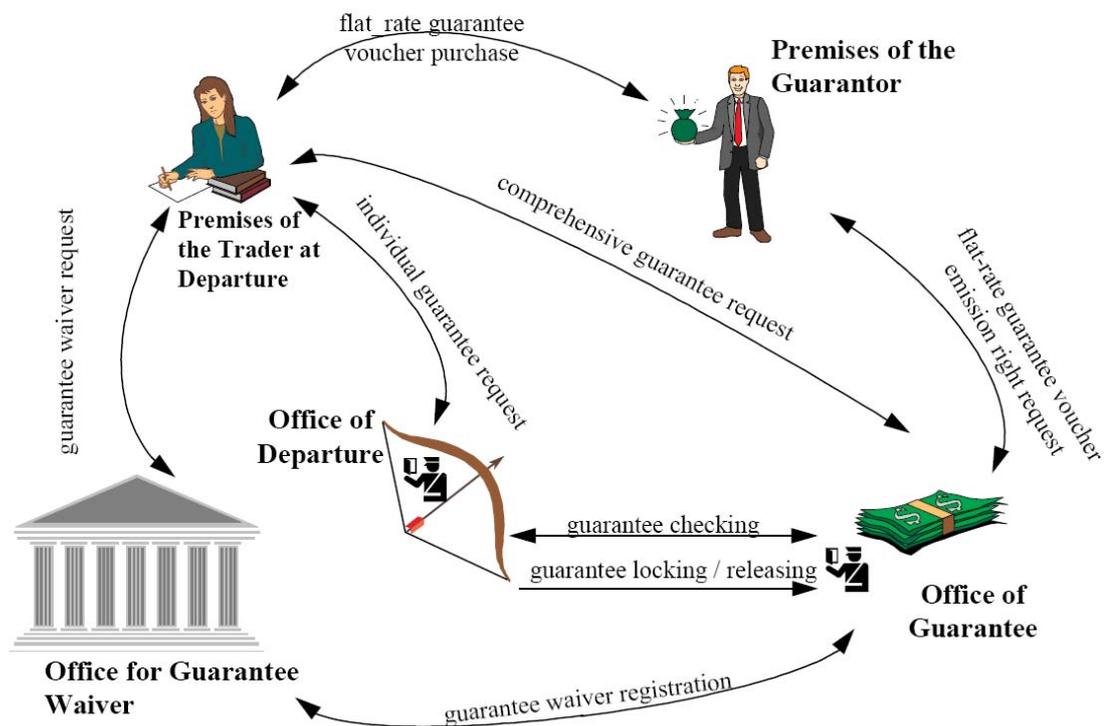


Figure 2-48 NCTS Simplified Procedure

**Central services** are defined at two different levels: National Domain and Common Domain whose needs are different. At the level of National Domain, they contain the functions that are common to different types of Customs Offices and the functions to manage the national information of reference (such as Customs Offices). For the Common Domain, they contain the functions to manage the information that is common to all countries (such as country codes). The central services are implemented through [CS/RD](#) system.

The central service processes are represented on the following diagram:

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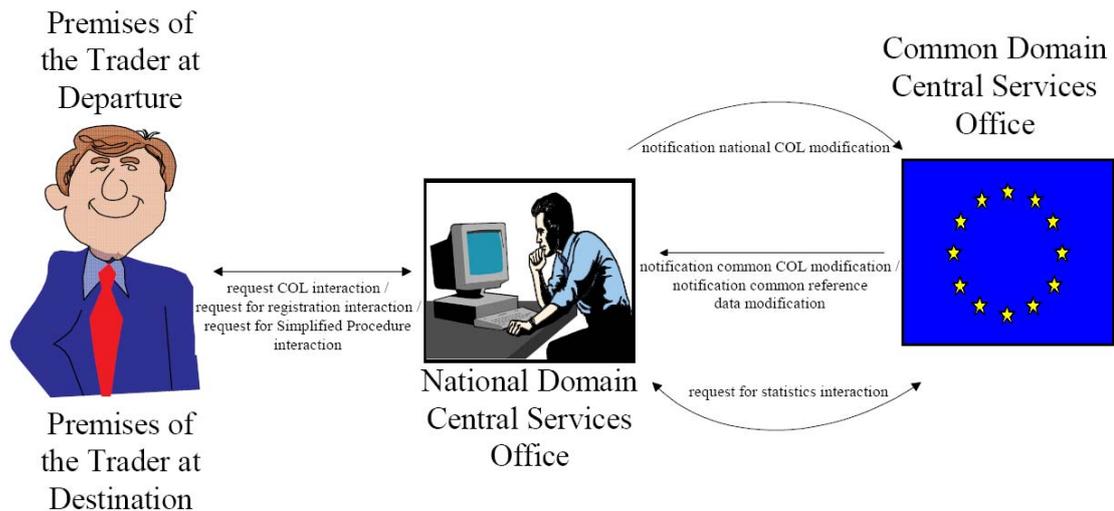


Figure 2-49 NCTS central service processes

The NCTS **Administration** covers services and utilities required to administer the system:

- archive procedures (down-loading/ up-loading from/ to off line support, data analysis and purge of database);
- data management (back up and restoring);
- fallback procedures, problem tracking and audit trail.

For additional information please take a look at: [MCC](#), [ECN](#), [GMS](#).

### 2.19.2.1 Use cases view

Here are represented the high-level essential use cases implemented in the NCTS system:

- I. Trader
  - At departure*
    1. Capture New Declaration (including guarantee data)
    2. Capture Declaration Modification (including guarantee data)
    3. Capture Cancellation Request
    4. Manage Guarantee Access Codes
  - At destination*
    5. Send arrival notification
    6. Send unloading remarks
  
- II. Office of Departure
  1. Accept Declaration
  2. Manage and Control Declaration
  3. Perform Risk analysis
  4. Check Guarantee
  5. Register Guarantee
  6. Release Transit Movement

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7. Launch Enquiry
8. Release Guarantee
9. Manage Transit Movement
10. Write-Off Transit Movement

III. Office of Transit

1. Validate Passage at Transit Office

IV. Office of Destination

1. Manage Transit Movement Arrival
2. Control Unloading
3. Release Goods from Transit

V. Customs Competent Authority

1. Perform Enquiry

VI. Office Of Guarantee

1. Manage Guarantee
2. Manage Guarantor

VII. Central Services

1. Manage Customs Offices Data
2. Manage Reference Data
3. Analyze Transit Movement Data and Statistics

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## 2.20 ECS

### 2.20.1 Reference and Applicable Documents

Id	Title	Reference	Version
ECS1	FTSS AES	FTSS_AES_Addendum_1 -2006_final.zip	

Table 2-20: ECS Reference documents

### 2.20.2 Functional perspective

The Export Control System (ECS) is a part of Automated Export System (AES). The objective of the AES is to ensure that export operations started in one Member State can be finalised in another Member State without re-submission of the same information. This includes the exchange of electronic messages related to the different stages of the operations amongst the various actors (customs, traders and other governmental administrations). This project has been divided in 3 phases:

- **Export Control System (ECS) phase 1** - exit "fiscal" control - provides for the full control of the conclusion of export operations via the electronic exchange of export/exit information between customs offices of export and customs offices of exit, in particular where different Member States are involved. This replaces the paper copy of the export declaration;
- **ECS phase 2** - exit "security" control - provides for the electronic handling of exit summary declarations under the security amendment [Regulation \(EC\) 648/2005](#) and will, inter alia, require additional information to be included in export declarations for safety and security purposes. It builds upon and keeps the functions of ECS Phase 1;
- **AES** - full deployment - will build on and contain the functionalities of ECS Phases 1 and 2 and, in particular, will introduce the central clearance approach.

ECS is built according to the [NCTS](#) logic, but re-adapted for the export procedure. It starts when a Trader submits an export declaration to the proper Customs Office of Export. Then, after the acceptance of the export declaration, he/she receives the Export Accompanying Document (EAD) with a unique Movement Reference Number (MRN) which identifies the movement. Then the means of transport carrying the consignment covered by this document goes to the Office of Exit. Normally, the consignment arrives at the Office of Exit. The goods are presented to the Actual Office of Exit which processes the exit of the goods. Once the exit processing is completed, the Office of Export finalizes the export operation.

The overall process is presented on the following diagram:

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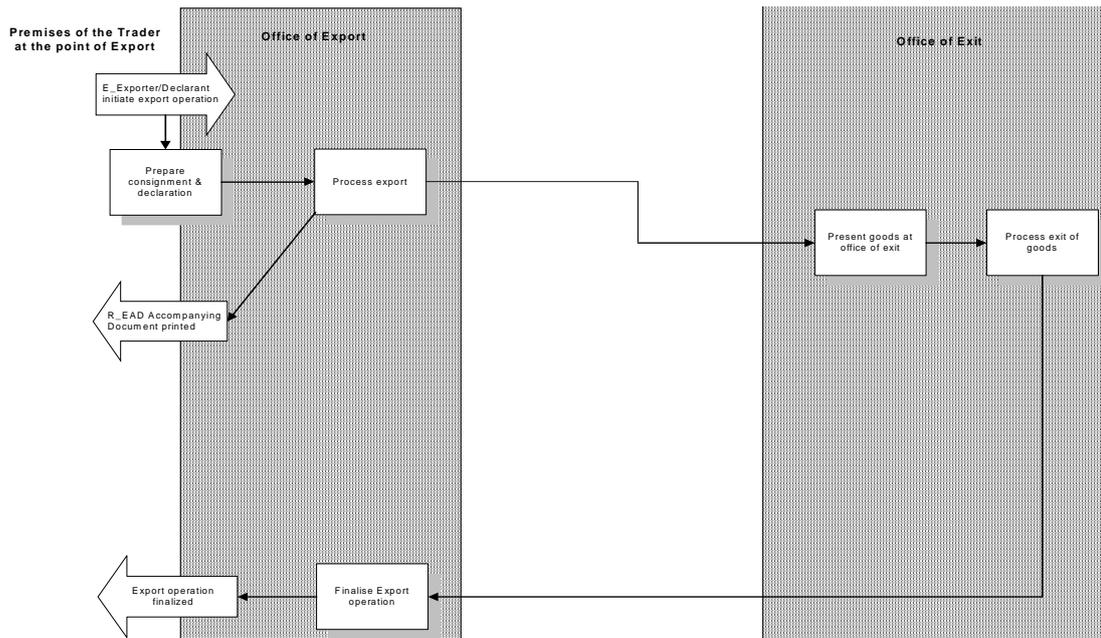


Figure 2-50 ECS - process overview

The core element of the ECS is the information exchange in the common domain between the office of export and the office of exit

- to inform the office of exit of the anticipated arrival of goods for which export formalities have been completed at the office of export;
- to handle diversions;
- to inform the office of export of confirmation of exit and/or control results including the date of exit from the customs territory of the European Union;
- to handle partial and consolidated shipments.

Essential parts of ECS processing are supposed to be fully automated, unless human intervention is specifically required by a national policy.

Automated processing is granted mainly to Authorized Traders, if following strict conditions are met:

***at Office of Export:***

- the declaration is formally valid and;
- the declaration is submitted within the hours agreed for that purpose and;
- the risk analysis does not propose to control the goods and / or documents and;
- the verification of data indicates no problems and;
- no duties and/or taxes have to be collected (which is normally the case in export).

***at Office of Exit:***

- goods are presented at Exit within the agreed time limits for this purpose;
- the risk analysis does not propose to control the consignment and;
- the departure notification is received from the local authority at exit.

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*at finalisation of export operation:*

- the exit confirmation is received within the time limits agreed for this purpose  
and;
- the control results of the exit confirmation are satisfactory.

For Authorised Traders the described *Normal Procedure* is replaced by *Simplified Procedure* analogically to the [NCTS](#) distinction.

ECS includes also the *Central Services* part where information about Authorised Customs Offices, Traders and global parameters are kept (similarly to the [CS/RD](#) application in [NCTS](#)).

### 2.20.2.1 Use cases view

Here are represented the high-level essential use cases implemented in the ECS system:

- I. Trader
  1. Capture New Declaration
  2. Capture Declaration Modification
  3. Capture Cancellation Request
  
- II. Office of Export
  4. Accept Declaration
  5. Manage and Control Declaration
  6. Perform Risk analysis
  7. Release Export Movement
  8. Launch Enquiry
  9. Manage Export Movement
  10. Finalise (Write-off) Export Movement
  
- III. Office of Exit
  11. Manage Export Movement Arrival
  12. Process and Control Cargo Manifest
  13. Release Goods for Export
  
- IV. Customs Competent Authority
  14. Perform Enquiry
  
- V. Central Services
  15. Manage Customs Offices Data
  16. Manage Traders
  17. Manage Reference Data
  18. Analyze Transit Movement Data and Statistics

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## 2.21 MCC

### 2.21.1 Reference and Applicable Documents

Id	Title	Reference	Version
MCC1	System Requirements Definition for MCC for Phase 3.2 part 1	TCE-SRD-L1MCC-P32_PART01.zip	4.10
MCC2	System Requirements Definition for MCC for Phase 3.2 part 2	TCE-SRD-L1MCC-P32_PART02.zip	4.10
MCC3	System Requirements Definition for MCC for Phase 3.2 part 3	TCE-SRD-L1MCC-P32-APP.zip	4.10

Table 2-21: MCC Reference documents

### 2.21.2 Functional perspective

Minimal Common Core (MCC) is one of the applications of a Centrally Developed Transit Application (CDTA) suite that has been developed to support [NCTS](#). The MCC application manages transit movements of a national administration (NA) in an [NCTS](#) compliant manner by:

- Processing messages from, and responding to, the NA's Trader systems;
- Managing the international exchange of information about transit movements with the transit systems of the NAs in [NCTS](#);
- Providing a mechanism for manual input by the NA's Customs Officers to control transit movements, and input data when the Trader systems are not available;
- Managing the exchange of information with the appropriate Guarantee Management System ([GMS](#));
- Managing the exchange of data with the Central Services.

In order to achieve the above goals, the MCC application interacts with the other NAs through the common domain (CD) and with the NA's Trader systems through the external domain (ED). Both of these interactions are based on the exchange of messages entitled IEs. MCC does not directly communicate with the CD or ED but uses Electronic Data Interchange and Common Systems Interface ([ECN](#)) node for this purpose. [ECN](#) manages the exchange of information across the two domains using dedicated queues.

#### 2.21.2.1 Use cases view

The functionality can be divided into several groups:

- Processing of the movement at the departure office;

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- Processing of the movement at the transit office;
- Processing of the movement at the destination office;
- Enquiry of the movement information;
- Cancellation of the movement;
- Querying the movement information;
- Administration.

### **Processing of the movement at the departure**

Several actions can be performed at the office of the departure.

- Capture declaration;
- Communicate with the risk analysis module;
- Manage Risk Analysis Result;
- Request confirmation on authorised consignee and handle the response;
- Handle control decision and control results;
- Query and select guarantees;
- Check and validate the usage of guarantee and analyse the results;
- Handle amendments of the declaration and guarantee;
- Request the guarantee usage registering by [GMS](#);
- Handle release request;
- Handle advanced arrival/transit notification;
- Handle route restrictions;
- Register decision of the release from the departure and issue transit transaction;
- Handle transit cancellation.

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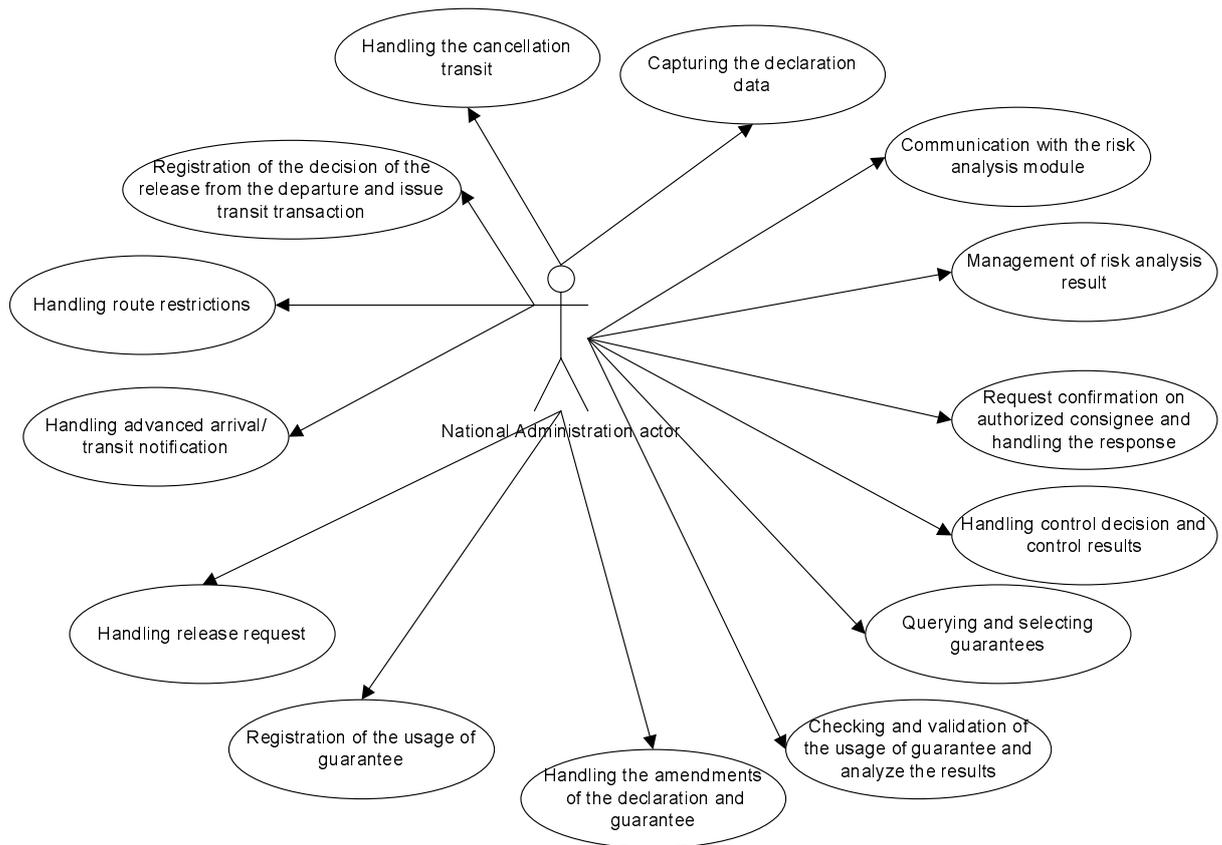


Figure 2-51 MCC Processing of the movement at the departure

The process starts when the declaration is submitted. The declaration can be received electronically or entered manually. The MCC system offers facilities of the declaration maintenance: creation, querying, preview, printing it and accompanying documents. It is also possible to edit the declaration if it is not released yet.

The customs officer can choose either to accept or to reject it. In latter case the trader is notified and the process ends. When declaration is accepted, the movement reference number (MRN) is allocated to the declaration.

The either internal or external risk analysis can be performed at the office of the departure. When it is set to internal, it is a random generated number, which can be increased or decreased manually. If it is set to external, the risk analysis module is a nationally defined one, as it communicates with external risk analysis module via sending and receiving the messages of predefined structure.

The customs officer can check if a consignee is an authorized consignee.

After accepting the declaration the customs officer can decide either to perform the control of transit operation, or to refuse to control. In case of control, control results can be recorded.

The customs officer can check the integrity/validity of guarantee. The declared guarantee is checked and the results are communicated. The user is able to perform queries on valid guarantees. When guarantee check is successful; the guarantee is registered. The trader is notified if the check of guarantee fails and can present the guaranty amendments. The customs officer decides either to accept or to reject the guarantee.

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If some minor discrepancies were found, and the Trader has not yet communicated his/her advice, customs officer can make some minor revision and move the declaration to the idle state until the release request from the trader is received.

Before the release of transit the guarantee should be accepted. The customs officer can handle the advanced arrival/transit notifications and route restrictions specifying a binding itinerary. After the release the transit operation is issued. The anticipated transit record (ATR) is created and the offices of transit and the office of destination are notified. The movement may go to destination and the trader has been granted permission to start transportation.

Due to unsatisfactory control results or due to expiration of the guarantee amendment time, the movement may not go to destination. The Trader is notified about not released transit operation.

### **Processing of the movement at the transit office**

Several actions can be performed at the office of the transit.

- Process transit notification and capture MRN;
- Request and receive anticipated transit record (ATR);
- Process movements offline at the office of transit;
- Validate passage;
- Turn-back or stop the movement;
- Register frontier crossing and handle NCF information at departure.

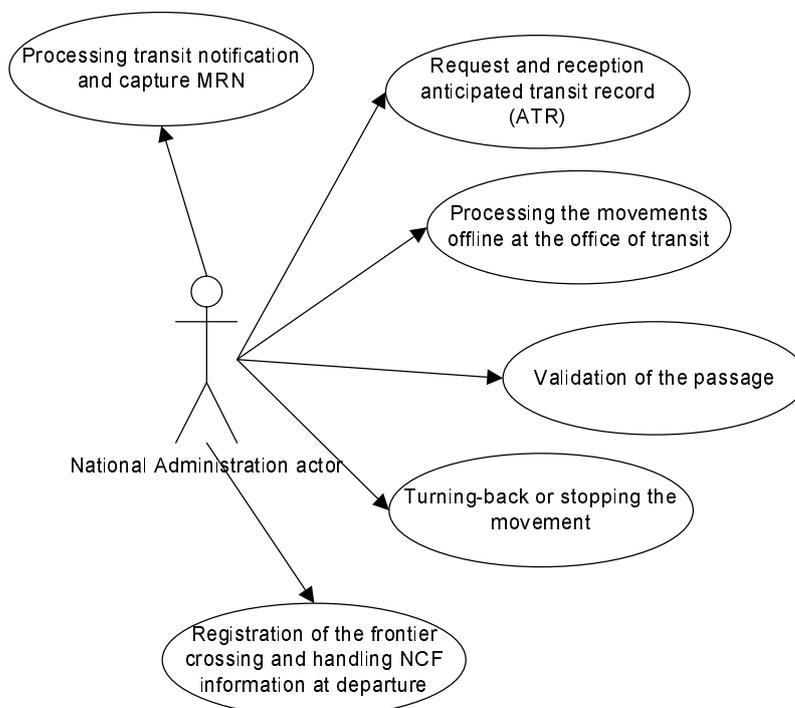


Figure 2-52 MCC Processing of the movement at the transit office use case

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The transit operation is issued by the office of departure and the anticipated transit record (ATR) should be created. The information about the transit operation is available at the office of transit. The customs officer can capture transit notification and MRN.

In case of loss of the ATR, the customs officer can request the movement details from the office of departure. If the MRN is known at the office of departure, the ATR is created and the processing of the movement is proceeded.

If the MRN is unknown at the office of departure, it could not provide the information requested and the ATR will be rejected. In latter case or after the expiration of waiting time, the customs officer can decide to process the movement offline. The Customs Officer can manually change the state of the movements.

When the office of transit has received the ATR, the customs officer validates the passage of a transit operation. The customs officer will be warned if the movement has a “binding itinerary”, or it already entered the country, or the declared guarantees are not valid in this country. If there is a diversion of binding itinerary, the consignment cannot cross the frontier, the customs officer can turn the movement back. In the case of the invalid passage the customs office can stop the consignment for enquiry and control purposes. The office of transit becomes the presentation office.

When the passage is valid, the customs officer registers the notification of crossing frontier (NCF). The notification is sent to the office of departure. The transit movement can proceed.

The “en route events” are occurrences that happen during the movement of goods from one country to another. The customs officer can add “en route events” when registering a transit notice

### **Processing of the movement at the destination office**

Several actions can be performed at the office of the destination, such as:

- Process arrival notification and capture MRN;
- Handle anticipated arrival record (AAR) request and response;
- Process movements offline at the Office of Destination;
- Record diversion and store and forward arrival advice;
- Force unloading permission;
- Store and analyse unloading remarks;
- Handle control decision and control results;
- Solve discrepancies;
- Register decision of the release from the destination;
- Carry out enquiry cancellation.

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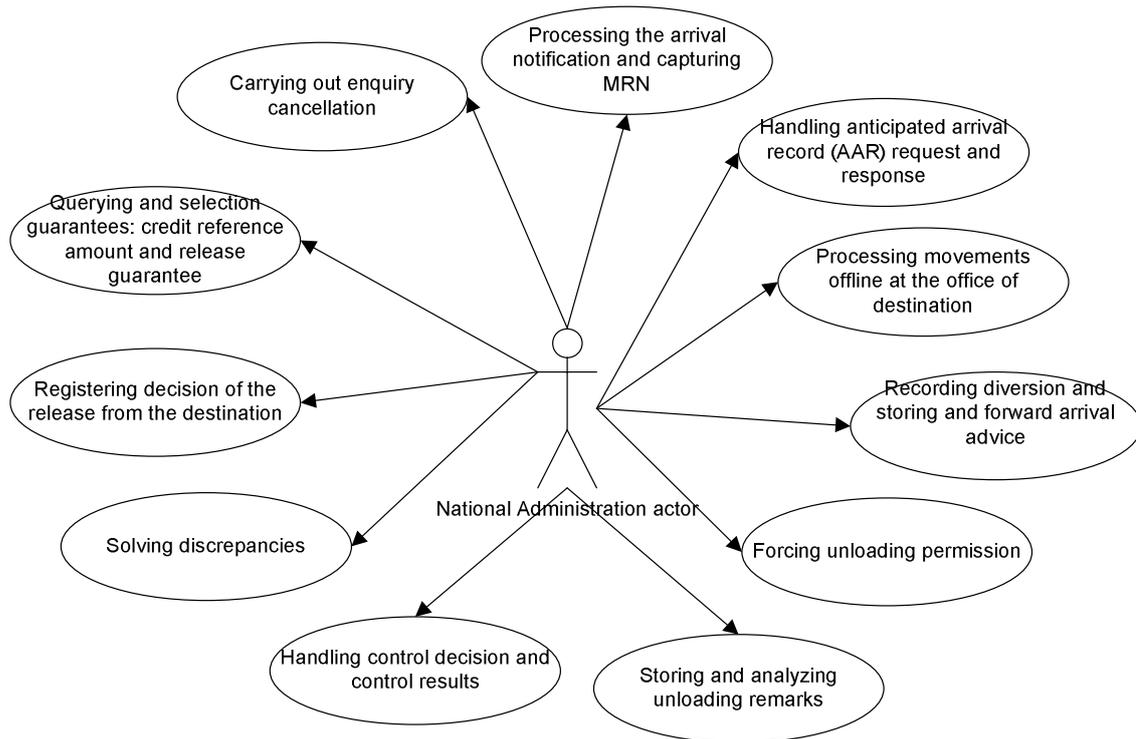


Figure 2-53 MCC Processing of the movement at the destination office use case

The transit operation is issued by the office of departure and the anticipated arrival record (AAR) should be created. The information about the transit operation is available at the office of destination. The customs officer can capture arrival notification and MRN.

If there is a diversion or loss of the AAR, the customs officer requests the movement details from the office of departure. If the MRN is known at the office of departure and the agreed location is included, the customs officer then has to accept or reject the arrival notification manually.

If the MRN is unknown, the office of departure could not provide the information requested and the AAR will be rejected. In latter case or after the expiration of waiting time, the customs officer can decide to process the movement offline. The Customs Officer can manually change the state of the movements. In case of the diversion of the destination point, the diversion can be accepted by the office of the departure. The office of the destination is notified about the arrival of the consignment at another office of destination by means of a forwarded arrival advice.

When the office of destination has received the AAR and the customs officer has accepted the arrival notification, he can decide either to perform the control of transit operation, or to refuse to control. In case of control, control results can be recorded.

The transit movement under Simplified Procedure is issued with permission to start unloading. The consignment is checked during the unloading of the goods. The office of destination receives the unloading remarks. If there are no remarks, no problems with seals reported and the unloading is completed, goods are released. Otherwise, the customs officer has to decide to or not to control the unloaded goods. When unloading remarks are received it is assumed that the unloading is completed.

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When the control results were not considered satisfactory, the customs officer sends the control results to the office of departure and notifies them that the office of destination is waiting for resolution of the discrepancies. If the office of destination receives the discrepancies notification message with the indication that the discrepancies have not been solved, movement can be released only after the manual intervention of the customs officer.

After registration of the satisfactory control results or non-satisfactory control results discrepancies are solved or the customs officer decides not to wait for discrepancies resolution, the goods are released from the office of destination.

### **Cancellation of the movement**

The transit movement can be cancelled either before the release from the office of the departure, or after the start of transit movement. Several actions can be performed during the cancellation.

- Handle cancellation request;
- Handle cancellation;
- Receive cancellation acknowledgments;
- Query and select guarantees for cancellation of their usage.

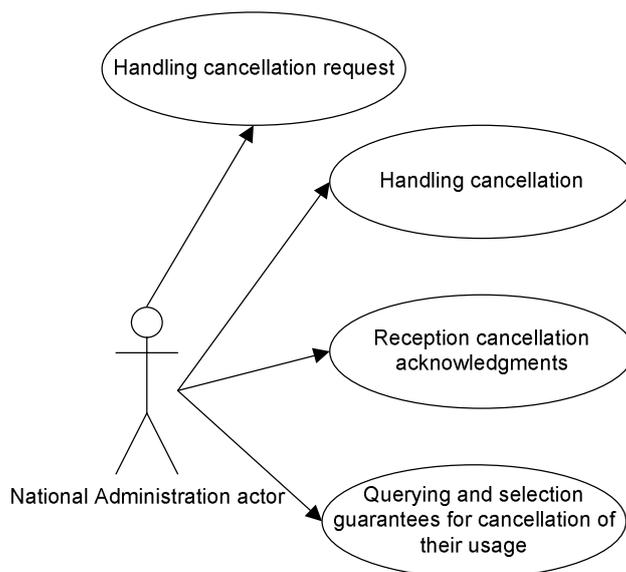


Figure 2-54 MCC Cancellation of the movement

The transit operation can be cancelled or by responding to the registered cancellation request received from the trader or on demand when the customs officer initiates the cancellation process. If the transit movement has been cancelled after the release from the office of the departure, the offices of transit and the office of the destination is notified about the cancellation of the transit operation.

### **Enquiry of the movement information**

- Proceed with enquiry;
- Process enquiry reminder;
- Process enquiry response;

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- Process negative response;
- Write - off movement;
- Record start recovery.

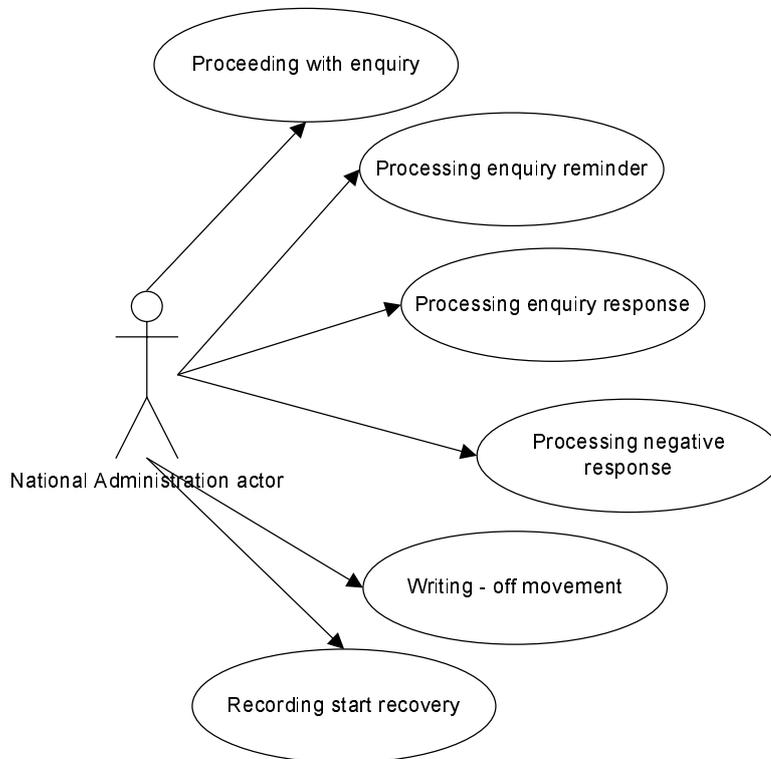


Figure 2-55 MCC Enquiry of the movement information use case

The transit operation is issued by the office of departure and the offices of transit and the office of destination are notified and should process the movement later.

When the date of the expected arrival or expected control results expires and no response is received, the enquiry is recommended. The customs officer starts by filling the form of enquiry. Other offices can be added to the list of offices to send enquiries to. The enquiry request is sent to all offices that are checked. Once the customs officer has started an enquiry, he is also able to send an enquiry reminder, provided the enquiry response timer has expired.

The customs officer at office of destination performs the required actions to provide the enquiry results. The movement can be under resolution of discrepancies, which have been found in the destination control results. In case of negative response received, the movement recovery procedure starts. Later the movement can be written-off and released.

### **Querying the movement information**

Several movement consultation facilities are available in the system

- Request for movement information and handle the response;
- Request information for a list of MRNs and handle the response;
- Request movement status and handle the response;

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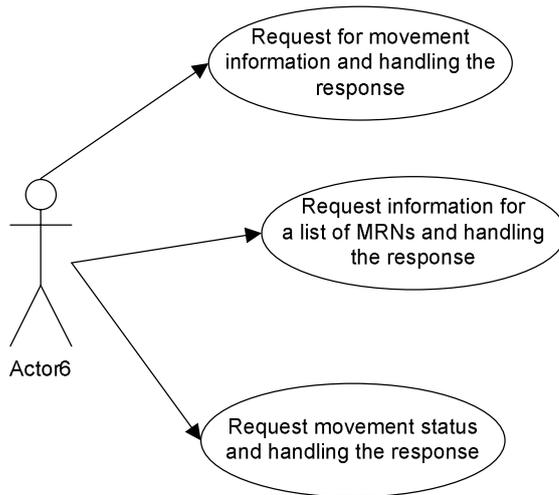


Figure 2-56 MCC Querying the movement information use case

The inspecting the current state of the movement can be done. The office of destination can view the state of the movement at all the transit offices declared for this country.

### **Administration**

The module, including various system administration functions has been developed.

- Process modification from common domain into national domain;
- Process modification id reference data from common domain;
- Synchronise reference data;
- Maintain national reference data;
- Maintain customs officer;
- Maintain user group;
- Maintain access control lists;
- Process submitted information exchange message;
- Process waiting information exchange message;
- Regeneration and resending of rejected messages;
- Locate movement data;
- Analyse movement data;
- Process valid movements with no MRN;
- Archive data to off-line support;
- Reload data from off-line support;
- Update statistics;
- Retrieve statistics information;
- Update system administration statistics;
- Analyse system administration statistics data;

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- Process unavailability schedule update.



Figure 2-57 MCC Administration use case

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### 2.21.2.2 Domain vocabulary

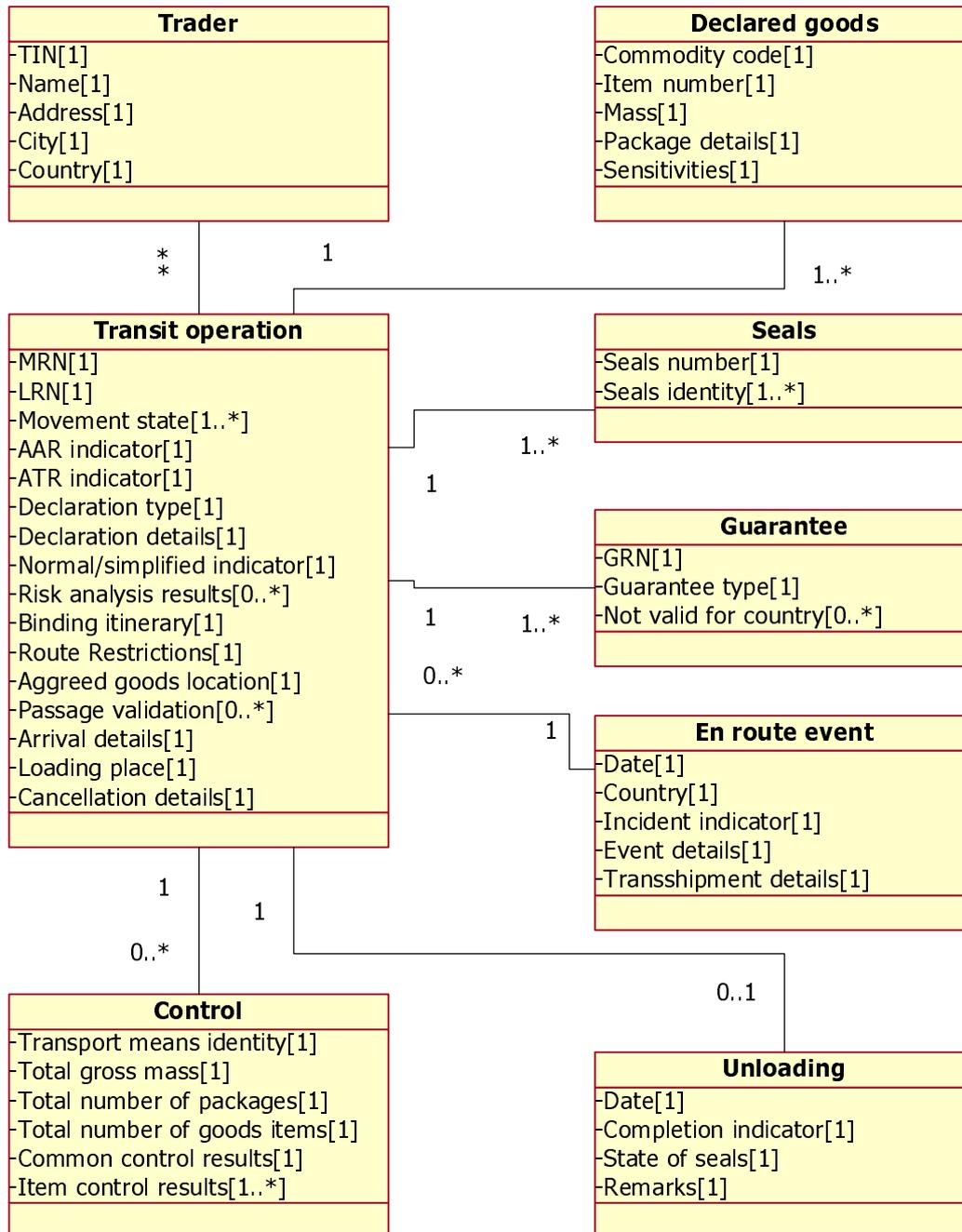


Figure 2-58 MCC Domain vocabulary

Major data objects managed in the system are:

- Trader
- Transit operation
- Guarantee
- En route events
- Unloading
- Control

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National domain reference data used are:

- Trader Authorization Details
- Trader Details
- Country Languages info
- Customs Sub Places and Agreed Locations
- Customs Return Copy locations
- Customs Competent Authorities
- Document Types
- Special Mentions Types
- Transport Types Crossing Border
- SP Goods Excluded
- Commodity Codes
- Suspended Goods Codes
- Authorisation text details

Common domain reference data are used:

- AAR Rejection reason
- Additional information request types
- Additional information response
- Amendment rejection motivation
- ATR rejection reason
- Control result codes
- Control results
- Control results types
- Country
- Country holidays
- Country/Region
- Currency codes
- Customs Office Geo info
- Customs Office information
- Declaration types
- Document types
- Guarantee monitoring
- Guarantee types
- Invalid guarantee reason

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- Language codes
- Measurement units
- Office role types
- Packaging codes
- Sensitive goods codes
- Special mention codes
- Statistics types
- Traffic types
- Transit operation state types
- Transport mode
- UN/LOCODE

### **Transit operation**

The main object in the system is the transit operation. It is based on the declaration data and contains general declaration information.

The transit operation contains the child objects of the declaration such as declared goods, seals, transport means.

The transit operation also includes the movement related information, such as route restrictions, binding itinerary, arrival details.

The transit operation object is also called the transit movement. The movement object can obtain different states during the transit process from the beginning after the declaration was submitted till the end after the goods were released at the destination. When the object changes its state the system can send a notification message. Also receiving the message from external systems can change the state of the object. The most important states are listed below, after the type of the office.

#### Office of departure

- Submitted
- Accepted
- Rejected
- Under Control
- Under Guarantee registration
- Guarantee Registered
- Cancelled
- Released

#### Office of transit

- Processed offline
- Stopped

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- Turned back
- Crossing frontier registered

#### Office of destination

- Processed Offline
- Arrived
- Arrival Reported
- Arrival Accepted
- Unloading
- Under Control
- Waiting for Discrepancy Resolution
- Discrepancies not solved
- Under Recovery Procedure
- Goods Released

#### Office of write – off and Office of competent authority

- Arrived
- Enquiry Recommended
- Under Enquiry Request
- Under Recovery Procedure
- Under Resolution
- Written – Off

### **Trader**

The transit operation is associated with the trader, which can be consignor, consignee, principal.

### **Guarantee**

The transit operation is associated with the guarantees.

### **En route events**

The en route events can occur during the transit process. The information regarding the occurred incidents and/or transshipments can be registered.

### **Control**

The control the consignment can be performed and the control results registered. The detailed control results are registered both in a transit operation and in an item level.

### **Unloading**

In case of the transit movement under simplified procedure at destination the permission to start unloading is issued and the unloading remarks are registered.

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The relations between major data objects together with their most important attributes are presented in the diagram.

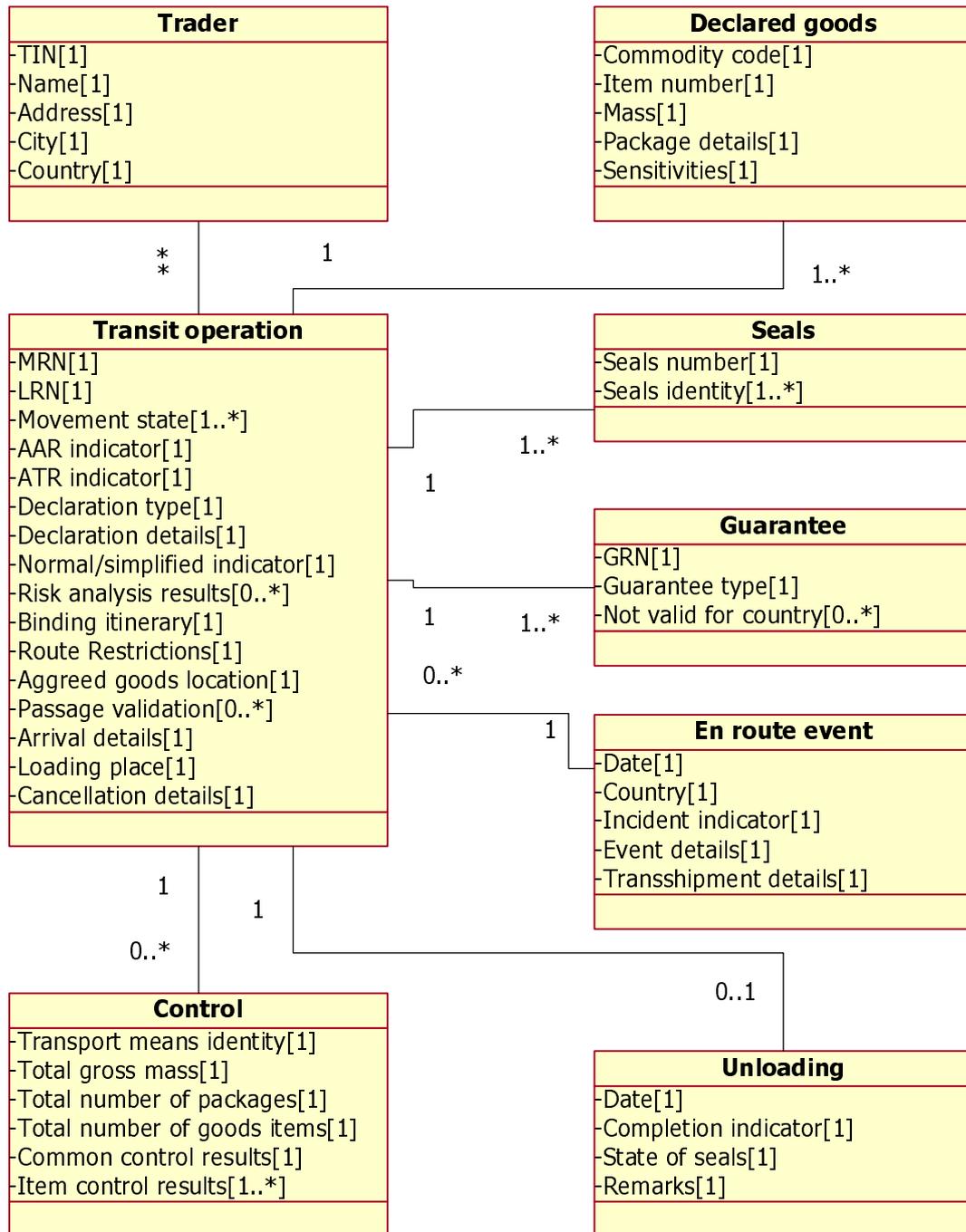


Figure 2-59 MCC major data objects relations diagram

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## 2.22 GMS

### 2.22.1 Reference and Applicable Documents

Id	Title	Reference	Version
GMS1	Functional Transit System Specification	0ftss-4.0-e.pdf, 1ftss-4.0-e.pdf, 2ftss-4.0-e.pdf, 3ftss-4.0-e.pdf, 4ftss-4.0-e.pdf, 5ftss-4.0-e.pdf, 6ftss-4.0-e.pdf, 7ftss-4.0-e.pdf, 8ftss-4.0-e.pdf, 9ftss-4.0-e.pdf	4.0
GMS 2	System Requirements Definition for MCC for Phase 3.2	TCE-SRD-L1MCC-P32-v3.90-EN_PART02.doc TCE-SRD-L1MCC-P32-APPA-v3.90-EN.doc TCE-SRD-L1MCC-P32-APPB-v3.90-EN.doc TCE-SRD-L1MCC-P32-APPC-v3.90-EN.doc	3.90-EN
GMS 3	MCC Phase 3.2: User Manual	TCE-UMN-L1MCC-P32-v3.40-EN_PART06.doc	3.40

Table 2-22: GMS Reference documents

### 2.22.2 Functional perspective

New Computerized Transit System ([NCTS](#)) is based on the electronic exchange of the transit data between the National Customs Administrations in parallel and in anticipation of the movement of the goods. [NCTS](#) provides a fully computerized Customs regime for goods which enter into the Common Transit.

Guarantee management system (GMS) is one of the applications of a Centrally Developed Transit Application (CDTA) suite that has been developed to support [NCTS](#). The GMS application manages transit movements of a national administration (NA) in an [NCTS](#) compliant manner by:

- Providing a mechanism for the maintenance of the guarantee information;
- Management the exchange of information with the Minimal common core ([MCC](#)) of the [NCTS](#).

#### 2.22.2.1 Use cases view

The functionality can be divided into several groups.

- Guarantee Usage
- Guarantee Data Management
- Querying the guarantee information

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- Access Codes management
- Administration

### Guarantee Usage

- Checking guarantee integrity
- Registering usage of guarantees
- Credit reference amount
- Releasing guarantees usage
- Cancellation guarantee usage

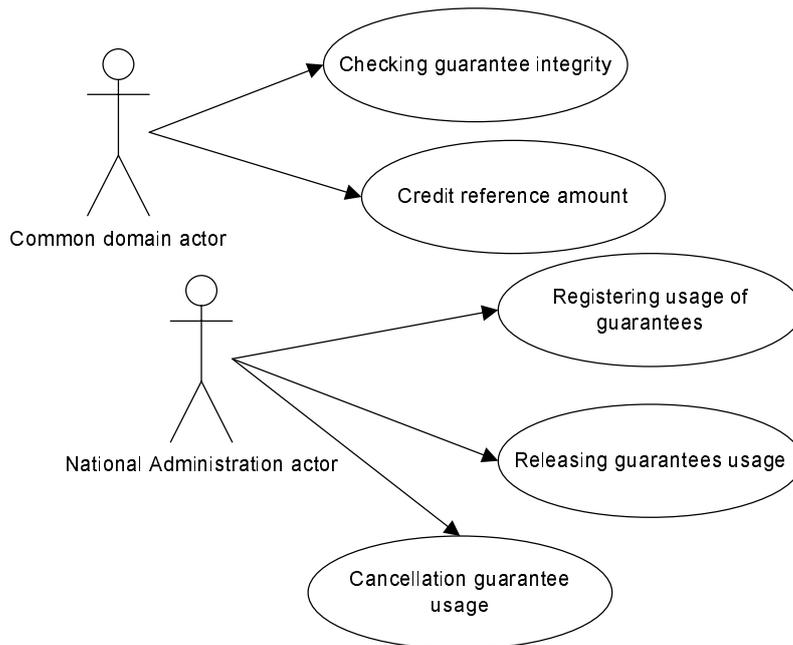


Figure 2-60 GMS Guarantee Usage

The system checks guarantee integrity. The system retrieves and validates all the related GRNs for the MRN. Moreover, the system shall validate the above GRNs. For an [NCTS](#) individual guarantee voucher, the following integrity checks will be performed: the existence, validity, usage and restrictions of the individual guarantee voucher and validity of presented access codes, also the correspondence of principles of voucher and declaration.

The system registers usage of guarantees. The system, for the specific MRN, identifies the different Offices of Guarantee for each GRN. For each Office of Guarantee the system validates the concerned amount against the reference amount for each GRN and proceeds with check of guarantee integrity. Then the registration of guarantee usage is performed for each GRN concerned.

The system credits reference amount. Upon the request for crediting the reference amount, the system gathers all the related GRNs for the MRN, validates each GRN and records the credit amount concerned.

The system releases guarantees usage. Upon the reception of guarantee usage cancellation, the system gathers and validates all the concerned GRNs related to the given MRN, records the release date, and status of the guarantee is changed to “valid”.

The system cancels guarantee usage. For all guarantees referenced by a certain MRN the system retrieves the amount that covers the given MRN, credits back the covered

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amount that has been previously debited to the reference amount for each specific GRN of the given MRN and records the invalidity of the reference of MRN to GRNs are no valid.

### Guarantee Data Management

- Processing of guarantee
- Amount calculation
- Updating comprehensive guarantee data
- Cancellation of the guarantee
- Recording information about sold [NCTS](#) individual guarantee vouchers

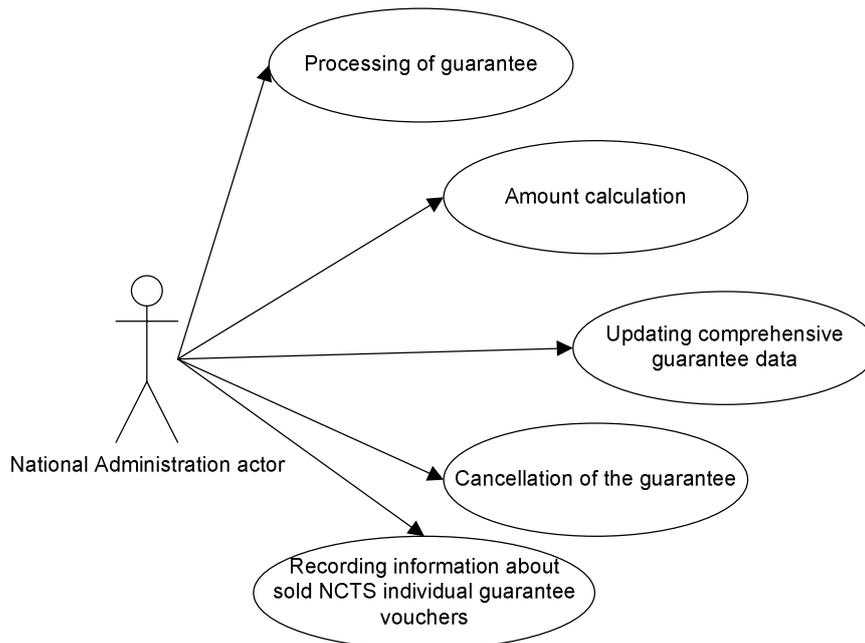


Figure 2-61 GMS Guarantee Data Management

The system provides facilities of possessing the guarantee information. The guarantee can be created, viewed and updated. The customs officer selects the guarantee type and enters the rest guarantee details, such as principal's TIN, reference amount, territorial validity, validity period, also specifies initial access code. The data fields and validation rules differ depending on the guarantee type. The guarantee should be registered after creation.

Latter it is possible to update guarantee's data. After update the system performs the integrity check and validation.

The customs officer can review the reference amount based on previous movement initiated by the given Principal in the country of the Office of Guarantee for the specified time period. The system summarizes the amounts of all associated GRNs. The Customs Officer can view the results of the calculation.

The customs officer can cancel/revoke the selected guarantee, by providing the cancellation date and type. The system enables the customs officer to print a notification letter and changes the status of guarantee to "Invalid".

The registration of sold vouchers is executed when the customs officer is informed by the Guarantor about a sold individual guarantee in the form of vouchers. The customs

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officer fills the GRN basic part and records the individual vouchers and enters the voucher's access code

### **Querying the guarantee information**

- Querying the guarantee information

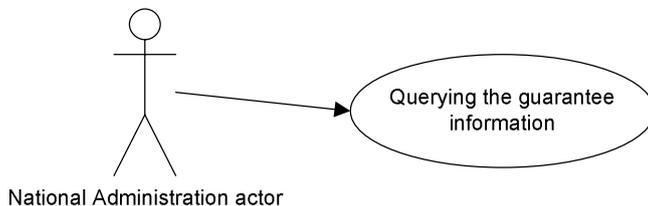


Figure 2-62 GMS Querying the guarantee information

The system processes query on guarantees. The system gathers all the appropriate data from the database according to the presented query parameters and generates the response to the information request.

### **Access Codes management**

- Management of the access codes

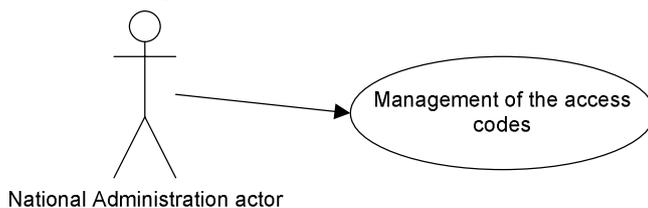


Figure 2-63 GMS Access Codes management

The customs officer can enter the access codes when the Principal hands in a hard copy, which contains the guarantee access codes that the Principal needs to assign or change related to a comprehensive guarantee, or to a guarantee waiver, or to individual guarantee with multiple usage. The access codes can be managed by the trader if system confirms that the Principal is indeed authorized.

### **Administration**

The module, including various system administration functions has been developed.

- Creating user groups
- Processing national reference data
- Reception of the full extraction of the Common Reference Data
- Freezing movement data

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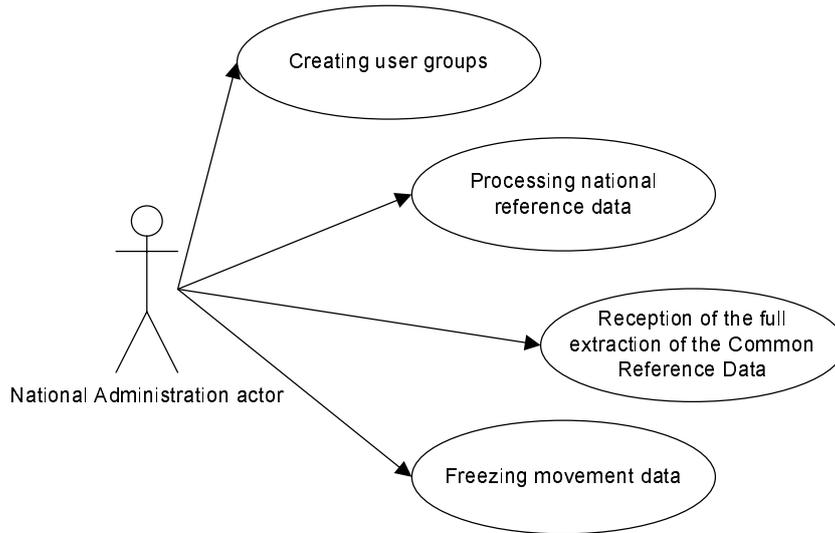


Figure 2-64 GMS Administration

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### 2.22.2.2 Domain vocabulary

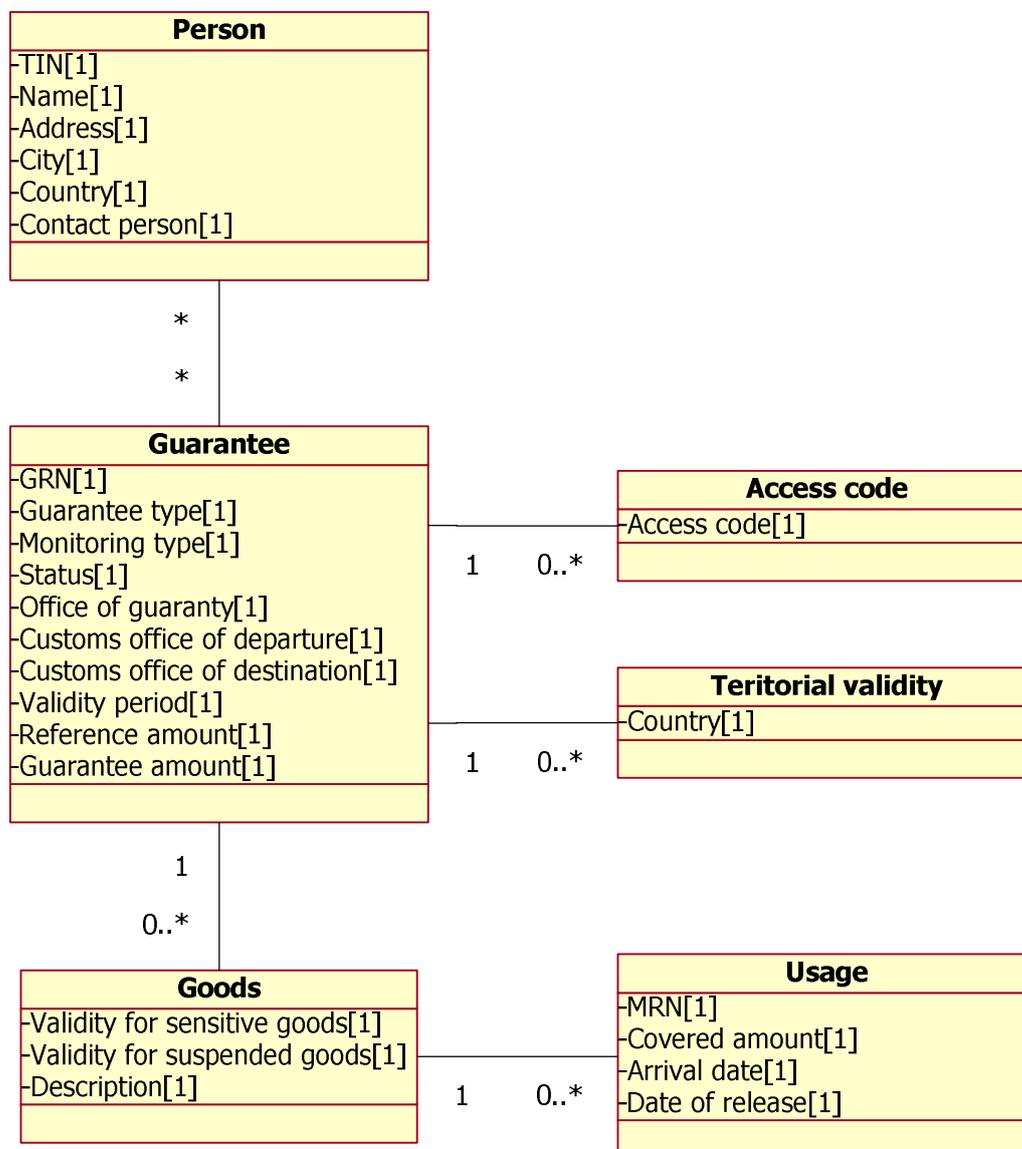


Figure 2-65 GMS Domain vocabulary

Major data objects are stored:

- Guarantee
- Person
- Usage

Reference data are used:

- Trader Authorization Details
- Trader Details
- Country Languages info

#### Guarantee

The object guarantee represents the guarantee details: the acceptance and expiry dates, reference amount, currency and percentage, number of certificates, movement details, offices of departure and destination, total number of vouchers. The data fields and

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validation rules differ depending on the guarantee type, which can be guarantee waiver, comprehensive guarantee, individual guarantee with multiple usages.

Beyond the information of guarantee itself it includes the guarantor and principal details, also the initial access code and the additional access codes, also the territorial validity including validity limitation, which means the list of countries where guarantee is valid.

### **Person**

The person represents either the Guarantor or the Trader.

### **Usage**

The usage shows the association between a transit Operation (MRN) and a guarantee (GRN). More specifically, this object represents which are the guarantees (GRN) that furnish a Transit Operation (MRN). The association is made via declared goods.

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2.23 - ECN plus	ISSUE DATE: 13/01/2009

## 2.23 ECN plus

### 2.23.1 Reference and Applicable Documents

Id	Title	Reference	Version
ECN+1	System Requirements Definition for ECN+	TCE-SRD-ECN+.zip	1.60

Table 2-23: ECN plus Reference documents

### 2.23.2 Functional perspective

The Export Control System ([ECS](#)) allows to National Customs Administrations the electronic exchange of information from the office of exportation to the office of exit and vice-versa. The office of export can then send this information to inform the economic operator and other government services that the goods have left the customs territory. The [ECS](#) is based on the New Computerized Transit System ([NCTS](#)) solutions.

The ECN+ application has been developed to support [ECS](#). The purposes of the ECN+ application are:

- to receive messages from the member state's own National Export System (NES), and then to manage the international exchange of information about export movements among the NES of the involved member states;
- to handle the national communication between a MS ECN+ system and its own NES;
- to provide a manual input of data when involved member state's National Export System is unavailable or it does not own a NES.

In order to achieve the above goals, the ECN+ application interacts with the Common Domain (CD) or other NESs in other national domains (ND). These interactions are based on the exchange of messages entitled IEs. ECN+ does not directly communicate with the CD or other ND but uses Electronic Data Interchange and Common Systems Interface node ([ECN](#)) for this purpose. [ECN](#) manages the exchange of information across the two domains using dedicated queues.

#### 2.23.2.1 Use cases view

The functionality can be divided into several groups.

- Processing of the movement at the export office
- Processing of the movement at the exit office
- Enquiry of the movement status
- Cancellation of the movement
- Querying the movement information
- Administration

#### **Processing of the movement at the export office**

Several actions can be performed at the office of the export:

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- Registration of a declaration
- Handling the reception of a declaration from NES
- AER request handling
- Exit results handling

The process starts when the export declaration is submitted. The declaration can be received electronically from the NES or entered manually.

When the declaration is registered in the NES at first, the anticipated export record (AER) is sent by NES to the ECN+/office of export. The system checks the uniqueness of MRN or in case if MRN does not exist, the system requests an MRN generation from [ECN](#). Finally, the system submits the AER to the office of exit and informs the NES in order to inform it about the generated MRN.

The customs officer can also create a new export declaration manually and enter the declaration data: consignor, consignee, countries of dispatch and destination, goods items, etc. The system requests an MRN generation from [ECN](#), sends the AER to the office of exit and submits the MRN and the rest information of the movement to the NES. The customs officer can print the export accompanying document (EAD).

The system facilitates the responding to the AER requests from the offices of exit. Upon the reception of an AER request, the system searches the database for the MRN and retrieves the full information of the specified movement and forwards the AER response. If the actual office of exit issuing the AER Request is different than the declared Customs Office of Exit (namely, an international diversion has occurred) the system indicates the diversion and notifies the declared office of exit and the NES.

Upon the reception of the exit results from the office of exit, and the control results are satisfactory or considered satisfactory, the system registers successful exit of the movement from the Community. If the control results are not satisfactory then the movement is stopped because of discrepancies at exit. Finally, the system submits the exit results to the NES and notifies it whether or not the exit of the movement from the Community was successful.

### **Processing of the movement at the exit office**

The following actions can be performed at the office of the exit:

- Handling the AER reception;
- Diversion recording;
- Handling the reception of arrival notification from NES;
- Processing of arrival notification;
- AER response handling;
- Risk analysis;
- Manual update of risk indicator;
- Handling the exit notification;
- Handling the reception of exit results from NES.

Upon the reception of the AER from the office of export, the system checks that the specific MRN of the AER is “unknown”, namely the movement does not already exist in the system and registers the information about the export movement. Finally, the system forwards the MRN and the rest information of the movement to the NES.

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Upon the reception of the diversion notification, the system records the national/international diversion of the export movement with the specified MRN and forwards the diversion to the NES.

Upon the arrival of the movement to the office of exit the arrival notification can be received electronically from the NES or entered manually. When the arrival notification is received from the NES the system checks the existence of MRN and registers the date and the rest information of the arrival. The customs officer can also create the arrival notification of export consignment manually and enter the date and the rest information of the arrival. The system searches the database for the specified MRN. If the specified MRN is known to the system registers the arrival notification and forwards it to the NES.

In case if there is no available information for the specified MRN due to the occurrence of either a diversion or an exceptional situation, the system submits the AER request to the Office of Export. Upon the received AER response from the office of export the system extracts the movement information and stores it in the database. In case of the AER rejection, the system stores the AER rejection reason in the database in the corresponding MRN record. If the actual customs office of exit issuing the AER request is different than the declared customs office of exit (namely, a diversion has occurred) then the system forwards the arrival information to the NES and proceeds to the risk analysis.

The system calls an external Risk Analysis module requesting a risk analysis for the specific AER. In case if an external Risk Analysis module does not exist, the system automatically generates a random number within the range 0 and 100. The system stores the received or generated risk indicator. The customs officer can update manually the automatic risk analysis result based upon his/her own perception of whether the specific movement data is qualified for control. The system enables browse or search for a movement in order to update the automatic risk indicator of the selected movement with his/her manual risk estimation in the range 0-100.

The control and exit results can be received electronically from the NES or entered manually. Upon the reception of the exit results from the NES the system checks the existence of MRN and registers the control results. The customs officer can also browse or search for a movement in order to register the actual exit of the export movement from the Community manually. The Customs Officer selects the necessary movement and enters the control results and exit date. If the control results are satisfactory, the system registers the exit of the export consignment from the Community. In the case on unsatisfactory control results the system fixes the state that the goods are not allowed to exit. Finally, the system sends the exit results to the office of export as well as to the NES. Finally the system submits the notification of exit results to the office of export.

### **Enquiry of the movement status**

Several actions can be performed at the office of the export:

- Movement status request
- Movement status response

The system enables the customs officer in the office of export to request the office of exit about the movement status. The customs officer can browse or search for a movement in order to send a status request for the selected movement. The system submits the status request to the proper office of exit, considering the case of the diversion. Upon the reception of the movement status request from the office of export

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the system checks if the movement for which the status is requested exists, i.e. its MRN is known to the system, then generates a response and sends it to office of export.

### **Cancellation of the movement**

Several actions can be performed in case of cancellation:

- Cancellation of the movement
- Handling the reception of cancellation from NES
- Finalizing Cancellation Request

The cancellation of the movement can be received electronically from the NES or entered manually. The cancellation can be initiated only at the office of export.

When the movement cancellation is registered in the NES at first, the cancellation message is send by NES to the ECN+/office of export. If the movement is in an appropriate (non-final) state, the system registers the cancellation of the movement and checks if a diversion has occurred before for that movement.

The customs officer can also cancel the movement manually upon the reception of a cancellation request from an exporter or the customs officer's decision. The system enables the customs officer to browse or search for a movement and select the necessary declaration in order to specify the cancellation date and the reason.

Finally, the system notifies the NES and the office of exit it about the cancellation, considering the case of the diversion.

Upon the reception of cancellation message at the office of exit, the system extracts the cancellation date and stores it in the database. Finally, the system generates and sends an acknowledgement to the office of export also submits the cancellation information to the NES.

### **Querying the movement information**

Several movement consultation facilities are available in the system

- Searching for an export operation
- Browsing the declaration list

The system enables the customs officer to browse all declarations in the system or enter the search criterion and view the list of declaration which correspond the criterion.

The Customs Officer can choose a declaration either to see the declaration data or to perform various actions, depending on the state of the movement, e.g. send the request, register the exit results or cancel the movement.

### **Administration**

The module, including various system administration functions has been developed.

- Maintenance of users
- Maintenance of group
- Maintenance of access control list
- Archiving export operation data
- Purging the archived export operation data
- Processing the modification of customs office list/common reference data
- Synchronizing customs office list/common reference data
- Loading updated national reference data

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- Processing unavailability schedule update
- Processing submitted and waiting information exchange messages

### 2.23.2.2 Domain vocabulary

Major data objects are stored:

- Export operation
- Trader
- Control

National domain reference data are used:

- Country Languages info
- Customs Competent Authorities
- Document Types

Common domain reference data are used:

- AER Rejection reason
- Control result codes
- Control results types
- Country
- Customs Offices
- Declaration types
- Language codes
- Measurement units
- Office role types
- Packaging codes
- Transport mode

#### **Export operation**

The main object in the system is the export operation. It is based on the declaration data and contains general declaration information.

The export operation contains the child objects of the declaration such as declared goods, seals, etc. The export operation also includes the movement related information, such as arrival details.

The export operation object is also called the movement. The movement object can obtain different states during the export process from the beginning after the declaration was submitted till the end after the goods exited from the Community. When the object changes its state the system can send a notification message. Also receiving the message from external systems can change the state of the object. The most important states are listed below:

- AER created
- AER requested
- Arrived elsewhere
- Cancelled
- Diversion rejected
- Exited
- Export stopped, discrepancies at exit
- Exported
- Goods not allowed to exit

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- Goods presented at exit
- Goods released for export

### **Trader**

The export operation is associated with the trader, which can be consignor or consignee.

### **Control**

The control the consignment can be performed and the control results registered. The detailed control results are registered both in a export operation and in an item level.

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The relations between major data objects together with their most important attributes are presented in the diagram.

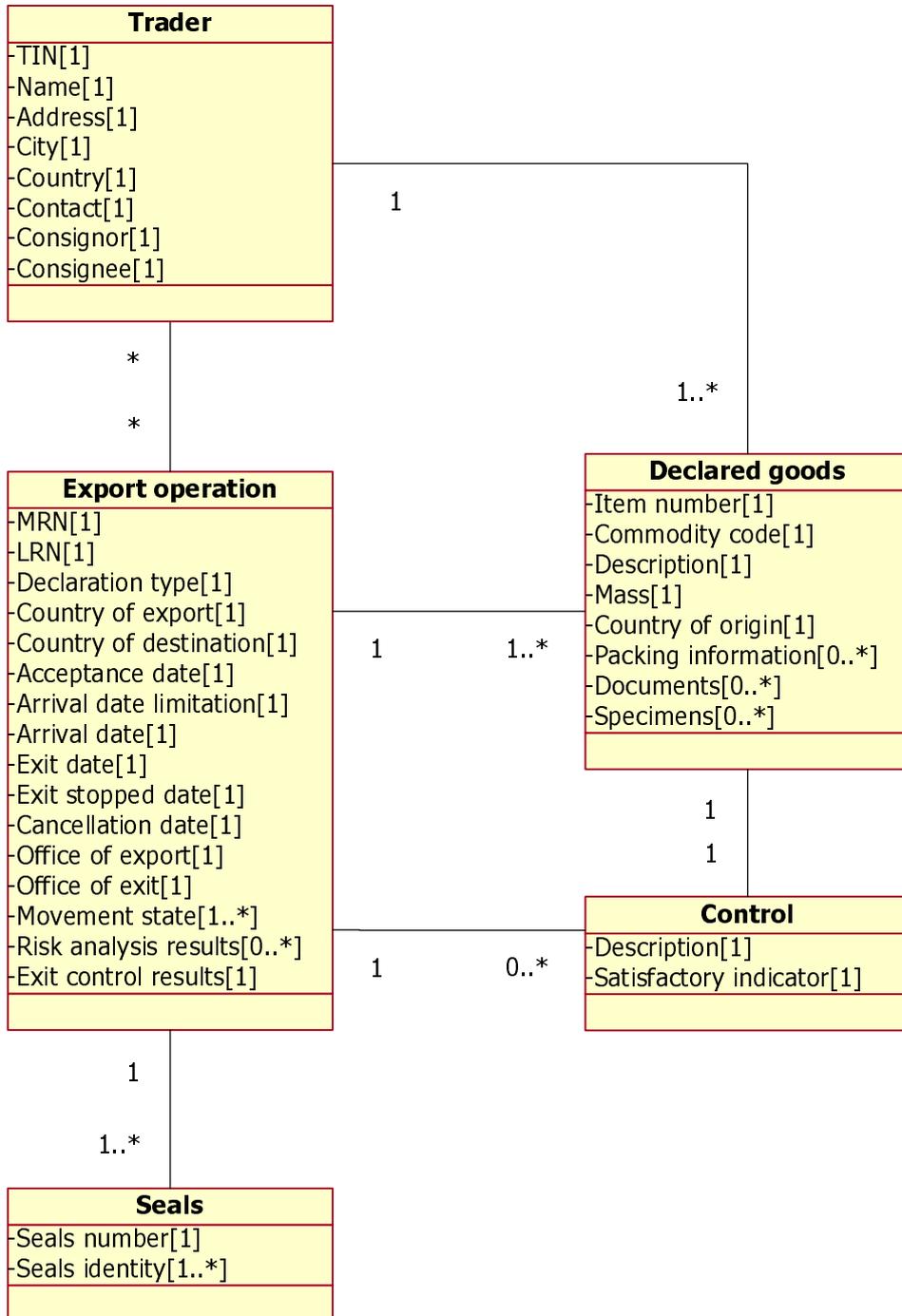


Figure 2-66 ECN+ major data objects relations

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2.24 - CS/MIS	ISSUE DATE: 13/01/2009

## 2.24 CS/MIS

### 2.24.1 Reference and Applicable Documents

Id	Title	Reference	Version
MIS1	System Requirements Definition	TCE-SRD-L1CSM-P32.zip	3.00

Table 2-24: CS/MIS Reference documents

### 2.24.2 Functional perspective

New Computerised Transit System ([NCTS](#)) is based on the electronic exchange of the transit data between the National Customs Administrations in parallel and in anticipation of the movement of the goods. [NCTS](#) provides a fully computerised Customs regime for goods which enter into the Common Transit.

Central Services/Management Information System (CS/MIS) is one of the applications of a Centrally Developed Transit Application (CDTA) suite that has been developed to support [NCTS](#) and [ECS](#), and ICS (Import Control System) in 2009.

CS/MIS provides the facilities needed to monitor and report on the operation of [NCTS](#) from the system, business and resources points of view.

- Monitoring and handling of the [NCTS](#) operations
- Reporting on [NCTS](#)-related traffic (messages, [NCTS](#) Movements)
- Reporting on [NCTS](#) resource utilization
- Monitoring and handling of National applications unavailability - National Transit Applications (NTAs) and National Export Control Applications (NECAs).

This is performed by collecting and distributing business statistics, CCN-TC statistics, information on movements (MRN follow-up), and information on availability of [NCTS](#). CS/MIS is located centrally at the Common Domain - Central Operations site.

#### 2.24.2.1 Domain vocabulary

##### **Unavailability information and statistics**

Major data objects are stored:

- Unavailability message;
- Unavailability;
- Unavailability statistics;
- Unavailability statistics details;
- Archive of unavailability messages;
- Archived unavailability message;
- Archived unavailability.

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Main reference data are used:

- Message type;
- Unavailability type;
- Business functionality;
- Action;
- Status;
- Statistic type;
- Country.

Every national [NCTS](#) or [ECS](#) application schedules its own unavailability. The unavailability of the system is reported by sending an unavailability message. Message contains the information the business functionality which will be unavailable during certain period in particular country. Several unavailabilities can be reported by one message.

The information of unavailabilities is being consolidated recurrently and stored in the unavailability statistics tables. The obsolete unavailability information can be transferred into archive.

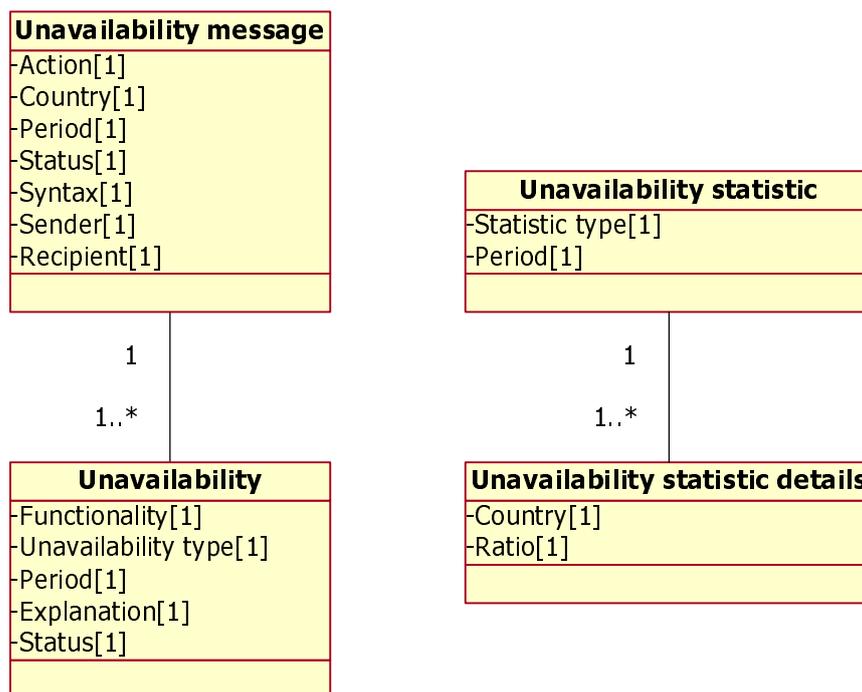


Figure 2-67 CS/MIS Unavailability information and statistics major data objects relations

The relations between major data objects together with their most important attributes are presented in the diagram.

### CCN-TC statistics

Major data objects are stored:

- CCN-TC message;

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- CCN-TC statistics;
- CCN-TC statistics details.

Main reference data are used:

- Message type;
- Message direction;
- Gateway;
- Consolidation status;
- Statistic type;
- Country.

CCN statistics based on volume of messages and volume of requests, reports and other information exchange activities is gathered automatically by the system. They are structured as summary entries that indicate the type and number of messages exchanged for a given day between pairs of CCN/CSI gateways.

The daily statistical data is consolidated for a particular month automatically by the batch process of the system. The information of the messages of different type is stored in separate tables, but the most important information is common: the message type, date, size, source and destination.

The relations between major data objects together with their most important attributes are presented in the diagram.

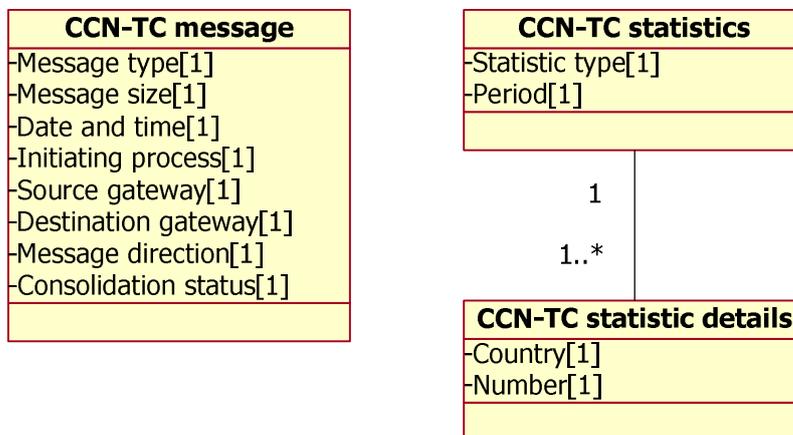


Figure 2-68 CS/MIS CCN-TC statistics major data objects relations

### **Business statistics**

Major data objects are stored:

- Business statistics message;
- Business statistics;
- Business statistics details.

Main reference data are used:

- Statistics type;

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- Consolidation status;
- Country.

Business statistics information includes the number of movements per transit regime, the number of control results per type, statistics on diversions, cancelled movements, movements under simplified procedure, statistics on declaration types, statistics on handle enquiry and recovery procedures, statistics on average movement handling time, etc.

[NCTS](#) business statistics messages are collected on a monthly basis. The information of business statistics is being consolidated recurrently and stored in the business statistics tables. Consolidation simply groups the numbers into a monthly report.

The relations between major data objects together with their most important attributes are presented in the diagram.

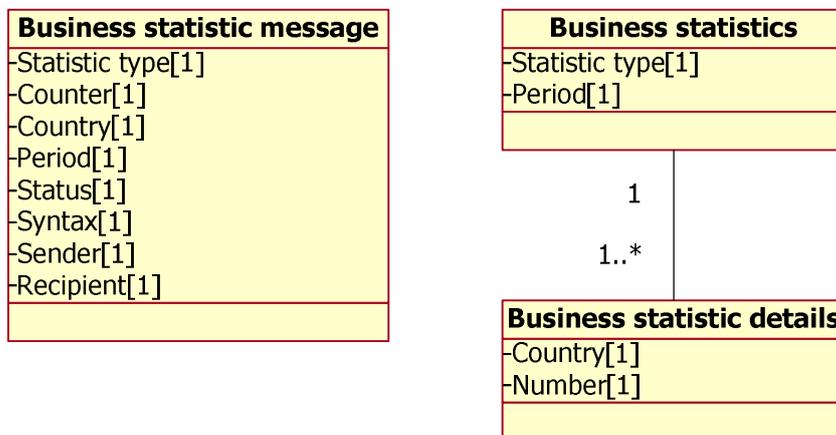


Figure 2-69 CS/MIS Business statistics major data objects relations

### MRN follow-ups

Major data objects are stored:

- MRN message;
- MRN movement;
- MRN statistics;
- MRN statistics details.

Main reference data are used:

- Message type;
- Gateway;
- Statistics type;
- Country;
- Country role.

The MRN message is exchanged between the countries involved in a movement. The movement is defined by MRN (movement reference number). The movement information includes the departure and destination countries; the list of involved

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additional countries and their roles in the movement can be included. The information is collected from the CCN/CSI audit files received from the NAs and consolidated by CS/MIS.

The relations between major data objects together with their most important attributes are presented in the diagram.

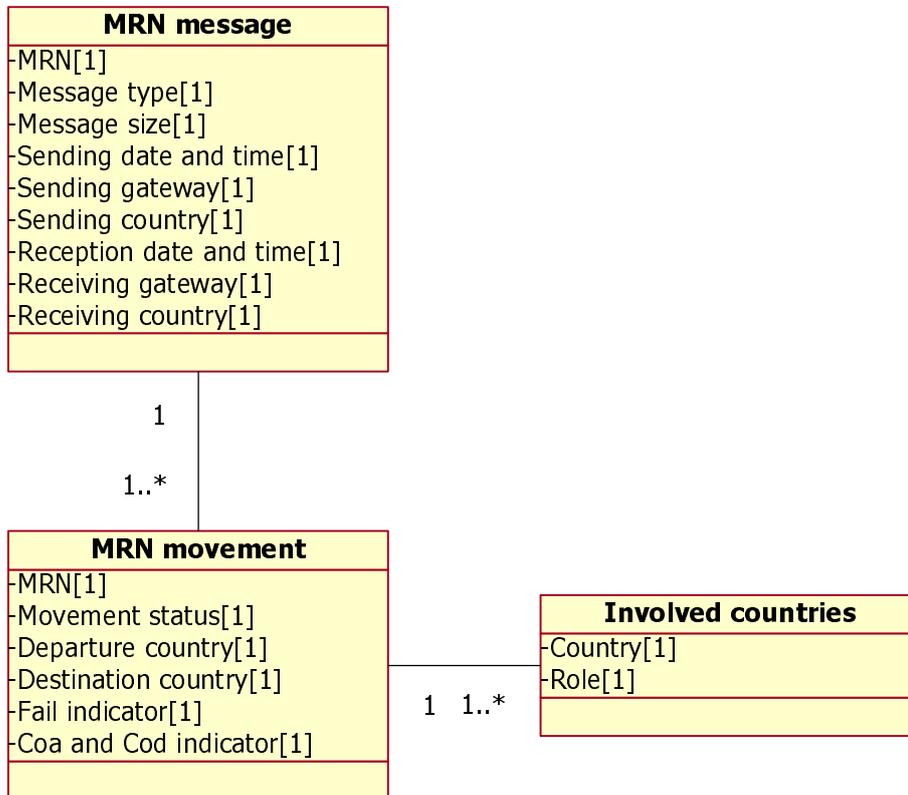


Figure 2-70 CS/MIS MRN follow-ups major data objects relations

### Administration

Major data objects are stored:

- User;
- Country;
- Gateway;
- [NCTS](#) mailing list;
- [ECS](#) mailing list;
- Language;
- Phrase.

Main reference data are used:

- Transit Regime;
- Environment;
- Domain;
- User profile.

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User is the central user for the CS/MIS Security. Country represents the list of countries that can be involved in transit movements. The profile of the user defines the role of the user. It can be the operator or administrator of the domain of national application, or CS/MIS domain.

The gateway defines the communication point of the national application of transit or export control. The environment in which the gateway operates can be production, backup or test environment of the system.

The relations between major data objects together with their most important attributes are presented in the diagram.

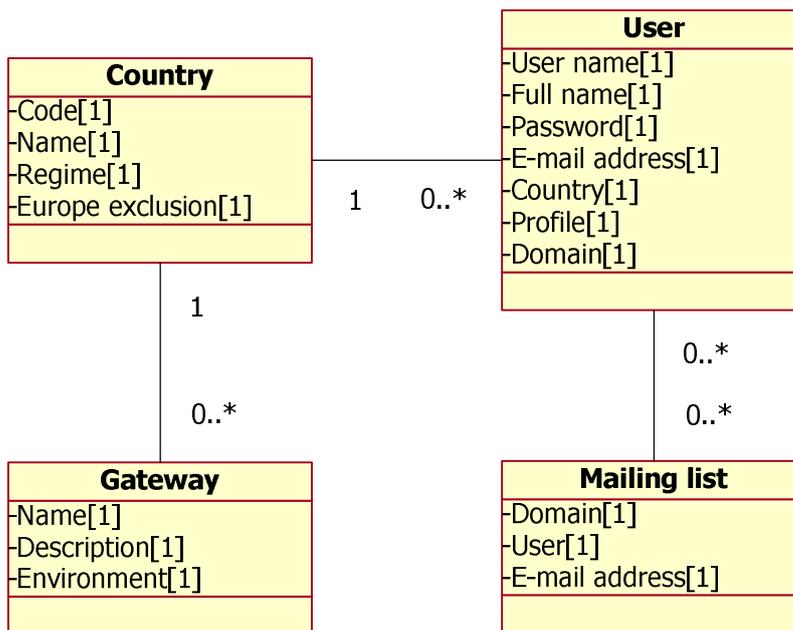


Figure 2-71 CS/MIS Administration major data objects relations

### 2.24.2.2 Use cases view

#### General principles

There are two domains in the system – [NCTS](#) or [ECS](#). The data structure and the functionality of the [NCTS](#) and [ECS](#) are similar, but functions are accessed and information is managed separately. However there are few extra [NCTS](#) functions, which are not used for [ECS](#).

Both [NCTS](#) and [ECS](#) subsystems are responsible for collecting, consolidation and display of CCN-TC statistics and system availability. The difference is that both systems deal with the different kind of movements: The [NCTS](#) collects, consolidates, displays and delivers information on [NCTS](#) movements, while [ECS](#) collects, consolidates and displays information [ECS](#) movements. Moreover the [NCTS](#) collects and distributes [NCTS](#) business statistics.

With the exception of the Business statistics functionality (that is not supported by the [ECS](#) subsystem), the below mentioned functionality layers are common for both the [NCTS](#) and [ECS](#) subsystems.

The read write access to the information depends on the user profile. The users of common domain have the access to all information. The users of national domains

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belong either to [NCTS](#) or to [ECS](#) domain and can access only [NCTS](#) and [ECS](#) data correspondingly. The users of national domains can modify only their country's reference data.

There are several modes for the access to the CS/MIS:

- An interactive mode allows to enter data using his web browser user interface.
- A manual mode allows easy manual upload of pre-prepared XML messages of predefined structure as well as downloads of XML messages of predefined structure.
- A programmatic mode allows automatic processes to communicate with the web server through a series of predefined protocols.
- An asynchronous mode allows the CS/MIS system to send and to receive XML messages of predefined structure using a queue based protocol over CCN/CSI.

The user interface elements and data are in English.

The functionality can be divided into several groups. The administration subsystem is common for both [NCTS](#) and [ECS](#). The rest of the functionality is implemented in both domains [NCTS](#) and [ECS](#), except business statistics:

- Unavailability;
- CCN-TC statistics;
- Business statistics ([NCTS](#) only);
- MRN follow-up;
- Administration.

### **Unavailability**

Monitoring of [NCTS](#) and [ECS](#) informs the NTAs and NECAs about the unavailability of a particular NTA or NECA, so that they can take measures to prevent the transmission of messages to the disabled NTA or NECA. The input information on unavailability includes the type of unavailability: scheduled, unscheduled, non-implemented

Every [NCTS](#) or [ECS](#) application schedules its own unavailability and distributes this schedule to all other NTAs or NECAs in order to prepare the other NTAs or NECAs for the disruption of service. The NTAs or NECAs sends its unavailability schedule separate for [NCTS](#) and [ECS](#) to the CS/MIS system, which stores the information and distributes the unavailability to all the [NCTS](#) or [ECS](#) countries including the original sender.

There are two alternative ways to communicate any unavailability to the CS/MIS system: either by uploading or by encoding. The upload option allows to upload the XML message of predefined structure. The encode option allows to enter unavailability data via interactive interface.

There are some consultation facilities for unavailability. The operational status option allows viewing real-time status of unavailability of certain or all business functionality of each national application and for a user determined number of calendar days. The system responds with a matrix that shows the unavailability entries for all NAs and the certain period. The other option allows viewing the current schedule of unavailability or

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query according to the several criteria. The system presents a list of all known unavailability entries – either current or planned – sorted in chronological order. Users can view the details of the selected particular unavailability entry.

The system allows to browse the most recent unavailability messages or to query all messages. The user can select any list entry in order to view its contents in more detail, in that case the corresponding XML message is retrieved.

Using the unavailability information provided by the NA, the CS/MIS computes the availability ratio of each NA participating to the [NCTS](#) or [ECS](#). These statistics on unavailability are produced on a daily, weekly and monthly basis.

Unavailability statistics inform the NAs about the ratio of unavailability of any NA, so that they can take measures to prevent the transmission of messages to the unavailable NA.

### **CCN-TC statistics**

Technical statistics provide information about the use of the CCN/CSI network. The CS/MIS system receives technical statistics on the number of messages exchanged over CCN/CSI on a daily basis from CCN-TC. The CS/MIS consolidates technical statistics on a monthly basis. It keeps summary entries in the database for the past months, and it only stores detailed records (e.g. per day) for the current and previous month. Currently CS/MIS keeps data for 48 months.

There are several options that allow selecting and viewing CCN-TC statistics. It is possible to view cumulated CCN-TC statistics for a specific time period and set of countries, to view monthly consolidated CCN-TC statistics or to view cumulated CCN-TC statistics for a specific time period and set of countries. Various indicators based on the number of the messages, such as movements of certain status (diverted, released, arrived etc.), anticipated transit records, movement queries/responses etc., are included into CCN-TC statistics. Data which are consolidated on a monthly basis, can be viewed HTML representation or downloaded in a Microsoft Excel (XLS) format.

### **Business statistics (NCTS only)**

Business statistics serve to provide information on Transit operations from the business perspective. Business statistics functionality has been developed for [NCTS](#) only. [NCTS](#) business statistics are collected on a monthly basis in the NTAs under automatic procedures by the NTA while archiving its movement's database.

There are two alternative ways to communicate business statistics to the CS/MIS system: either by uploading or by encoding. The upload option allows to upload the XML message of predefined structure. The encode option allows to enter business statistics data via interactive interface.

The view status option allows monitoring the reception by CS/MIS of business statistics from the various NTAs.

Each month, the different reports received from the various National Administrations will be consolidated into a single report, which will be stored on the CS/MIS web site. The consolidation will be done by an automatic batch process. A consolidated report is available for download in the XML, HTML, text or MS Excel format.

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### MRN follow-up

The CCN/CSI Audit files provide sufficient information to fully track movements. The information on all the messages and CCN reports exchanged between the countries involved in a movement is available for display and diagnosis. The CCN/CSI audit files received from the NAs and consolidated by CS/MIS, allow the users to track all the messages of a particular MRN.

CCN/CSI provides several ways to get all the data available about a particular MRN. It is possible to enter the MRN number directly and to get a list of entries, associated to that particular MRN. The several query options allow searching MRN messages or movements that match specified criteria. The system offers a wide set of selection criteria, such as a list of involved countries, including the role, date and time interval, etc. Several options of result presentation are available: the sort order, the number of entries per page, the format of results for preview or download (XML, HTML or MS Excel).

The CS/MIS allows the user to manually upload the request of MRN follow-up information or to send an e-mail with the attached request. In both cases the request and the result list are an XML files of predefined structure.

The CCN/CSI provides the set of pre-run reports that present the number of movements (the number of distinct MRN found for the country pair) for the certain period.

### Administration subsystem

The Administration subsystem provides the interactive interface for the maintenance of the data that are required to configure and support the system and for administration of the batch processes of the system. Those system data objects can be common or belong only to [NCTS](#) or [ECS](#).

- Users;
- Countries;
- Gateways;
- Languages;
- Phrases;
- [NCTS](#) and [ECS](#) mailing lists.

Standard data maintenance facilities, such as consultation, creating, editing or deleting are available for users, countries, and gateways, also so called Europe reference data – languages and phrases and for [NCTS](#) and [ECS](#) mailing lists. The functionality for managing the data is uniform for all above mentioned data objects. When the necessary data object is selected, several facilities are available. User can browse the list, i.e. quickly lookup the whole list or build and execute a complex query, and view the resulting list of occurrences, corresponding the query conditions. The new occurrence can be created. The existing occurrences can be opened for viewing or editing or deleted directly from the browse or query result list.

The other group of functions related to monitor and manage various system tables. The set of [NCTS](#) and [ECS](#) system tables are similar; just there are few extra [NCTS](#) tables, which are not used for [ECS](#). The common functionality for the [NCTS](#) and [ECS](#) is the uniform, but functions are accessed and information is managed separately.

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The consultation and management of the system tables of messages of different kind: unavailability, CCN-TC daily and monthly statistics, business statistics ([NCTS](#) only), communication of CS/MIS System with Europa. User can browse the list, i.e. quickly lookup the whole list or build and execute a complex query, and view the resulting list of messages, corresponding the query conditions. User can view the details of the selected particular message. In case of incoming messages, the user may then accept or reject the selected message.

The maintenance of the archive. The archive functions allow to archive all the (obsolete) unavailability messages that are kept in the database and to monitor information related to the process of archiving. It is also possible to browse all the archived entries available on the system. Each entry can be deleted or restored

Clean-Up Load operation allows to remove information about [NCTS](#) movements and the messages that were exchanged for these movements automatically. User can provide the data selection criteria, such as country, time interval etc.

The application provides the ability to schedule a process to prepare special reports. These reports present a list of NCTS movements that have specific message types exchanged and other message types that may or may not have been exchanged. The reports are accessible via the specific administration module.

Besides the interactive services available via the CS/MIS user interface, the CS/MIS system comprises of a number of batch processes that are responsible for: collecting, validating, processing and publishing information.

Unavailability batch processes:

- Unavailability statistics builder;
- Full unavailability schedule builder;
- Unavailability archiver.

CCN-TC statistics batch processes:

- CCN-TC data receiver;
- CCN import;
- CCN consolidate;
- CCN convert;
- CCN-TC data cleaner.

Business statistics batch processes ([NCTS](#) only):

- Business statistics consolidator;
- Monthly consolidated business statistical reports builder.

MRN follow-up batch processes:

- Audit files consolidator;
- MRN archiver;
- MRN restorer;
- Movements predefined report builder;
- Specialised report builder.

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In addition, the CS/MIS system provides a console with Graphical User Interface, which allows to execute the various batch processes for [NCTS](#) or [ECS](#) domain.

## 2.24.3 Application perspective

### 2.24.3.1 Application structure

CS/MIS system is composed of three applications. These are CS/MIS [NCTS](#), CS/MIS [ECS](#) and CS/MIS Admin. First two have similar functionality but handle data coming from different types of movements (transit and excise). The third one is used for administering the system.

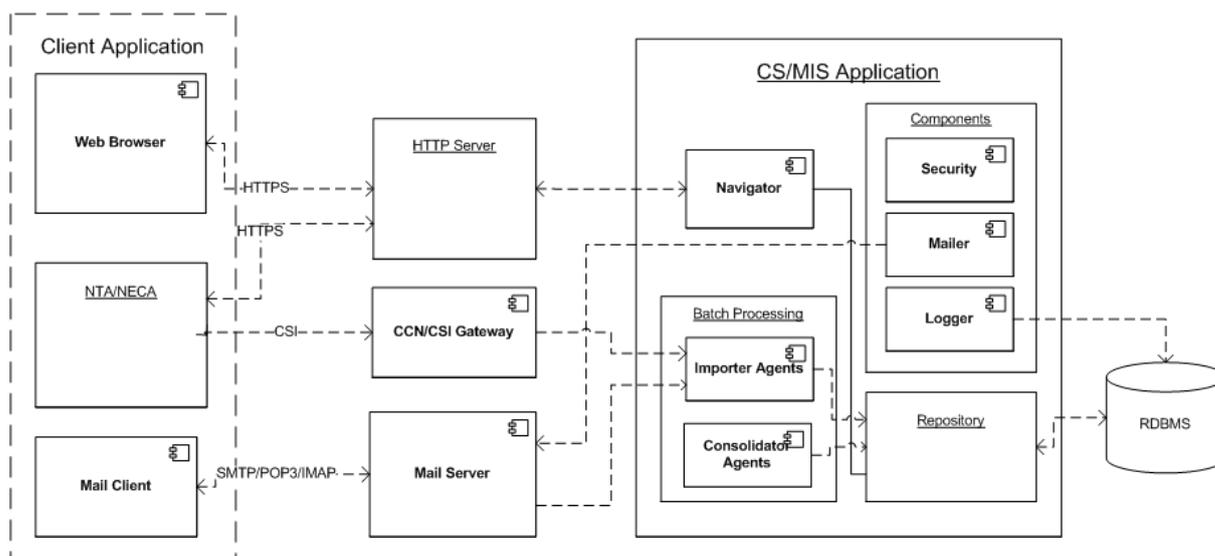


Figure 2-72 CS/MIS Application structure

The main business applications [NCTS](#) and [ECS](#) are built as J2EE applications running on the application server. The user interface is served by HTTP server. All the business and administrative information is stored in the database. Some of the activities of the application which are long running processes are built as external batch commands. These can be triggered by the Web application itself, but are executed as external processes. This affects in particular agents responsible for the import or consolidation of the messages.

#### Components

The main components of [NCTS](#) and [ECS](#) applications are:

- Repository - holds all application data. The persistent storage of the repository is guaranteed by the use of a relational database system.
- HTTP Server - accepts/process all HTTP requests. For security reasons, data communications between the Central Operation and the National Administrations takes place over HTTPS. This component participates in the user authentication.
- Logger - provides a system-wide logging facility.
- Security Component - controls system access.
- Mailer - sends a notification to the recipients of the system mailing list (typically ND Administrators). This component is also used to send e-mail notifications to the CS/MIS Operator.

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- Navigator - has the overall responsibility to build the user interface for the web application. It builds HTML in response to user requests.
- Batch processing subsystem used to run application agents.
- Importer agents – responsible for importing the messages from the queues, validating and inputting them to repository.
- Consolidator agents – responsible for processing the statistical data available in the repository, preparation of the reports and publishing them back into repository.

### 2.24.3.2 Application dynamics

The main processes of the application are connected to:

- gathering the statistical information important for the functioning of [NCTS](#) and [ECS](#) systems
- disseminating statistics based reports to interested parties

The following diagrams present sequence of operations for message importing and sending:

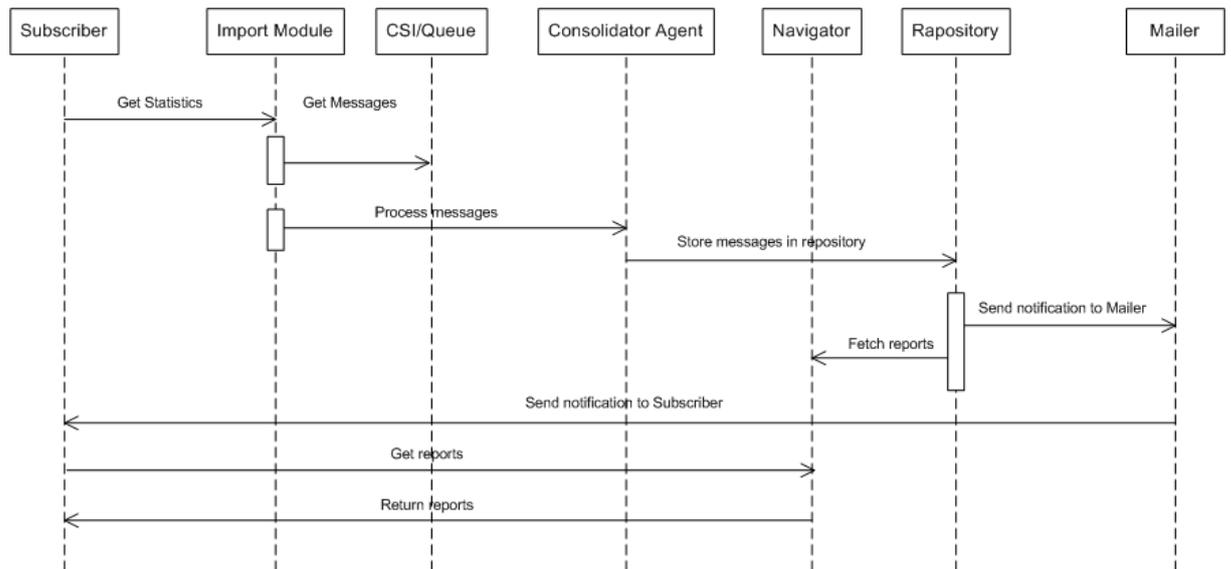


Figure 2-73 CS/MIS importing and sending messages 1

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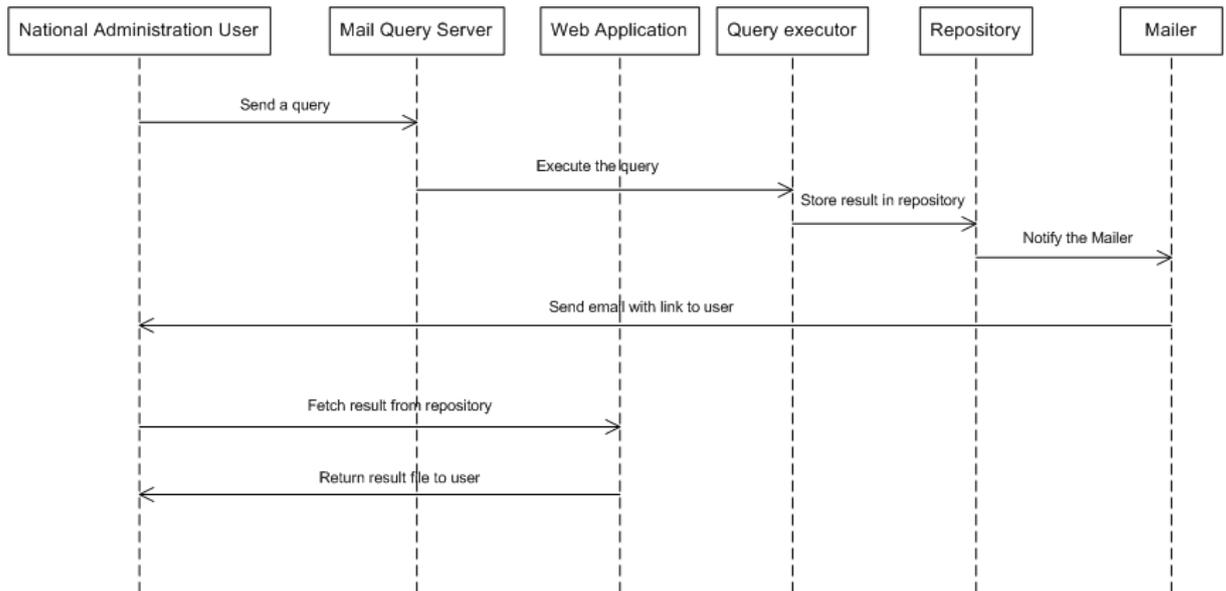


Figure 2-74 CS/MIS importing and sending messages 2

Some of the statistical information can be retrieved by NA using the Mail Query Server. The NA can send a query in the form of a message over CCN. The Query Server retrieves the request and performs the query. The result is stored in the repository and the server sends an email with the link pointing to the output file for download.

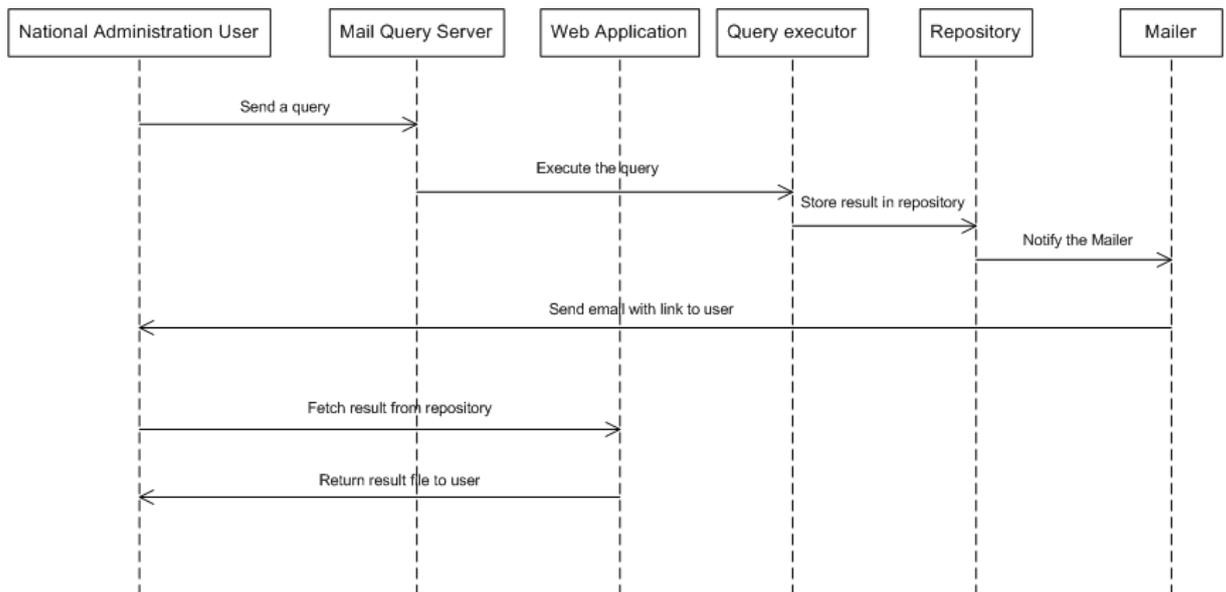


Figure 2-75 CS/MIS retrieving statistical information

## 2.24.4 Technical perspective

### 2.24.4.1 Service access and delivery

Due to the critical nature of the CS/MIS application to the [NCTS](#) infrastructure National Domain Administrators can access the system in many different ways.

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### **Access Channels**

The system is accessible by means of a standard Web browser. The NTA or NECA may plan a scheduled unavailability in advance and enter this information in an online form which is then submitted to CS/MIS as an IE message. This information is kept in a central database, and distributed as another IE message to all [NCTS](#) or [ECS](#) countries (including the originator).

Unscheduled unavailability may be communicated by any means to the Central Help Desk. It is entered into CS/MIS.

CNN statistics which include TC statistics and Audit files are entered automatically into the system by means of CSI. In this context CCN/CSI Stack for AIX and Windows 2000 (version 4.3.7) is used.

All [NCTS](#) or [ECS](#) countries receive an e-mail notification on all the events occurring within the system. Additionally National administrators can request on-demand statistics and reports using an email interface. Statistics generated by the Query Server in response to such requests are available to end users after being retrieved from repository and transformed to XML format. Users can download such files directly from a HTTP server or obtain them transformed to HTML or MS Excel formats (generated by Apache Jakarta POI framework).

### **Delivery Channels**

Content is delivered to users over the Internet by means of a Web browser or directly to the NTA application in Programmatic mode. NTA and NECA can also access CS/MIS using a standard CCN/CSI backbone.

### **Service transport**

CSMIS uses HTTPs protocol for Internet based communication, and CSI protocols while connecting through CCN.

Additionally users can forward and obtain certain data using email POP3 and SMTP protocols.

#### **2.24.4.2 Service platform**

### **General platforms**

The CSMIS system runs Sun One Web Server 6.1 deployed on IBM AIX Version 5.2 platform hosted by ITSM Infra.

System is developed in Java using Sun Java Development Kits (JDK) 1.4.2 with components complying to the Sun Java 2 Enterprise Edition (J2EE 1.3) specification.

### **Delivery servers**

Online access channels are supported by the Web Container of the Sun One Server.

CCN access is provided using standard CCN/CSI infrastructure based on Tuxedo Middleware.

For email communication any production standard SMTP/POP3/IMAP mail server may be used.

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### **Database**

The CS/MIS system uses Oracle RDBMS 9.2.0.1 database to store all persistent data.

### **Security**

The CS/MIS system uses the SSL protocol for all HTTP transfers. When the system is accessed through CCN/CSI, standard Tuxedo security mechanisms are used.

CS/MIS is protected from the Internet by a firewall. A second firewall is used to protect the CCN from NCTS-CO (domain name).

Logging mechanism is based upon Apache LOG4J package.

### **User presentation**

Apache XERCES XML Parser Version 2.6.2 is used as XML processor for presentation means, and Apache XALAN XSL Processor Version 2.2 for XML to HTML conversion.

Apache Jakarta POI version 1.5.1 package is used for Excel report transformation. The user interface is only available in English – no internationalization is supported.

### **Business logic**

Application business logic is implemented using J2EE technology.

### **Data management**

For database connectivity CS/MIS uses Oracle JDBC driver (thin and OCI).

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## 2.25 CS/RD

### 2.25.1 Reference and Applicable Documents

Id	Title	Reference	Version
CSRD1	System Requirements Definition for CS/RD for NCTS Phase 3.2 and ECS	TCE-SRD-L1CSR-P32.zip	3.10

Table 2-25: CS/RD Reference documents

### 2.25.2 Functional perspective

New Computerized Transit System ([NCTS](#)) is based on the electronic exchange of the transit data between the National Customs Administrations in parallel and in anticipation of the movement of the goods. [NCTS](#) provides a fully computerized Customs regime for goods which enter into the Common Transit.

Central Services/Reference Database (CS/RD) is one of the applications of a Centrally Developed Transit Application (CDTA) suite that has been developed to support [NCTS](#) and [ECS](#), and ICS (Import Control System) in 2009.

The main functionality of the CS/RD system is to store and distribute common reference data. The two main groups of data are:

- The Customs Office List (COL) in all participating countries: This is a list of the Customs Offices of Export and Exit and Excise Offices.
- The Common Reference Data (RD): reference data such as country names, currency codes, units of measure etc.

The repository is located centrally at the Common Domain - Central Services Office. The notifications of every modification of the COL and RD are sent to all National administrations (NAs) of Member States (MSs).

#### 2.25.2.1 Use cases view

The functionality can be divided into two groups:

- Maintenance of common reference data
- Maintenance of customs office list

Standard data maintenance facilities, such as consultation, creating or editing as well as uploading, extraction, and retrieval are available for the reference data items. All reference data items are versioned. All reference data modifications performed per domain during the work session become visible to other users by publishing. The non-published data modifications are visible only for the author and to the administrators. Once the Reference Data changes have been published, they are automatically dispatched to all subscribed users. The cancellation revokes all modifications made during the active work session. Furthermore, there is a facility to consult historical data

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and modifications performed during current or previous sessions. There is a possibility to filter sessions and view historical data made during filtered sessions.

By subscribing to the CS/RD notification service, a user may receive changes of Reference Data via e-mail, CCN queues or programmatic mode. Reference Data changes are dispatched as a XML or an EDIFACT attachments of predefined structure to all subscribed users, as soon as manually made modifications is published or a file upload is successfully processed. Each notification message contains all modifications.

CS/RD accepts the provision of new or updated Reference data by mean of uploads of the file, containing XML or EDIFACT messages of predefined structure. The upload allows the NAs of MSs to communicate their country specific data and it allows members of the [NCTS](#) Central Operations to update country-independent data.

Extraction allows the users to extract the common RD or COL data valid for a given period. Retrieval allows the users to retrieve modifications made to the repository during a given period in time. The extraction or retrieval requests are submitted by filling an appropriate form. The results of extraction or retrieval can be downloaded as the XML or EDIFACT messages of predefined structure. It should be stressed that retrieval is functionally very different from extraction, as the time range given for the retrieval does not relate to validity dates but to actual dates where the modifications were entered in the repository. For instance, it does not make any sense to do retrieval for dates in the future. A full retrieval means retrieving all the modifications to the COL or the Common RD since the database was first set up.

Some monitoring facilities are implemented. A status function for upload, extraction and retrieval facilities displays a list of at most the latest action requests from the current user. The function of latest changes provides a complete list of all the Reference Data types manages by the CS/RD system.

The facilities of manual data maintenance are also available. The functionality of the CS/RD system for managing the common reference data is uniform for all types of reference data. By selecting the manual data maintenance, a list of all the available Reference Data types is presented. When the necessary Reference Data type is selected, several facilities are available. User can view the structure of the particular reference data type, browse list of occurrences, i.e. quickly lookup the whole content of the reference data or build and execute a complex query, and view the resulting list of occurrences, corresponding the query conditions. The new occurrence can be created. The existing occurrences can be opened for viewing or editing or deleted directly from the browse or query result list. The applicability of the Reference Data Type can be changed.

### **2.25.2.2 Domain vocabulary**

Major data objects of the CS/RD reference data itself: The CS/RD repository contains the following entities of reference data:

- Anticipated Arrival Record (AAR)/AER rejection reason
- Additional information response
- Amendment rejection motivation
- Anticipated Transit Record (ATR) rejection reason
- Control result code

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- Country holidays
- Country regime
- Country/region
- Country
- Currency code
- Customs office information
- Customs office geo info
- Declaration type
- Discrepancies solved notification
- Diversion rejection reason
- Document type
- Guarantee type
- Guarantee monitoring
- Invalid guarantee reason
- Language code
- Packaging code
- Query on guarantee type
- Requested additional information
- Results of control
- Role
- Sensitive goods code
- Special mention code
- Specific notes code
- Statistics type
- Traffic type
- Transport mode
- Transit operation state type
- UN/LOCODE (United Nations Code for Trade and Transport Locations)
- Units of measure

The reference data managed by the CS/RD system consists of occurrences of defined entities such as “country”, “unit of measure”, etc. The functionality of the CS/RD system for managing the common reference data is uniform for all of these entities; this means for example that the functionality provided for adding a “country” is analogous to adding a “unit of measure”.

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Each Reference Data Type has common properties such as code, or modification subtype. It is also associated to validity date. This validity date indicates when the occurrence of an entity becomes, became or will become valid. The entity includes the set of attributes, different for the specific Reference Data Type. The textual attributes, such as name, description are language dependent.

## 2.25.3 Application perspective

### 2.25.3.1 Application structure

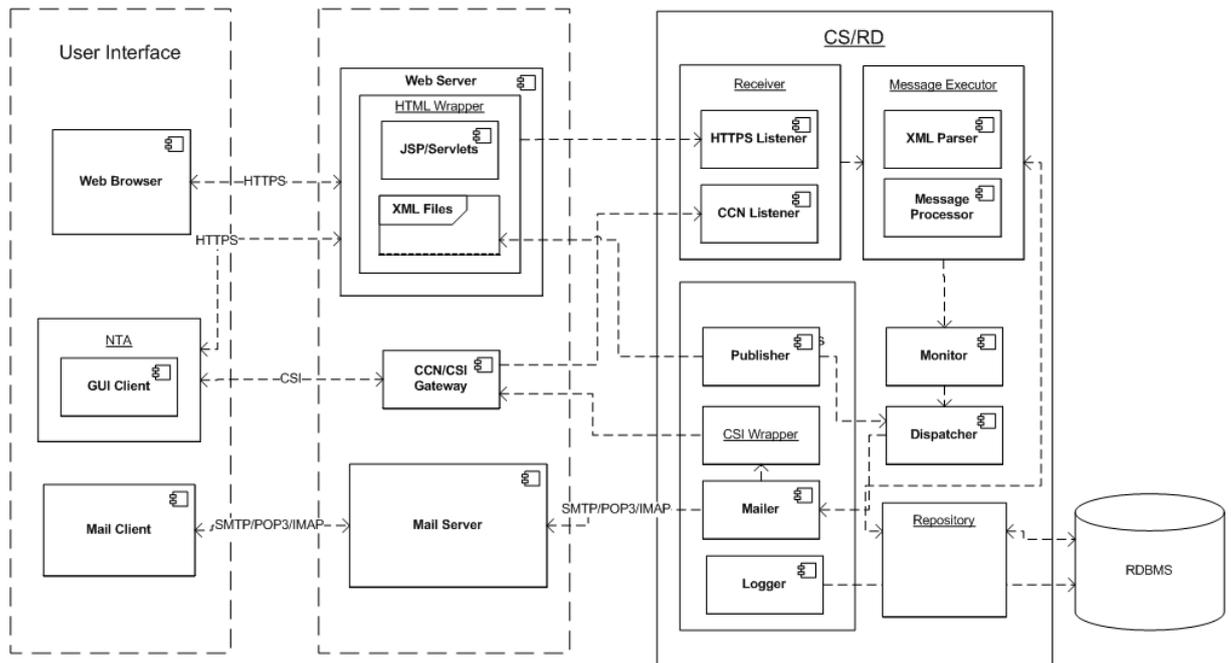


Figure 2-76 CS/RD Application structure

The architecture of the CS/RD application is based on the Client/Server model using a four tier architecture. The Clients interact with the Server in both interactive and message based modes.

The *SMTP Client* takes the form of a standard Internet mail client.

The *HTTPS Client* takes either the form of a standard web browser (the *Interactive or Manual Client*) or that of a dedicated application or application component (the *Programmatic Client*) that directly integrates CS/RD data into a Transit Application.

The *Listener* consists of two components:

- The *HTTPS Listener* – this is *HTTPS* server, complemented with a number of CS/RD specific modules (Java Servlets). Jointly, the *HTTPS* server and the Java Servlets, implement the two *HTTPS* interfaces (message based and interactive) to the system. The *HTTPS Listener* automatically detects whether it is communicating with a web browser or not and offers either the manual or the programmatic interface accordingly.
- The *CCN Listener* - consists of the *CCN/CSI* stack and of a number of CS/RD specific modules that jointly implement the message-based interface.

The *CS/RD Services* - core of the application logic of the system. The Object Request Broker (*ORB*) layer represents the Common Object Request Broker Architecture

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(CORBA) services through which the Listener communicates with the CS/RD Services. The various CS/RD Services make also use of the ORB to communicate with one another.

The CS/RD Services are the following:

- **CS/RD Wrapper** - provides a single entry point for all message based processing functionality. It provides access to the CS/RD Services through an Application Programming Interface (API) that can be called from either the HTTPS interface or the CCN interface.
- **Message Builder** - builds CS/RD messages. CS/RD messages can wrap Information Exchange (IE) messages or extraction requests. CS/RD messages have associated context information. This information includes for example the optional e-mail notification address that must be used when the result is ready, as well as the name of the domain that the retrieval/extraction request is applied. This means that only Common RD data, applicable to the requested domain are returned by the retrieval/extraction request. This Service's task is to provide access to the asynchronous message processing functionality of the CS/RD system.
- **IE Message Receiver** - accepts incoming IE messages in various formats. Accompanying parameters define the sender of the message, the format of the message and the address where the processing result has to be delivered i.e. the Publisher Service.
- **Message Converter** - used to do all kinds of conversions in an asynchronous way. This includes format conversions such as from XML to EDIFACT. It also includes compression and decompression in, for example, zip format.
- **Message Executor** - processes incoming messages by interpreting and executing their contents. The processing result is put in the outgoing message.
- **Repository** - an API that allows its clients to manage the CS/RD repository. This is the core API of the system. It provides synchronous access to the reference data.
- **Security Component** - manages the list of known identities and their associated rights and privileges. It is used throughout the system to implement access control.
- **Monitor** - gathers information from the system about what it does and how well it does it. To accomplish this, it communicates with all CS/RD components.
- **Dispatcher** - provides the notification functionality. It manages the list of subscribers per domain and schedules the extractions requested by the ADE subscribers and/or the retrievals requested by the EMCS subscribers. The list of subscribers and the subscription parameters per domain are maintained in the database and manipulated via the Repository. The Dispatcher relies on the Monitor to be informed of data types' modifications in which it is interested.
- **Mailer** - allows the CS/RD system to send SMTP and/or CCN notifications to the registered users or clients. This component is a supporting component for the Dispatcher.
- **Publisher** - responsible for making processing results and system information available to the public. Publisher is able to accept files and to store them for later

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access. It is a generic component that provides a web based browser facility and is used for most information distribution. It presents the files with their corresponding annotations and attributes such as creator, size and creation date.

### **Batch processes**

A batch Timetable Update process will allow the CS/RD Administrator to prepare annually the Notification of Customs Offices modification to Common Domain (IE030) for each Country, making the timetable of every valid Customs Office valid for the next year. Additionally, a batch process that allows the CS/RD Administrator to reduce the COL data that are kept in the CS/RD application by cleaning up COL updates occurred in the past is specified.

#### **2.25.3.2 Application dynamics**

The following diagram shows the sequence of message transfer triggered by the modification of Customs Office List at the national level:

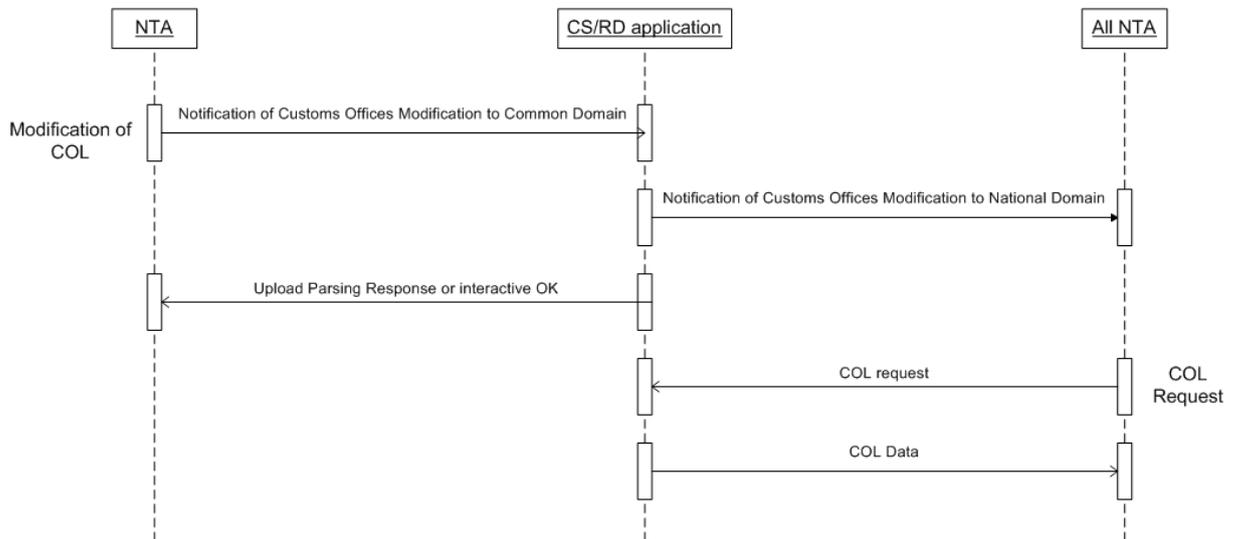


Figure 2-77 CS/RD modification of Customs Office List sequence of messages

Modification of COL performed by the operator of National Transit Application or National Export Control Application triggers modification notification event passed to the CS/RD applications. CS/RD application processes the modified data and when the modification are successfully applied to the central repository the CS/RD sends notifications on central data modification to every NTA/NECA connected to the central system.

Upon reception of COL modification notification the specific NTA sends a COL request to the CS/RD application which in turn returns the up to date COL to the requesting client.

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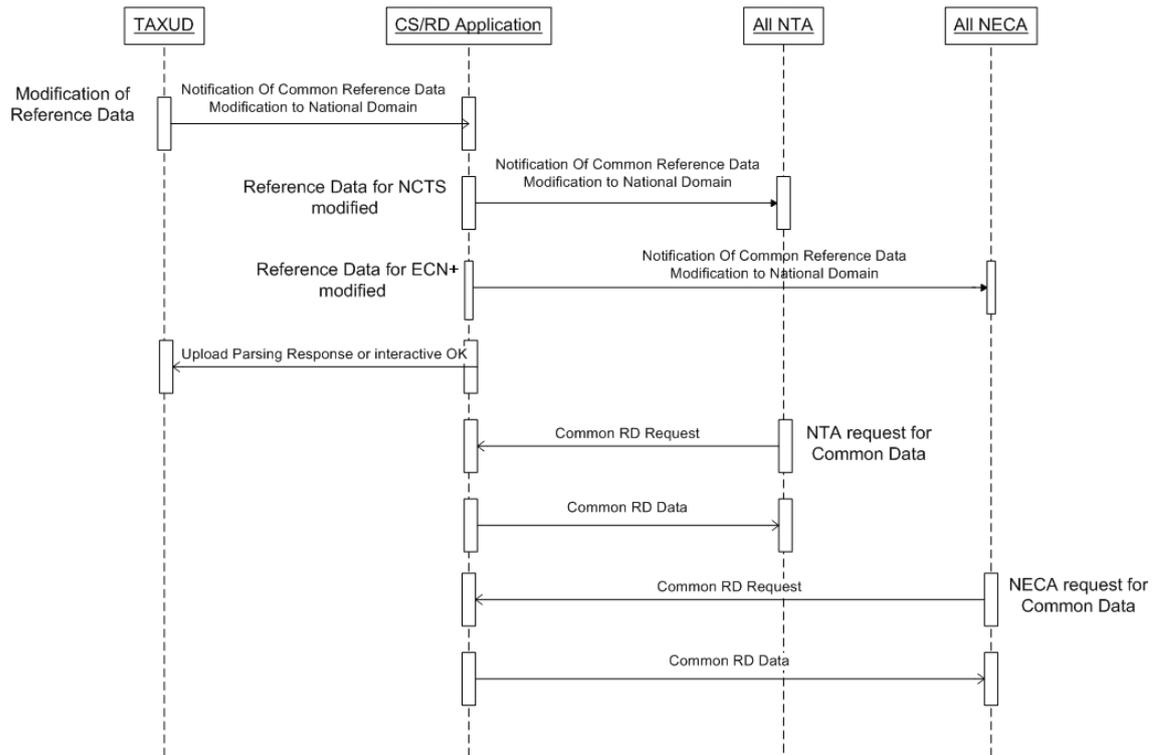


Figure 2-78 CS/RD modification of reference data sequence of messages

Modification of reference data at the Central Office triggers notification to the CS/RD application. Depending on the scope of modification the CS/RD systems sends reference data modification event notifications to all National Transit Application clients, National Export Control Application clients or both. Upon receiving this type of notification the client applications at National Domains issue Common Reference Data requests to the CS/RD which in turn supplies updated data.

Four different modes of operation of CS/RD system are provided:

- Interactive mode - mode of operation available to access the CS/RD using a standard Web browser.
- Manual mode - this mode allows upload and download of files to be made with little implementation effort on the user side. The only software that is required at the client side to access the manual mode is a web browser that supports RFC-1867. Unlike the *interactive mode*, this mode requires that the messages to be uploaded are prepared in advance.
- Programmatic mode – in this mode client application can interact with CS/RD system over HTTPS in a fully automated manner. This mode allows upload/download of messages to be integrated into a NTA or NECA.
- Asynchronous mode – messages are exchanged asynchronously using CCN/CSI queues.

### **Reference Data Repository maintenance**

The *Reference Data Repository maintenance* (both Common Reference Data and Customs Office List) is the core functionality of the CS/RD system. Modifications of any of the elements (partially or entirely) are sent to the CS/RD repository. Then, the NAs (NTA) and MSs (NECA) are supplied with the changes of the global COL and of

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common reference data, depending on the domain that the reference data modifications are referring.

The user can manipulate interactively the CS/RD repository by invoking the *Repository API* starting with the selection of the Reference Data entities that he/she wants to modify up to deleting entities, creating new entities, changing domain applicability on entities (e.g. current domain is [NCTS](#) and make the entity applicable to [ECS](#) too) and printing selected entities based on the domain that are applicable. All these operations are performed via multiple invocations of the *Repository API* within a work-package context. The Interactive Reference Data repository mode is only available via HTTP(S).

### **Asynchronous modification of Data Repository**

A CS/RD user can send a file containing IE030/IE032 messages using a “post” message to the HTTPS server or a CCN Message queue operation over the CCN/CSI network.

For messages sent via the Internet, the post event starts a Java Servlet that accepts the file and the associated parameters. It uses the *CS/RD Wrapper API* to send the request to the CS/RD system.

For messages sent via CCN/CSI, a National Administration or Member State can send an IE030 message to the CS/RD input queue. The *Listener* part for each domain of the *CCN Wrapper* module that browses the input queue at periodic intervals will detect and receive the message. The *CCN Wrapper* then uses the *CS/RD Wrapper API* to send the request to the CS/RD system.

The *CS/RD wrapper* invokes the *Message Builder* to construct a CS/RD message that contains the IE030 messages. It also contains context information such as format information and the optional e-mail notification address. It does not contain domain applicability information or change domain applicability operation as the operations on the IE032 message are applied to the current domains of the modified data. See section 6.3.2 of the [\[CSRDI\]](#) document.

Once the CS/RD message is built, it is processed asynchronously in the CS/RD system. The system uses message queues for this purpose. While the message processing proceeds, the *CS/RD Wrapper* returns the URI where the result will be available. The Java Servlet returns this URI to the client. For messages received via CCN an IE913 message is sent back to the recipient’s Administration Queue.

The first step for the IE030/IE032 messages is the conversion. The *Message Converter* optionally first decompresses the messages and then translates them into the XML format (from EDIFACT if necessary). The *Message Executor* only takes IE messages in the XML format. It parses the IE030 messages and then calls the API of the *Repository* to apply the IE030/IE032 modifications. The *CS/RD Repository API* is responsible for fetching the data from the CS/RD database.

The *Message Processor* produces one result message for each domain ([NCTS](#) and [ECS](#)) by initiating one query per domain using the CS/RD Repository API. The Repository API returns the data modifications per domain. An XML message is constructed to

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reflect these data modifications. The result messages are then passed back to the *Message Converter*. This converter optionally converts the XML message to EDIFACT if specified in the message context. A character set transliteration is first performed (if needed), followed by an XML to EDIFACT translation (if needed). Transliteration - when requested - takes place as specified in the message context to ISO-8859-1, ISO-8859-2, ISO-8859-4, ISO-8859-5 or ISO-8859-7.

When the conversion is done, the messages are delivered at the *Publisher*. This component stores the message at a place also specified in the message context. Finally, it notifies the *Monitor* of the arrival of a result message and it passes the message context information to the *Monitor*.

The *Monitor* sends an event to the *Dispatcher* that has expressed interest in result messages reaching their destination. The *Dispatcher* checks the message context information to see if it contains a notification address. If it does, it uses the *Mailer* component to notify the message sender. If the message arrived via HTTPS, the *Mailer* sends SMTP e-mail to the address provided by the sender, plus the IE031 message as an attachment in XML and zip format. If the message arrived via CCN/CSI, the *Mailer* will send the upload response via CCN/CSI, using the *CCN Wrapper*. The type of produced messages corresponds to the available domains that the users are subscribed to and they contain the exact data modification per domain, occurred when uploading the IE032 message to the CS/RD system.

Once the result arrives at the *Publisher*, the CS/RD client can fetch it by issuing a “get” request to the HTTPS server using the result URI. When the server receives a “get” request, it uses a Java Servlet that delegates the request to the *Publisher* that delivers the result message.

For National Administrations users, only IE030 messages are accepted. When other messages are sent, a suitable error message is produced.

### **Extraction requests processing**

When a CS/RD client wants to extract information from the CS/RD repository (by means of outgoing IE931/IE932 messages), it has to send a “post” message to the HTTPS server of the CS/RD system. A Java Servlet processes this message. This Java Servlet uses the API of the *CS/RD Wrapper* to create an extraction request.

Alternatively, a National Administration or Member State may send IE914 and IE916 messages in EDIFACT or XML format via CCN/CSI receiving back the relative IE931/IE932 messages in EDIFACT or XML format respectively. These messages are processed by the *CCN Listener* that uses the API of the *CS/RD Wrapper* to create an extraction/retrieval request. IE931 and IE932 messages should be sent to the CS/RD queue, while the error messages IE906, IE907 and IE913 should be sent to the Admin Queue of the corresponding recipient.

A partial retrieval of COL has been added. The IE914 has been enhanced in order to incorporate the appropriate fields that will specify the start and the end date of the period for which a retrieval will be requested. The empty “Date To” field will be consider as the latest possible date in the far future in both contexts, extractions and retrievals.

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Additionally, a flag has been added in the header of the IE914, which denotes whether an extraction or a retrieval is requested. If the flag is absent, the default request will be for retrieval.

The same enhancements have been added to the IE916 in order for the users to be able to request a full/partial retrieval/extraction of the reference data.

The NAs that do not intend to use this feature will not be impacted from this enhancement, since all the additional fields that will be added in the structure of the IE914 and the IE916 will be optional.

The wrapper delegates the work to the *Message Builder* by passing the extraction parameters. The latter component makes a CS/RD extraction request message. Like in the previous scenario, the message context is used to store operational information such as result format information and the e-mail notification address. Also the domain where the extraction request is applied for will be stored in the CS/RD message. Once built, the CS/RD message is stored in a queue for further asynchronous processing. While the processing continues, the *CS/RD Wrapper* returns the result URI that is returned to the client.

The first processing stage is the *Message Converter*. For an extraction request, this processing step does not represent any work. Then the message is sent to the *Message Processor*. This component parses the message, identifies the domain of the request ([NCTS](#) or [ECS](#)), retrieves the requested data per specified domain from the repository, and formats them (using a mapping between the data model and the IE structure) into the relevant IE931/IE932 message. The resulting IE message, which is in XML format, is used to build the result message.

Next, the result message arrives at the *Message Converter*. This component performs any required conversion. The converted message is then sent to the *Publisher*. This component stores the message at the location described in the message context. It also notifies the *Monitor* that a result message has arrived at its destination. The result-ready notification process and result retrieval takes place as in the incoming message scenario.

For the production of IE931/IE932 to be sent to the ADE/EMCS subscribers, part of the above process is used. In this particular case, a message is sent (at the configured frequency) by the *Dispatcher* directly to the *Message Processor*, hence bypassing the *CS/RD Wrapper* and the *Message Converter*. Specific notes are given to the *Message Processor* whenever no full IE932 message extractions are requested. In that case, the *Message Processor* selects only part of the Common Reference Data domains and generates a partial IE932 message instead of a full extraction.

## 2.25.4 Technical perspective

### 2.25.4.1 Service access and delivery

#### Access Channels

An interactive mode of operation allows the operator to access the CS/RD using a standard Web browser.

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The manual mode allows upload and download of file messages prepared in advance.

The software that is required at the client side to access the manual mode is a web browser that supports RFC-1867.

The programmatic access mode uses the HTTPS protocol. Instead of the browser guiding the user a thick client application with fixed access points (URIs) to the system defined and the request parameters specified is accessing the system to manage Reference Data.

In synchronous mode the CS/RD system maintain the list of destinations (CCN/CSI queues) to which the IE messages are sent.

### **Delivery Channels**

Content is delivered to users over the Intranet by means of a Web browser or directly to the NTA application in Programmatic mode. NTA and NECA can also access [CS/MIS](#) using a standard CCN/CSI backbone.

### **Service transport**

CS/RD uses HTTP protocol for Intranet based communication, and CSI protocols while connecting through CCN.

The interfaces of all the components are provided using CORBA except for the *Publisher* component that also provides an HTTPS-based interface.

#### **2.25.4.2 Service platform**

### **General platforms**

The CS/RD system runs Sun One Web Server 6.1 deployed on IBM AIX Version 5.2 platform. System is developed in Java using Sun Java Development Kits (JDK) 1.4.2 with components complying to the Sun Java 2 Enterprise Edition (J2EE 1.3) specification.

### **Delivery servers**

Web based user interface is deployed on the Web Container of the Sun One Server hosted by ITSM Infra.

CCN access is provided using standard CCN/CSI infrastructure based on Tuxedo Middleware.

For email notifications any production standard SMTP/POP3/IMAP mail server may be used.

### **Database**

The CS/RD system uses Oracle RDBMS 9.2.0.1 database to store all persistent data.

### **Security**

The CS/RD system uses the SSL protocol for all HTTP transfers. When the system is accessed through CCN/CSI, standard Tuxedo security mechanisms are used.

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### **User presentation**

The CS/RD user interface will apply the basic styles (i.e. default font and background color) of the Web 2000 style-sheet.

The system uses Unicode (UTF-8 representation) to represent textual data.

All string processing functions and the user interface use Unicode for textual data representation.

### **Business logic**

The business logic of the application is developed using J2EE technology.

### **Data management**

CS/RD uses the Oracle type 4 JDBC driver for Oracle 9.2.0.1.

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## 2.26 SMART

### 2.26.1 Reference and Applicable Documents

Id	Title	Reference	Version
SMART1	System requirements definition for SMART	TCE-SRD-L1SMRT-P32.zip	1.80

Table 2-26: SMART Reference documents

### 2.26.2 Functional perspective

The Statistics Management Analysis Reporting Tool (SMART) is one of the applications of a Centrally Developed Transit Application (CDTA) suite that has been developed to support [NCTS](#) and [ECS](#), and ICS (Import Control System) in 2009.

The main purpose of SMART is to expand the scope of the monitoring of [NCTS](#) operations by having the possibility to execute flexible queries on the operational data, generate statistics, identify open movements in the system and collect data on abnormal behavior and in general maintain an overview of [NCTS](#) Operations.

SMART consists of the several components. The data from the data sources is being extracted, transformed, consolidated and loaded to the data warehouse while not affecting the operations of the Data Sources. The structure of the data in this database is specifically designed and optimized for reporting and querying purposes, providing the increased performance. Data delivery and consumption tool provides the creation and delivery of the information to the end users.

#### 2.26.2.1 Use cases view

The functionality can be divided into several groups.

- Extracting, transforming and loading
- Data delivery and consumption
- Predefined reports
- Administration

#### **Extracting, transforming and loading**

The data from the data sources is being extracted by the extraction process and is being propagated to a database schema called data staging area, where it is being transformed and cleaned before being loaded to the data warehouse.

The process of extraction reads and collects the data from the data sources using specific criteria for selecting data, and, on finding qualified data, transports the data to the Data Staging area. The process of transformation converts the extracted data from its original state into what is demanded, in order to be placed into the warehouse database. The process of loading writes the data into the data warehouse database.

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### **Data delivery and consumption**

SMART provides a visualization of the information available in the data warehouse. An intermediate semantic layer between the front-end tool and the data warehouse database maps the data in the warehouse database to business terms that the end user can easily create of queries.

There are two different types of documents and two different tools for creation. These are the WebIntelligence and BusinessObjects documents. All SMART predefined reports belong to the first category. The BusinessObjects documents allows user to create and include his own report documents if he wishes to extend the system's functionality.

All existing report documents are categorized. Two main categories are the corporate documents and the personal documents. The user can search for documents, view a list of available report documents and run the reports. The user can also create or edit his own report documents and manage categories.

### **Predefined reports**

SMART provides the user with a set of predefined reports. The reports request the user to input his/her preferences for certain parameters, such as period, country, customs office role, message type, movement status, etc.:

- List of movements in a specific status grouped per country pairs and per status for any or selected role
- Percentage of messages of the specific type per country
- Percentage of open movements per country of departure
- Volume of movements per country pairs and per status
- The list of messages that have been exchanged for movements grouped per country pair and per movement
- The list of messages that have been exchanged for a specific movement
- The list or volume of messages (independently of the movements for which these messages have been exchanged) based on specific criteria
- The list of non-acknowledgement messages that reject specific message types.
- The average time in days between the messages of specific types: the reception of the anticipated arrival record message and the sending of the arrival advise message; the sending of the arrival advice message and the sending of the destination control results message; the reception of the anticipated arrival record message and the sending of the destination control results message; the reception of the anticipated transit record message and the sending of the notification of crossing frontier
- The movements that the time between the messages of specific types is equal/more/less/between a given number of days: the reception of the anticipated arrival record message and the sending of the arrival advice message; the sending of the arrival advice message and the destination control results message; the sending of the anticipated arrival record message and the destination control results message
- The list of movements that the exchange of specific message types has taken place for those movements and the exchange of other message types has / has not taken place

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- The list of movements that the exchange sequence of their related messages does/does not match a given message exchange sequence
- The volume of messages over time: a time diagram indicating the number of messages (of the requested message type) in the requested time scale, over the requested period of time.

### **Administration**

SMART includes various system administration functions. Most of the administration functions are performed using the WebIntelligence and BusinessObjects administration tools:

- The management of users and access rights
- System monitoring
- System auditor
- Definition of the query properties for SMART reports

Some administration functions have been developed:

- Scheduled Execution for CCN Audit Messages Receiver
- Maintenance of SMART parameters
- SMART Administrator's Reports

The CCN Audit files comprise the source for the extraction of data. The CCN Audit Messages Receiver retrieves the CCN/CSI Audit files from the queue and stores them in the file directory as ASCII files. The process can be configured to be automatically executed on regular intervals.

SMART enables to maintain the Movement's Parameters, Gateways and Message Sequences.

The movement parameters are taken into consideration during the extracting, transforming and loading processes actually compose a number of rules that apply on each message included in the CCN Audit file in order to perform movement state transitions.

The gateways are defined by the country and the national application environment (production or backup for example).

The message sequence is a list containing one or more message types linked together. The message sequence defines how the message of certain type shall or may follow each other.

#### **2.26.2.2 Domain vocabulary**

The data warehouse comprises the data stores:

- Dimensions
- Facts
- Aggregate tables
- Metadata

### **Dimensions**

Dimensions are single perspectives on the data that determine the granularity (data detail level) to be adopted for fact representation. Each dimension is described by a set of descriptive attributes, which qualify the data content. Four main dimensions are used.

- Country

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- Role
- Message type
- Message status

The role means the customs office role in the process of movement: departure, transit, destination, etc.

### **Facts**

Facts are relational database tables that contain numerical and historical data (facts) that represent a specific business area/activity. The data are loaded during the load process.

- Movements
- Movement country roles
- Messages

The movements table stores data related to the movement definition, status and the list of dates, when the IEs of certain types have been produced. The movement table is associated with the list of the movement countries and roles pairs. The message table stores data related to the messages of a given movement. This table consists of monthly partitions, which are updated every two weeks.

### **Aggregate tables**

Aggregate tables are relational database tables that contain pre-calculated information summed, or aggregated, from lower level detail contained in the data warehouse. SMART extracting, transforming and loading process fills several aggregated tables.

### **Parameters**

The movement parameter table stores the movement processing parameters, e.g. Enable/disable the check of the conditions mentioned during extracting, transforming and loading process.

The date parameter table contains the dates required when using a period query option in any of the reports contain dates and period options. The dates included are 'today', 'yesterday', 'last week' and 'last month'.

### **Metadata**

Metadata is used to link the operational data model with the data warehouse data model. Actually it incorporates the objects that map the database entities to business entities. These objects are used by the end user to create queries.

Extraction Metadata contains data files definitions and maps the translation of information from the operational system to the warehouse. This includes an extract history describing data origins, updates, algorithms used to summarize data, and frequency of extractions from operational systems.

Transformation Metadata includes a history of data transformations, changes in names, and other physical characteristics. It also contains validation, data correction and calculation rules.

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The relations between major data objects together with their most important attributes are presented in the diagram.

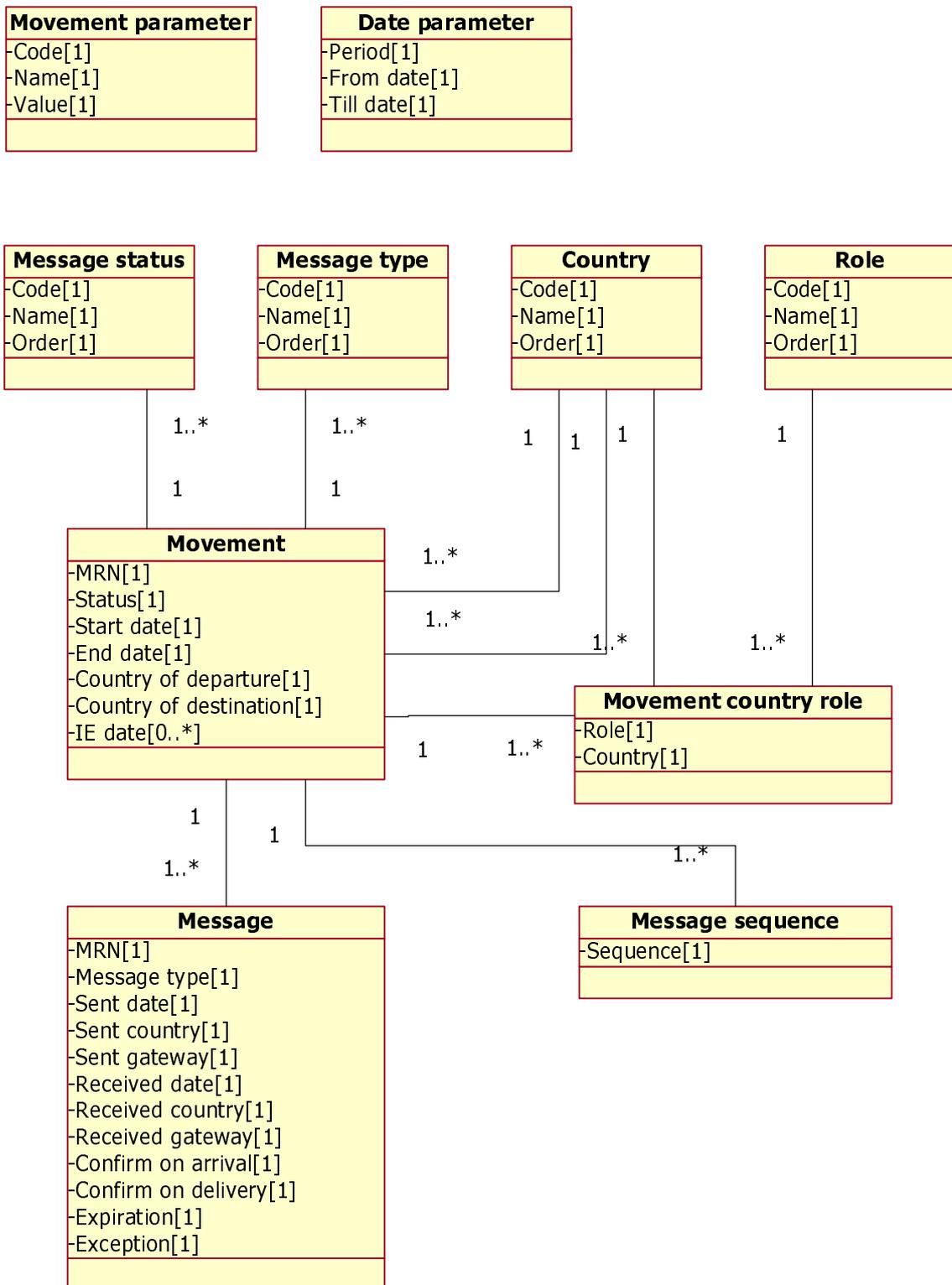


Figure 2-79 SMART major data objects relations

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## 2.26.3 Application perspective

### 2.26.3.1 Application structure

Statistics Management and Analysis Reporting Tool SMART provides detailed statistics on various aspects of the inter-application communication within the [NCTS](#) system.

There are two distinct types of users operating SMART system. SMART Administrator is responsible for the correct functioning of the Application Server and the Database Server. SMART Administrator is working at the DIGIT Data Centre. This section describes the specific responsibilities and the tasks performed by this actor.

SMART Administrator:

- Accesses the Application Server, the Database Server and the CSI Server
- Configures, starts, stops (shutdown) or installs the system if necessary
- Performs back-up management
- Performs Database administration

SMART Operator is responsible for the correct functioning of SMART system. SMART Operator is working at the NCTS-Central Office.

SMART Operator:

- Accesses the log files produced by SMART processes
- Performs the system monitoring
- Manages SMART users and groups. The *Business Objects* authentication mode is used by SMART system
- Accesses the CCN receiving messages queue in order to check technical statistics message reception
- Manually places in a dedicated directory of the CSI server archived CCN audit files
- Manages SMART application parameters
- Creates and maintains *smart* schema objects on SMART Database
- Deploy SMART Application (reports' publishing) on the Application Server
- Accesses the Administrator workstations; installs and configures SMART COTS on them

#### Components

The figure below presents the components of SMART system:

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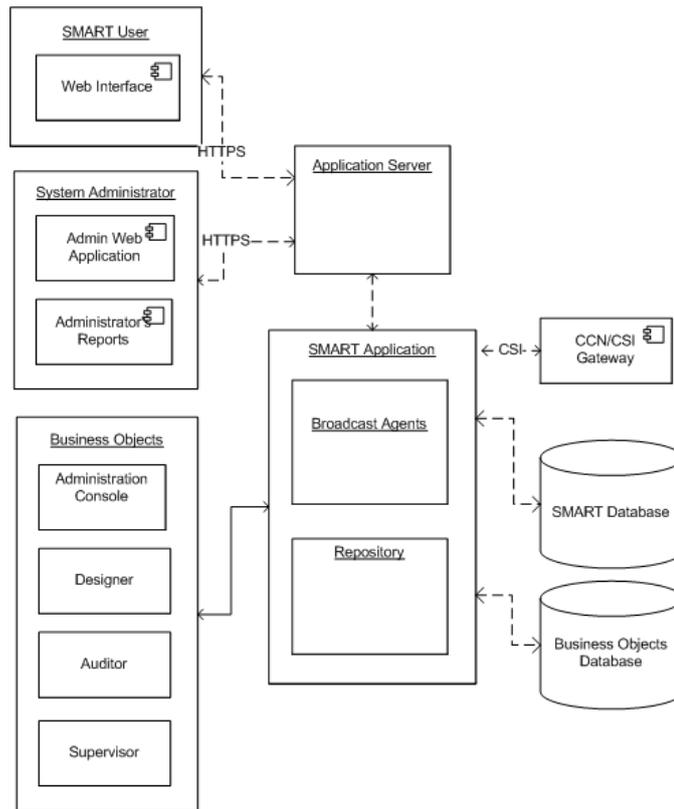


Figure 2-80 SMART system components

The functionality of SMART is encapsulated in the following modules:

- SMART Admin Web Application enables SMART Administrator to maintain movement's, gateways and message sequences parameters.
- SMART Administrator's Reports presents validation errors which occurred during the execution of verification process on the received CCN Audit Files.
- Business Objects Administration Console serves as a central control panel for the Business Objects server. It shows at a glance what modules are enabled on the Application server. The Administration Console is used to enable, disable and define settings for the modules installed on the Business Objects server.
- Business Objects Auditor is a web application that allows SMART Operator to monitor and analyze user and system activity for SMART system. The Audit facility traces system and user activity and logs the information to the Audit database. The Business Objects Auditor application is used to view and analyze the information created and stored by the Audit facility. SMART Operator could use the predefined reports provided by the Auditor application to access the activity information in order to monitor, analyze and optimize SMART system.
- Business Objects Supervisor is the application used to set up and maintain a secure environment for SMART system. The Supervisor application is used to create the Business Objects repository and to define SMART users and groups. For the purposes of SMART system the following groups of users are defined:
  1. Readers - access the predefined reports through the web Interface or receive the predefined reports in his/her inbox that are updated in scheduled times (daily, weekly etc.).
  2. Interactive - perform basic actions on report analysis (sorting, filtering etc.) or/and analysis of report's data (drill, rank, slice etc) for presenting information from different perspective.

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3. Power Users - perform ad-hoc query of data, create and format reports. They are also responsible for publishing and broadcasting reports.

- Broadcast Agents enable SMART users to process and distribute documents, automatically and securely, at scheduled dates and times. A Broadcast Agent is assigned as a property of a group, to which only users who are members of that group or sub-groups have access. A given user can belong to more than one group, and can therefore use more than one Broadcast Agent.
- Business Objects Designer is the application mainly used to create the semantic layer, or universes.
- The Application server is used to provide the web content for SMART system user.

### 2.26.3.2 Application dynamics

SMART Application receives statistics data from CCN/CSI in the form of audit files. The files are being validated and transformed and the data is put in the Repository in the form of SMART user reports. Broadcast agents retrieve the reports from the repository and forward them to the application server. End users are able to view and download SMART reports from the web user interface. The sequence diagram for SMART components interaction is presented below:

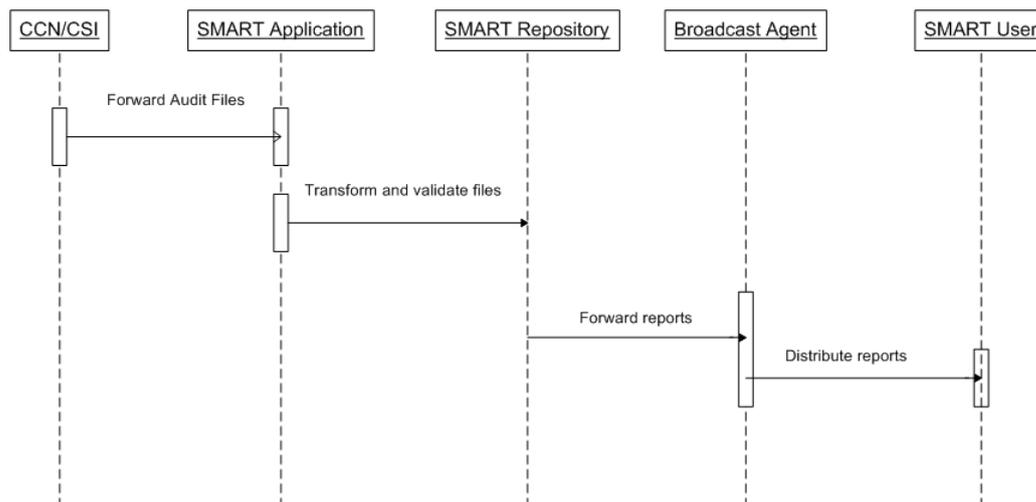


Figure 2-81 SMART components interaction

## 2.26.4 Technical perspective

### 2.26.4.1 Service access and delivery

#### Access Channels

The application may be accessed by a web browser or by ORACLE Net Client.

#### Delivery Channels

SMART is delivered over the CCN network. Commission user can application through a web client.

#### Service transport

Protocols used to exchange information are HTTP and CCN\CSI specific protocols.

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#### 2.26.4.2 Service platform

##### General platforms

The application server is on running on a Sun Solaris v9 operating system hosted by DIGIT.

##### Delivery servers

The application is deployed on a BEA Weblogic Application Server v8.1.

##### Database

Data is persisted with Oracle 10g Database Server 1.0.2.0.1.

#### 2.26.4.3 Component framework

##### Security

User authorization is realised by Business Objects security mechanisms, with the user data being stored in the repository. Access rights are allocated on specific user groups.

##### User presentation

Users access SMART system through a portal, which provides them with personalised access to SMART information capital. The *Business Objects* InfoView and WebIntelligence modules provide this portal. Information is presented on static HTML pages, JSP pages and bitmaps. Java Servlets are also used as web application controller parts.

##### Business logic

Business Logic is implemented as services deployed on the application server and Business Objects solutions.

##### Data management

Data is being managed by Business Objects.

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## 2.27 STTA

### 2.27.1 Reference and Applicable Documents

Id	Title	Reference	Version
STT1	System requirement definition for STTA for NCTS phase 3.2 and ECS	TCE-SRD-L1STT-P32.zip	v2.00

Table 2-27: STTA Reference documents

### 2.27.2 Functional perspective

Standard Transit Test Application (STTA) is one of the applications of a Centrally Developed Transit Application (CDTA) suite that has been developed to support [NCTS](#) and now [ECS](#).

The main purpose of the STTA application is the testing of the conformity of a national application (NA) – national transit application (NTA) or national export control application (NECA) – against the specifications for the Common and External Domains. The testing of the NTA/NECA with STTA is message-oriented. The [NCTS](#) system specifications provide the definition of several types of information exchange messages (IEs) that can be exchanged between the applications during their operation.

#### 2.27.2.1 Use cases view

The functionality can be divided into several groups.

- Initiating the test session
- Maintenance of the IE repository
- Communication
- Maintenance of the reference data repository
- Configuration

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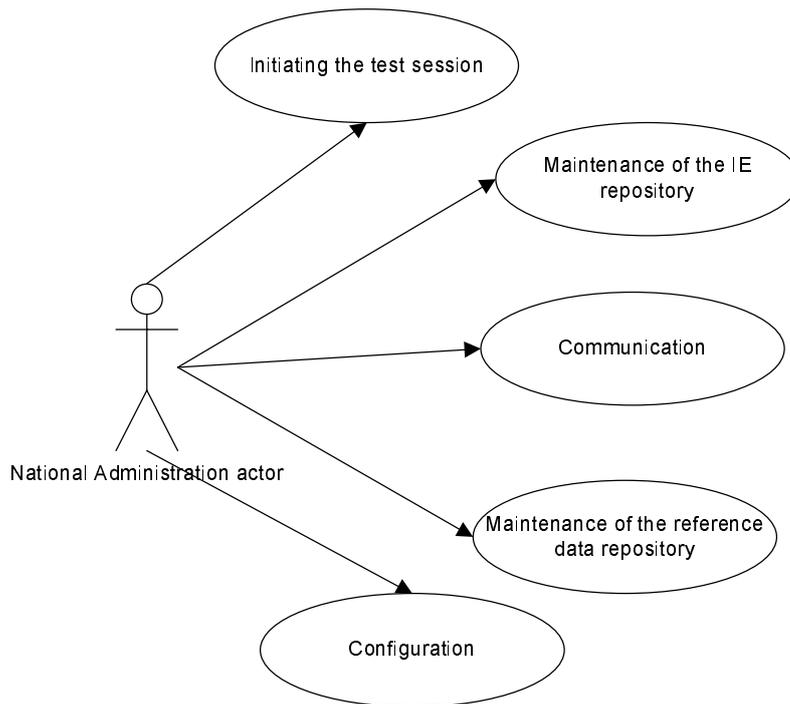


Figure 2-82 STTA use case

### Initiating the Test Session

The STTA can operate in the mode of two testing domains:

- The NCTS Domain mode;
- The ECS Domain mode.

The STTA application can work in the two modes:

- The Common Domain (CD) mode;
- The External Domain (ED) mode.

The NCTS testing domain allows the testing of the NAs using the common domain (CD) and external domain (ED) modes. When choosing to test in the NCTS domain the user can choose either common domain or external domain mode.

The ECS testing domain allows the testing of the NECAs only using the Common Domain mode.

After setting the testing domain and the operation mode, the user can select the role that the NTA/NECA plays and the corresponding role that the STTA will play during the test session.

When testing in the NCTS domain for the Common Domain Mode:

- Office of Departure;
- Office of Destination;
- Office of Transit;
- Office of Guarantee;
- Competent Authority of Country of Departure;
- Higher Authority of the Office of Destination.

When testing in the NCTS domain for the External Domain Mode:

- Office of Departure;

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- Office of Destination;
- Trader at Departure;
- Trader at Destination.

When testing in the ECS domain in the Common Domain Mode:

- Office of Export;
- Office of Exit.

After setting the roles played by the NTA and the STTA, the user can select the mailboxes to be used in the test session.

STTA offers the means to test the applications by exchanging these IE messages, using different interfaces:

- The CCN/CSI queue-based interface;
- The file-based interface.

Queue-based interface allows STTA to place messages in CCN/CSI persistent queues located on the CCN/CSI Gateway. File-based interface is associated with two valid directories on the Windows XP File System. These hard disk locations are used for reading (retrieving) the incoming STTA messages and writing (sending) the outgoing STTA messages. Both the file based and the queue based locations are mapped to an individual mailbox through the STTA Mailboxes configuration mechanism.

When the above mentioned settings are made, the user starts a new testing session and can start sending and receiving IEs. The test session can be suspended, and again restarted, or the session can be closed.

From the moment a test-session is started, the logging functionality is enabled and all actions (send, receive, verify) are logged. After the stopping the session, the logging of all actions is stopped.

### **Maintenance of the IE repository**

During the sending, verifying and receiving of an IE, the STTA deals with the IE in two formats namely the IRF format and the EDI format. The EDI format is the format of the IE when it is sent or when it is received. The IRF format is the format of the IE inside the STTA. A message in correct EDI format will be converted to a message in IRF format if this is possible and vice versa by the STTA.

The facilities of the IE repository allow the manipulation of IEs within the repository.

The user can create new IE from scratch by selecting the IE type, or by choosing the predefined template, by copying the existing message, or by importing the message in XML or in EDIFACT format. The already existing IE can be opened and viewed, also printed or exported. The mentioned options allows both the XML or EDIFACT formats.

For all the above mentioned operations, the IE is presented in the IE editing screen which allows the user to edit the message and perform various actions on it (i.e. Validation, Rules Check, Translate or Send). Note that for already sent/received messages, no further editing is possible.

In common domain mode for both NCTS/ECS testing domains, when a message is loaded from the repository it can be instantiated with country specific information.

### **Communication**

There are two communication actions: send and receive messages.

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The message can be sent when user creates new message or opens an existing. In the beginning of the sending process, the IE is loaded or created in IRF format. STTA verifies the permission of the IE type for the role that STTA is playing, also carries out the verification of rules and conditions and the IRF structure against the DTD. When the user decides to send the IE, STTA automatically translates the IE to the EDI format and hands it to the transport mechanism. In case of errors, an IE of specific type containing a detailed error description is generated.

When receiving, STTA checks the incoming mailbox, retrieves the available message one by one and processes them. In the beginning of the receiving process, the transport mechanism hands over the IE in EDI representation format. STTA then verifies the permission of the IE type for the role that STTA is playing. Next, STTA performs the translation from EDI format to IRF format.

After the translation, STTA automatically proposes the user to verify the rules and conditions and to perform a DTD Validation. In case of errors, an IE of specific type containing a detailed error description is generated.

### **Maintenance of the reference data repository**

The facilities of the reference data repository enables the user to manage the reference data, the customs offices list and the traders list, also provides the function of import of IEs containing above mentioned data.

### **Configuration**

The facilities of the configuration enable to determine various settings of the testing process. The user can set various parameters: logging, parsing and translation parameters, also the parameters of rules and conditions, etc.

The facilities of the instantiation data repository allow maintaining all instantiation data categorized by country. The STTA is able to automatically instantiate all CD messages stored in the IE repository based on pre-defined instantiation data. In order to enable the message instantiation mechanism the user must configure the mailbox parameters for each role.

The user also can set various communication parameters and configure the mapping between the individual mailboxes and file based and the queue based communication interface locations.

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### 2.27.2.2 Domain vocabulary

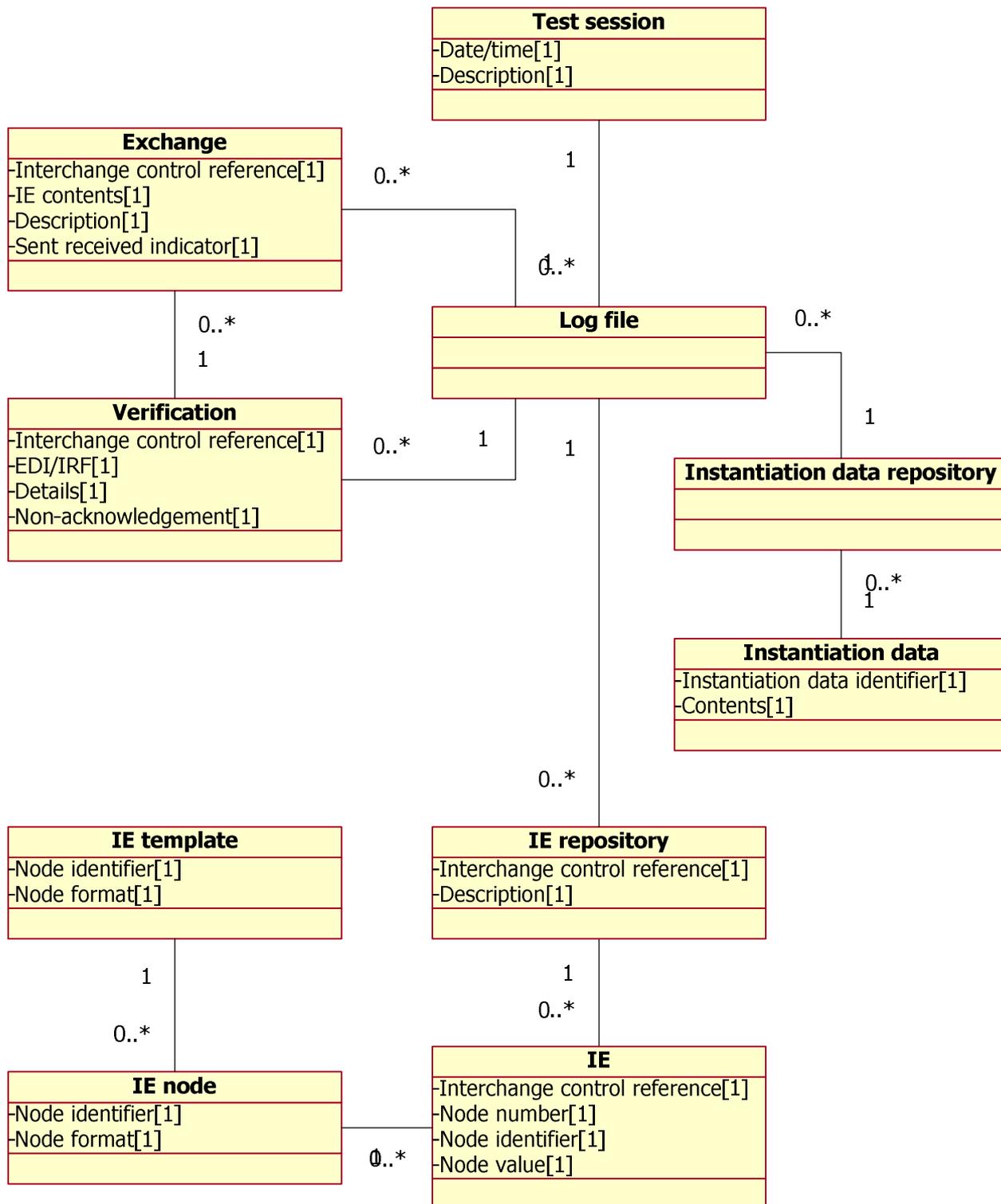


Figure 2-83 STTA Domain vocabulary

Major data objects are stored:

- IE Repository
- Exchange

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- Instantiation data repository
- Test session
- Log file

Common domain reference data are used:

- Reference data
- Customs offices
- Traders

### **IE repository**

The IE Repository contains the different information exchanges (IEs), which are uniquely identified by their file name. An additional free text field is foreseen to allow the user to enter a free text description.

The IE contains the actual contents of the information exchanges - the different IE nodes, which can be identified inside each IE together with their value. IE Template defines the structure of each IE type including the format of the data-item.

### **Exchange**

The exchange contains the contents of each IE that has been sent/received and is identified by means of a unique Interchange Control Reference. This table is not directly linked to the IE table since the contents can be changed after fetching the IE from the IE Repository.

The verification of the exchange contains the detailed information of the verification, an indication if the verification is done in EDI or in IRF format. It also contains the content of non-acknowledgement messages.

### **Instantiation data repository**

The instantiation data repository contains all instantiation data categorized by country. The STTA must contain the instantiation data for all countries and respective roles.

### **Test session**

Every test-session is identified by means of a unique date/time stamp. The user can also add some free-text description of the test-session.

### **Log file**

The log file contains the actual contents of all logged information. A link from other main data objects is foreseen to the log file to ensure that changes in the tables can be logged.

Several tables are used for various settings: the queue addressing, also the EDIFACT and IRF definitions, different rules and conditions. The reference data repository contains the link to the reference data, customs offices and/or traders. The reference data contains the reference data that is centrally managed by the system [CS/RD](#). Each data type as defined in [CS/RD](#) is stored based upon the unique name of the item.

The customs offices are identified by means of the unique customs office reference number. The traders are identified by means of the unique trader identification number.

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The actual contents, such as name, address, etc. are stored for the customs offices and traders.

## 2.27.3 Application perspective

### 2.27.3.1 Application structure

STTA (Standard Transit Test Application) tests the conformity of the National Transit Application (NTA) against the specification for the CD (Common Domain) and the ED (External Domain).

#### Components

The figure below presents the components of the STTA application:

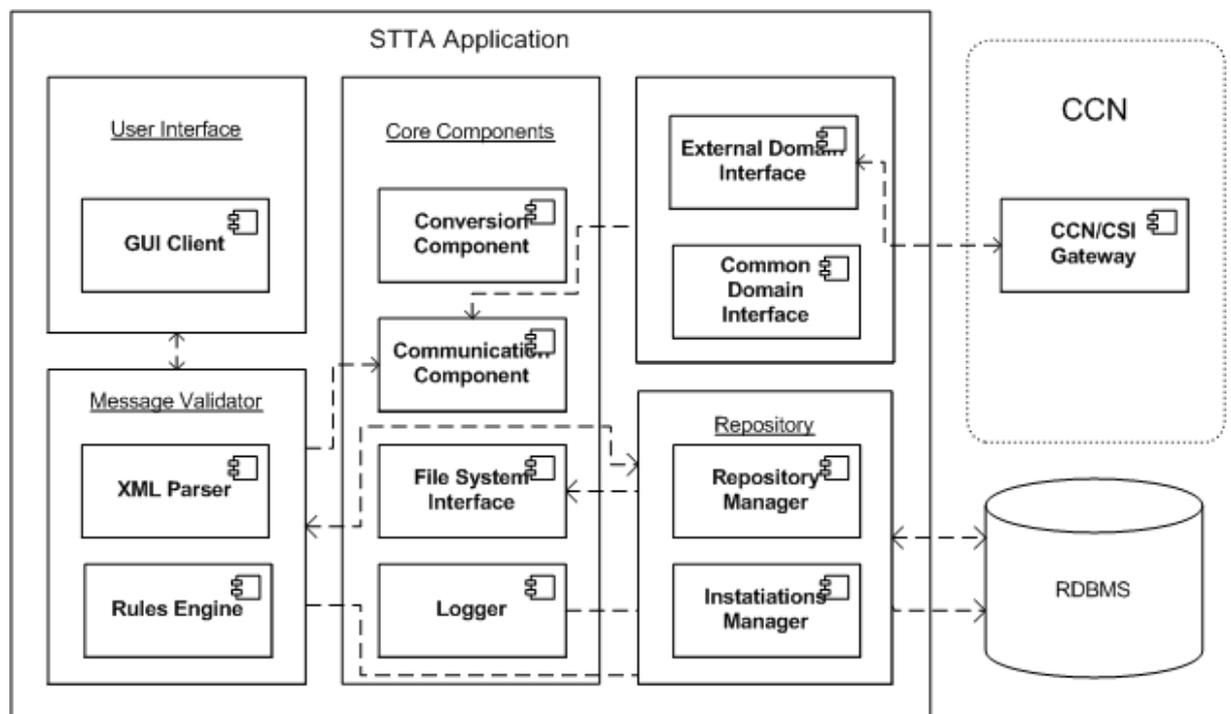


Figure 2-84 STTA application components

The functionality of the STTA is encapsulated in the following components:

- Reference Data Repository – contains Reference Data values for Business Domain (NCTS/ECS), Customs Office or Trader.
- Instantiation Manager - instantiates an IE from the IE repository.
- Repository Manager - performs all the communication between the IE Repository database and the other modules.
- User Interface – enables user to carry out the manipulation of all information including the IE Repository, Reference Data and Instantiation Data.
- Conversion Component – perform conversions between IRF and EDI formats.
- Communication Component – responsible for sending and receiving messages from/to the STTA and handling all the communication aspects of the application.
- Message Validator – processes messages and performs validation utilizing the Rules Engine.

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- External Domain Interface - an interface to support the exchange of IEs with the External Domain.
- Common Domain Interface - an interface to support the communication within the Common Domain.
- Logging Component - performs all the storage of data in the logging database.

### Logging

All verifications and errors encountered are logged. Additionally all send/receive/verify actions are also logged with date & time stamp. Log data is stored in the logging database.

### Security

The STTA does not provide any specialized security mechanisms except CSI security.

#### 2.27.3.2 Application dynamics

User can define a number of inbox/outbox pairs for IE messages. It allows the user to reply to a certain received IE and STTA is able to generate a new IE based on the received IE.

Application data is kept in the repository which consists of a collection of files grouped in predefined directories.

The Message Instantiation component instantiates messages stored in the STTA repository with country specific data. STTA validates maintained IE messages against DTD templates and XSD schemas. Finally, the Message Translation component translates the messages from EDIFACT to XML and vice versa.

The sequence of operations is presented in the diagram below:

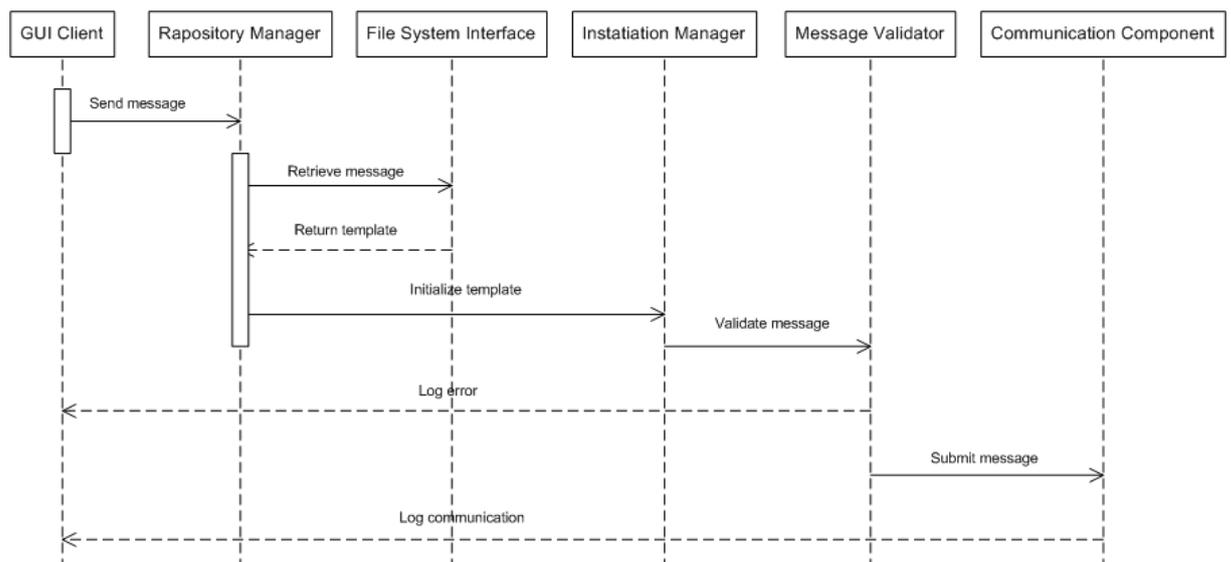


Figure 2-85 STTA sequence of operations

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## **2.27.4 Technical perspective**

### **2.27.4.1 Service access and delivery**

#### **Access Channels**

STTA application is built as a thick client using Java Swing (JFC) classes and usually installed on the end user workstation.

#### **Delivery Channels**

STTA application connects to the application which is being tested using LAN.

#### **Service transport**

STTA communicates with the tested application CCN/CSI queues.

### **2.27.4.2 Service platform**

#### **General platforms**

The STTA application is a PC based application that runs under Windows NT, Windows 2000 or Windows XP on an Intel CPU platform.

#### **Delivery servers**

CCN/CSI communication is provided using standard CCN/CSI stack and queues and also a REDIX application for handling translations and validations of messages.

#### **Database**

STTA uses file system for data storage.

#### **Security**

The STTA does not address security issues except CSI security.

#### **User presentation**

GUI is build using The Java Foundation Classes package (JFC) that is incorporated with the Java JDK (since version 1.2).

The STTA provides a completely separate user interface for exchanging IE's in CD Mode and in ED mode, to enable completely independent handling of CD and ED IE's.

Both user interfaces have a common look-and-feel.

#### **Business logic**

There is no business logic implemented directly in the STTA application. System operators are able to test different business message exchange scenarios using STTA as a test platform.

#### **Data management**

STTA does not use database to manage its data.

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## 2.28 TTA

### 2.28.1 Reference and Applicable Documents

Id	Title	Reference	Version
TTA1	System requirement definition for TTA for NCTS phase 3.2 and ECS	TCE-SRD-L1TTA-P32.zip	v2.20

Table 2-28: TTA Reference documents

### 2.28.2 Functional perspective

Transit Test Application (TTA) is one of the applications of a Centrally Developed Transit Application (CDTA) suite that has been developed to support [NCTS](#) and now [ECS](#).

The main purpose of the application is verifying the technical conformance (Conformance Testing) of a national application (NA) – national transit application (NTA) or national export control application (NECA) – against the [NCTS](#) specifications for the Common Domains. The test of the NTA/NECA focuses on the IE's that an NTA/NECA may exchange with a counterpart NTA/NECA over the Common Domain. The purpose of the testing is to verify that the candidate NTA/NECA must be able to properly generate and/or respond to the functional IEs.

The TTA is used to execute pre-defined scenarios with pre-defined roles and test data in order to verify the messages per role against the expected outcome using an automated mechanism. The TTA provides the NTA/NECA a remote console that allows the TTA operator to setup, execute, and monitor the execution of test scenarios, as well as view logs on the execution. Furthermore, the TTA is able to play multiple roles of Customs Offices in one instance applicable.

#### 2.28.2.1 Use cases view

The functionality can be divided into several groups.

- Management of test scenarios
- Management of the user profile
- Management of guarantee
- Execution of test-scenarios
- CCN/CSI communication
- Conversion and verification
- Test session reports
- Configuration

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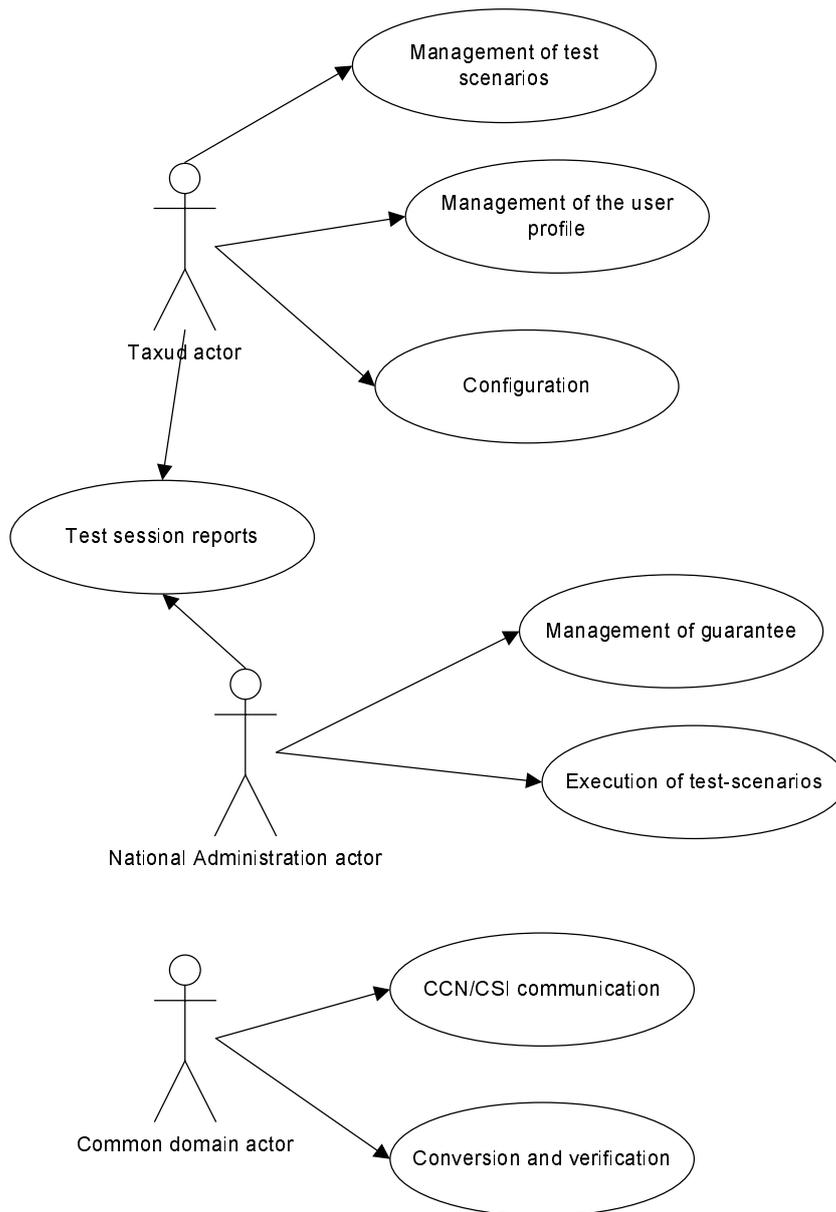


Figure 2-86 TTA use case

### **Management of test scenarios**

The test scenario editor allows managing the scenarios in the Scenario UNIX folder: to create, update and delete abstract test scenarios and to validate the syntax of the test scenarios by compiling and debugging them. When test scenarios are created, they are made in an abstract format. After the test scenarios have been compiled in an executable format, they can be executed.

### **Management of the user profile**

The system provides the facilities for the user profile management: creation, update or deletion of the user profiles per NTA/NECA. A profile identifies the set of test scenarios related to a particular implementation under test.

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### **Management of guarantee**

The TTA console implements guarantee management functionality for the [NCTS](#). This guarantee management refers to all the functions that TTA should offer and implement via the user interface to allow the user to maintain the guarantees that TTA will use when executing scenarios for the business category “guarantee management”: creation, viewing, modification and deletion of guarantees.

### **Execution of test-scenarios**

The TTA operator has the possibility to select and run a pre-defined test-scenario.

A scenario is defined by a sequence of IE messages exchanges. When message is sent or received during the execution of a test scenario, several conversion or verification functions are used automatically. The message is amended as per the scenario statement. The TTA supports a set of verbs that can be included in a scenario to allow changes to the IE contents at runtime, and to send the modified IE to the NTA/NECA. The NTA/NECA has to answer with the expected IE recorded in the TTA scenario. The TTA performs the verification on this IE and results are transmitted to the TTA Operator. When this is done, the TTA is ready to continue the scenario by sending or receiving the next message. The testing of a scenario ends when all messages in the scenario have been exchanged, when the TTA encounters an error, or when the TTA operator decides to stop because of a problem. All the events that occur are logged and the TTA operator then is provided with the test results, which include the TTA assessment of the scenario execution, and detailed logs.

The testing verifies that both the normal and exceptional processes are performed correctly:

- Valid testing verifies the behavior of the NTA/NECA in the processing of valid IE formats and messages sequence.
- Invalid testing verifies the behavior of the NTA/NECA in the processing of invalid IE formats (incomplete, incorrect values, or badly formatted in IRF & EDI format) and messages out of sequence.

During the testing process, the TTA can play the role of different entities to the tested application. In the NCTS domain, the roles can be the office of departure, the office of transit (actual and/or declared), the office of destination (actual and/or declared), the office of guarantee, higher authority of destination, and competent authority of departure. In the ECS domain, the roles can be the office of export and the office of exit (actual and declared).

TTA is able to allow several countries to operate at the same time. The TTA is able to play more than one different role but of the same system in the same queue set in the same country. The TTA allows the NTA to play various roles.

If the NA plays one role, the TTA acts as all the other remaining roles. If the TTA is playing two or more roles, it defined at the level of the test scenarios what communication cases between NA and TTA roles should be performed. Furthermore, in order to manage the case of diversion, a distinction is made between the “Actual Arrival” and “Declared Arrival” sub-roles for offices transit and of destination.

### **CCN/CSI communication**

The system provides the communication over a CCN/CSI gateway with the NTA/NECA under test using CCN/CSI addressing schemes. During the conformance

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testing, TTA and NTA/NECA exchange IE's from and to the common domain on a queue-based interface.

Since the TTA is able to play several roles at the same time, the TTA support several queues, acting according the different roles.

### **Conversion and verification**

System provides several conversion or verification functions:

- EDIFACT translator
- Field-by-Field verification against the expected content
- Verification of the message sequence
- IRF mapping and checking the rules and conditions applicable to the message
- Verification of the syntax of the message in CSI format, in EDIFACT format and in IRF format.

The EDIFACT Translator allows translating messages from and to EDIFACT.

During the sending, verifying and receiving of an IE, the TTA deal with the IE in two formats, namely the IRF format and the EDI format. The EDI format is the format of the IE when it will be sent or when it is received. The IRF format is the format of the IE inside the TTA. The system provides the functionality of the conversion of a message from EDIFACT to the IRF format and vice versa. Furthermore, the IRF mapping verifies the rules and conditions applicable to the message.

The system provides the functionality for the field-by-field checking, which is the analysis of the data contained in the message fields versus the expected data.

The system provides the functionality of verifying the sequence of the exchanged IEs.

The TTA Checkpoint mechanism logs checkpoints during the scenario execution. After the end of the scenario execution these checkpoints are used to diagnose the success or failure of the executed scenario. Checkpoint entries are made for all operations including displaying informative text on screen, sending an IE message, receiving an IE message, receiving a CCN/CSI report, detecting an error at EDIFACT or Functional level and detecting an error at a message sequence error.

### **Test session reports**

After the execution of the test-scenarios, test session reports are generated on the basis of the stored events. Reports contain the information on the execution of the test-scenarios and on the result and outcome, so that the status of conformance testing for this NTA/NECA can be easily established.

### **Configuration**

The facilities of the configuration enable to determine various settings of the testing process, such as EDIFACT translator parameters, Testing Process Parameters, CCN/CSI Parameters.

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### 2.28.2.2 Domain vocabulary

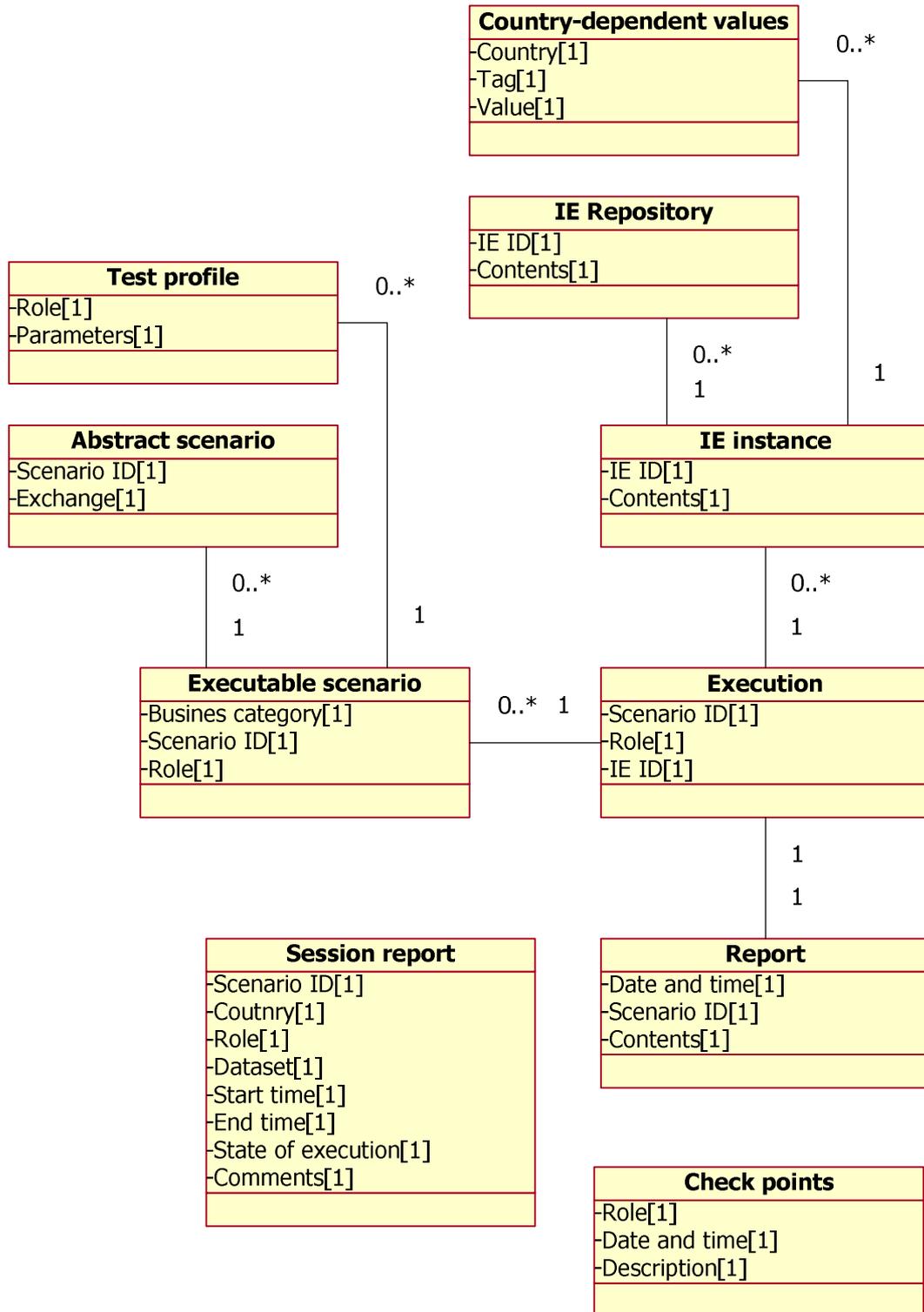


Figure 2-87 TTA Domain vocabulary

Major data objects are stored:

- Test-Scenario
- IE repository
- Execution

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- Report

Common domain reference data are used:

- Country
- Role
- Business category

### **Test-scenario**

Abstract scenarios are the test scenarios containing the general aliases to indicate the different roles. Executable scenarios are abstract test scenarios which are compiled from their API-format into a binary executable together with the information defined in the test profiles. Test profiles include different roles and for each of the roles the parameters, such as the queue address.

### **IE repository**

IE repository contains the templates of different IEs, which are non-dependent from country specific information. Country dependent values represent the list of generic tags and for each country it presents their contents. Every template IE is converted into an actual IE instance by replacing the generic fields by country-specific fields and date/time stamps.

### **Execution**

The execution includes the actual contents of the execution of a scenario, namely the IEs exchanged for each scenario including the date and time of the exchange action. The checkpoints per scenario execution are stored.

### **Report**

Reports contain the information on the execution of one test-scenario and on the result and outcome. Session report contains the information for all scenarios execution.

## **2.28.3 Application perspective**

### **2.28.3.1 Application structure**

The Transit Test Application (TTA) allows testing of the message exchange across the Common Domain (CD) through CCN/CSI. The TTA is based on scenarios. When processing a test scenario the TTA is able to follow the sequence of message exchanges.

### **Components**

TTA components are presented in the figure below:

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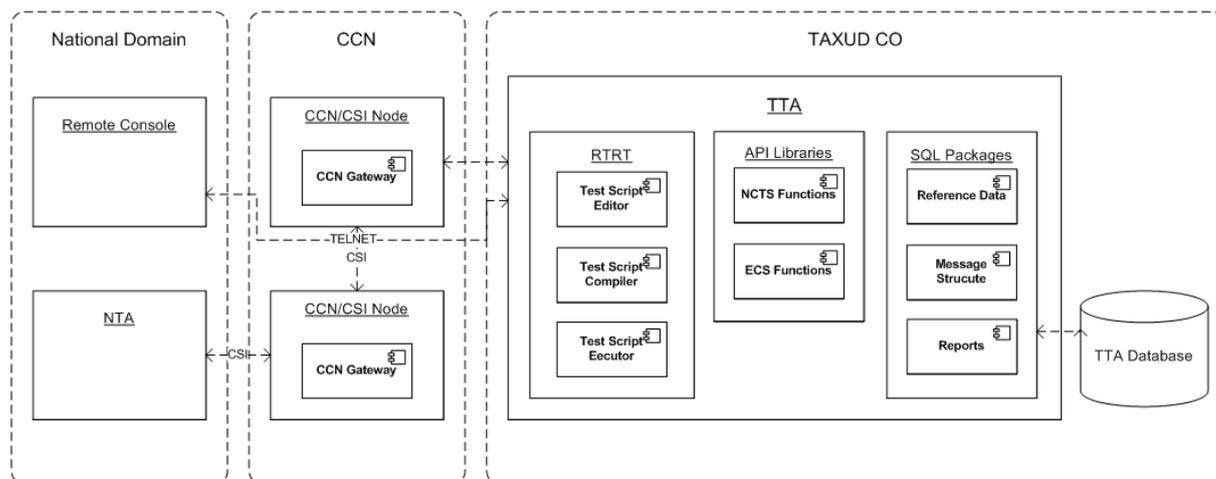


Figure 2-88 TTA Application structure

The functionality of TTA is encapsulated in the following modules:

- TTA Remote Console – remote user interface which enables the user to log into the TTA host using a plain text console and execute a scenario. In addition the Remote Console provides the functionality to maintain guarantees that TTA will use when executing scenarios of the Guarantee System.
- TTA API Libraries – utility libraries containing functions used within the TTA scenarios. These functions include rules and conditions check, CSI sending/receiving calls, message repository interface and logging.
- TTA Database – the RDBMS that stores repository data.
- TTA SQL Packages - additional code for the manipulation of the data contained in the TTA Database.
- IBM Rational Test RealTime (RTRT) - TTA system integrator offering all the scenario-related functionality including tools like RTRT Test Editor and RTRT Compiler.

### Database

The TTA database contains the following information:

- reference data set used in the conformance testing
- message structure for each type of message
- mapping of message elements to EDIFACT elements
- messages exchanged during the various test executions, in the various stages of their processing
- TTA configuration data (CCN/CSI queues, runtime flags)
- data related to guarantees

During the execution of the test scenario, all the events that occur are logged in the Traces database. After the execution of the scenarios, reports are generated. The reports are created, based on the events that are stored in the Traces database and stored in the Reports database.

### Logging

Logging include one physical master log file containing general information and associated log files containing the IE's (the master log file keeps reference to the associated log files containing the IE's). Each IE log file is identified by scenario number/IE number/date/time.

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## Security

The connection between the remote console and the TTA instance relies on UNIX security features (username and password at UNIX level). The TTA provides access restrictions based on user profiles with a logon security feature using name/password.

### **2.28.3.2 Application dynamics**

A test scenario starts when the TTA Operator selects it from the TTA Remote Console and decides to execute it. The scenario contains a sequence of IE exchanges and detailed information about message structure and content.

When the TTA sends an IE, it takes the message from the IE folder, generates all required dynamic fields and modifies the IE as specified in the scenario. Upon receiving of a IE, TTA performs verifications.

New and modified scenarios source files have to be compiled prior to using them in test cases.

Users can compile scenarios using a special UNIX shell script *full\_scenario\_compilation.sh*

It is important that the TTA libraries are up to date while running the compilation script.

## **2.28.4 Technical perspective**

### **2.28.4.1 Service access and delivery**

#### Access Channels

TTA host is using a plain text console.

#### Delivery Channels

Telnet or similar sessions can be used by the TTA operator at the NA/MS site to access and operate, over the network connection, the TTA Remote Console.

#### Service transport

The TTA interfaces with the NTA/NECA through a network connection, supporting TCP/IP protocols.

### **2.28.4.2 Service platform**

#### General platforms

The TTA system is composed of an UNIX server hosting the TTA (TTA server) and one or more TTA end-user stations (PC based) used to access and operate the TTA on the TTA server. BULL Escala PL220T is required to deploy the TTA Server, where an AIX Version 5.2 operating system is standing. GNU Make Version 3.80 and GNU C/C++ and standard C library (including STL) Version 3.3.3 are required for compilation and runtime. REDIX AnyToAny XML Format Converter Engine (stand alone or Network/CAL installation) and CCN/CSI libraries are also required.

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The TTA client workstation must be a MS-Windows XP Professional with Service Pack 1 or higher operated machine. X-Windows Client requires Exceed for Windows NT/2000/XP, version 6.1 or higher (from Hummingbird Communications Ltd), Reflection (LSL) for Windows NT/2000/XP, version 7.1 or higher (from WRQ), or any other similar X-Windows emulator COTS for the Windows XP environment.

An X-Windows application needs to be properly installed and the connection to the server must be functioning properly. To check it, after start, the X-Windows emulator shows the list of available servers including the TTA server

### **Delivery servers**

The application does not use any delivery servers.

### **Database**

The application uses Oracle RDBMS 10.2.0.2.

### **Security**

When the system is used for external tests over the CCN/CSI, the standard MQ SERIES mechanisms is used (described in standard documentation CCN/TC).

### **User presentation**

### **Business logic**

Test functionality is implemented using Executable Scenarios compiled from their API-format into a binary executable together with the information regarding the roles.

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## 2.29 ECN

### 2.29.1 Reference and Applicable Documents

Id	Title	Reference	Version
ECN1	ECN System Requirements Definition for NCTS Phase 3.2 and ECS	TCE-SRD-L1ECN-P32-v4.00-EN.doc	4.00
ECN2	ECN Detailed Design for NCTS Phase 3.2 and ECS	TCE-DTD-L1ECN-P32-v2.50-EN.doc	2.50

Table 2-29: ECN Reference documents

### 2.29.2 Functional perspective

New Computerized Transit System ([NCTS](#)) is based on the electronic exchange of the transit data between the National Customs Administrations in parallel and in anticipation of the movement of the goods. [NCTS](#) provides a fully computerized Customs regime for goods which enter into the Common Transit.

Electronic Data Interchange (EDI)/Common Systems Interface (CSI) Node (ECN) is one of the applications of a Centrally Developed Transit Application (CDTA) suite that has been developed to support [NCTS](#) and [ECS](#).

The ECN is the technical crossroad for the various domains in the customs related business. The ECN also provides translation and communication services to applications belonging to these domains. The communication is implemented with the CCN/CSI dedicated network and service. Business messages issued or received are placed on or retrieved from the CCN/CSI gateways.

#### 2.29.2.1 Use cases view

The system functionality can be divided into several groups:

- Message exchange service
- Administration and configuration

##### Message exchange service

The ECN service is considered as a technical service supporting the message exchange between various domains:

- National Domain (ND) of national transit application (NTA) or national export control application (NECA),
- Common Domain (CD) and other NTA's and NECA's through the CD,
- External domain (ED),
- Guarantee Domain (GD),
- Central Services/Reference Data ([CS/RD](#)),
- Central Services/Management Information System ([CS/MIS](#))

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- Risk Analysis Module (RAM)

The communication in the same domain is realised via local queues only. The CCN/CSI gateways are used for the communication with the remote domains, e.g. common domain and other national domains. The ECN handles the CCN/CSI confirm on delivery (CoD) and confirm on arrival (CoA) acknowledgements and inform the local NTA or NECA of the successful sending through a Translation&Sending report.

The ECN supports the exchange of messages in an asynchronous way by means of queues-based or file-based interface.

The ECN communicates with and provides services to other [NCTS](#) or [ECS](#) systems, but it does not communicate directly with business functions and therefore, there is no direct interaction with end-users.

The services that ECN provides to the components are:

- Communication with the CCN through the CSI API;
- Getting information exchanges from interface queues;
- Putting information exchanges on interface queues;
- Message conversion from XML into EDIFACT and vice versa;
- Message validation;
- Handling the conversion and validation errors;
- Logging all incoming and outgoing information exchanges;
- Logging events and errors;

The communications modules of the ECN are responsible for receiving or sending messages from the common, national or external domains. These modules have listener and handler. Listeners are responsible for receiving the messages and submitting them to the incoming queues. Handlers are responsible for the sending of messages. Handlers scan the outgoing queues and route the outgoing messages to their destination.

After the message is placed into the queue, the conversion from XML into EDIFACT or vice versa and validation of the message is being performed. In case of conversion or validation errors the sender is being notified. In case of the communication with the external domain the ECN is able to identify the format of an incoming message.

The ECN keeps the local NTA or NECA informed of the status of the messages exchanged by means of a report.

The logging module operates in parallel and logs information in the ECN database.

All incoming and outgoing information exchange messages are logged as well as the events and errors.

The ECN implements an MRN generator engine when the movement is initiated. The MRN identifier is shared between [NCTS](#) and [ECS](#) and it has to be unique for a specific country and a specific year which implies that it is unique for all countries for all years.

In some cases the ECN is able to guarantee the proper sequence of some message types concerning the same movement (same MRN), e.g. destination control results can not be sent before the arrival advise or the arrival advise is only sent after the notification of crossing frontier has been received in cases where the office of destination and office of transit are the same office of presentation.

### **Administration and configuration**

The system administrator can perform administration and configuration of the ECN:

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- Configuration of the ECN converter, the ECN processes, the ECN queues
- Maintenance the internal Trader format store.
- Logging and archiving flags and conditions.
- Reports based on the contents of the log files.
- Following the ECN traffic, access and manage queues.
- Alarm and error management.
- Accounting management.
- Installation other than Normal Operation (training and testing) modes.
- Specification a configurable trace level parameter on the Trace log files.
- Merging the Trace log files in a consolidation report.
- Archiving logged information;

### **2.29.2.2 Domain vocabulary**

Major data objects are stored:

- Information exchange
- ECN log

#### **Information exchange**

The different types of messages that can be received and processed:

- Business IEs
- Control IEs
- Service IEs
- CCN/CSI Technical Messages
- External IEs

The ECN supports two formats of messages – XML and EDIFACT. The information structure depends on the type of message.

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The relations between major data objects together with their most important attributes are presented in the diagram.

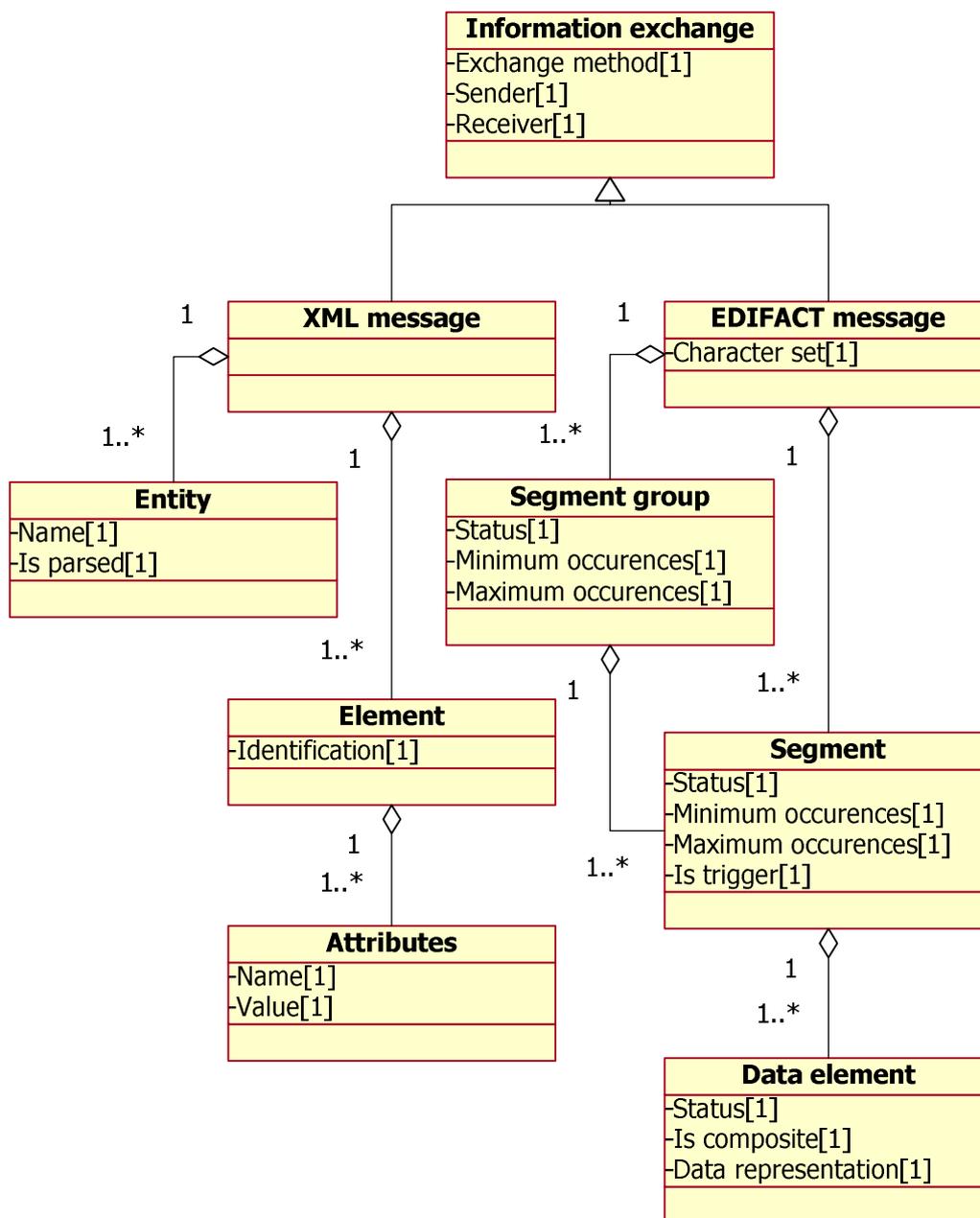


Figure 2-89 ECN Information exchange major data objects relations

### ECN log

All incoming and outgoing information exchange messages are logged as well as the events and errors.

For each message that is processed by the ECN, the trace is kept describing the progress of the message through the ECN. The audit log is also kept for each message, but it contains the external reference of the message, origin and destination and all details of the message.

The events are related to various states and errors of the system modules.

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The relations between major data objects together with their most important attributes are presented in the diagram.

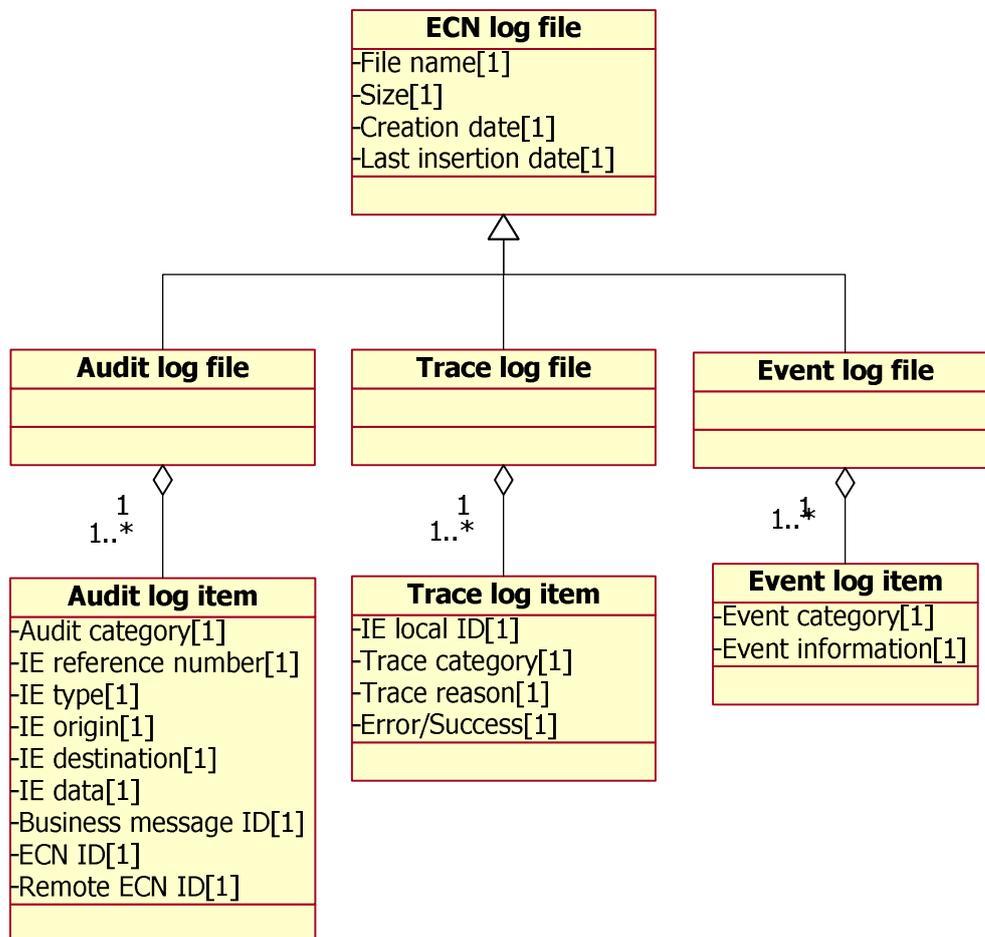


Figure 2-90 ECN log major data objects relations

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## 2.30 Movement Verification System

### 2.30.1 Reference and Applicable Documents

Id	Title	Reference	Version
MVS1	Movement Verification System - System Requirement Definition	ECP0-FITSDEV-SA02-STEP2.2-MVS-SRD-V2.00.doc	2.00
MVS2	Movement Verification System - Functional System Specifications	ECP0-FITSDEV-SA02-STEP2.2-MVS-FSS-V2.00.doc	2.00
MVS3	Movement Verification System - Technical System Specifications	ECP0-FITSDEV-SA02-STEP2.2-MVS-TSS-V2.00.doc	2.00

Table 2-30: MVS Reference documents

### 2.30.2 Functional perspective

The Movement Verification System (MVS) is one of the components of administrative assistance between Member States (MS) in the excise field. MVS allows the services responsible for monitoring movements to verify individual movements of goods in the framework of duty suspension procedure. MVS is applied after goods have been consigned and involves simple exchanges of information based on specific queries for the verification of the movements. The information necessary to carry out spot checks under MVS is exchanged by means of a uniform control document.

#### 2.30.2.1 Use cases view

MVS covers only the e-form templates. Copies of all sent and received messages are stored in the national file repository of each member state. This repository can be used to create the statistics, consult the audit trail of all messages sent and received for one request, check requests that have not been answered and send the reminders.

#### **E-form**

The e-form functionality covers the preparation, submission and reception of MVS Request, MVS Reply, MVS Deadline Report, MVS Reminder messages via CCN Mail 2. There are three main functionalities provided:

- Preparation of messages;
- Submission of messages;
- Reception of messages.

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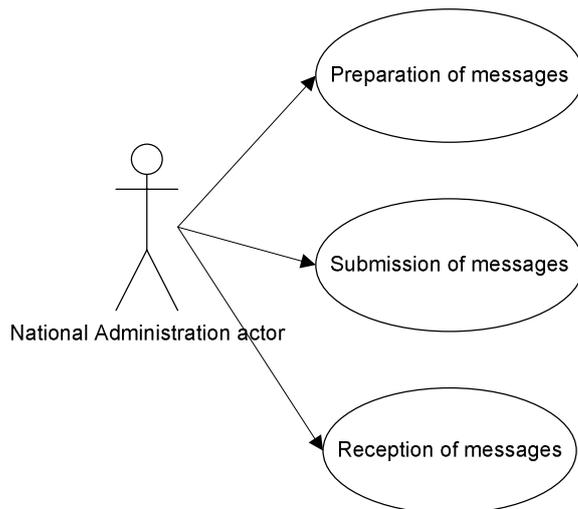


Figure 2-91 MVS E-form use case

An MVS Request is issued after goods have been moved, when the requesting authority wishes to verify consignments of goods subject to excise duty, or the requesting authority wants further information on flows of excise products or payment of excise duty. The requesting authority prepares the MVS Request and sends it to the addressed authority.

After reception of the MVS Request, the check should be performed. If the addressed authority requests an adjustment of the due date, an MVS Deadline Report message to the requesting authority.

The addressed authority prepares the MVS Reply to the MVS Request on the basis of the checks and investigations it carries out. It provides the results of the investigations on the form they received as the MVS Request. Additional information can be provided with attached documents. If no verification took place, the department responsible for the checks should state its reasons. The addressed authority sends the reply to the requesting authority.

If an MVS Reply has not been received by its due date, the requesting authority prepares the MVS Reminder and sends it to the addressed authority.

Both the requesting and addressed authority records the sending and receiving the messages of all types.

### **Statistics**

The MS provide statistics on the usage of MVS to DG TAXUD. The main functionalities are:

- Creation of statistics
- Submission of statistics

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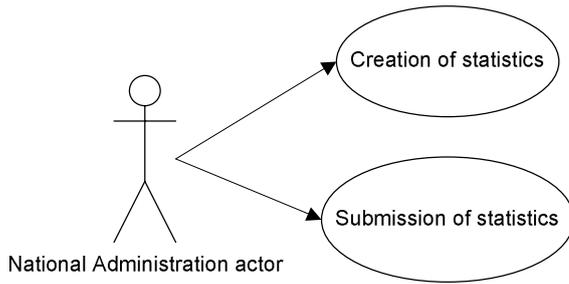


Figure 2-92 MVS Statistics use case

The creation of statistics is implemented as pre-defined Excel sheets. The statistics message is transmitted either as an Excel file, or as a file in CSV format.

### 2.30.2.2 Domain vocabulary

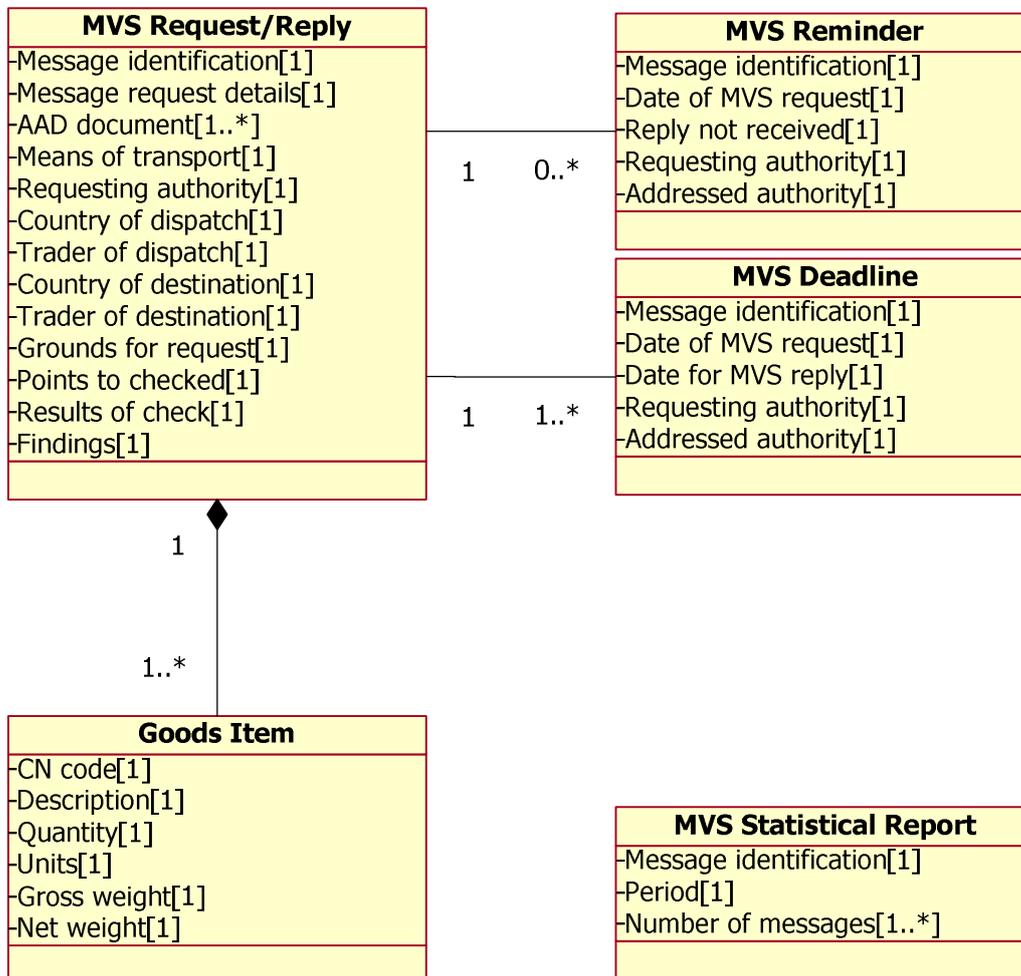


Figure 2-93 MVS Domain vocabulary

The system uses several types of messages:

- MVS Request;
- MVS Reply;

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- MVS Reminder;
- MVS Deadline report;
- MVS Statistical Report.

Main reference data used are:

- Country;
- Excise Office;
- Mean of Transportation.

The reference data are static lists and are used during filling and validation of e-form.

### **MVS request**

### **MVS reply**

The MSA which sends the MVS request is called the requesting authority and the MSA which received the MVS request is called the addressed authority. The requesting authority can be the excise office responsible for supervising the authorized warehouse-keepers and traders, also the customs office where the goods are placed. The addressed Authority is the competent authority which performs the checks and investigations.

The same form is used both for the MVS request and MVS reply. If the requesting authority sees the need for movement verification, it prepares an MVS Request message and sends it to the addressed authority. The addressed authority prepares the MVS Reply on the basis of the checks and investigations it carries out. They provide the results of the investigations on the form they received as the MVS Request. If no verification took place, the department responsible for the checks should state its reasons. A MVS Reply message is sent to the requesting authority.

### **MVS Reminder**

### **MVS Deadline Report**

An MVS Reminder and an MVS Deadline Report are used in order to coordinate the process of check. If an MVS Reply has not been received by its due date, the requesting authority sends an MVS Reminder. If the addressed authority needs an adjustment of the due date of the MVS Reply, a MVS Deadline Report message indicating the new date is sent.

### **MVS Statistical Report**

An MVS statistical report contains information about the movement volume per certain period in the specific country.

An element, common to most of the MVS messages (request, deadline report, reminder and reply messages) is the MVS Message Reference (MVS-REF). This is a unique identifier, which is used for example to enable the storing of the message, to collate messages which belong to a specific request and to easily distinguish the different types of MVS messages. The MVS-REF is composed of several data fields: requesting and addressed authorities, triggering request number, date, message type and ID.

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## 2.30.3 Application perspective

### 2.30.3.1 Application structure

MVS application consists of one self standing module, an e-form module. MVS is a simple Adobe e-Form file opened in the Adobe Acrobat Reader application. It is the form, where the whole data preparation and managing logic is implemented. It's the place where the user can prepare a specific case form, export it to a PDF or XML file and import data from an external or local made XML file. If needed, an email message may be created directly from the form and opened in an email client (eg. Outlook), where the data is added as mail attachment. Therefore the local machine on which the forms are executed, should have an email client with access to a national domain or common domain mailbox (CCN Mail 2).

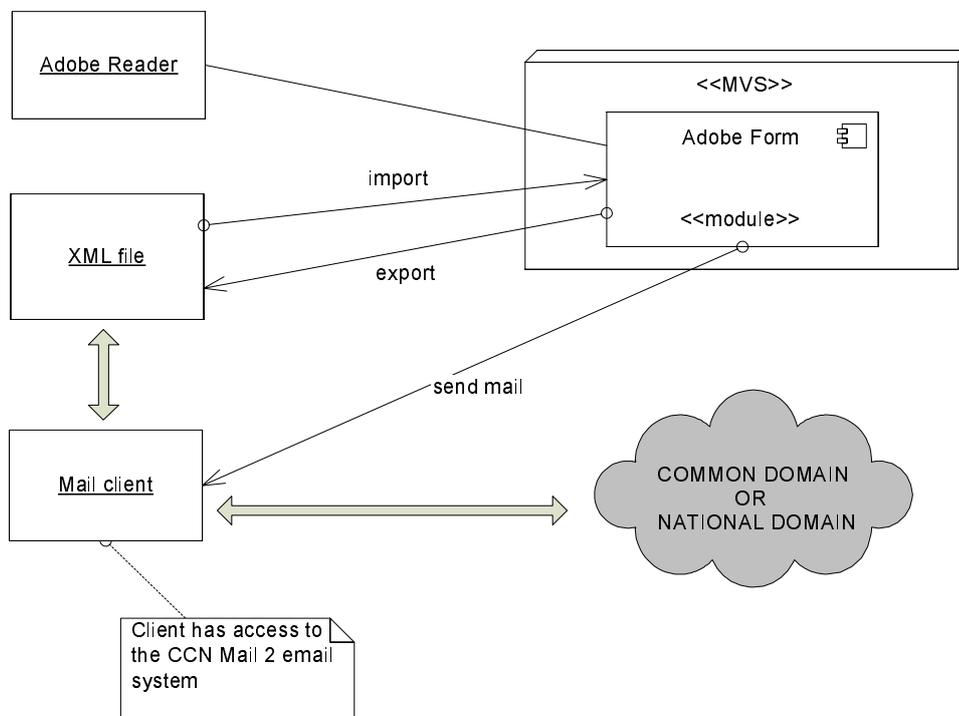


Figure 2-94 MVS Application structure

### 2.30.3.2 Application dynamics

The application main functionalities gather around the Request/Reply communication with other authorities (e.g. ELO offices). The functional specification defines few types of use cases, which may take place.

#### MVS Request/Reply management

When a requesting authority wants various information, like verification of identity, excise products, flows of products it prepares a MVS Request. It may be saved as pdf file, xml file, printed or sent by email. The following possibilities are described below.

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### Save MVS Request\Reply as xml file

The user opens a specific form in the Adobe Acrobat Reader application. Fills all the data needed for that kind of request. Some fields are mandatory and some are not, but some of the fields may become mandatory because of the data filled in other fields. The form makes an input validation as a reaction on the 'Export to xml' button click event, checking if the entered data is allowed in a field, a mandatory field is not missing, input is too long etc. If some problem is found, an error or warning message is thrown in a separate window. All of those operations are managed by the Javascript code. If no errors were found, the user will see a new *save file* window. The same process is used when saving file as PDF file.

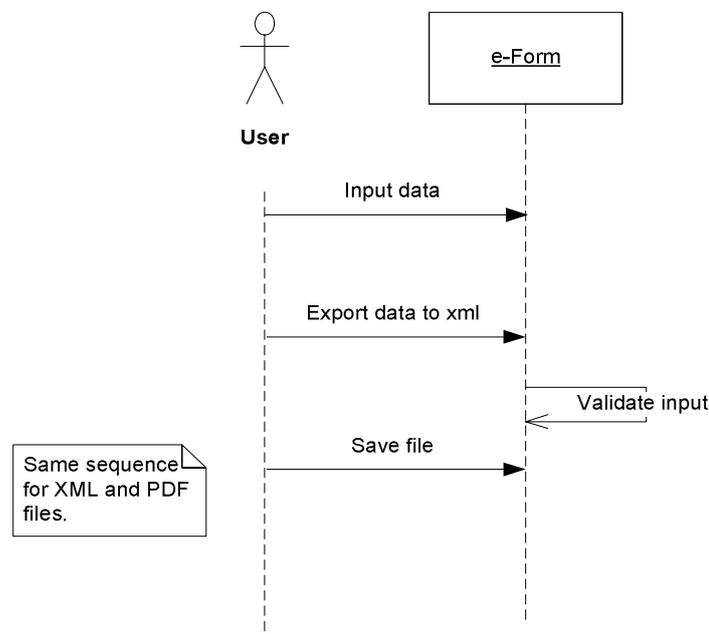


Figure 2-95 Save MVS Request\Reply as xml file process

### Send MVS Request\Reply as email

A MVS Request may also be sent as attachment to another authority. In order to do that, the user fills the proper form with data and clicks the 'Send email'. The form validates the input, and again if something is not correct, a error or warning message is shown. If not, the default mail client defined on the local machine is launched. All the needed mail attributes are defined (subject, attachment, message body – instructions for the receiver in 3 different languages) except for the recipient address. When the recipient is filled manually the message may be sent. In the case of a Reply, the receiving user loads the mail attachment to a Request form, and when all the incoming data is loaded to the form – clicks the “Reply” button. This converts the form to a Reply form, and copies all common data to the proper fields. The mandatory fields, that remained after the conversion, have to be filled. When the message is completed the user may send the Reply message data in the same manner as the Request.

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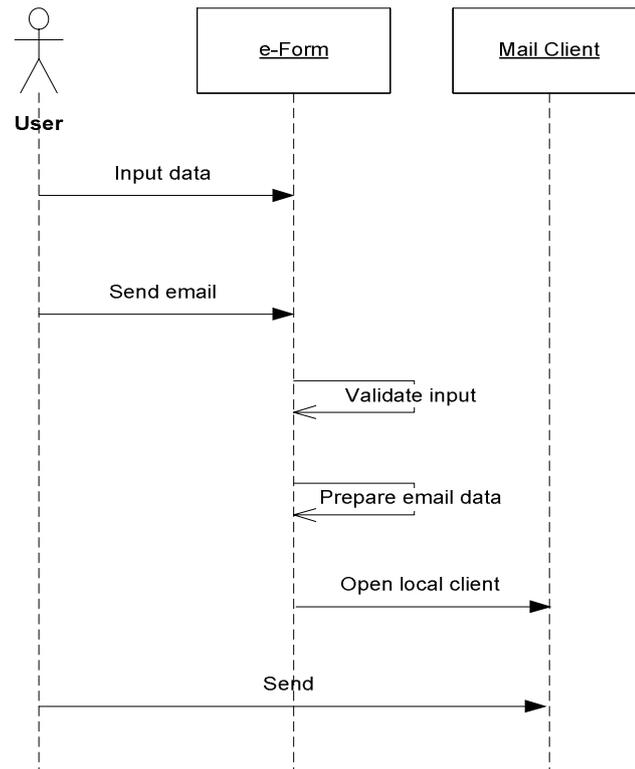


Figure 2-96 Send MVS Request\Reply as email process

### Importing incoming data

The form may import data from an xml file which has been received as attachment. Therefore the attached file must be detached from the message in the mail client. In the Request/Reply form, the button 'Import data' must be clicked. A new window will appear with the file selecting functionality. There is no XML schema validation in Adobe e-forms. So the file validation is implemented in Javascript. Only when the user chooses a valid XML file, the form will be created with data from that file.

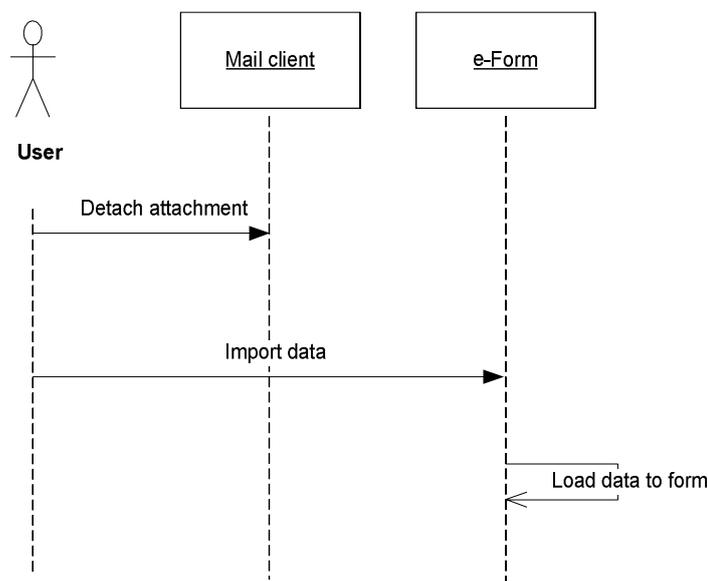


Figure 2-97 MVS Importing incoming data process

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It is possible to customize the e-form template for the specific office so that fields which are invariable for most of the messages (e.g. contact telephone or email) are already filled. Customizing the e-form template is done by editing an XML file which is processed when loading the e-form.

## **2.30.4 Technical perspective**

### **2.30.4.1 Service access and delivery**

#### **Access Channels**

The application is accessible through Adobe Acrobat Reader, where the prepared forms are viewed as Portable Document Format files, with special logic extensions.

#### **Delivery Channels**

The forms are delivered via email using Common Domain CCN Mail 2 infrastructure.

#### **Service transport**

The messages are delivered using standard mail protocols via local mail client application installed at the client workstation.

### **2.30.4.2 Service platform**

#### **General platforms**

The application requires Adobe Acrobat Reader version 7.05 running on Microsoft Windows system.

For proper mail exchange of MVS messages, the mail client on the client workstation should have access to a CCN Mail 2 mailbox, or a local national mail exchange system.

#### **Delivery servers**

No application or web servers are used.

#### **Database**

There is no working database in the operational scope of MVS.

### **2.30.4.3 Component framework**

#### **Security**

The message exchange security is achieved by the usage of CCN Mail 2.

#### **User presentation**

Adobe Acrobat Reader plays the role of the user interface. It is where the predefined e-form templates, delivered as PDF files are viewed. The MVS installation package delivers specified Adobe e-form files, which have a PDF format. The user may launch them by simply opening the file.

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The created forms support internationalization, so that all of the EU (after 2007 extension) languages are supported. It is achieved by the *Multilinguals* – a set of Javascript functions that provide multi language support.

### **Business logic**

The validation of the data filled in the form is done by Javascript code embedded in the templates.

### **Data management**

There is no database in the scope of a local MVS application. The created forms (pdf) or their data representation files (XML) may be saved on the local machine, the national template repository machines (with normal file structure) or in the common template repository.

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## 2.31 Early Warning System for Excise

### 2.31.1 Reference and Applicable Documents

Id	Title	Reference	Version
EWSE1	Early Warning System for Excise - System Requirement Definition	ECP0-FITSDEV-SA02-STEP2.2-EWSE-SRD-V2.00.doc	2.00
EWSE 2	Early Warning System for Excise - Functional System Specifications	ECP0-FITSDEV-SA02-STEP2.2-EWSE-FSS-V2.00.doc	2.00
EWSE 3	Early Warning System for Excise - Technical System Specifications	ECP0-FITSDEV-SA02-STEP2.2-EWSE-TSS-V2.00.doc	2.00

Table 2-31: EWSE Reference documents

### 2.31.2 Functional perspective

Early Warning System for Excise (EWSE) enables central liaison offices in Member States to exchange information or warning messages as soon as they are in possession of the Administrative Accompanying Document (AAD) information, and at the latest when the products are dispatched. As part of this exchange of information, a risk analysis based on the AAD information is carried out before a message is sent.

EWSE provides e-forms for creation, validation and sending of EWSE Information/Warning messages and replying to them with EWSE Feedback messages.

The source of the initial information is the accompanying administrative document (AAD) for the movement under duty-suspension arrangements of products subject to excise duty, defined in the Commission Regulation. The submission of AAD by the trader triggers the message exchange process between Member State Administrations (MSA) of departure, transit and destination of the consignment.

The EWSE e-forms produces XML documents which are afterwards transmitted using CCN Mail 2 as e-mail attachments. During creating, import and export of the XML documents into and from the EWSE e-forms, the XML messages are validated to comply with the appropriate XML Schemas and the set of functional and technical rules and conditions.

#### 2.31.2.1 Use cases view

EWSE covers only the e-form templates. Adobe e-form solution has been chosen as a basis for the implementation of the e-forms. Copies of all sent and received messages are stored in the national file repository of each member state. This repository can be used to create the statistics, consult the audit trail of all messages sent and received for one request, check requests that have not been answered and send the reminders.

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### E-form

The e-form module covers the preparation, submission and reception of EWSE Information/Warning, Feedback/Deadline Report, Global Feedback and Change of Destination via CCN Mail 2:

- Preparation of messages
- Submission of messages
- Reception of messages

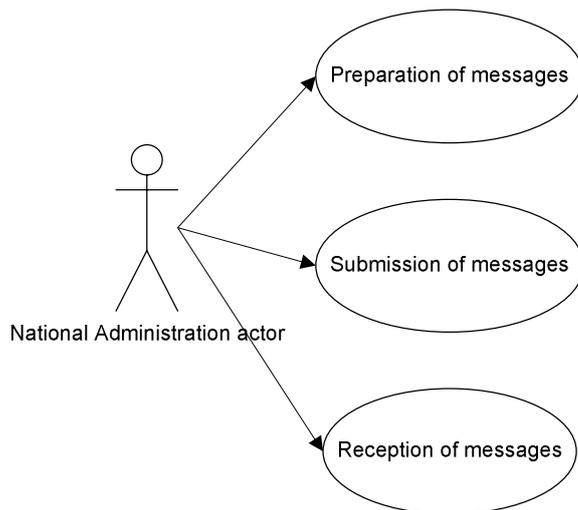


Figure 2-98 EWSE E-form use case

The AAD is submitted by the Trader at departure. A risk assessment of the AAD is made by the MSA at Departure. This step could either result in no action or the creation of an EWSE Information or Warning Message. If it is needed, the MSA at Departure sends the EWSE Information/Warning Message to the MSA at Destination. EWSE Warning Message is sent if the risk analysis indicated a high risk. Copies of the EWSE message are made to all known MSA of transit.

The MSA at Destination sends the Feedback or Deadline Report message to the MSA at Departure. The type of Feedback depends on the original EWSE Message and the results of the checks. The MSA of destination sends the EWSE Deadline Report message if it is impossible to perform the checks requested in the preceding EWSE Warning Message. If the MSA of Destination proposed a new due date the MSA of Departure can expect a Feedback message containing the results of the checks by that date. There is an EWSE Global Feedback message containing cumulated feedback for Information messages meeting certain conditions and a dedicated single Feedback message for all the other Warning or Information messages.

If there is a change of destination of a consignment and an EWSE Information or Warning Message was submitted for the “original” AAD, the MSA at Departure issues an EWSE Change of Destination message with a reference to the former EWSE message and sends it all recipients of the former EWSE message. In any case, the consignment is again subject of risk assessment.

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## Administration of statistics

### Statistics

The MS provide statistics on the usage of [MVS](#) to DG TAXUD. The following main functionalities are provided:

- Creation of statistics
- Submission of statistics

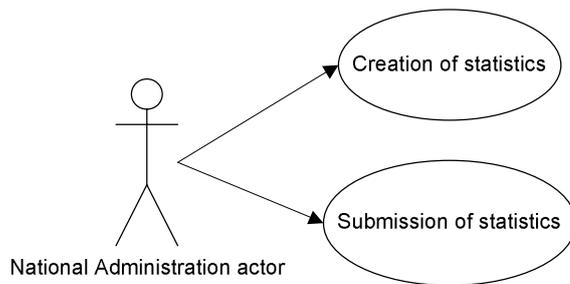


Figure 2-99 EWSE Statistics use case

The creation of statistics is implemented as pre-defined Excel sheets. The statistics message is transmitted either as an Excel file, or as a file in CSV format.

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### Domain vocabulary

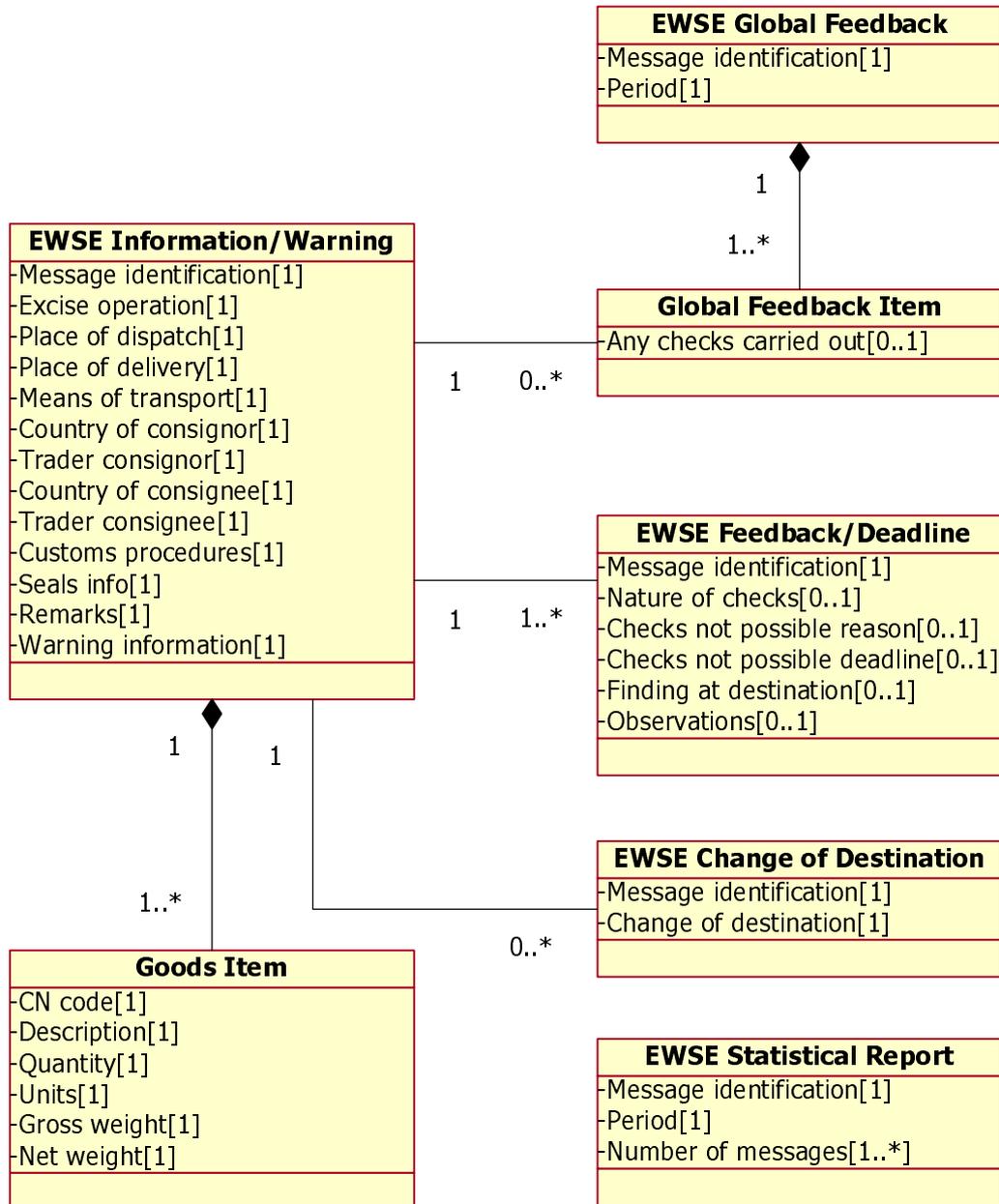


Figure 2-100 EWSE Domain vocabulary

The system uses several types of messages:

- EWSE Information;
- EWSE Warning;
- EWSE Feedback;
- EWSE Deadline Report;
- EWSE Change of Destination;
- EWSE Global Feedback;

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- EWSE Statistical Report Message.

Main reference data used are:

- Message type;
- Country;
- Mean of Transportation;
- Check type;
- Finding type.

The reference data are static lists and are used during filling and validation of e-form.

The Trader at departure submits the AAD for a specific consignment to the MSA before shipping. The AAD information can be collected on paper, fax, e-mail or any e-form solution, including the usage of a “proforma” EWSE message.

### **EWSE Information**

#### **EWSE Warning message**

Both the EWSE Information and EWSE Warning messages provide information on a consignment and are based on the AAD data. After the trader submits AAD, the MSA sends either EWSE Information or EWSE Warning message. The EWSE Warning is sent in case of a high risk. Because of the similarity between the EWSE Information and the EWSE Warning Messages, they are sometimes referred to as “EWSE Information/Warning Message”.

#### **EWSE Feedback**

#### **EWSE Deadline Report**

EWSE Feedback is a response to particular EWSE Information/Warning message. The EWSE Feedback is always sent after receiving EWSE Warning. After receiving EWSE Information message the EWSE Feedback is sent only when irregularities have been detected during check of consignment. EWSE Deadline Report is a response to an EWSE Warning message, where an extension of the due date for reply is requested or the requested checks can not be carried out. Because of the similarity between the EWSE Feedback and the EWSE Deadline Report, they are sometimes referred to as “EWSE Feedback/Deadline Report message”.

#### **EWSE Global Feedback**

The EWSE Global Feedback message is a cumulative response to EWSE Information messages, where no irregularities have been detected. It is prepared and sent to the according MSAs. The Global Feedback message cannot be used to reply to an EWSE Warning message.

#### **Change of Destination message**

A Change of Destination message is a notification submitted when the consignee or the place of delivery has been changed on an AAD and an EWSE message was submitted for the “original” AAD.

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### **EWSE Statistical Report message**

The EWSE Statistical Report message is sent quarterly to the Commission. It provides statistical data on the usage of EWSE.

An element, common to most of the EWSE messages (Information, Warning, Feedback, Deadline Report and Change of Destination messages) is the EWSE Message Reference (EWSE-REF). This is a unique identifier, which is used for example to enable the storing of the message, to collate messages which belong to a specific consignment and to easily distinguish the different types of EWSE messages. The EWSE-REF is composed of several data fields: member states of departure, destination, AAD reference number, date, message type and ID.

#### **2.31.3 Application perspective**

EWSE application and [MVS](#) are based on the same concept. Message exchange between involved authorities, data import/export, PDF export – all of these are based on the same solutions as in the [MVS](#) case. The only difference are the forms prepared and used in the functional scope of EWSE.

For a detailed application structure and dynamics, see [MVS](#) – Application perspective.

#### **2.31.4 Technical perspective**

EWSE application is based on the same technical concept as the [MVS](#) application. EWSE application uses Adobe e-Forms and CCN Mail 2. From the architectural point of view EWSE and [MVS](#) are the same applications. For the technical perspective description of EWSE refer to the [MVS](#) – Technical Perspective.

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## 2.32 SEED

### 2.32.1 Reference and Applicable Documents

<b>Id</b>	<b>Title</b>	<b>Reference</b>	<b>Version</b>
SEED 1	System Requirements Definition for SEEDv0	ECP0-FITSDEV-SA02- SEEDv0-SRD-SEED- v1.04.doc	1.04
SEED 2	Functional Excise System Specification for SEEDv0	ECP0-FITSDEV-SA02- SEEDv0-FSS-v1.04.doc	1.04

Table 2-32: SEED Reference documents

### 2.32.2 Functional perspective

The SEED application (System for Exchange of Excise Data) provides the core of the SEEDv0 platform and offers services for managing, storing and consulting information on the Economic Operators register. The role of this module is to provide a scalable and efficient platform to facilitate the efficient exchange of SEED data between MSAs. The SEED focuses on offering stable persistence mechanisms and a robust communications model for exchanging information between users. In all cases, MSAs remain the owners and maintainers of any business data stored by SEED – the SEED application is the mechanism for storing and propagating information between interested parties.

Member State Administrations exchange registers of authorized warehouse keepers and registered traders, and premises authorized as tax warehouses.

The System for Exchange of Excise Data (SEED) provides the following central services:

- Consolidation of the information sent by all countries in a central repository;
- Consultation of the SEED central repository via on-line web interface;
- Extraction of the content of the SEED repository on request;
- Automatic dissemination of the content of the SEED repository whenever the data from any of the Member States has been updated;
- The uploading the lists of all Excise Offices (EOL) in all Member States into the Customs Office List (COL) and consultation of excise offices information;
- Limited access to the SEED information for economic operators, in order to perform simple verification queries.

#### 2.32.2.1 Use cases view

The system functionality can be divided into several groups:

- Register maintenance
- Register data export
- Register consultation
- Business statistics analysis
- Task Scheduling

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- Management of modifications
- Internal Data Replication

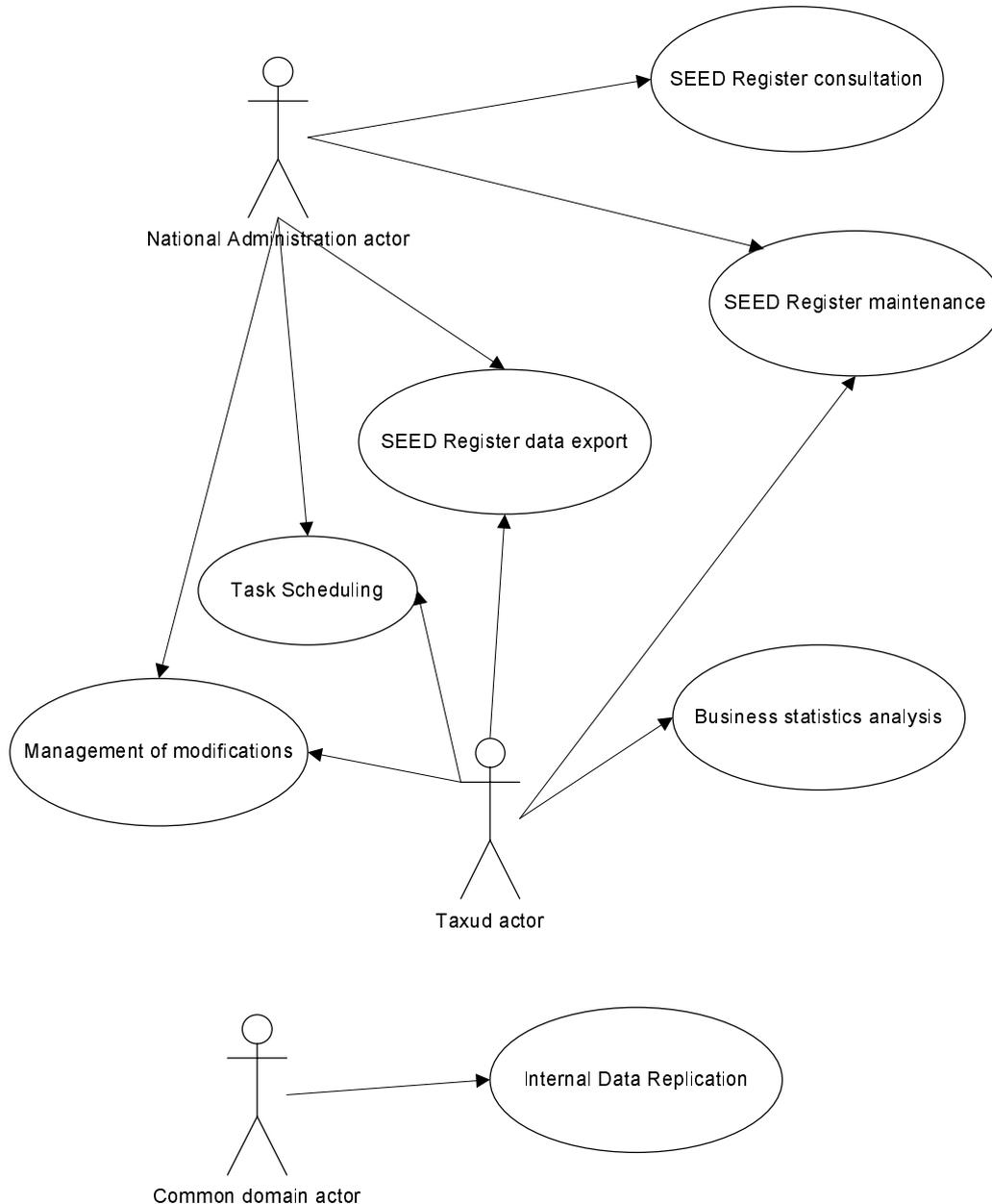


Figure 2-101 SEED use case

### Register maintenance

The system provides the facilities of data maintenance

- Maintenance of economic operators
- Maintenance of excise products
- Maintenance of user and notification profiles

The system supports the standard data manipulation (insertion, updating and invalidation) facilities for the economic operator. The invalidation allows marking an existing economic operator as invalid so that it will no longer be used, but it is not deleted from the register.

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When the user submits the details of the operation of any kind for the economic operator or excise product, the system verifies the business rules and performs integrity checks. The modifications are marked as pending until the user explicitly publishes the change.

The system supports the insertion and update for the excise product.

The MSAs can maintain the users and the preferences associated with user notification profile. This allows MSAs to define if and how and what they will be notified of changes to the SEED register as they occur.

### **Register data export**

The system provides the facilities to request and download a complete export of the SEED register. This can be used to import into national systems, and provides a complete view of the centralized SEED register. Two types of export are available:

- Data retrieval;
- Data extraction.

Data retrieval is intended to show the activity of the SEED register. The system returns the set of modifications and updates to the SEED register that have been received during the specified query dates.

Data extraction is intended to show the state of the SEED register. The system returns the state of information of each element as it occurs at the start of the query date range, regardless of whether the information has been modified or not.

The user selects which type of data (economic operators or reference data) he wants to export, then specifies the period and chooses either data retrieval or a data extraction, as well as define the channel over which they will receive the results. The results can be either sent via CCN/CSI, or downloaded via the Web interface.

### **Register consultation**

The system provides the facilities of data consultation:

- Browse Excise Products
- Search & Consult SEED Register
- View SEED Record History
- View Latest SEED Activity

The user can browse the current set of excise product categories maintained by the SEED system. It provides a quick-reference summary of the current excise codes and their descriptions. The facilities of searching and consulting provide more flexible functionality. The user can search in the different categories of the information:

- Registered Traders;
- Authorized Warehouse keepers;
- Tax Warehouses;
- Excise Products;
- Excise Offices

The sets of the specific criteria are available for each category. The system returns a list of matching entries. The user can select the particular entry and view the details.

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When SEED record is selected by browsing or viewing the search results, the user can request the history of changes for this particular record. The system responds with details of all modifications.

The SEED register may undergo many changes as excise authorizations are created and modified or economic operator details are updated. The user can view the most recent changes that have been submitted by other users. After user request the system returns the last modifications that have been received, showing the details of the modification: (date and time, type of action, the type of data being modified, the modified values, originator of the change etc.).

### **Business statistics analysis**

The system provides facilities for viewing the statistical data related to the excise authorizations and SEED activity. Several types of statistic reports are available:

- Total number of active and inactive economic operators;
- Total numbers each type of economic operators: registered traders, authorized warehouse keepers and tax warehouses;
- Total numbers of excise activity for each type of excise product group;
- The total number of changes to excise authorizations;

The user selects the criteria used for breaking down the statistics by the member state, business period or both. The user may request to download the report in a specified format, i.e. PDF, RTF, XML, XLS, etc.

### **Task Scheduling**

The SEED system supports the task scheduling and allows users to define and maintain their tasks.

- Maintenance of scheduled tasks
- Execution of scheduled tasks

The user can request and browse the list of tasks. The user can create a new task of certain type, such as data extraction, data retrieval or business statistics. The system presents the attributes that are required to define the task. This depends on the type of task being created. The user specifies the attributes and the execution schedule for the task. This can be one of: every day/week/month or on a specific day. The user also should select the channel for the receiving the results, which can be either sent via CCN/CSI, or downloaded via the Web interface. The system confirms that task scheduling and executes the task when it becomes eligible for execution. Users are notified about the finishing of the task execution using the channel specified in the task definition.

### **Management of modifications**

All changes made to the SEED register are considered private to the user and do not take effect until the user explicitly requests this. The system provides the facilities for working with the updates:

- Apply Pending Updates
- Clear Pending Updates
- View User Updates

User can choose to apply all modifications that have been performed since the last time the user requested this action and make them visible to all other users of the SEED

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system. All users of the system are notified of the changes via the other supported communications channels.

The system also allows to clear any selected pending updates. In this case changes are not applied to the SEED register and are lost.

The user can view all the modifications that he has made to the SEED register. This includes updates that are pending and modifications that have already been made. The user can view the details of the selected entry.

### **Internal Data Replication**

The internal data replications are available in the system:

- Data export for [DDS](#)
- [CS/RD](#) data import

The DDS system provides limited services based on data received from SEED and [NCTS CS/RD](#). The SEED system can regularly create extracts from the SEED register, and communicates these to DDS. The extraction contains the duty number and the period of the authorization of the economic operator and the list of the products that the economic operator is authorized to handle.

The SEED system requests the latest changes to excise offices and reference data for the certain period from [CS/RD](#). After the receiving the response the SEED system sends the confirmation that the response was received and uses the received information in order to update its internal tables.

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### 2.32.2.2 Domain vocabulary

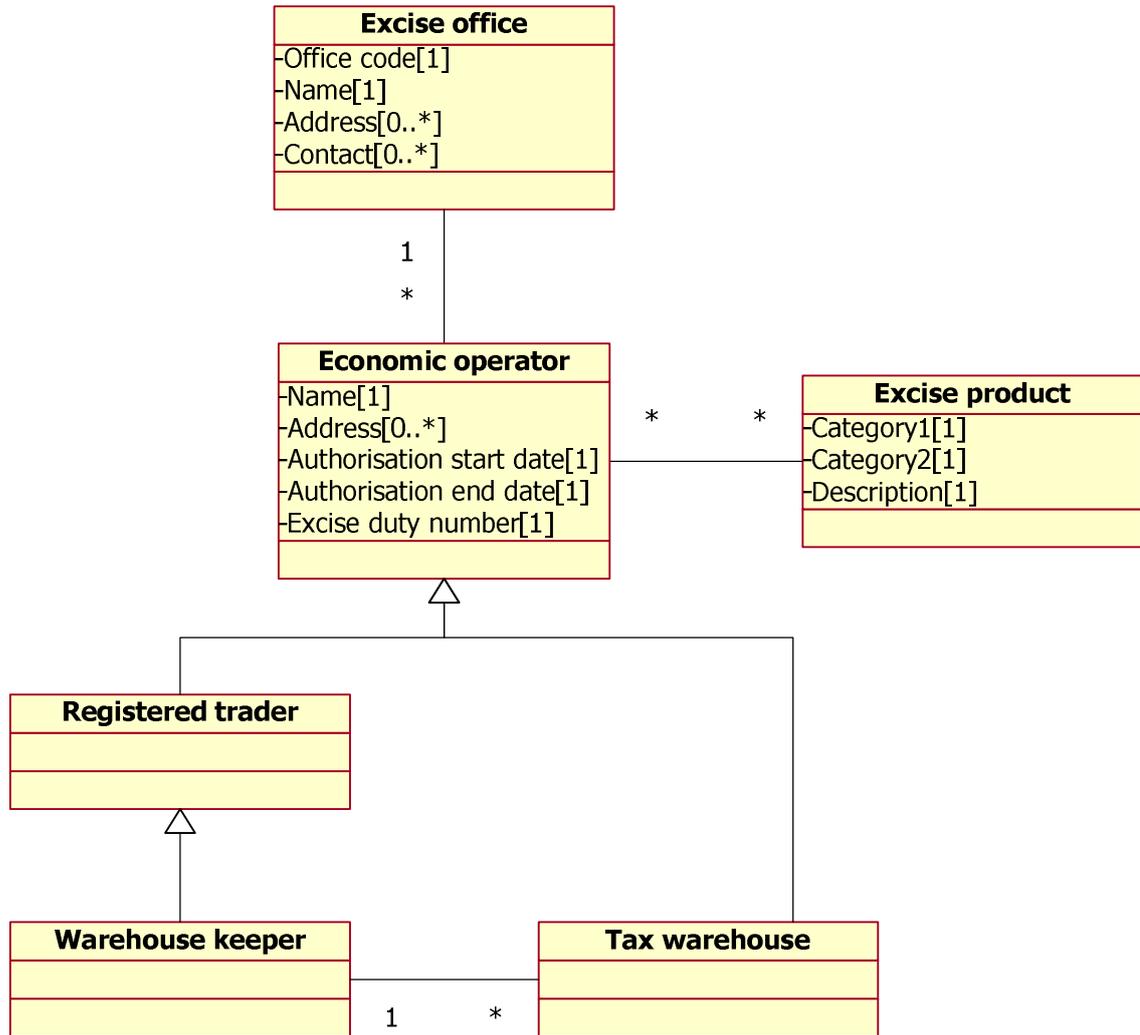


Figure 2-102 SEED Domain vocabulary

Major data objects managed by the application are:

- Excise Product
- Economic operator
- Excise office

Main reference data used by the application are:

- Country
- Language

#### Excise products

The excise products are goods belonging to one of the excise product categories or one of the subcategories, i.e. tobacco, beer wine, spirits, energy products. These goods can be moved between traders in the Community under duty-suspension arrangements.

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### Economic operators

The economic operators can be of three types: registered traders, authorized warehouse keepers and tax warehouses. The excise number identifies a registered trader, a warehouse keeper or a tax warehouse within the excise community. Excise numbers are granted at national level by the competent fiscal authority, and must be unique. The first two letters of the excise numbers are the ISO country code and the next 11 alphanumeric characters are the identifier of the operator.

### Excise office

The economic operators are authorized by the institutions of the member states, so called excise offices.

## **2.32.3 Application perspective**

### **2.32.3.1 Application structure**

The functional requirements of the Common Domain – under the responsibility of the Commission – are implemented by four interconnected applications and CCN:

- SEED – a new application to manage the central view of European Economic Operators and Excise Products
- NCTS CS/RD – the management of Excise Offices information and some common reference data is to be implemented by the existing NCTS CS/RD application
- [DDS](#) and EUROPA – the publication of limited information (excise authorisations validity) to EUROPA will be implemented using the existing [DDS](#) infrastructure
- CCN – provides the communication channels between MSA and the SEED application, as well as communication between SEED and other applications. CCN also handles the authentication of MSA users and applications and their authorisation to access SEED

MSAs can only communicate with SEED via CCN, using several connection models:

A programmatic interface (CSI) to allow direct exchange of application messages

Using HTTPS for web-based and Web Services applications

Using e-mail communication

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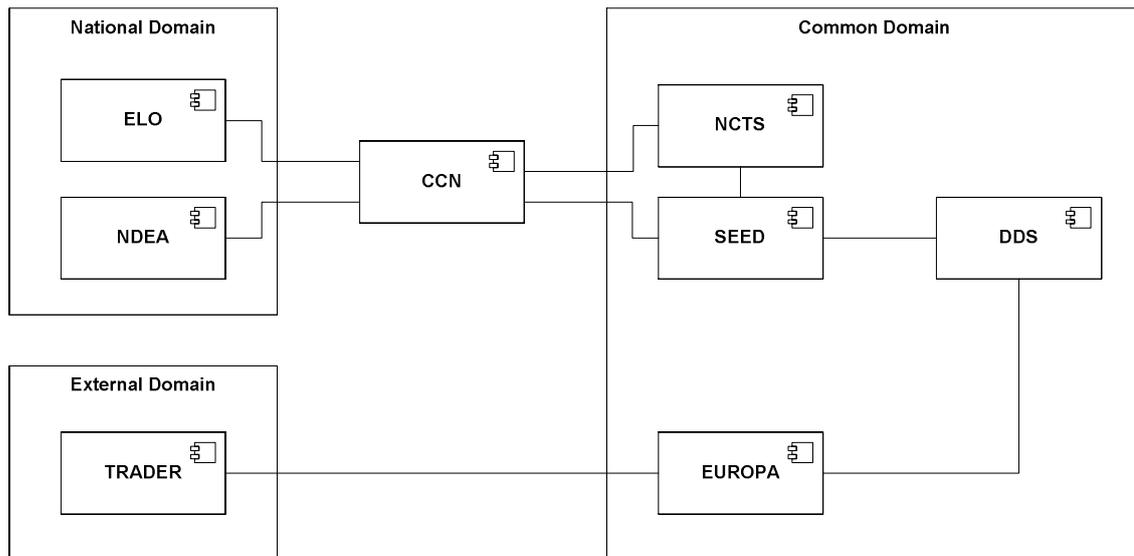


Figure 2-103 SEED Application structure

### 2.32.3.2 Application dynamics

The SEEDv0 Web Application provides simple access to the SEED Central Repository. In general, the SEEDv0 Web Application provides functionality to search, browse and maintain information for Registered Traders, Warehouse keepers, Tax Warehouses and Excise Products.

The core services provided by the SEED application can be summarized as:

Centralised repository of Economic Operator information relating to registered traders, authorised warehouse keepers and tax warehouses

Maintain and share a consistent view of Excise Product definitions

Basic maintenance tool to maintain data in the SEED repository

A notification mechanism to inform users of any changes to SEED data

User management to maintain access to authorised parties

Multiple modes of interaction

Generation of business and technical statistics

The SEED application requires information relating to Excise Offices as well as some reference data that are already maintained by NCTS CS/RD. To obtain these data, SEED acquires a read-only copy of this information from NCTS CS/RD. The SEED application also provides the [DDS](#) application with limited information regarding Economic Operators and excise authorizations, in order to offer a limited consultation service on EUROPA.

The NDEA – under the sole responsibility of the MSA – provides SEED with information relating to National Economic Operators and their excise authorizations. The NDEA also receives updates from other MSAs via the SEED application, to provide a consolidated view of European Economic Operators.

The ELO has the possibility to manage its National Economic Operators information and to consult the central view of European Economic Operators via a Web interface made available through the CCN Intranet.

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Economic Operators have access to limited consultation on Excise information through the EUROPA portal.

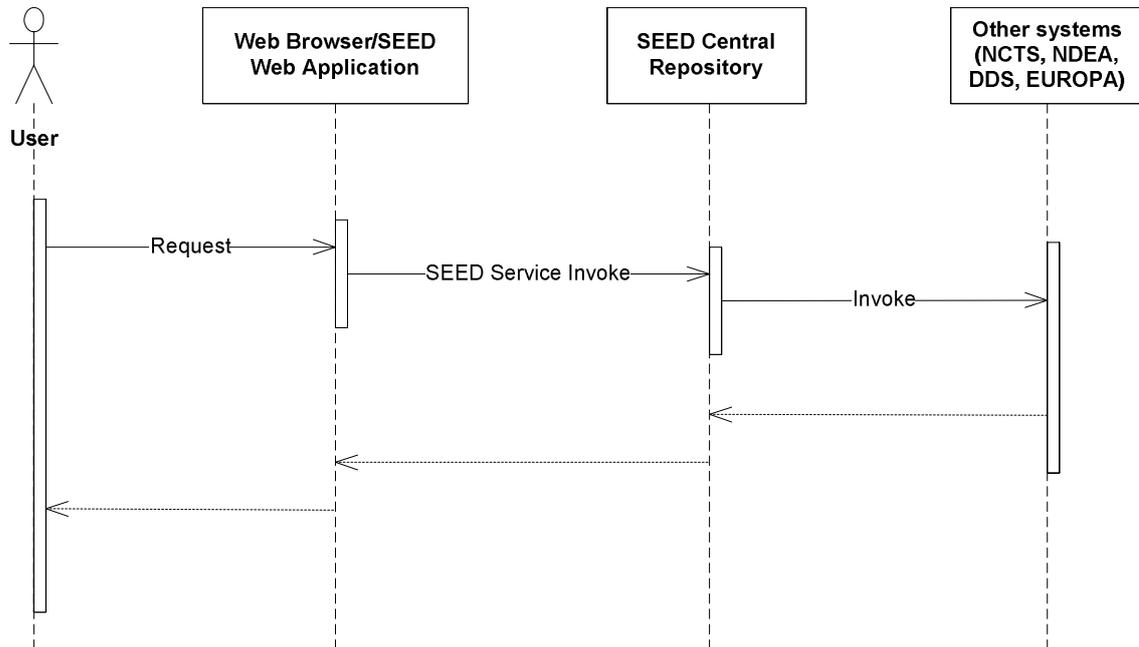


Figure 2-104 SEED access to the Central Repository

## 2.32.4 Technical perspective

### 2.32.4.1 Service access and delivery

#### Access Channels

The SEED is a web application that uses web browser. Officially two browsers are supported (IE 6.0.x + or Firefox 1.0.x).

#### Delivery Channels

SEED is delivered over the CCN/CSI network and internet.

#### Service transport

User agent communication with SEED application holds on HTTP protocol. Other systems communicate with SEED over Web Services (SOAP) or SMTP/POP3/IMAP4 protocol.

### 2.32.4.2 Service platform

#### General platforms

Successful execution of the SEED installation requires Sun Solaris 9 operating system. Installation of the SEED requires also the use of the Java JRE 1.4.2\_05 development environment and JCSI Java Client.

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To connect to the SEED application client workstation requires Firefox or Internet Explorer 6.0 or higher.

Installation of the database on the server requires Sun Solaris 8 (5.8, 32 or 64 bit Update 5) operating system.

### **Delivery servers**

SEED is built based on J2EE technology.

The application server is a BEA Weblogic 8.1 SP4 product.

For reporting means Business Objects v 6.5.1 (server products) for Sun SPARC Solaris is used.

### **Database**

SEED data is stored in Oracle 9.2.0.1 database. Business logic to connect with database used Oracle Type 4 JDBC driver version 10.1.0.2.0 .

### **2.32.4.3 Component framework**

#### **Security**

Access to the SEED system is restricted to authorized users only. Users of the SEED web interface must logon to the system as soon as they connect. They will not be permitted to access *any* functions without being successfully authenticated to the SEED Web Application.

All external access is protected with firewalls. The firewalls block access from an attacker network address.

#### **User presentation**

User interface is done in JSP and Java Servlets technology.

#### **Business logic**

BEA Weblogic Application Server is used to perform the client requests and as business logic container of the SEED application.

#### **Data management**

Oracle JDBC driver is used for business logic persistence operations, in the Oracle database.

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## 2.33 Data Dissemination System

### 2.33.1 Reference and Applicable Documents

Id	Title	Reference	Version
DDS1	DDS Data Model	DDS_Data_Model_V1.14.doc	1.14
DDS2	DDS Data Model & Bridge Design	DDS-DSG-BRI v1-0.doc	1.00
DDS3	Data Dissemination System web site	<a href="http://ec.europa.eu/taxation_customs/dds/home_en.htm">http://ec.europa.eu/taxation_customs/dds/home_en.htm</a>	

Table 2-33: DDS Reference documents

### 2.33.2 Functional perspective

The Commission develops and operates several databases in conjunction with Member States Customs and Taxation Services. The databases are parts of the information systems of Taxation and Customs Union.

The Data Dissemination System (DDS) is the public website for customs and VAT information. The system covers information coming from various TAXUD systems. For VAT information the system acts as a switch to the various national VIES systems in a transparent way. The system supports all languages including the new languages.

#### 2.33.2.1 Use cases view

The DDS system provides the facilities of data consultation, querying and in some cases download. The information of several systems can be accessed:

- [TARIC](#)
- [ECICS](#)
- [EBTI](#)
- [SUSPENSIONS](#)
- QUOTA
- [SURVEILLANCES](#)
- VIES (VoW – VIES ON THE WEB)
- [SEED](#)
- CUSTOMS OFFICES
- EXPORT MRN Follow-up
- TRANSIT MRN Follow-up

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## **TARIC**

The nomenclature in all Community languages and all Community measures relating to imports and exports can be queried. Data are copied on a daily basis from the [TARIC](#) production server.

A facility for querying the tariff information is available. The several search criteria can be combined: simulation date and [TARIC](#) code, country of origin/destination or goods description. The filtered [TARIC](#) goods nomenclature hierarchy is presented and can be browsed in sections and chapters until the final level of the hierarchy. There is a facility for the list of duty rates. The details of duty rates include the list of countries/country groups of origin/destination, measure type and duty rate, preferences and the list of regulations.

## **ECICS**

The chemical names in all Community languages along with their tariff classification in the Combined Nomenclature can be queried. Data are copied on an annual basis from the EXCIC production server.

A facility of querying the chemical products is available. The several search criteria can be combined: CAS RN, CUS and [CN](#) codes and name. The language for the presentation of the result list should be selected.

The list of chemical products corresponding the query criteria is presented. The list consists of combined nomenclature code, CAS RN and CUS classification numbers, product type and name. There are two hyperlinks in order to open the filtered [TARIC](#) goods nomenclature hierarchy or list of product names in all languages.

## **EBTI**

The information concerning all non-confidential European Binding Tariff Information with their images is available for querying. Data are copied on a daily basis from the EBTI production server.

A facility of querying the binding tariff information is available. The several search criteria can be combined: issuing country, BTI reference, validity period, date of issuing, nomenclature code range, keyword, description.

The list of BTIs corresponding to the query criteria is presented. The list consists of BTI Reference, nomenclature code, validity period and number of images. There is a hyperlink in order to open the details of particular BTI. Besides the already mentioned essential BTI data, classification justification, place and date of issue, issuing organization name and address, description, keywords and images are presented for the specific BTI.

## **SUSPENSIONS**

The information concerning information on autonomous tariff suspensions, in preparation or in force is available for querying. Information is updated upon user request from the SUSPENSION production server.

Two facilities of querying the suspensions are available.

- Suspensions in force via [TARIC](#) code, description and simulation date

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- Suspensions in preparation via publication cycle or combined nomenclature section or chapter;

The list of suspensions in force corresponding to the query criteria is presented. The list consists of [TARIC](#) code, description and the rate of autonomous duty. There are two hyperlinks in order to open the [TARIC](#) goods nomenclature hierarchy and the details of duty rate of particular suspension. The goods nomenclature hierarchy is filtered according to the goods nomenclature code of the suspension. The details of duty rates include the list of countries/country groups of origin/destination, measure type and duty rate and the list of regulations.

The list of suspension dossiers in preparation corresponding to the query criteria is presented. The list consists of priority code of combined nomenclature, dossier type, request status and text summary. There is a hyperlink in order to open the details of particular suspension dossier. Besides the already mentioned essential data, the suspension texts, footnotes, comments, additional [TARIC](#) codes, CUS/CAS numbers are presented for the specific suspension dossier.

### **QUOTA**

The balances of each tariff quota applicable in the present year and in the past can be queried. Other relevant information such as the date when a particular tariff quota is exhausted also presented. Quota, data are copied on a daily basis from the QUOTA production server.

Two facilities of querying the quotas are available.

- Autonomous tariff quotas in force via origin or order number;
- Autonomous tariff quotas in preparation, via publication cycle or combined nomenclature section or chapter.

The list of quotas in force corresponding to the query criteria is presented. The list consists of the period, origin and balance in kilograms for that period and origin. There is a hyperlink in order to open the details of the particular quota. Besides the already mentioned essential data, the details of the quota include the initial amount, balance, last allocation date, percentage allocated, status, total awaiting allocation, last import date, exhausted date, block date and associated [TARIC](#) codes.

The list of quota dossiers in preparation corresponding to the query criteria is presented. The list consists of order number, priority code of combined nomenclature, dossier type, request status and text summary. There is a hyperlink in order to open the details of particular quota dossier. Besides the already mentioned essential data, the quota footnotes, [TARIC](#) codes, CUS/CAS numbers are presented for the specific quota dossier. There is a hyperlink in order to open the list of associated quotas by the period and origin.

### **SURVEILLANCES**

The total import of each surveillance represented by his order number is available for querying. Data are copied on a daily basis from the SURVEILLANCE production server.

A facility of querying the binding tariff information is available. The several search criteria can be combined: origin country, surveillance reference number, type and description.

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The list of surveillances corresponding to the query criteria is presented. The list consists of surveillance reference number, type, description and period. There is a hyperlink in order to open the list of particular surveillance by origin. The list of origins consists of description, period, threshold, and totals for volume and value for every origin. There is a hyperlink in order to open the details of surveillance for the specific origin. Besides the already mentioned essential surveillance data, the list of associated [TARIC](#) codes is presented in the details.

### **VIES**

Validation of a VAT number issued by any Member State is available. VIES data are managed by the Member States.

When the member state and VAT number of the trader is entered, it is checked if such number exists and the name and address of the corresponding trader are presented.

### **SEED**

Validation of excise authorization number issued by any Member State in respect of the person or premises is available. Data are updated on a daily basis from the [SEED](#) application export.

When the excise authorization number is entered, it is checked if such number exists and the name and address of the corresponding person or premises.

### **CUSTOMS OFFICES**

The information concerning the Customs Offices involved in Transit: name, address, phone number, opening hours, holidays, etc can be queried and downloaded. The DDS provides the information based on the data delivered and maintained by the competent authorities of the National Administrations of Member States. The Customs Offices data is updated upon user request.

Two facilities of querying are available:

- Customs offices via the usual name or reference number, country, region and the city, also the role;
- Public holidays via country and region.

The list of customs offices corresponding to the query criteria is presented. The list consists of country, city, usual name and reference number. There is a hyperlink in order to open the details of particular customs office. Besides the already mentioned essential data about customs office, the address, contact, opening hours, also the list of roles and some additional information is presented in the details. The list of public holidays, including name, date and region are presented for the specific country.

The information of customs offices and the supplementary reference data can be downloaded as an XML files. The DTDs are also available.

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## 2.33.3 Application perspective

### 2.33.3.1 Application structure

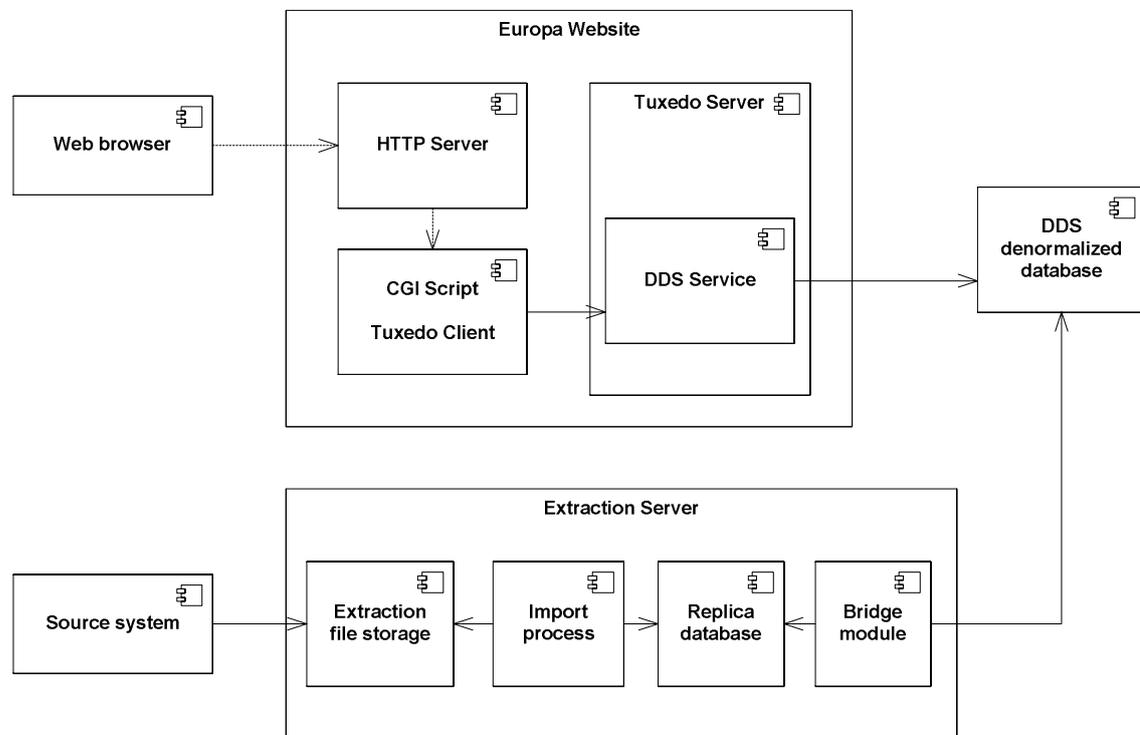


Figure 2-105 DDS Application structure

DDS is a Web application accessible from the Internet. It consists of a set of static and dynamic web pages. Dynamic pages are built by CGI scripts being Tuxedo client applications. The logic of preparation of data for display on the page is contained in the services deployed on the Tuxedo server. Tuxedo server is also responsible for giving access to denormalized DDS database.

Separate part of DDS application is extraction server. The server is composed of the:

- import procedure responsible for processing the extraction files received from the source systems and loading the data to replica database,
- bridge modules which are responsible for processing the source information from the replica database and denormalizing into the form suitable for efficient presentation on the web. Prepared data is stored in denormalized DDS database.

Web pages and forms are served to the end user browser via HTTP server. When the form is submitted the HTTP server runs CGI script. CGI script is running Tuxedo client application which uses services deployed on the Tuxedo server to fetch the data from the denormalized DDS database.

### 2.33.3.2 Application dynamics

The DDS application is a web application that uses CGI scripts, Tuxedo services and an Oracle database as data repository. The user sends a request via a user agent (browser) to the web server which forwards it to a CGI script. The CGI script forwards the query to the proper Tuxedo service. The Tuxedo service sends SQL request to the Oracle database and sends a result set to the CGI script. The CGI script merges the received

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result set with an HTX template file in order to produce a result HTML file, send back to the user agent.

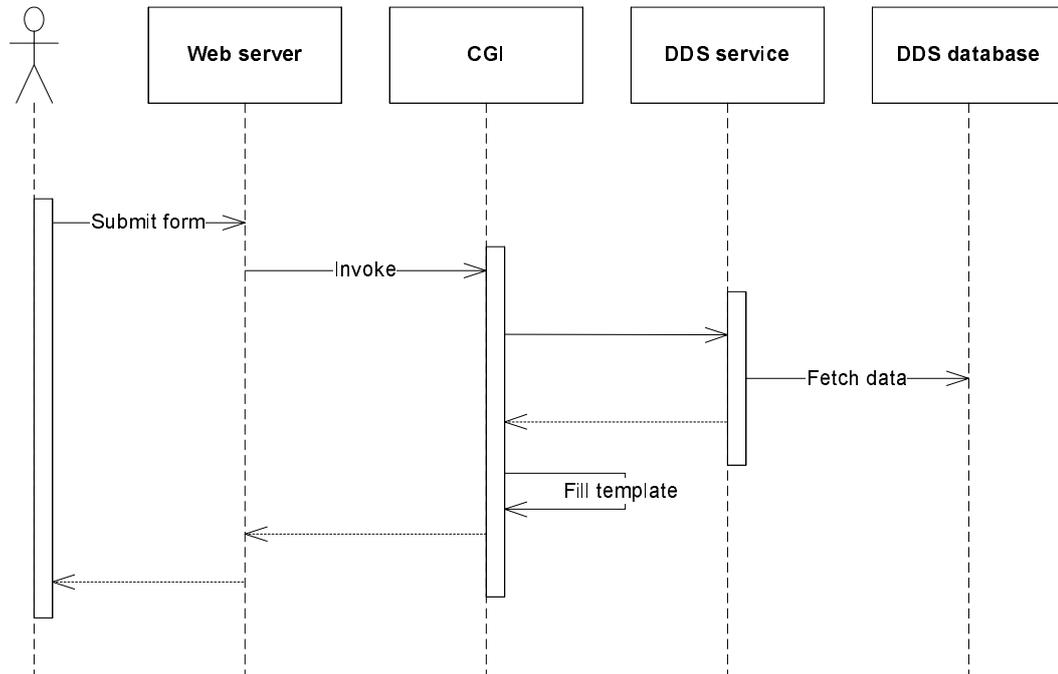


Figure 2-106 DDS access to the service

A classical workflow of the DDS application can be described as follows:

- An HTML containing a request form page is presented to the user;
- When the user submits the form CGI script is executed which sends a request to Tuxedo service with a set of input information contained in the form;
- Tuxedo service called by the script accesses the database with SQL statements built on the provided input information;
- The service returns the result of the query to CGI script;
- The CGI script receives the result information and merges it with an HTML template file (called an HTX file). Such mechanism is used to provide the results in HTML;
- The result is shown to the user in browser.

The DDS application makes use of HTX and HTM files. HTM files are classical HTML static files while HTX files are templates containing applicative tags that will be replaced with Tariff information. Separate sets of HTX and HTM files must exist in all the European languages.

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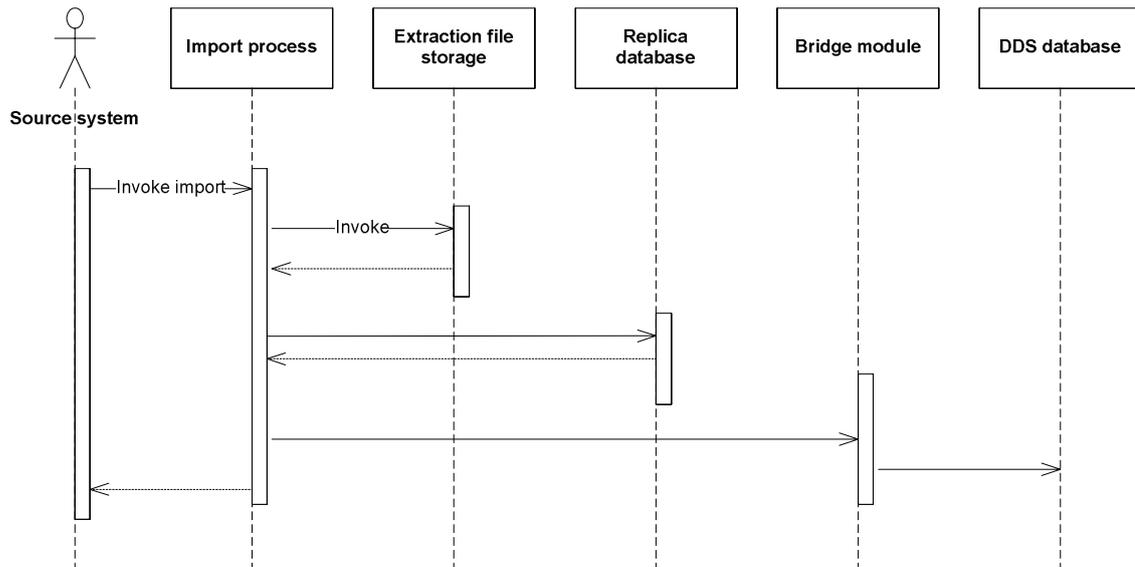


Figure 2-107 DDS database update

The information in the DDS database is updated on a regular basis from the extraction files received from the source systems via ftp or CSI queues. For each of the source systems there is an import process prepared which places the data from the extraction files in the replica database. Then for each type of data bridge module processes that information into the form which is most suitable for efficient presentation on the web page. The results of these processing is placed in the denormalized DDS database which is used by the DDS presentation services.

## 2.33.4 Technical perspective

### 2.33.4.1 Service access and delivery

#### Access Channels

The DDS application is a web application it is accessed by a web browser.

#### Delivery Channels

DDS is accessible over the World Wide Web.

Data import from external systems to DDS is done over the CCN network.

#### Service transport

User agent communication with DDS application uses HTTP protocol.

### 2.33.4.2 Service platform

#### General platforms

The system is running on Solaris 8 operating system.

Java 2 1.4.2 JDK/JRE is needed for the deployment of the services.

#### Delivery servers

The application uses Netscape Enterprise and Certificate Server 3.6 or higher.

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The transactions are managed by Tuxedo System transaction manager / T 6.4 or higher.

### **Database**

Oracle 10g database is used for persistent storage of the data.

#### **2.33.4.3 Component framework**

### **Security**

In the DDS application only translation management module takes advantage of the user authentication mechanisms provided by the web server.

### **User presentation**

User interface is done in CGI technology. The output of the DDS service call is formatted into HTML page using dynamic templates.

DDS is a multilingual application. All the templates are provided in several language versions, for each of the supported languages.

### **Business logic**

Tuxedo transaction manager server is used to serve CGI client requests. Business logic of the DDS is implemented in the form of Tuxedo services.

### **Data management**

Tuxedo transaction manager server is used to execute the dissemination queries on the Oracle database.

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## 2.34 WEB2000

The Web2000 application is very sparsely documented. The documentation which was available for producing this description covered only selected fragments of the application functionality. Neither detailed technical specification or architecture design documents were available.

### 2.34.1 Reference and Applicable Documents

Id	Title	Reference	Version
WEB1	NCTS WEB 2000 Specification	TCI-LA2-WEB_v100.doc	1.00
WEB2	ITSM WEB portal documentation	ITSM_Portal_Documentation.pdf	05/03/2008

Table 2-34: WEB2000 Reference documents

### 2.34.2 Functional perspective

Web2000 is a content data management system for the issues related to the New Computerized Transit System ([NCTS](#)) or Integrated Tariff management system (ITMS). Web2000 facilitates the communication and the information sharing among National Administrations (NA), contractors and the Commission. Via Web2000, National Administrations can access, view and follow-up their calls, find the links to various applications, access the project baseline and download documents or application releases.

The NCTS Web 2000 covers the several main functional sections:

- Central Help Desk targeted to the communication between the NAs and the Central Project Team (CPT).
- Operational Section contains the links to the operational or training environments for various applications.
- Project Section contains documentation, manuals, demos and presentations, project planning and progress, etc.
- TCP-Office Network (TCP-ON) Section meeting documents, contractual documents and information related to the project office in general.

WEB 2000 is also used as an ITSM portal and has

- The historical and new service calls regarding Customs (eCUSTOMS) and Excise;
- The service catalog;
- Some static and utility pages (accessible only for limited set of users):
- news and help, etc.

#### 2.34.2.1 Use cases view

The information and functionality of the Web 2000 site are grouped into several main sections:

- General pages.

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- Central Help Desk targeted to the communication between the NAs and the Central Project Team (CPT).
- Operational Section contains the links to the operational or training environments for [CS/RD](#) and [CS/MIS](#) – applications belonging to the CDTA suite.
- Project Section contains various documentation of the projects
- TCP-Office Network (TCP-ON) Section

The content of sections and subsections is hierarchically structured, documents are versioned and versions are available. Several functions are available:

- Search and browse documents and software
- Download documents and software
- Submit comments
- Add/delete/update documents
- Respond to comments
- Change the comment to a Central Help Desk call

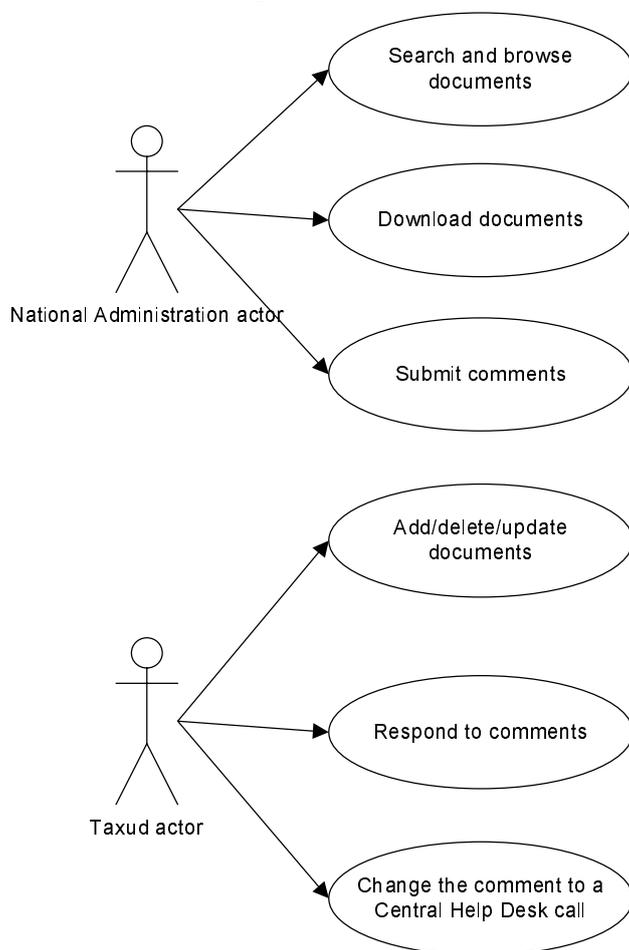


Figure 2-108 WEB2000 use case

### **General Pages**

The general pages contain the common functionality such as home page, search of the documentation, news, i.e. a list of the last changes to site files, contact information, changing of password, help.

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### Central Help Desk

The Central Help Desk provides the unique entry-point for exchange of information between the NAs and the Central Project Team:

This section is divided in the following functional sections:

- Query central help desk call status
- Browse historical archives

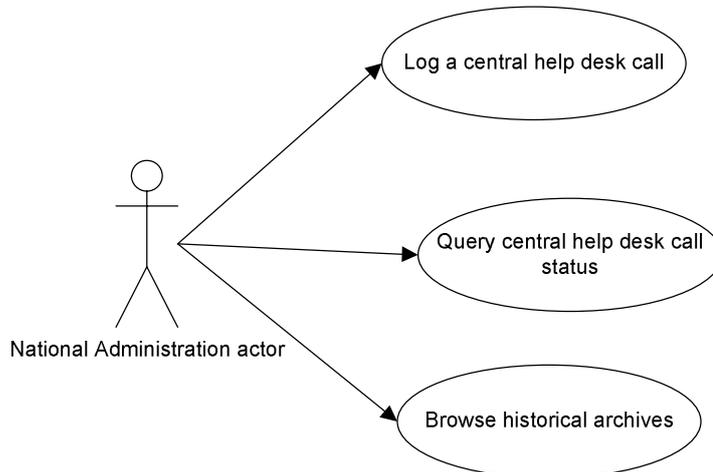


Figure 2-109 WEB2000 Central help desk use case

The Log of a Central Help Desk Call provides the access to the Central Help Desk implementation. When the users log a call to the Central Help Desk, it shall allow attaching files to the call.

The Historical Archives allow checking the historical information:

- Problem Statements from Conformance Testing
- Problem Statements from International Testing
- Problem Statements from AGA Testing
- Problem Statements from NA [MCC](#) TIR Testing
- TCP Questions and Answers
- TIR Question and Answers
- Web Forum

The user can browse through the contents of each database or to perform a search that will look for information in the current Central Help Desk system as well as in the historical databases.

### Operational Section

The operational section provides the access to [CS/RD](#) and to [CS/MIS](#), as well as an overview of the CDTA tools that are applicable - the name of the tool, the date and version of release. This part of the NCTS Web 2000 also provides some information about the transit movements

### Project Section

This section contains various documents. The functional sections that are part of the Project section are:

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- The documentation section shows mainly the documents which come from the baseline of the [NCTS](#) system;
- The terminology section presents the list [NCTS](#) Glossary of Terms, grouped to abbreviations and definitions;
- This meetings section contains documents related to meetings. The meetings are grouped by the type of meeting or the organization: Steering Committee (SC), Transit Computerization Working Party (TCWP), [MCC](#) User Group (MUG), Missions or Bilateral Meetings, as well as Workshops/Training;
- The Demos and Presentations section presents a list of demos of CDTA-tools and a list of presentations;
- The Monthly Central Project Planning section provides the Commission report to the NAs;
- The National Progress section provides the National Progress Report and National Progress Plan for the member states;
- The section of comments on documents allows the NA users to access existing feedback comments and make new ones on documents that are presented at the site.
- The testing section provides up-to-date information related to local testing (Mode-1) or international testing (Mode-3), as well as conformance testing (Mode-2). The access to this information will be restricted to the Central Project Team and the NA concerned. The user will be presented with testing documentation, planning and depending on testing type the testing results per country or per pair of countries.

The content of above mentioned sub-sections is hierarchically structured, documents are versioned and versions are available. In order to find the document, the user can browse through the structure and sorted list of documents, or to perform a search. Documents can be previewed and downloaded. Administration functionality allows to add/delete/update the different documents and related information.

Beyond the above mentioned standard facilities, the section of comments on documents the system provides the additional functionality to submit the comment including the submitter country, the document reference, the chapter and remarks. Taxation and Customs Union DG automatically receives the comment in order to act for follow up on the comment. Taxation and Customs Union DG can respond to the comment or change the comment to a Central Help Desk call. The user can browse through the ordered comments and responses that were made previously also print or download the set of comments on a document, including the decision and associated justification.

### **TCP-ON Section**

TCP-ON is the office network for the transit computerization development project. It is dedicated to the central project team (CPT). It covers documents related to the different meetings and contractual documents between Taxation and Customs Union DG and its contractors. It is sub-divided in the following sections:

- The section of bilateral monthly meetings contains documents related to the meetings between Taxation and Customs Union DG and each of its contractors in separate subsections.
- The section of transit monthly meetings contains documents related to the meetings between Taxation and Customs Union DG and all its contractors.

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- The section of technical meetings contains documents related to the Meetings that are held between Taxation and Customs Union DG and one or more of its contractors.
- The section of contractual documents contains contractual documents between the Taxation and Customs Union DG and each of its contractors in separate subsections.
- The section of the project office contains information related to the project office in general and consists mainly of planning for deliverables, meetings and tests and the results of site acceptance test.

The meetings of all kinds are presented in chronological order. The user can select one of the meetings and choose the following sub-divisions:

- Agenda
- Working Material
- Monthly Progress Report (not available for technical meetings)
- Minutes of Meeting

In the section of contractual documents the user can select one individual contractor, and then choose the following sub-divisions:

- Terms Of Reference
- Specific Quality Plan (SQP)
- Specific Quality Plan / Addendum (SQP/A)

In the section of the project office the user is presented with the following sub-divisions:

- Meeting Calendar where the schedule file of all meetings can be found
- pre-SAT and SAT Planning and results
- Deliverable tracking matrix

The content of above mentioned sub-sections is hierarchically structured. In order to find the document, the user can browse through the structure and sorted list of documents, or to perform a search. Documents can be previewed and downloaded. Administration functionality allows to add/delete/update the different documents and related information.

If that case when the information is related to the individual contractor (e.g. bilateral meetings or contractual documents) the contractor user is presented with the information regarding its lot only. The Central Project Team user is presented with a screen that lists all contractors. The access to the deliverable tracking matrix is restricted to Taxation and Customs Union DG only.

#### **2.34.2.2 Use cases view (ITSM portal)**

The information and functionality of the Web 2000 site are grouped into several main sections:

- Service catalogue
- Documents
- Utility pages
- Historical service calls
- New service calls

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### **Service catalogue**

The service catalogue page lists the available WP documents for download in pdf format. A link also directs the user to the Request Service e-form page.

### **Documents**

The privacy policy document page provides a link to the Privacy Policy Document download. The user registration form page provides a link to the User Registration Form download in .doc format. The document is accessed through a direct link to the file location of the document on the server.

### **Utility pages**

The utility pages offer news and news archive, the user help, and logout pages.

### **Historical service calls**

The user can query and view the list of historical service calls regarding Customs or Excise issues. The details of the selected call can be opened.

### **New service calls**

The new service calls pages can be accessed from a link on the ITSM Web Portal Homepage. It directs the end-users to the Web2000 environment. The purpose of the newly developed call list pages is to provide the same functionalities as the pages previously existing in Web2000.

Several options are available:

- Call list
- Action list

The call list page lists the new service calls (incidents) and their related actions (incident steps). The calls can be queried using various search criteria such as call id number, the organization, the issuer, the category, the open and close date, and so on. A link directs the user to the call detail page.

The action list page lists the actions only. Different search criteria are also available: search on the actions id number, the action id number, the action description, the priority, the open and close date, and so on. A link directs the user to the call detail page and the action detail page.

Export links enable users to export their search results to a .csv file. Calls can be exported with their related actions or by themselves only.

#### **2.34.2.3 Domain vocabulary (WEB 2000)**

Major data objects are stored:

- Movement
- Status
- CDTA tool
- Documentation
- Terminology
- Meeting
- Presentation and demo

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- National progress plan-report
- Comment on document
- Testing

### Movement

Movement provides some metrics of the number of movements that have occurred.

### Status

Status provides the user with an overview of the status of each country if they are already participating in [NCTS](#) Operations.

### CDTA tool

CDTA tool
-Name[1]
-Date[1]
-Version[1]

Movement
-From[1]
-To[1]
-Date[1]
-Status[1]

Status
-Country[1]
-Status[1]

Figure 2-110 WEB2000 CDTA tool major data object

CDTA tool provides the overview of the versions of the CDTA tools that are applicable. It consists of the name of the tool, the version and the date of release.

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### Documentation

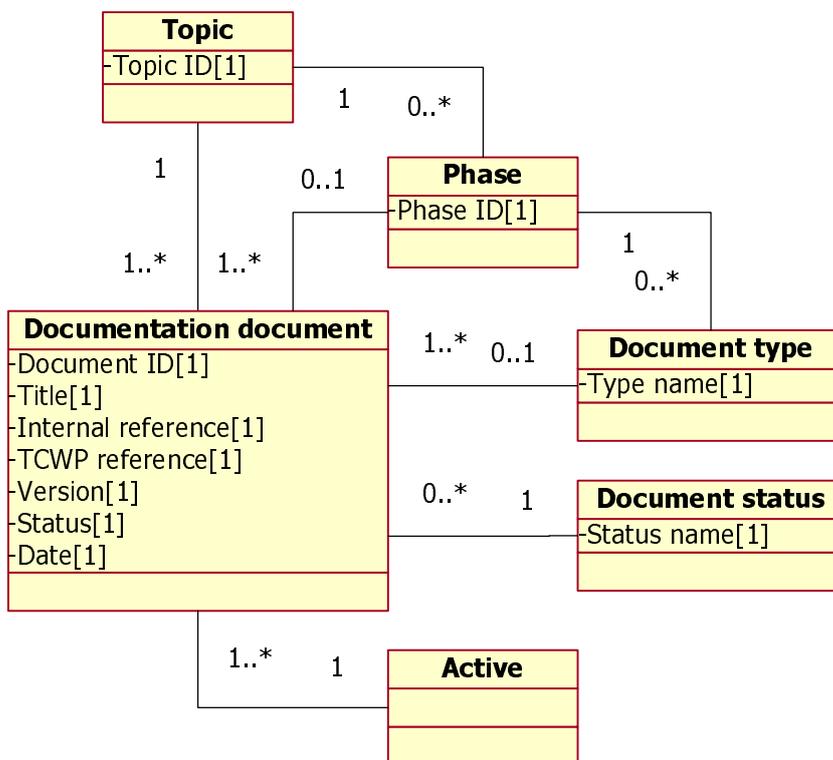


Figure 2-111 WEB2000 Documentation major data object relations

The documentation of NTCS includes documents from the baseline of the [NCTS](#) system and other documents, which need to be presented in the site. Documents are categorized by the topics and document type and are associated with the Phase of [NCTS](#).

### Terminology

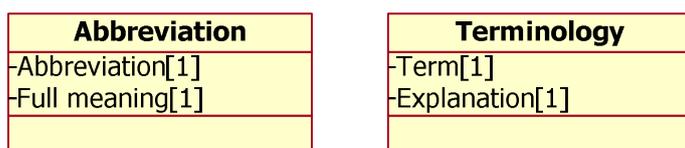


Figure 2-112 WEB2000 Terminology major data object

The terminology consists of the list of abbreviations and their full meaning and the list of terms and an explanation.

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### Meeting

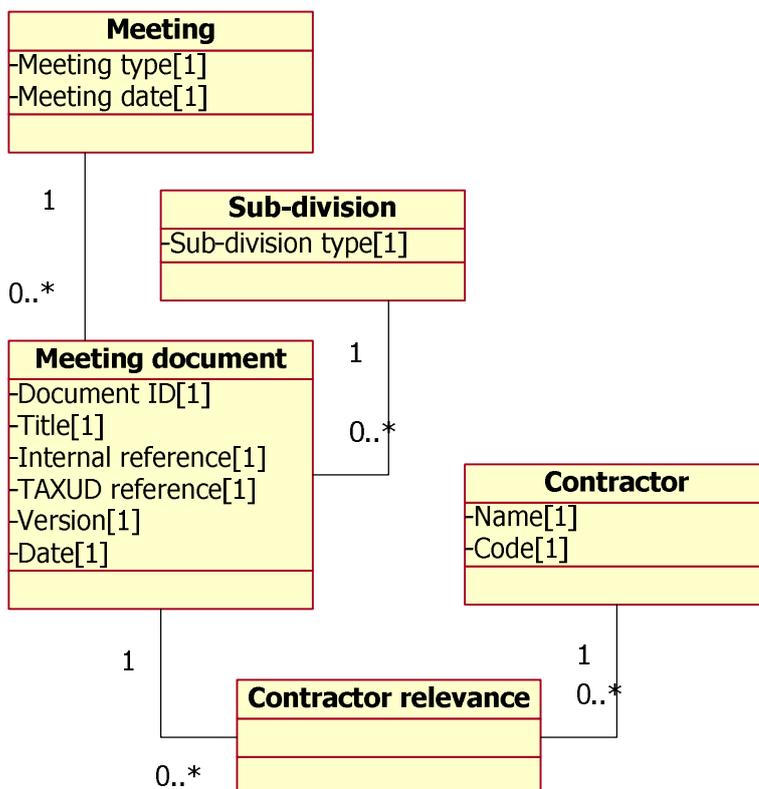


Figure 2-113 WEB2000 Meeting major data object relations

Meetings are defined by the date and categorized by the type of meeting, which can be Steering Committee (SC), Minimal Common Core (MCC) User Group (MUG), Transit Computerization Working Party (TCWP), Missions or Bilateral Meetings, Workshops/Training, etc. Documents related to the meetings are sub-divided into Agenda, Working Material, MPR, Minutes. The meeting documents are associated to the contractors: one document can be associated to one or more contractors and vice versa. This association serves for the document access restriction.

### Presentation and demo

Presentations and demos of CDTA-tools can be downloaded.

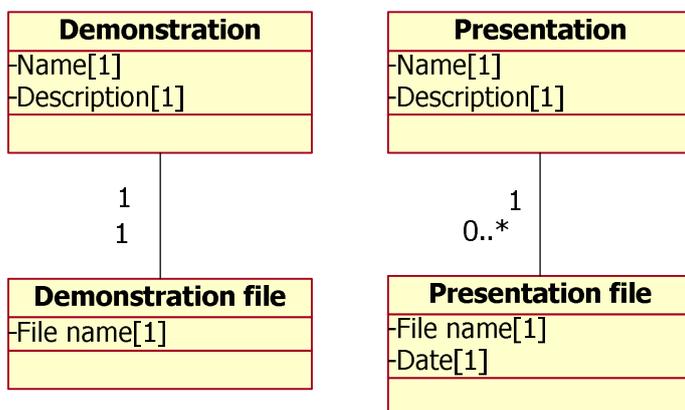


Figure 2-114 WEB2000 Presentation and demo major data object relations

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### National progress plan-report

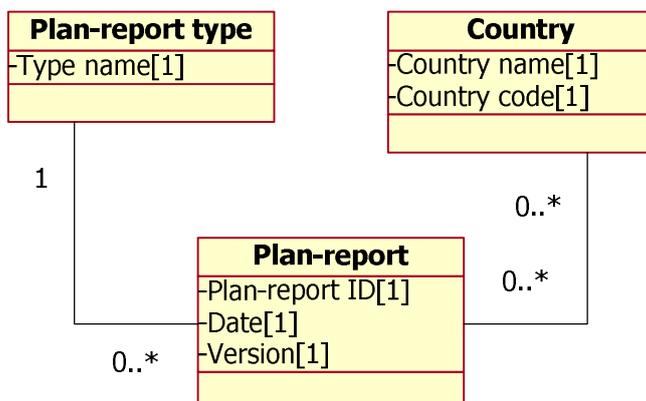


Figure 2-115 WEB2000 National progress plan-report major data object relations

The national progress plan and national progress report are contained in the same data object. It is defined by the issue date and version and it is associated to the country.

### Comment on document

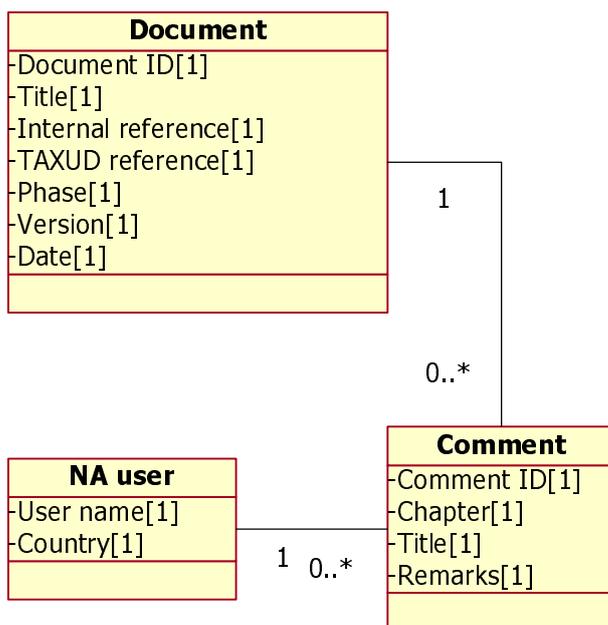


Figure 2-116 WEB2000 Comment on document major data object relations

The feedback comments on documents present the submitter country, the document reference, title and version. The number of a chapter for which the remarks on that chapter is submitted, should be named.

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### Testing

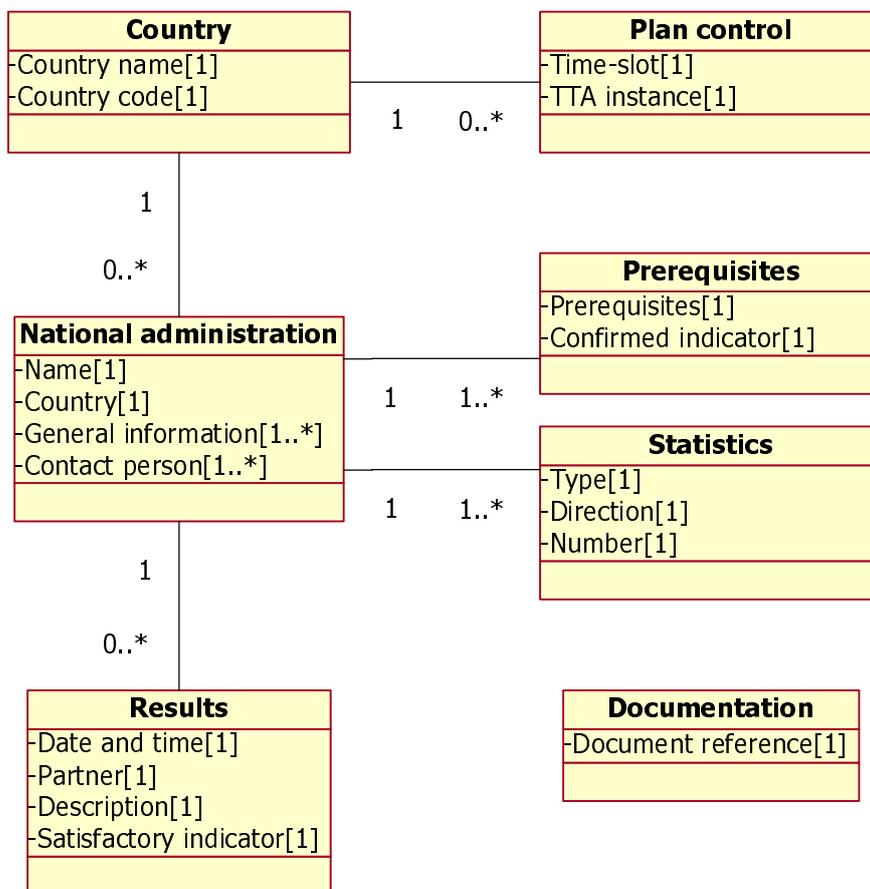


Figure 2-117 WEB2000 Testing major data object relations

The testing can be local, international or conformance testing. The prerequisites and statistic are available only for the conformance testing. The plan control presents the current planning of the NCTS-CO, giving the expected occupation of Transit Test Application (TTA) instance by the certain country at that time-slot. The testing results include the description and indication if the national administration has passed the test. The documentation needed for the testing is available as the list of the document references.

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### 2.34.2.4 Domain vocabulary (ITMS portal)

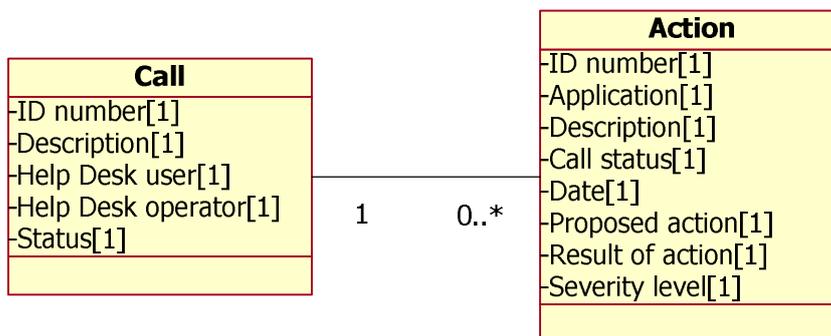


Figure 2-118 WEB2000 Domain vocabulary (ITMS portal)

Major data objects are stored:

- Call

#### Call

The call represents the problem or question the end-user have addressed with. The call can be associated with a list of actions that have followed the call. Action can be proposed or already implemented. Action can change the status of the call.

### 2.34.3 Application perspective

#### 2.34.3.1 Application structure

WEB2000 is a Content Data Management System (CDMS), which is deployed for data exchange by a potentially large amount of contributors. From the technical side it is a simple web application built to store files, like documentation documents or others, so that specific users may download them. The targeted group of contributors is the National Administrators (NA).

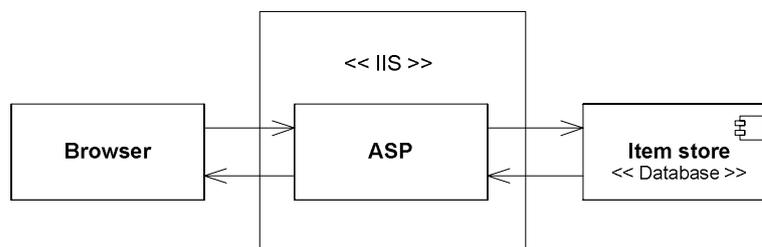


Figure 2-119 WEB2000 Application structure

#### 2.34.3.2 Application dynamics

No specific documentation on application dynamics is available.

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## 2.34.4 Technical perspective

### 2.34.4.1 Service access and delivery

#### Access Channels

The application is accessed through a thin client – web browser. Recommended versions of browsers are Ms Internet Explorer 5.5 128bits or higher and Firefox 2.0 or higher with the JRE or Java plug-in installed.

#### Delivery Channels

WEB2000 is accessible through the DG TAXUD internal network.

#### Service transport

The protocol used in client-application exchange is HTTP and HTTPS.

### 2.34.4.2 Service platform

#### General platforms

The application should be deployed on a machine with Windows OS (2000 or higher).

#### Delivery servers

The application is delivered on the Microsoft Internet Information Services server.

#### Database

Application stores its data in the Oracle 9 Database Server.

### 2.34.4.3 Component framework

#### Security

Access to WEB2000 is restricted only for registered users associated with customs countries and Excise community. To register a new user, the National Project Manager (NPM) has to fill a user registration form and sends it through ITSM SD to DG TAXUD. If the form is accepted, the Central Helpdesk creates an account for the requested user, and sends the user credentials by express email. Each user has associated profiles, which define their access right. Profiles have access only to specified resources.

Only Central Helpdesk operators may publish new documents on WEB2000.

#### User presentation

The presentation layer is created with the use of Active Server Pages (ASP), HTML and CSS.

#### Business logic

Business logic is implemented inside the ASP pages.

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### **Data management**

Data is stored in an Oracle Database.

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## 2.35 VIES System

### 2.35.1 Reference and Applicable Documents

Id	Title	Reference	Version
VIES	Functional Specifications for VIES applications (VIES-FS-030)	VIES-FS-030 v1.9.doc	1.9

Table 2-35: Vies System Reference documents

### 2.35.2 Functional perspective

The national VIES applications and databases constitute the core of VIES system (VAT Information Exchange System). Each Member State is obligated to maintain an electronic database which should contain the VAT identification numbers of its traders; such information would extend to the name, address and, where appropriate, the date of cessation of validity of the number. That information should be available "without delay" for tax administrations and other authorized users (e.g. AEO CDCO or VIES-on-the-WEB). This provides the facility to make an immediate check on the validity of a VAT identification number in another Member State. In addition, Member States must ensure that traders themselves are given the facility to confirm the VAT status of their intra-Community customers. The database maintained by a Member State should also enable each Member State to obtain "directly and without delay from each (other) Member State" access to information in the form of a quarterly list of the VAT identification numbers of all intra-Community purchasers in that Member State, together with the associated net total turnover value in relation to each of these VAT numbers. On request, the values given can then be further broken down into the individual amounts declared by each supplier in the Member State that collected the data. This information can then be used by the Member State receiving it to compare with the value of intra-Community acquisitions declared on the VAT periodic returns, and ultimately checked against the purchasers' accounting records.

In respect to requirements placed upon Member States, information exchanged between the National VIES applications can be divided into two main categories:

- Identification data enabling a Member State to verify that a particular VAT number from another Member State is valid, or has been valid (VAT and Historical VAT information)
- Turnover data information submitted by traders in every Member State.

#### 2.35.2.1 Use cases view

The VIES system covers exchange of defined messages and files between the National VIES Applications. An Applicant Member State (MS-A) prepares and sends a request for information to a proper Member State. In the response Requested Member State

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(MS-R) sends a message or a file containing relevant data. Also any of the Member States can send spontaneously data to another Member State.

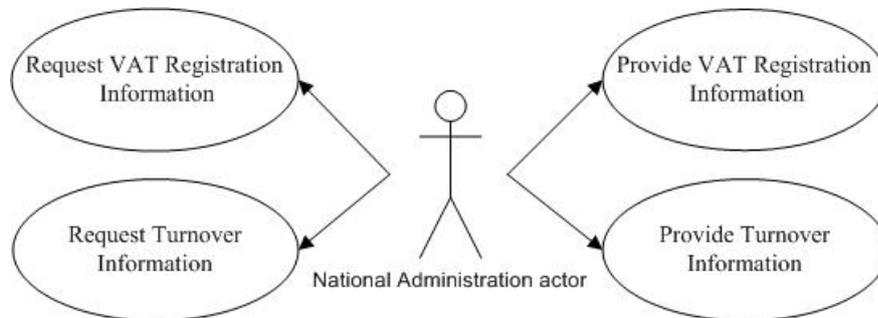


Figure 2-120: VAT System use case

### **Request VAT Registration Information**

Any National Administration can direct a request for information concerning VAT Registration to another National Administration. National Administration from which the request originates, acts as an Applicant Member State (MS-A). National Administration for which the request is addressed assumes a role of a Requested Member State (MS-R). The request for information on VAT Registration concerns actual status but also can concern historical data.

### **Provide VAT Registration Information**

As a response to a request for information concerning VAT Registration National Administration acting as a Requested Member State (MS-R) provides an Applicant Member State (MS-A) with requested data. Depending on the character of the request a response can concern actual and also historical data.

### **Request Turnover Information**

Any National Administration can direct a request for information concerning turnover of trade to another National Administration. National Administration from which the request originates, acts as an Applicant Member State (MS-A). National Administration for which the request is addressed assumes a role of a Requested Member State (MS-R). The request for information on turnover can concern data related to one or all purchasers from MS-A and one or all sellers from MS-R. Also any of the Member States can send spontaneously data to another Member State.

### **Provide Turnover Information**

As a response to a request for information concerning turnover, National Administration acting as a Requested Member State (MS-R) provides an Applicant Member State (MS-A) with the requested data. Depending on the character of the request, a response can concern data related to one or all purchasers from MS-A and one or all sellers from MS-

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R. Also any of the Member States can send spontaneously data to another Member State.

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### 2.35.2.2 Domain vocabulary

In this chapter there are presented messages concerning VAT registration status and also examples of exchanged turnover data

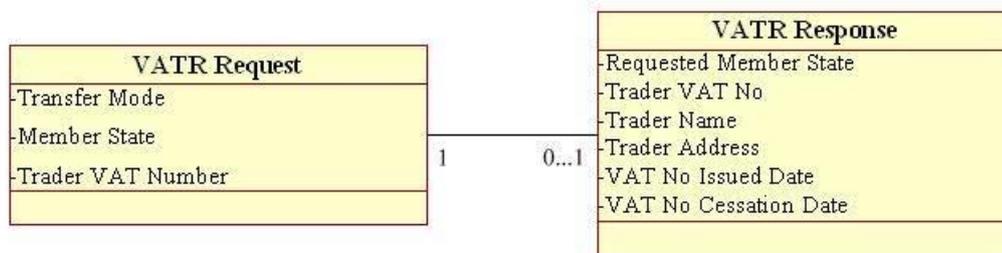


Figure 2-121: VATR (VAT Registration)

**VATR** (VAT Registration) Request is used to obtain confirmation of the validity of VAT identification numbers. As a response to VATR Request with a valid number\* VATR Response consists of a single database record.

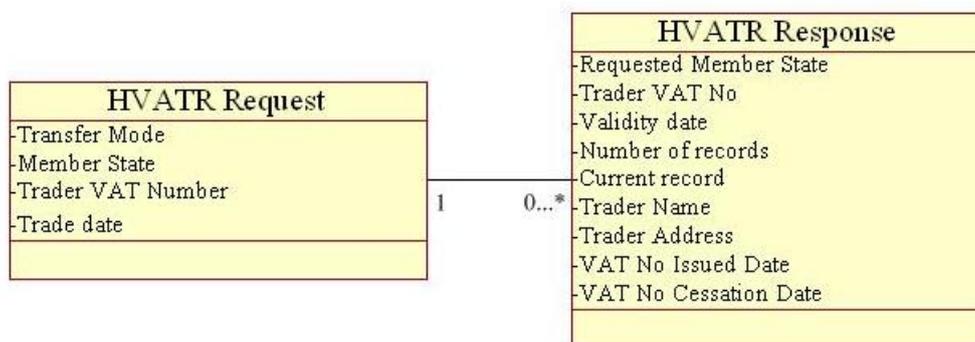


Figure 2-122: HVATR (Historical VAT Registration)

**HVATR** (Historical VAT Registration) Request is used to obtain information about a given VAT identification number. As a response to HVATR Request with a valid number\* HVATR Response consists of one or several database records per VAT identification number.

\* valid number: allocated number which is active or has a cessation date

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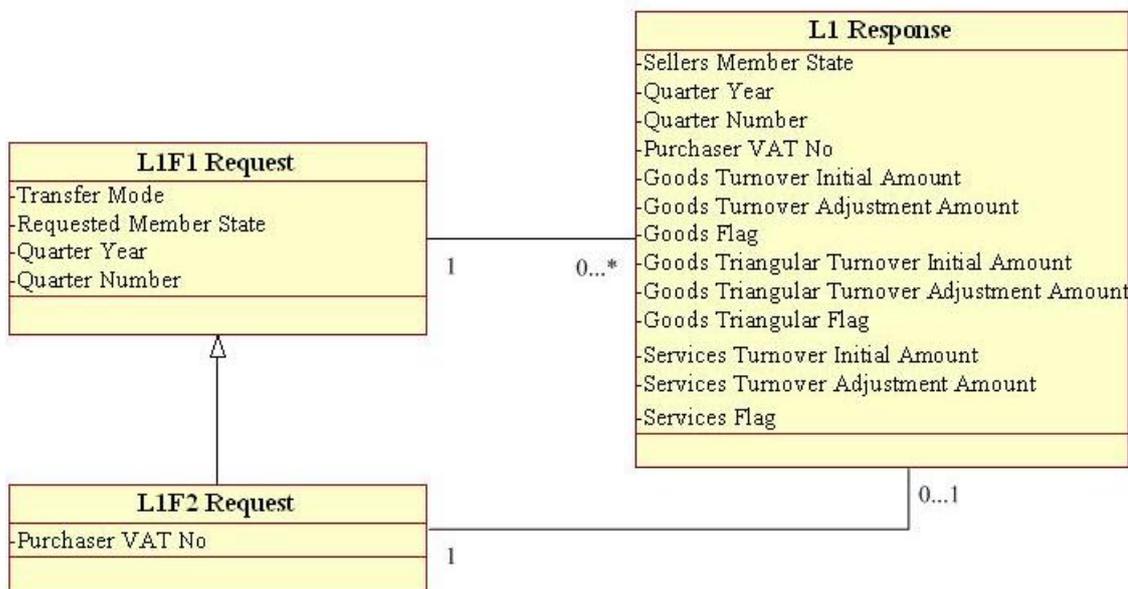


Figure 2-123: L1F1 (Level 1, Facility 1) & L1F2 (Level 1, Facility 2)

**L1F1** (Level 1, Facility 1) Request is used to obtain information about total turnover related to transaction between purchasers from Applicant Member State (MS-A) and sellers from Requested Member State (MS-R). Response to such a request consists of several database records containing relevant data.

**L1F2** (Level 1, Facility 2) Request is used to obtain information about total turnover related to transaction between one specific purchaser from Applicant Member State (MS-A) and sellers from Requested Member State (MS-R). Response to such a request consists of single database record containing relevant data.

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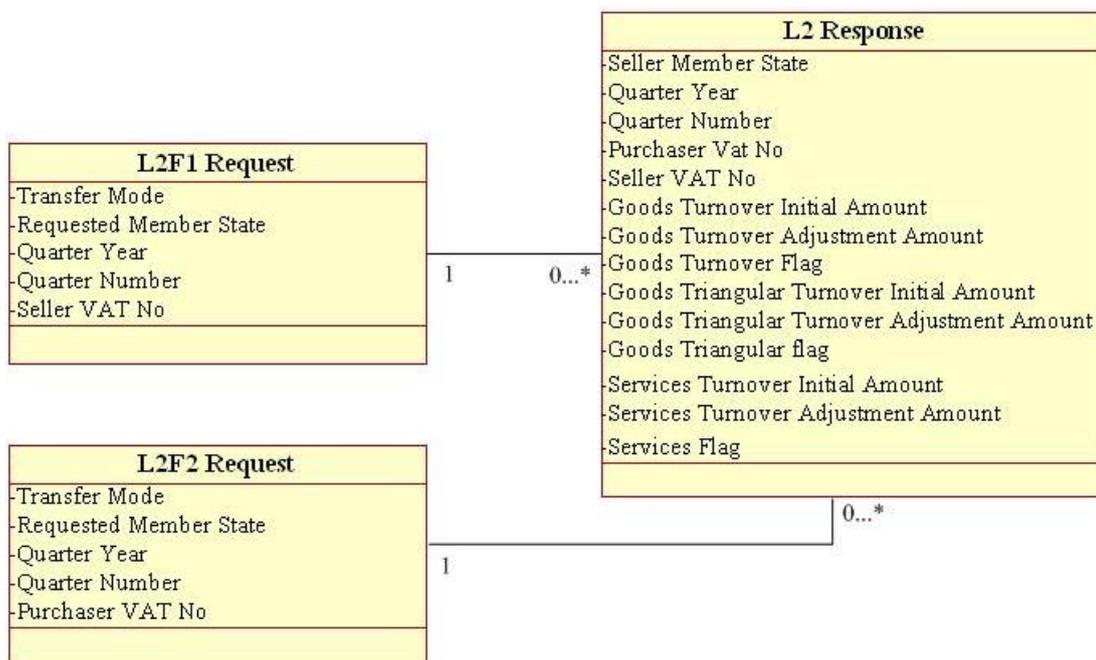


Figure 2-124: L1F1 (Level 2, Facility 1) & L1F2 (Level 2, Facility 2)

**L1F1** (Level 2, Facility 1) Request is used to obtain information about turnover related to transaction between purchasers from Applicant Member State (MS-A) and one specific seller from Requested Member State (MS-R). Response to such a request consists of several database records containing relevant data.

**L1F2** (Level 2, Facility 2) Request is used to obtain information about turnover related to transaction between one specific purchaser from Applicant Member State (MS-A) and sellers from Requested Member State (MS-R).

Response to such a request consists of several database records containing relevant data.

### 2.35.3 Application perspective

#### 2.35.3.1 Application structure

The VIES system (VAT Information Exchange System) is a distributed information system. It operates in client-server model design concept as described in the following figure.

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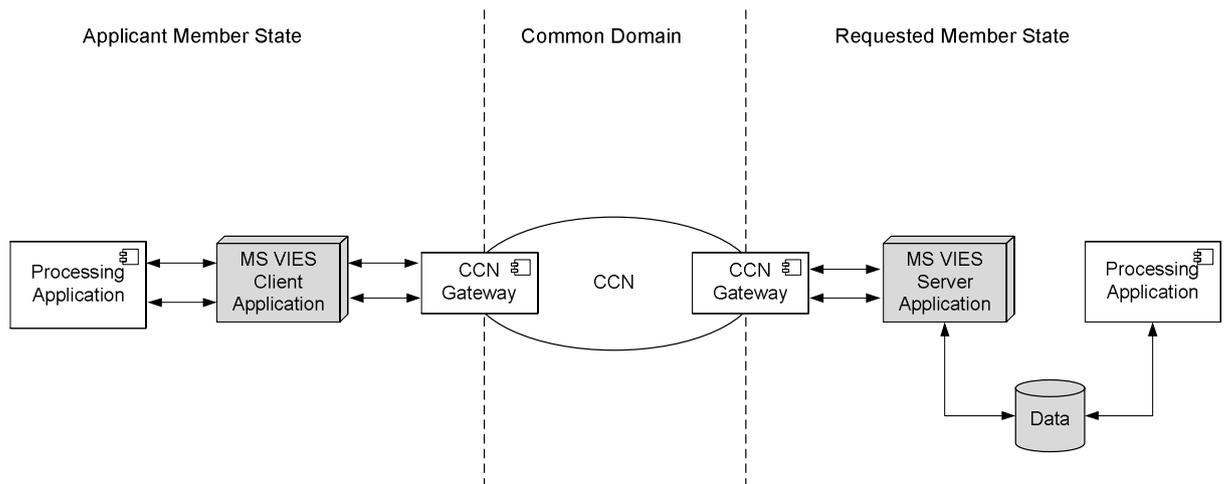


Figure 2-125: General VIES System architecture concept

The user interface of the client application lets the user put a question (a request) to the system. This request is a VIES formatted message, which the CCN Network conveys to the server application.

The server builds the reply by consulting the database (built by the production application) and puts it in the response as a VIES formatted message, which is transported back to the client application.

The client and server applications offer an API to send spontaneous messages, but will not send them automatically.

All VIES applications located in the Member States are interconnected via CCN. They must use a common set of programming interface (CSI) and a well defined message protocol to communicate with each other.

Additionally, the VIES system is also supported with complementary applications that are serving VIES system services to the external users, monitoring national applications availability or gathering and presenting usage statistics. Those applications, to give a broader view of the system, are also considered in this chapter.

Main properties of the VIES system are:

- Each MS developed its own VIES application, with its own database.
- The communication between the VIES applications is based on service based messaging solution, where distinct national VIES applications expose a defined set of and can be accessed by other applications within the system.
- The different messages (registration, TOD) are sent between Member States over the CCN network using a CSI Stack and Remote API Proxy's. The communication over DG TAXUD domain is realised over EC Local Network.
- Messages can be sent synchronously or asynchronously

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### **VIES National Application (Nationally Developed and Operated application)**

Each Member State is responsible for implementation of its own VIES national application. This application, later on, is plugged into existing VIES system, enabling other Member States to exchange VIES messages with given Member State.

The VIES national application must consist of at least two modules: Client module, responsible for submitting information requests, and Server module responsible for handling incoming requests.

Additionally, DG TAXUD delivers to the National Administration, the “VIES initial application” that can be used as a reference to create their national applications.

### **VIES Central applications.**

DG TAXUD operates several additional tool applications supporting the VIES System. Those applications provide monitoring and reporting functionalities of the system in work. The VIES-on-the-Web application allows external, non government users, access to limited VIES System functionality. The list of applications, as well as short definitions of its responsibilities, is placed below:

#### **VIES Monitoring**

The role of the application is to verify the availability of the different Member States VIES applications. The tool periodically sends preformatted VIES messages to each Member State in both synchronous and asynchronous modes. The response received is used to verify “on-line” the availability of the Member States VIES application. Availability data is stored in a local database and is later used to generate the VIES availability monthly statistics.

#### **VIES-on-the-Web (VoW)**

The objective of VIES-on-the-Web is to allow traders involved in the intra-Community supply of goods or of services to obtain confirmation of the validity of the VAT identification number of any specified person. There is no VAT central database at Community level; the verification is done against the national VAT database using the synchronous R-VATR service of the traditional VIES system.

VIES-on-the-Web is centrally developed and is operated by Taxud

The application can be accessed by any of two interfaces:

- HTTP Web Page access.
- API (SOAP Web Service)

#### **VIES-on-the-Web Monitoring**

The purpose of the VIES-on-the-Web Monitoring is to monitor and log the availability of the VIES-on-the-Web services, by sending request to VIES-on-the-Web Interactive

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and API for each Member State, There is an additional Web based graphical interface, for presenting collected availability data.

### **VIES-on-the-Web Configuration**

VIES-on-the-Web Configuration Tool is used to change the configuration of VIES-on-the-Web, in principle:

- Change detail of information provided to users
- Restrict the number of requests processed
- Block VAT numbers
- Block IP addresses
- Upload translations of VoW pages in all EU official languages

VIES-on-the-Web communicates with the users through the HTTP Graphical User Interface.

### **VIES and VoW Statistics**

The application is aimed at preparation of VIES and VIES-on-the-Web statistic reports. The reports can be built on data from various sources: ITSM/TC (Monitoring and SMT), CCN/TC (Member States VIES Traffic), DG TAXUD (VIES-on-the-Web), generated in several formats (xls, pdf, xml) and sent to DG TAXUD.

### **VIES Test Application**

The VIES Test Application is used by XXX to perform conformance tests of the Member State applications and also to test VAT related applications developed by DG TAXUD.

#### **2.35.3.2 Application dynamics**

As described in Application Perspective section, communication model utilized within the VIES system, is request-response and spontaneous messaging solution. The messages are exchanged with the use of CCN/CSI messaging services and must comply with the VIES message format, designed especially for VIES communication. The communication between parties involved (VIES client, VIES server) can be performed in, either synchronous or asynchronous mode, depending on the actual conditions and request type.

#### **Synchronous transmission**

In synchronous mode an end-to-end communication path is established between the two remote applications. A dialogue (request and response) is held on this communication path. Each process lying on the communication path relays the received data to the next process on this path and waits for the reply received from this process.

This communication mode is very attractive for performing user interactions, as the response times are small. Also, the reliability of the service is affected by the fact that

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all the processes lying on the communication path must be accessible during the dialogue for the request to be satisfied.

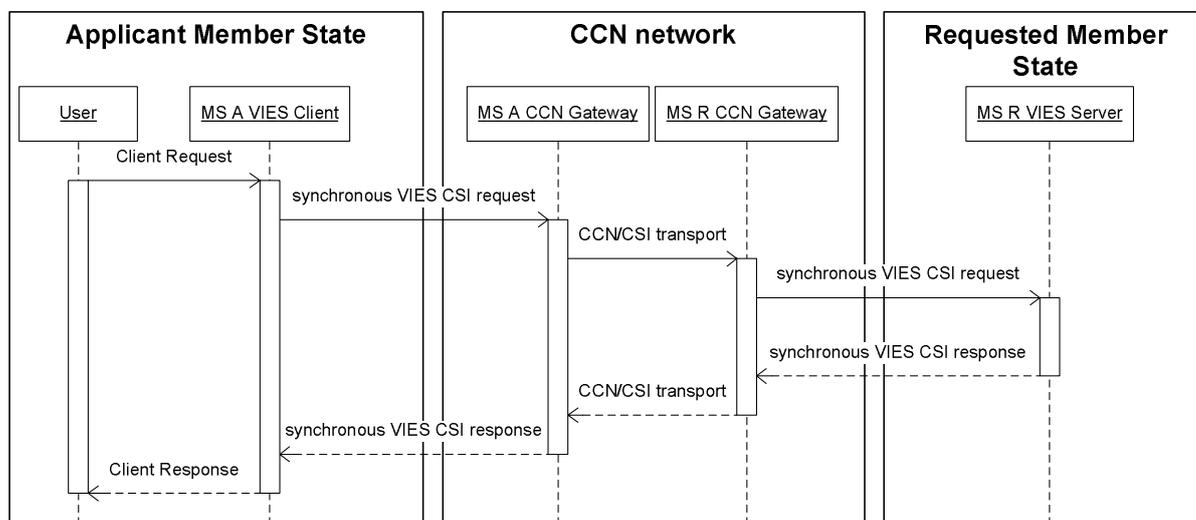


Figure 2-126: VIES System synchronous transmission model

1. User, located in Applicant Member State (MS A) submits a request to MS A VIES Client.
2. Synchronous request is transported to Requested Member State (MS R), through MS A CCN Gateway, over CCN network and MS R CCN Gateway.
3. The MS R VIES Server, awaiting requests, receives, processes the request and returns an appropriate reply.
4. The client receives the reply or, in the event of error (respectively problem of the remote application), the received error code and displays appropriate response to the User.

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### Asynchronous transmission

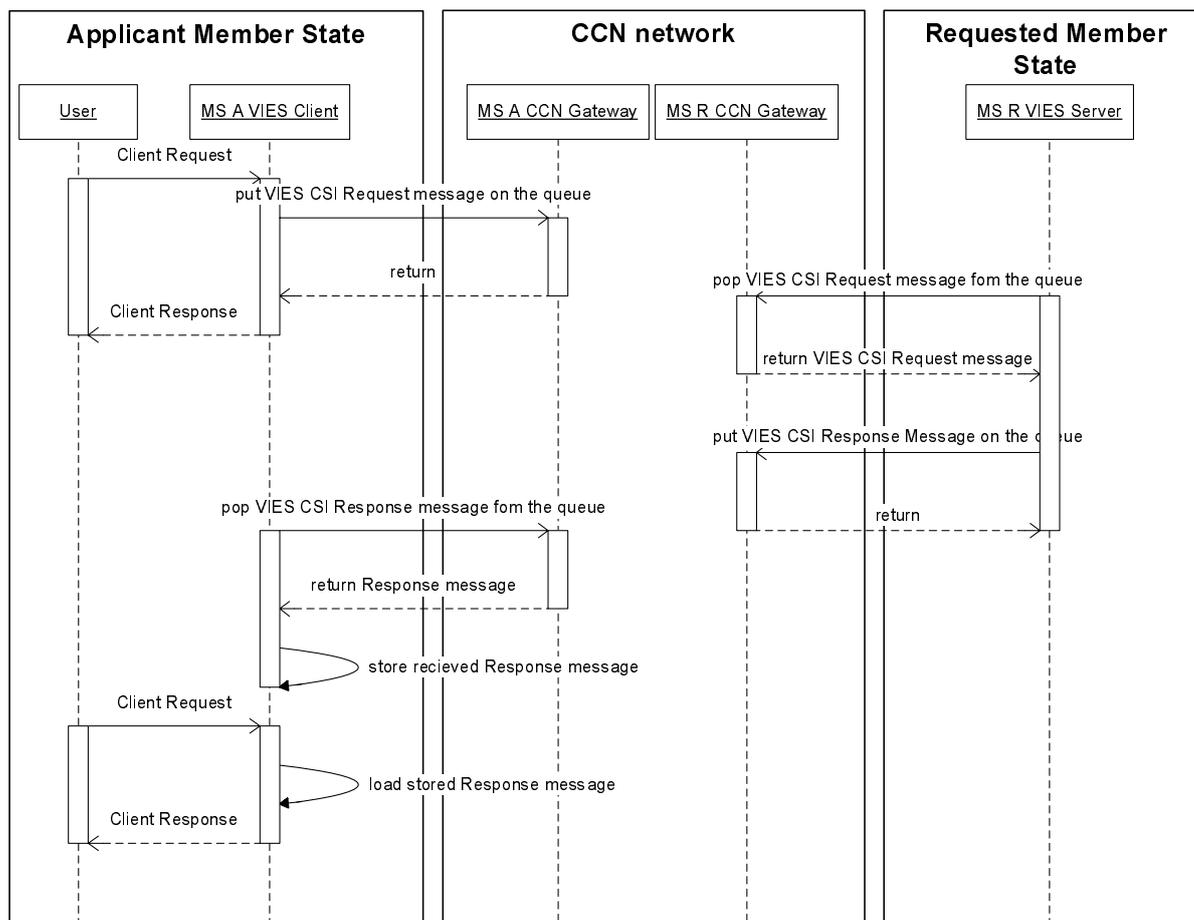


Figure 2-127: VIES System asynchronous transmission model

1. User, located in Applicant Member State (MS A) submits a request to MS A VIES Client.
2. MS A VIES Client puts request Message to the queue, trough a MS a CCN Gateway, and returns to the User.
3. The MS R VIES Server pops request Message from the queue and processes the request.
4. The MS R VIES Server puts response Message, containing an appropriate reply, to the queue, trough a MS R CCN Gateway.
5. MS A VIES Client pops response Message from the queue and stores it.
6. User performs request to the MS A VIES Client, the stored message is loaded and presented to the User.

### Synchronous + Asynchronous transmission

Client-Server applications handling only small replies like VAT registration applications can be implemented entirely over the synchronous service.

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Client-Server applications handling larger replies must use, at least partially, the asynchronous service. For example, a client turnover application can send all its requests through the synchronous service, but has to get some of its replies through the asynchronous service.

Therefore, Client-Server applications must be able to handle a switch from synchronous to asynchronous mode. This is especially true if the synchronous service is not available (not at all or temporarily).

In case, when a switch from synchronous to asynchronous mode is requested (indicated in the request header), the MS-R application will reply in synchronous mode, with an acknowledge message (S\_ACKN) notifying that there has been a mode switching.

## **2.35.4 Technical perspective**

### **2.35.4.1 Service access and delivery**

#### **Access Channels**

Full access to the system can be obtained using National VIES Client application, developed independently by the Member States. Those applications can be implemented and accessed through different means (Web client, dedicated thick client), depending on the country implementation decisions.

#### **Delivery Channels**

VIES national applications communicate among themselves over CCN network (G2G communication channel).

#### **Service transport**

The applications within VIES System communicate using the CCN/CSI specific protocols.

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## 2.36 VAT-on-e-Services

### 2.36.1 Reference and Applicable Documents

Id	Title	Reference	Version
VOES _TS	VAT on e-services Technical Specifications	VAT on e-services - TS_v5.2.doc	5.2
VOES _FS	VAT on e-Services Functional Specifications (VER. 6.1)	VAT on e-services - FS_v6.1.doc	6.1

Table 2-36: VoeS Reference documents

### 2.36.2 Functional perspective

According to principles established by the European Union, Value Added Tax (VAT) on a trade over electronic networks is to be charged in the country of a purchaser and not in the country of a supplier (seller). Therefore it is necessary to ensure a flow of relevant information between all Member States. VAT-on-e-Services (VoeS) provide such functionality for specific cases. It enables exchange of information between Member States concerning transactions of electronic services and goods, their participants, charged Value Added Tax (VAT) and amount of tax paid and due, when a supplier is a non-established taxable person within the territory of the European Union. There can be distinguished two concerned situations:

- a supplier has neither established his business nor has a fixed establishment in any of Member States of the European Union and a purchaser is a non-taxable person,
- a supplier is not otherwise identifiable for tax purposes and a purchaser is a non-taxable person.

In such case supplier has a possibility to register as a taxable person in one of the Member States of EU, which becomes then his “The Member State of identification” (the country of a supplier). The Member State of identification is responsible for settlement of VAT paid and due with concerned Member States of consumption.

#### 2.36.2.1 Use cases view

Each Member State maintains its own National VoeS application and electronic database. VoeS system covers exchange of defined messages between National VoeS Applications.

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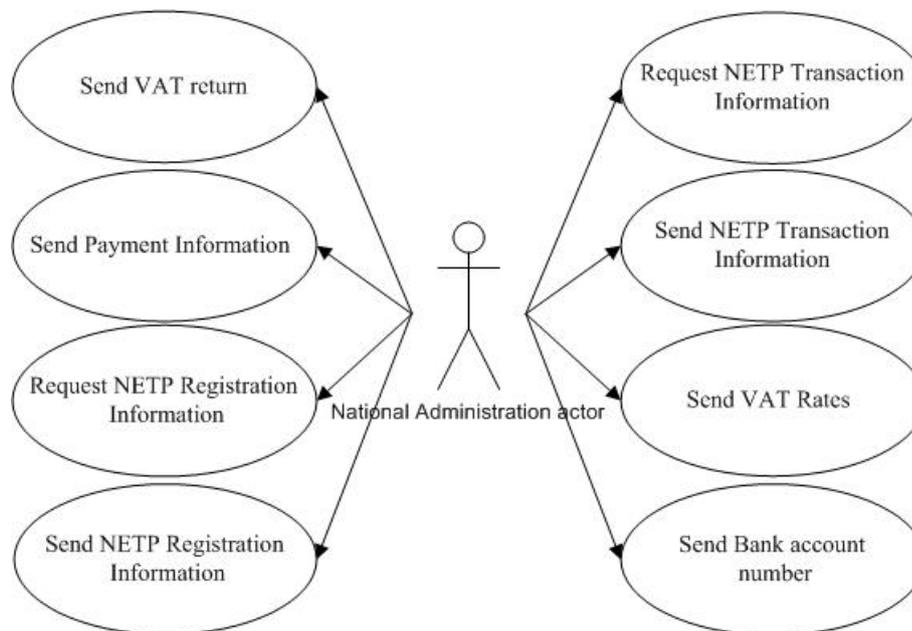


Figure 2-128: VAT-on-e-Services use cases

### **Send VAT return**

The Member State of identification collects information concerning non-established taxable persons and their transactions. On their basis the Member State of identification sends to the Member State of consumption messages containing information on VAT return.

### **Send Payment Information**

The Member State of identification sends to the Member State of consumption information concerning payment resulting from specific VAT return.

### **Request NETP Registration Information**

The Member State of consumption can request from the Member State of identification information on specific non-established taxable.

### **Request NETP Transaction Information**

The Member State of consumption can request from the Member State of identification information on specific transaction that took place.

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### Send NETP Registration Information

As response to the request for NETP Registration Information the Member State of identification provides the Member State of consumption with requested data.

### Send NETP Transaction Information

As a response to the request for NETP Transaction Information the Member State of identification provides the Member State of consumption with requested data.

### Send VAT Rates

Member States are also able to exchange information about actual applicable VAT rates.

### Send Bank account number

Also Member States are able to exchange information on their bank accounts numbers.

#### 2.36.2.2 Domain vocabulary

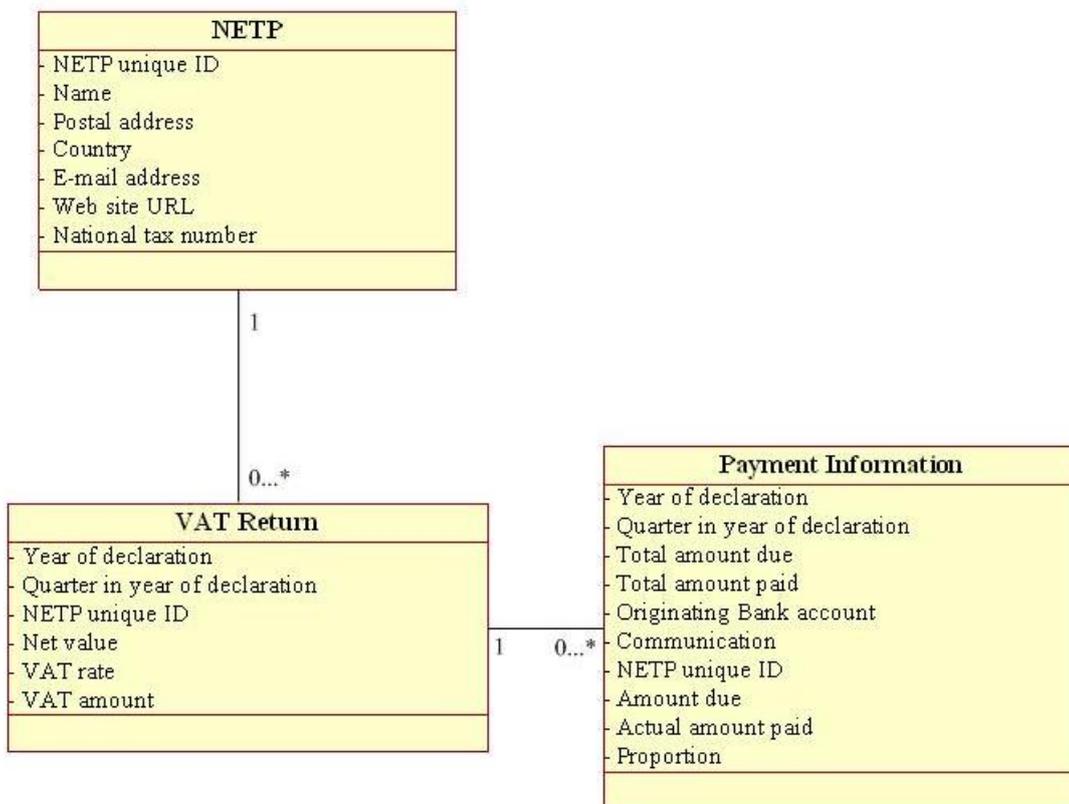


Figure 2-129: VAT-on-e-Services main information

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**NETP** represents registered in the Member State of identification non-established taxable person involved in an electronic transaction resulting in necessity of exchange VAT information between Member States of EU.

**VAT Return** represents all messages sent from the Member State of identification to all concerned Member States of consumption containing information about VAT paid on electronic transactions involving one particular non-established taxable person in given period.

**Payment Information** concerns VAT return directed from the Member State of identification to one specific Member State of consumption and involving one particular non-established taxable person in given period.

## 2.36.3 Application perspective

### 2.36.3.1 Application structure

VAT on e-services (VoeS) is a distributed information system, operating in a client-server model design concept. In this model, participating parties (Member State of Identification and Member State of Consumption) exchange, through VoeS national applications, defined messages among themselves. VoeS national applications are developed and operated by each Member State separately; DG TAXUD delivers only messages specifications and guidelines for implementing national VoeS applications.

Detailed information, concerning data exchanged, as well as its business means, is presented in the Functional Architecture concerning VAT on e-services.

The communication between Member States, taking part in conversation, is realised by the services provided by CCN infrastructure, acting as a passive transport layer. The CCN mail application is used as the transport mechanism for the e-services messages.

They (CCN gateway and CCN mail) are common components of the National and DG TAXUD communication layer and provide services to other applications besides VoeS.

The following diagram presents main architectural components taking part in business process.

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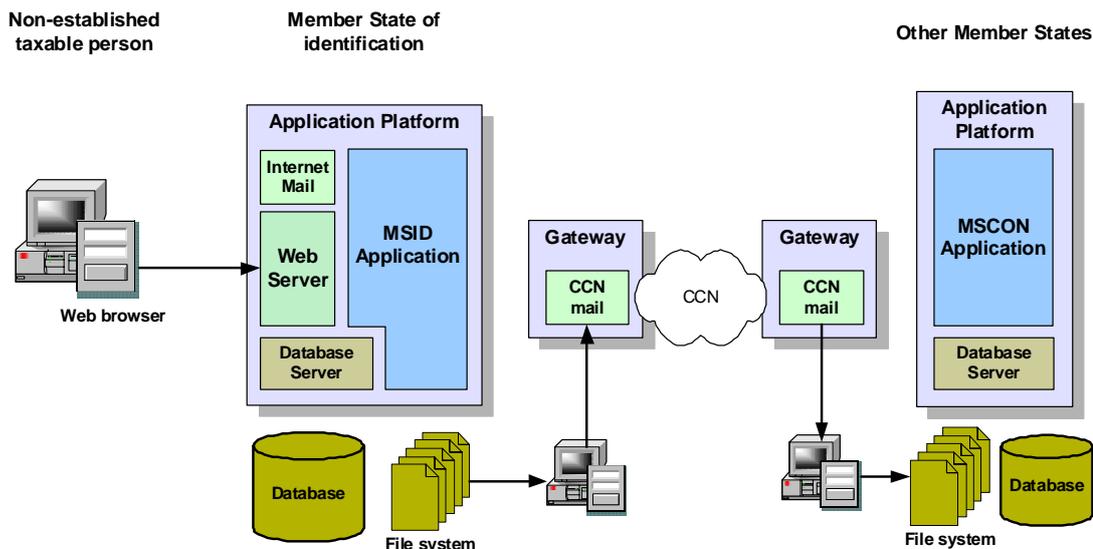


Figure 2-130: VAT on e-services (VoeS) Application structure

In the adopted communication model, each Member State VoeS Application can either act as a Member State of Identification or Member State of Consumption part. The role that is actually played in the conversation depends on the side which initiates the conversation.

Understanding this, the following system components can be identified:

**On the Member State of identification side:**

**Web and/or mail server and application** – are responsible for gathering the data from the non-established taxable person and preserving it in a database.

**Database and database server** - storing data received from the non-established taxable person.

**CCN Gateway, CCN mail** – external to the VoeS system, are responsible for transporting messages over the Common Community Network, between Member State VoeS applications taking part in conversation.

**File system** – used to store files that are attached into the CCN mail messages.

**Internet mail (external)** – used to send e-mail messages to the non-established taxable person.

**Member State of Identification (MSID) VoeS Application** – the core of the national part of the VoeS system. This application, by using system components described above, manages communication with other Member States VoeS applications, and implements the core business functionality of the national part of VoeS system.

**On the Member State of consumption side:**

**CCN Gateway, CCN mail** – counterparts of the component located on the MSID side, external to the VoeS system, are responsible for transporting messages over the

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Common Community Network, between Member State VoeS applications taking part in conversation

**Database and database server** – responsible for storing the non-established taxable person’s data received from the Member State of identification.

**File system** -to store files that are attached into the CCN mail messages.

**Member State of Consumption VoeS Application** - the core of the national part of the VoeS system. As its MSID counterpart, application, by using system components described above, manages communication with other Member States VoeS applications, and implements the core business functionality of the national part of VoeS system.

### 2.36.3.2 Application dynamics

Communication model utilized within the VAT on e-services (VoeS) system is request-response messaging solution. The messages are exchanged with the use of CCN mail service. This method of communication imposes certain limitations to the communication model adapted; detailed information on this topic is placed in Technical Perspective section. Due to the limitations described in mentioned chapter, asynchronous mode of communication must be utilized, where each party involved in communication must continuously pool its mailbox for new messages to be able to react appropriately.

The diagram presented below, shows communication path established between the two remote Member States VoeS applications. An asynchronous dialogue (request and response) is held on this communication path. Each component of the system lying on the path relays the received data to the next process on this path. The response message is send backwards, and originator of the request, must pool its CCN mailbox for the reply message.

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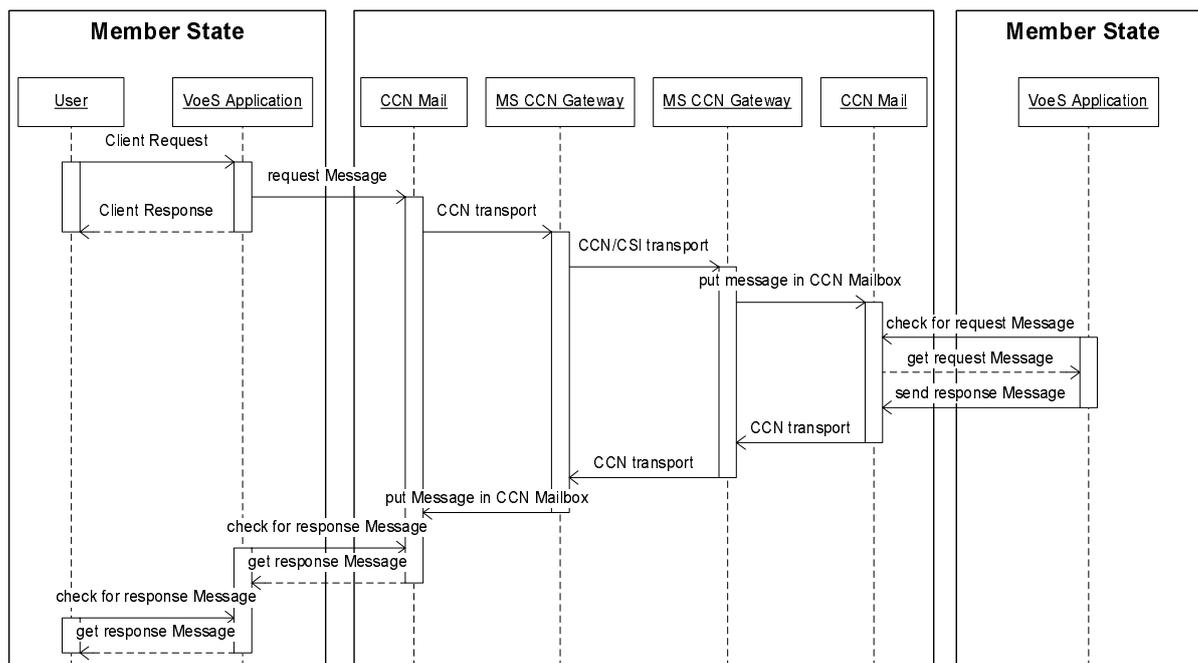


Figure 2-131: VAT on e-services (VoeS) Application dynamics

## 2.36.4 Technical perspective

While describing VAT on e-services as a system, due to the fact that they are under the decisions and responsibility of the Member States, and may substantially vary between different implementations of VoeS National Applications, sections concerning Service Platform and Component Framework cannot be filled. In this matter, only recommendations for building National Applications have been provided.

### 2.36.4.1 Service access and delivery

#### Access Channels

Access channels among different VoeS National Applications may vary, but generally Web page access is recommended.

#### Delivery Channels

VoeS National Applications, must be able to be accessed by the community, therefore its services shall be delivered through Internet.

#### Service transport

Service transport is dependent on the VoeS National Application implementation decisions, but generally for being able to be accessed by a Web page, HTTP/ HTTPS protocols shall be utilized.

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## 2.37 Taxation of Savings

### 2.37.1 Reference and Applicable Documents

Id	Title	Reference	Version
TOS_ FS	Taxation of Savings - Functional Specifications	FITSDEV-SC04-FS- TaxSavings-v2.03.doc	2.03
TOS_ TS	Taxation of Savings - Technical Specifications	FITSDEV-TS- TaxSavings-v2.01.doc	2.01

Table 2-37: Taxation of Savings Reference documents

### 2.37.2 Functional perspective

According to principles established by the European Union, in the situation when the interests are paid by an entity in one of the Member State of the European Union and a recipient of interest payments is resident of another Member State of the European Union, then process of taxation of those interests falls under the authority of the second. Meaning that tax return forms should be submitted in the Member State of Relevant Interest Recipient and also there taxes on interests should be paid. Also withheld taxes should be transferred from other Member States to the Member State of Relevant Interest Recipient. Therefore it is necessary to ensure a flow of relevant information between all Member States and **Taxation of Savings System** provides such functionality.

#### 2.37.2.1 Use cases view

Taxation of Savings System covers exchange of information between Competent Authorities of Member States involved in taxation of paid interests. Transmission of information takes place between a Member State in which an entity paying interests (the Paying Agent) is located and a Member State of a subject receiving interest payments (the Beneficial Owner or the Residual Entity).

The Competent Authority of the Paying Agent collects the interest payment information, from all national Paying Agents, performs a compilation and a break down of this information at least per Member State, per Beneficial Owner and per Residual Entity, and transmits this information to the Competent Authority of every concerned Member State. Also in the case of tax withholding mechanism the Competent Authority of the Paying Agent collects information on withholding tax revenue for the fiscal period. The global withholding tax revenue is broken down per Member State and distributed to the Competent Authority of each concerned Member State.

The Competent Authority of the Relevant Interest Recipient on the basis of information received from The Competent Authority of the Paying Agent concerning interest payments and withheld taxes estimates tax liability of every Beneficial Owner for the specific fiscal period. The other recipient of interest payments - the Residual Entity is

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not a legal person and its profits are not taxed. They constitute interests that will be paid by the concerned Residual Entity to its members. In the cases when a member is not individual resident of a Member State of the Residual Entity, the Residual Entity assumes the role of a Paying Agent.

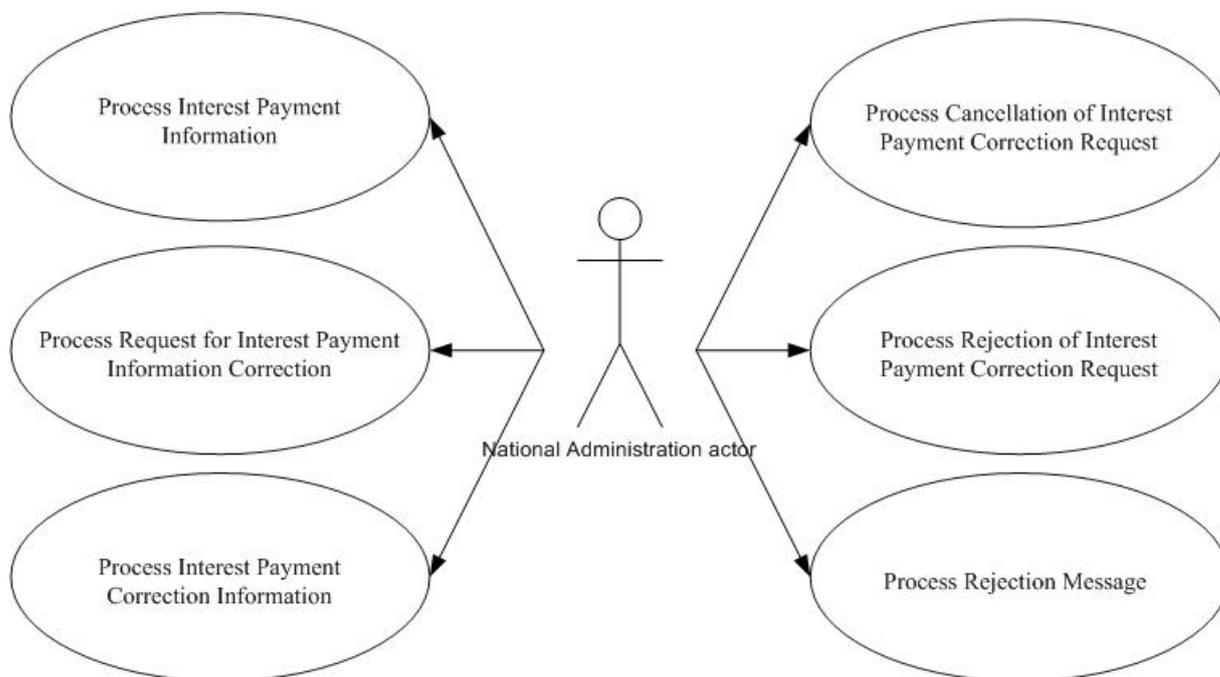


Figure 2-132: Taxation of Savings Use Case View

### **Process Interest Payment Information**

The Competent Authority of a Paying Agent prepares a message containing interest payment information and transmits it to the Competent Authority of Relevant Interest Recipient. The date and time of the transmission, and sufficient details to allow it to repeat the transmission if necessary are recorded by The Competent Authority of a Paying Agent.

The Competent Authority of Relevant Interest Recipient receives interest payment information from the Competent Authority of a Paying Agent. Received message is validated to ensure its proper format and compliance with the defined schema. This process may be done immediately upon receipt of an interest payment transmission or delayed until the interest payment information is processed. The Competent Authority of Relevant Interest Recipient may send a rejection message to the Competent Authority of a Paying Agent in the case of failed validation, but is not obliged to do so.

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### **Process Request for Interest Payment Information Correction**

If the Competent Authority of Relevant Interest Recipient identifies data concerning the interest payment information that needs to be corrected it can prepare a correction request message and send it to the Competent Authority of a Paying Agent.

### **Process Interest Payment Correction Information**

Upon receipt of the Request for Interest Payment Information Correction it undergoes validation. The Competent Authority of a Paying Agent may send a rejection message to the Competent Authority of Relevant Interest Recipient in the case of failed validation, but is not obliged to do so. Afterwards the Competent Authority of a Paying Agent prepares a message containing the corrected interest payment information and transmits it to the Competent Authority of Relevant Interest Recipient. However the Transmission of Interest Payment Correction Information does not have to be dependent on a previous request. It also can have spontaneous character and be sent on the initiative of the Competent Authority of a Paying Agent.

The Competent Authority of Relevant Interest Recipient receives interest payment information correction from the Competent Authority of a Paying Agent.

### **Process Cancellation of Interest Payment Correction Request**

If the Competent Authority of Relevant Interest Recipient decides that the specific Request for Interest Payment Information Correction is not necessary it can be cancelled by sending a proper message to the Competent Authority of a Paying Agent.

Upon receipt of the Cancellation of Interest Payment Correction Request it undergoes validation. The Competent Authority of a Paying Agent may send a rejection message to the Competent Authority of Relevant Interest Recipient in the case of failed validation, but is not obliged to do so.

### **Process Rejection Request for Interest Payment Correction**

If the Competent Authority of a Paying Agent has a valid reason not to provide correction information it may reject the request for correction. In such a case a proper message is sent to the Competent Authority of Relevant Interest Recipient. The message refers to the request for correction and gives the reason why it has been rejected.

The Competent Authority of Relevant Interest Recipient receives notification that a request for correction has been rejected by the Competent Authority of a Paying Agent, and the reason for the rejection. If the reason for the rejection is that insufficient information was provided to process the request, the Competent Authority of Relevant Interest Recipient may resubmit the request with more information. For all other reasons the Competent Authority of Relevant Interest Recipient must accept the decision of the Competent Authority of a Paying Agent.

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### **Process Rejection Message**

The Competent Authority that received a request or information transmission sends a rejection to the originating Competent Authority. The rejection message must contain enough information to associate it with the original request or information transmission and it must contain an error code to describe the reason for the rejection. The rejection message should contain any other information to allow the sender of the original transmission to identify and, if necessary, rectify the problem. For example, the rejection message may include the error output from a message parser.

The Competent Authority analyses the received rejection message in order to identify an occurred error. After finished analysis the Competent Authority implements necessary corrections.

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### 2.37.2.2 Domain vocabulary

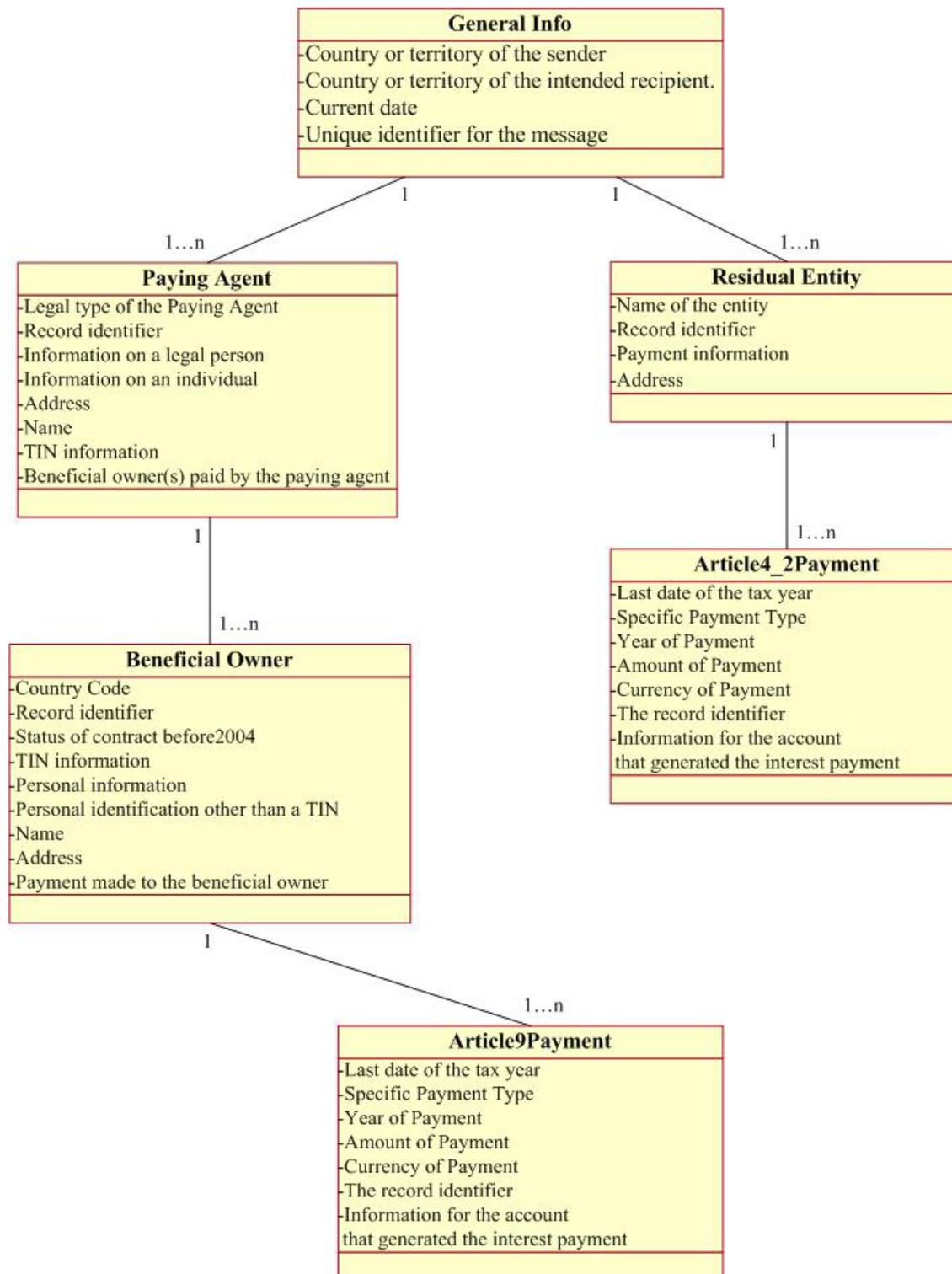


Figure 2-133: Taxation of Savings Domain Vocabulary: Interest Payment Information

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### Interest Payment Information

The diagram represents data included in a message containing interest payment information transmitted from the Competent Authority of a Paying Agent to the Competent Authority of Relevant Interest Recipient (as in the use case: Process Interest Payment Information). Interest payment information is broken down per Member State, per Beneficial Owner and per Residual Entity.

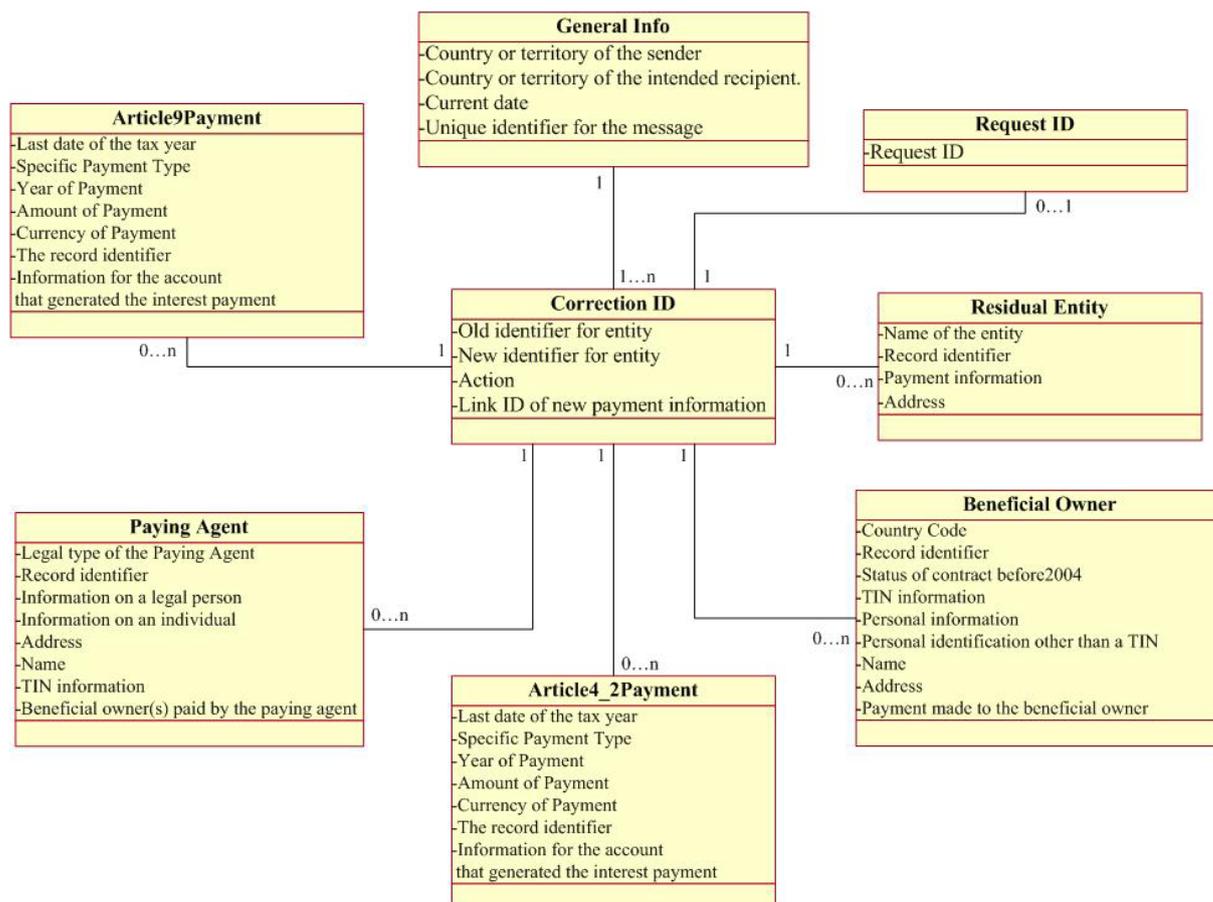


Figure 2-134: Taxation of Savings Domain Vocabulary: Interest Payment Correction Information

### Interest Payment Correction Information

The diagram represents data included in a message containing interest payment correction information transmitted from the Competent Authority of a Paying Agent to the Competent Authority of Relevant Interest Recipient (as in the use case: Process Interest Payment Correction Information). The correction can concern Paying Agent, Beneficial Owner, Residual Entity or Interest Payments. It can be related to a specific request (Request ID) or to be of spontaneous character.

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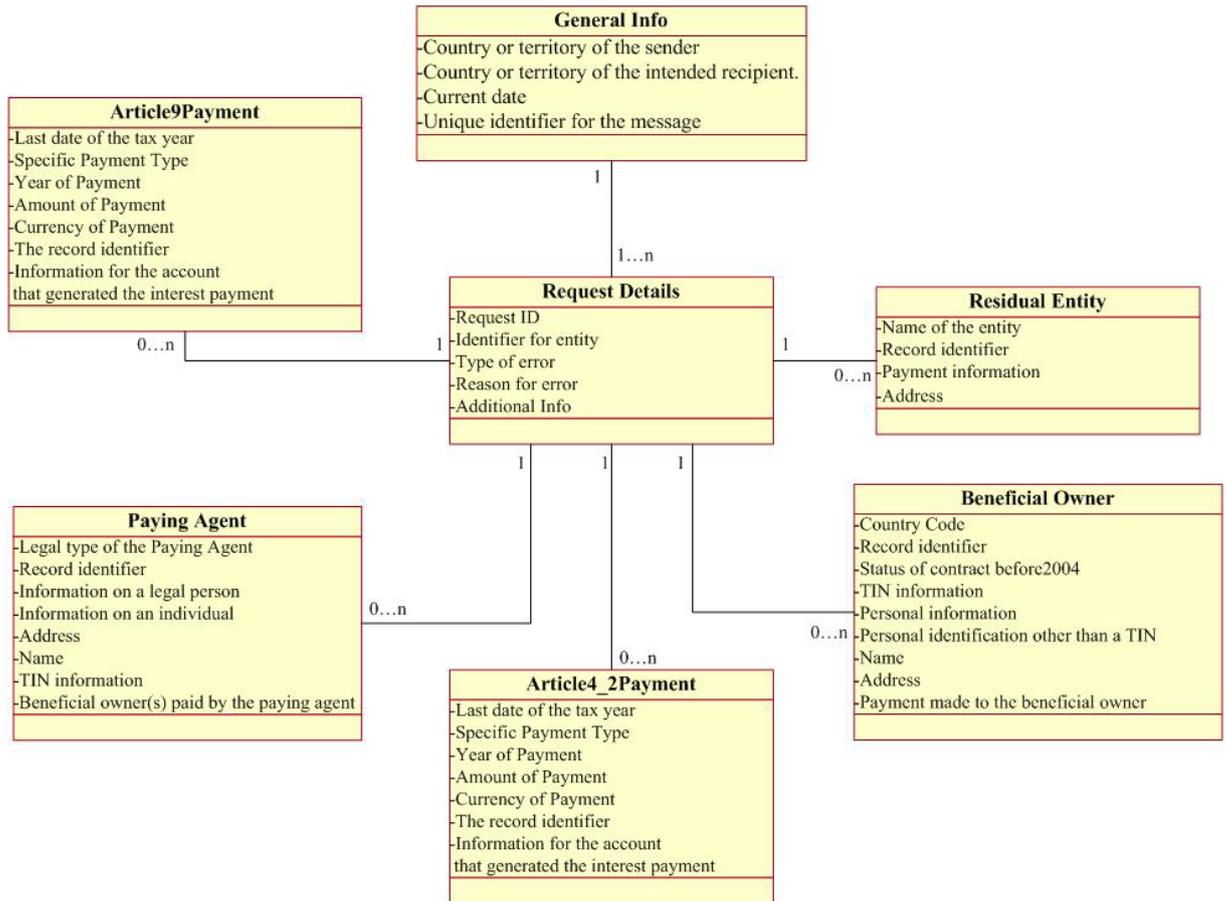


Figure 2-135: Taxation of Savings Domain Vocabulary: Interest Payment Correction Request

### **Interest Payment Correction Request**

The diagram represents data included in a message containing interest payment correction request transmitted from the Competent Authority of Relevant Interest Recipient to the Competent Authority of a Paying Agent (as in the use case: Process Request for Interest Payment Information Correction). The request for correction can concern Paying Agent, Beneficial Owner, Residual Entity or Interest Payments.

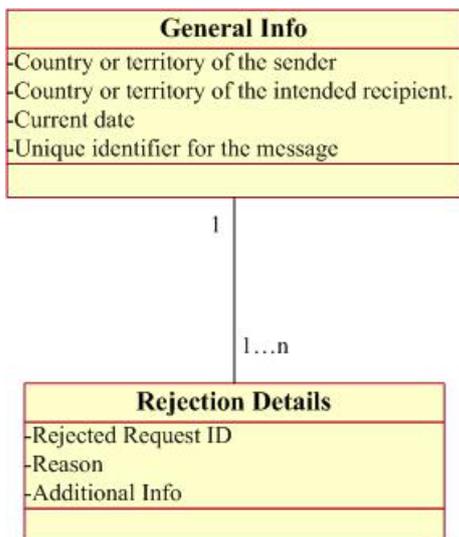
### **Cancellation of Interest Payment Correction Request**

<b>Cancellation of Request for Correction</b>
-Country or territory of the sender
-Country or territory of the intended recipient.
-Current date
-Unique identifier for the message
-Request ID to be cancelled

The class represents data included in a message containing cancellation of interest payment correction request transmitted from the Competent Authority of Relevant Interest Recipient to the Competent Authority of a Paying Agent (as in the use case: Process Cancellation of Interest Payment Correction Request).

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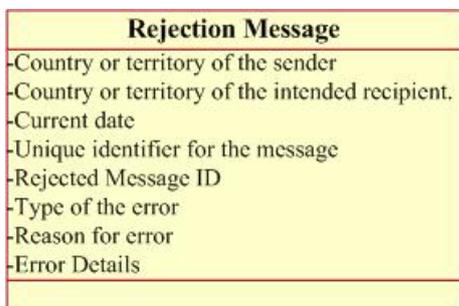
Figure 2-136: Taxation of Savings Domain Vocabulary: Cancellation of Interest Payment Correction Request



### Rejection of Request for Interest Payment Correction

The diagram represents data included in a message containing rejection of request for interest payment information correction transmitted from the Competent Authority of a Paying Agent to the Competent Authority of Relevant Interest Recipient (as in the use case: Process Rejection of Interest Payment Correction Request).

Figure 2-137: Taxation of Savings Domain Vocabulary: Rejection of Request for Interest Payment Correction



### Rejection Message

The class represents data included in a message containing rejection of the message transmitted from one Competent Authority to another Competent Authority (as in the use case: Process Rejection Message)

Figure 2-138: Taxation of Savings Domain Vocabulary: Rejection Message

## 2.37.3 Application perspective

### 2.37.3.1 Application structure

The design of the Taxation of Savings Application is the sole responsibility of the MSA. DG TAXUD provides only the specifications defining a set of required functionalities and proposed communication model. It also presents a proposal of high level

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architectural design that MSA should consider when implementing national applications.

The following section presents the proposed architecture and describes the core functionalities the application modules will support.

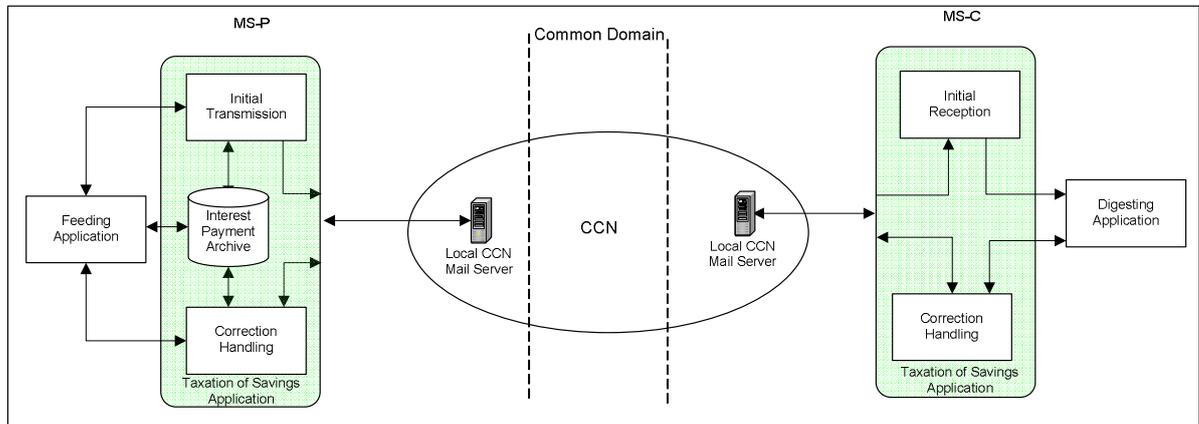


Figure 2-139: Taxation of Savings Application Structure.

A key requirement of the use of CCN Mail 2 as the communication channel, applicable to all components described below, is that a human operator must manage all the interactions with CCN Mail 2, such as attaching and detaching files.

### **Feeding Application**

This represents the national processing of MS-P. Depending on the implementation, the responsibilities of this component could be:

- receive and compile interest payment information received from the national paying agents;
- receive and process on-demand requests for correction passed by the ‘Correction Handling’;
- receive and compile spontaneous corrections from the national paying agents;
- prepare interest payment information messages according to the SDF;
- prepare and dispatch requests for correction to the national paying agents;
- trigger the automatic initial transmission of interest payment information;
- maintain the interest payment archive.

### **Initial Transmission**

The component must be able to take a prepared initial interest payment message and send it by CCN Mail 2 to MS-C.

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Due to the limitations of CCN Mail 2, the size of a message, including the attachment, may be no larger than 10 MBytes, therefore messages larger than this size must be split.

If the overall size of the message approaches 10 MBytes (the maximum capacity of a CCN Mail 2 savings-dir mailbox) the message must be sent in careful coordination with the recipient.

### **Initial Reception**

The component must be able to open an e-mail in the CCN Mail 2 savings-dir inbox containing an interest payment information message and pass this message to the Digesting Application. This component may also immediately check the syntax of the message and send a rejection message to MS-P in the event of a syntax error; alternatively, MS-C may delay this check until the message is actually processed and, if necessary, send a rejection message at that time.

### **Interest Payment Archive**

The purpose of the archive is to support re-transmission of interest payment information and correction of transmitted information.

### **Correction Handling (MS-P)**

The component must be able to open an e-mail in the CCN Mail 2 savings-dir inbox containing a request for interest payment correction and pass the request to the Feeding Application. This component may also immediately check the syntax of the request and send a rejection message to MS-C in the event of a syntax error; alternatively, MS-P may delay this check until the request is actually processed and, if necessary, send a rejection message at that time. The component must be able to send a correction rejection message to MS-C in the event that a request for correction is rejected by MS-P. This component must also check for and process rejection messages sent by MS-C if such messages are managed by computer systems and not by operational procedures.

### **Correction Handling (MS-C)**

The component must be able to take a prepared request for correction message and send it by CCN Mail 2 to MS-P. It must be able to open an e-mail in the CCN Mail 2 savings-dir inbox containing an interest payment correction message and pass this to the *Digesting Application*. This component may also immediately check the syntax of the correction message and send a rejection message to MS-P in the event of a syntax error; alternatively, MS-C may delay this check until the correction message is actually processed and, if necessary, send a rejection message at that time. This component must also check for and process rejection messages sent by MS-P if such messages are managed by computer systems and not by operational procedures. These can arise due to syntax errors in the request for correction or if MS-P has rejected the request for correction.

### **Digesting Application**

This represents the national processing of MS-C. Depending on the implementation, the responsibilities of this component could be:

- reconcile tax information;
- prepare requests for correction.

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### **2.37.3.2 Application dynamics**

Due to the fact that the design and implementation of the national Taxation of Savings applications is up to the concerned Member States, only flow of information and processing between Taxation of Savings national applications can be presented here.

Particular use case scenarios will be realised as a composition of several message exchanges between interested parties (MS-P and MS-C). For every use case implemented, the path of information flow between applications will be identical, differing only in messages content, its business meaning and internal processing connected to the particular use case realised.

The following sequence presents general message exchange path between two interested Member States running Taxation of Savings Application.

The executed steps are as presented:

1. The MS-P Taxation of Savings Application produce the CCN Mail 2 message and send it using the MS-P local CCN Mail Server. The content of the message is dependent on the context of the communication.
2. The message is transported over the CCN network to the desired MS-C Local CCN Mail Server.
3. The MS-C Taxation of Savings Application connects to the MS-C Local CCN Mail Server and opens the CCN Mail 2 savings-dir inbox.
4. Depending on the business context of the communication, the message is then processed by different MS-C Taxation of Savings Application sub-modules.
5. If required, the MS-C Taxation of Savings Application produce relevant response message.
6. The response message is sent to the MS-C Local CCN Mail Server.
7. The response message is transported over the CCN network to the desired MS-P Local CCN Mail Server.
8. The MS-P Taxation of Savings Application connects to the MS-P Local CCN Mail Server and opens the CCN Mail 2 savings-dir inbox.
9. Depending on the business context of the communication, the message is then processed by MS-P Taxation of Savings Application sub-modules

### **2.37.4 Technical perspective**

For the Taxation of Savings application DG TAXUD provides only proposal of high level application architecture. Leaving implementation decisions up to the concerned Member State the DG TAXUD defines a list of non-functional requirements that national applications should met.

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### Security

The technical architecture is required to provide the following services to the implemented application:

The system must ensure a high level of reliability and data integrity. It must ensure that only authorized users in the intended Competent Authority will be able to access the information according to user privilege.

Recovery procedures must be put into place to deal with disruption of any component of the technical architecture due to unexpected event or disaster.

Fallback transmission means should be used in case of disruption of the primary transmission channel

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## 2.38 Exchange of Forms

### 2.38.1 Reference and Applicable Documents

Id	Title	Reference	Version
EOF_ FS	E-Forms - Functional Specification	FITSDEV-SC10-FS-E-Forms-v1.07.doc	1.07
EOF_ TS	VIES2 - e-Forms - Technical Specifications	FITSDEV-TS-VIES2-E-FORMS-v1.05.doc	1.05

Table 2-38: Exchange of Forms Reference documents

### 2.38.2 Functional perspective

The E-Forms System is an element of a common system for the exchange of information between Member States. The main objective of the E-Forms System is to establish means for exchange of certain information between Member States. Its essential functionalities are revolving around three major issues:

- information requests, requests for administrative enquiries and exchange of spontaneous data sent by the competent authority of one Member State (the requesting authority) to the competent authority of another Member State (the requested authority),
- notification of an administrative decision to another Member State who communicates it to its taxable person,
- introducing of a simplified form for a fast exchange of information in case of suspected fraudulent operation.

The E-Forms System covers exchange of information between competent authorities in the Member States of the European Union. There can be distinguished three different authority types:

- Central Liaison Office,
- Liaison Department,
- Competent Official.

Each Member State designates a single **Central Liaison Office** which is responsible for contacts with other Member States in the field of administrative cooperation. Information on designated Central Liaison Office must be provided to the Commission and the other Member States. The competent authority of each Member State may also

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assign Liaison Departments or Competent Officials. In such a case the Central Liaison Office is responsible for keeping the list of Liaison Departments or Competent Officials up to date and making it available to the Central Liaison Offices of the other Member States concerned. **Liaison Departments** and **Competent Officials** are designated to exchange information directly with offices of other Member States. Every time they send or receive a request for assistance or a reply to a request for assistance they are required to inform the Central Liaison Office of their Member State. They are also obliged to notify the Central Liaison Office and competent authority of their Member State about any request for assistance received which requires action outside their territorial or operational area.

### 2.38.2.1 Use cases view

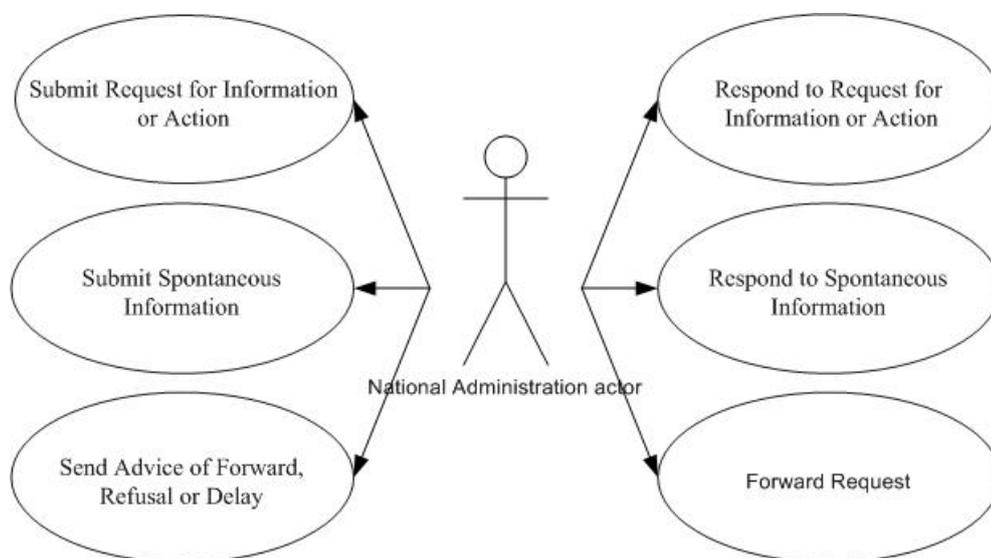


Figure 2-140: Exchange of Forms Use Case View

#### **Submit Request for Information or Action**

The Applicant Authority from the Applicant Member State creates request for information or for administrative action and send it to the competent authority (Requested Authority) of the Member State concerned (Requested Member State).

#### **Respond to Request for Information or Action**

The Requested Authority from the Requested Member State receives request from the Applicant Authority from the Applicant Member State. In the response to the received request the Requested Authority prepares information or undertakes proper administrative actions. Afterwards information or outcome of action is send to the Applicant Authority.

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### **Forward Request**

In the case when a request has been addressed to the wrong Authority. The concerned Authority can forward it to the proper one, but only within the same Member State.

### **Send Advice of Forward, Refusal or Delay**

The Requested Authority can send such information to the Applicant Authority when it decides that the request is not relevant from the perspective of the Requested Authority or it is not geographically or operationally competent to provide a response. Also when the Requested Authority decides that it needs additional input to respond to the request, an input that the Requested Authority does not anticipate to receive in due time.

### **Submit Spontaneous Information**

The proper Authority in one of the Member States can send information, it deems to be important, to the proper Authority in another Member State.

### **Respond to Spontaneous Information**

Upon receipt of Spontaneous Information the concerned Authority can decide to send feedback concerning received information to the Authority that provided it. However contrary to the Request for Information or Action there is no obligation to proceed with such an action and the concerned Authority does not have to reply to Spontaneous Information.

#### **2.38.2.2 Domain vocabulary**

The E-Forms System covers exchange of messages in strictly defined formats. There can be distinguished three forms that are used:

- SCAC (Standing Committee on Administrative Cooperation ) FORM 2004
- SCAC (Standing Committee on Administrative Cooperation ) Notification
- SCAC (Standing Committee on Administrative Cooperation ) Missing Trader Fraud

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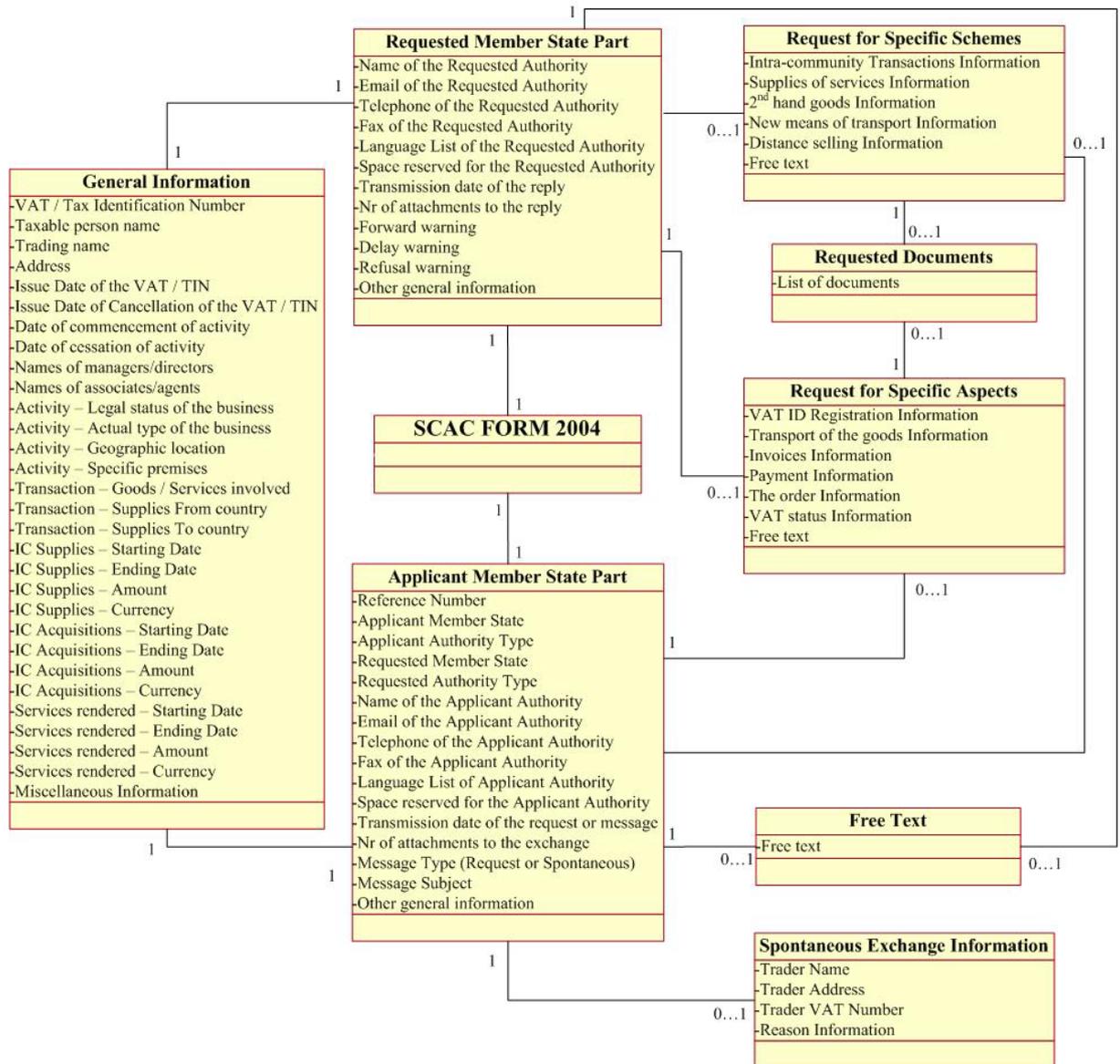


Figure 2-141: Exchange of Forms Domain Vocabulary: SCAC FORM 2004

**SCAC FORM 2004** is a form used by the Applicant Authority to submit Request for Information to the Requested Authority. Available requests for information can be split into two main types the Requests for Specific Aspects and the Requests for Specific Schemes. SCAC FORM 2004 is also exploited to provide a reply to the specific request. Moreover beside Request for Information it can also carry Spontaneous Information and if need be corresponding to it optional response.

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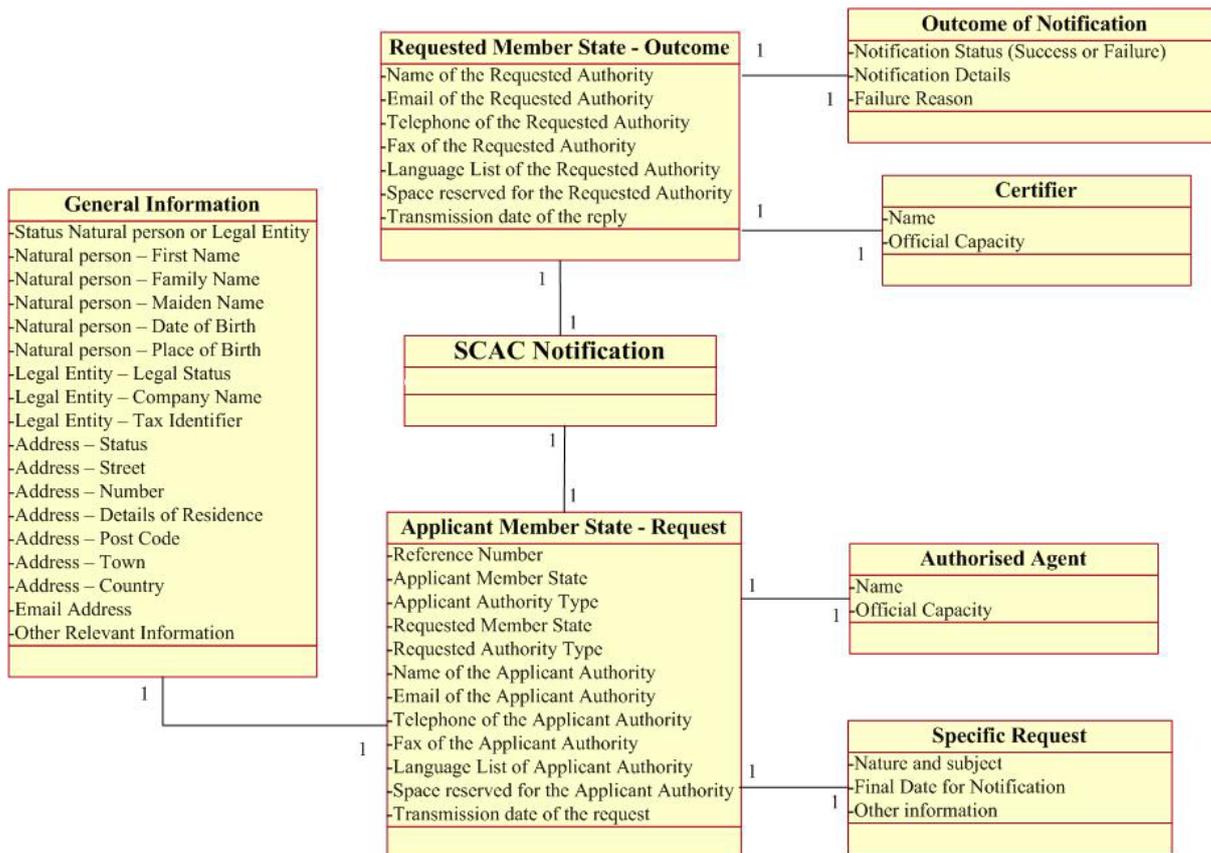


Figure 2-142: Exchange of Forms Domain Vocabulary: SCAC Notification

**SCAC Notification** is a form commonly used to notify of the Applicant Authority decision to another Member State who communicates it to its taxable person. Generally it is used by the Applicant Authority as a mean to submit Request for Action to the Requested Authority. SCAC Notification is also exploited to carry a feedback concerning the specific request.

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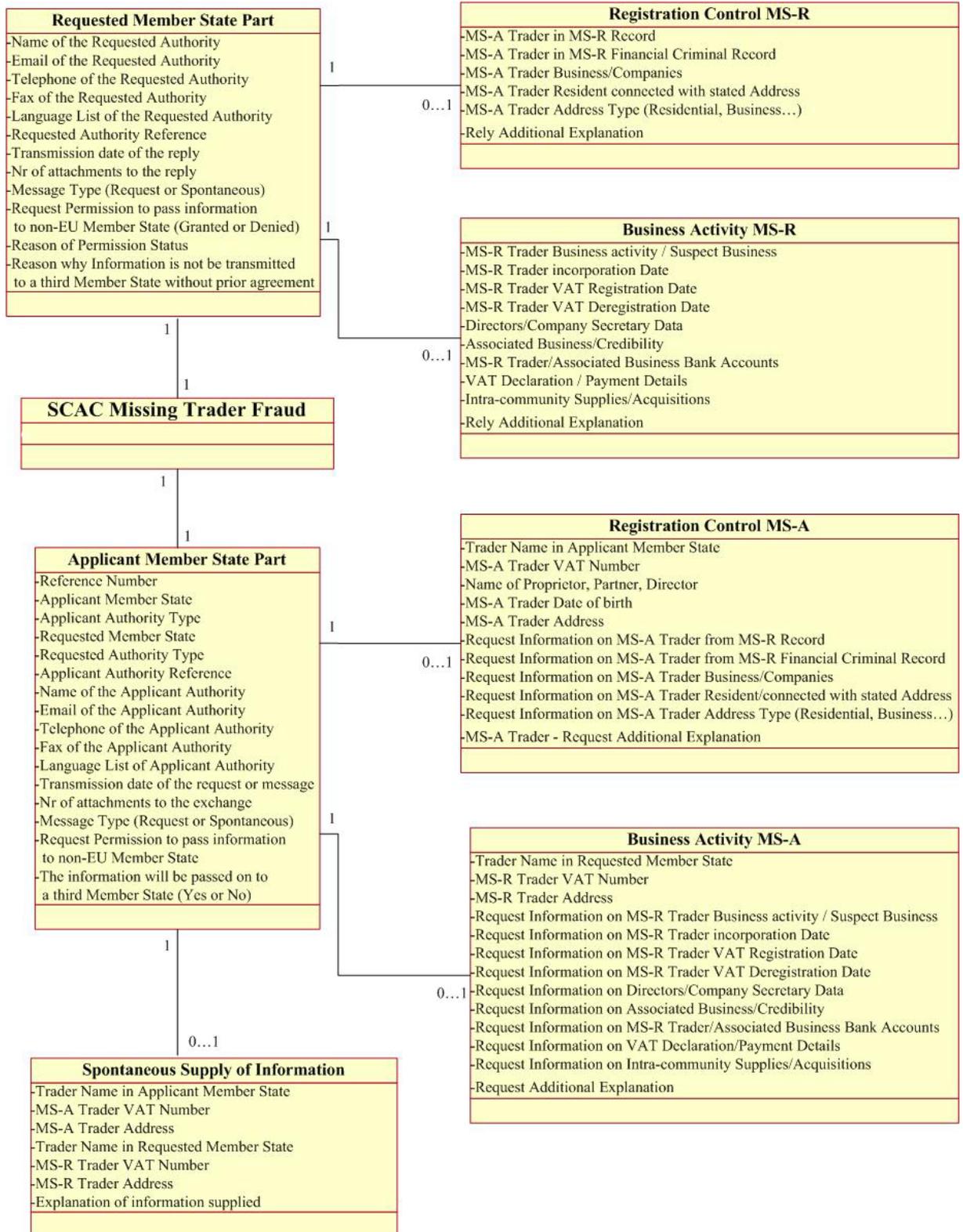


Figure 2-143: Exchange of Forms Domain Vocabulary: SCAC Missing Trader Fraud

**SCAC Missing Trader Fraud** is a form used for as fast exchange of information in case of suspected fraudulent operation. It can carry Request for Information from the

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Applicant Authority to the Requested Authority. Also it is then also exploited to provide a reply to the specific request. However it can also carry Spontaneous Information and if need be corresponding to it optional response.

### **2.38.3 Application perspective**

The application perspective of the system has been presented in the [Movement Verification System \(MVS\) - Application Perspective section](#). The MVS system is the implementation of the Exchange of Forms system, where different forms are defined and exchanged between concerned Member States.

### **2.38.4 Technical perspective**

The technical perspective of the system has been presented in [the Movement Verification System \(MVS\) - Technical Perspective section](#).

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## 2.39 VIES Test Application

### 2.39.1 Reference and Applicable Documents

Id	Title	Reference	Version
VIES_ TA_F S	Test VIES Phase V/Unicode - Functional Specification	FITSDEV-FS-VIES- ViesTestApp-V3.01.doc	3.01
VIES_ TA_T S	Test VIES Phase V/Unicode Technical Specification	FITSDEV-TS-VIES- ViesTestApp-V3.01.doc	3.01
VIES_ ATS	Test VIES Phase V/Unicode Acceptance Test Specification	VIES-ATS-030 (1.11)_TC.doc	1.11
VIES_ ATS_ SPEC	VIES - 3rd MS Request - Specific Acceptance Test Specifications	FITSDEV-ATS- 3rdMSRequest-v1.01.doc	1.01
VIES_ INIT	Initial VIES Phase V/Unicode Technical Specification	FITSDEV-TS-VIES- ViesInitApp-V3.01.doc	3.01

Table 2-39: VIES Test Application Reference documents

### 2.39.2 Functional perspective

The VIES System covers exchange of defined messages between National VIES Applications. Each Member State maintains its own National VIES application and electronic database. Therefore it is necessary to confirm that National Administrations have implemented correctly the rules governing exchange of VAT and turnover information in the Common Domain into their local applications. The **VIES Test Application** is dedicated to test, if the tested VIES application is able to provide correct support for exchange of information with other VIES applications and authorized users.

#### 2.39.2.1 Use cases view

The VIES Test Application emulates a Member State providing a tested National VIES application with a party to exchange information with. When the VIES Test Application acts as an Applicant Member State (MS-A) the tested National VIES application (MS-T) fulfils a role of a Requested Member State (MS-R). Accordingly when the VIES Test Application assumes role of a Requested Member State (MS-R), the tested National VIES application (MS-T) acts as an Applicant Member State (MS-A).

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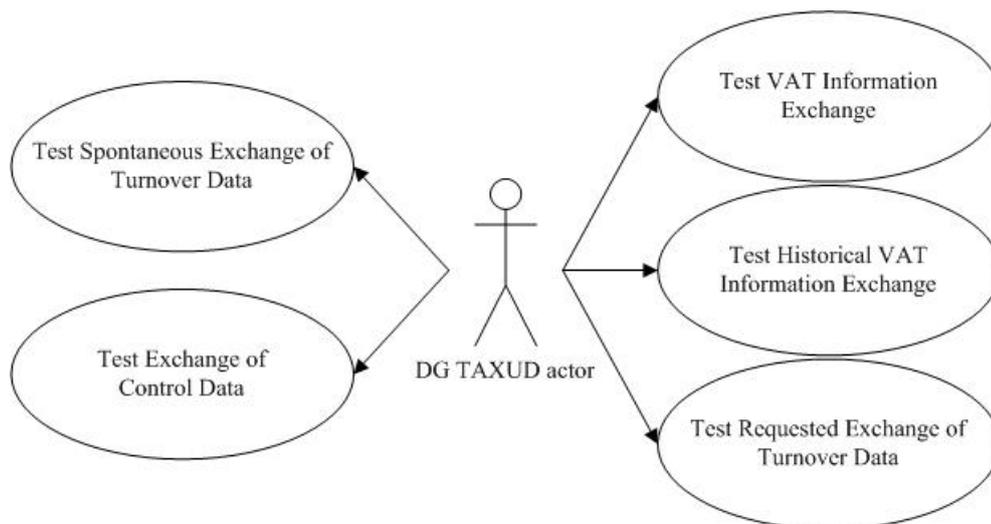


Figure 2-144: VIES Test Application Use Case View

### **Test VAT Information Exchange (VATR)**

The VIES Test Application acting as an Applicant Member State (MS-A) prepares and sends to the tested National VIES application (MS-T) a request for VAT Information. The tested National VIES application acting in the capacity of a Requested Member State (MS-R) provides the Applicant Member State (MS-A) with a corresponding reply to the received request. The VIES Test Application verifies correctness of this message.

The VIES Test Application acting as a Requested Member State (MS-R) receives from the tested National VIES application (MS-T) a request for VAT Information. This message is verified concerning its correctness. On the basis of test data present in a database, the VIES Test Application prepares message, corresponding to the request and sends it to the tested National VIES application (MS-T).

### **Test Historical VAT Information Exchange (HVATR)**

The VIES Test Application acting as an Applicant Member State (MS-A) prepares and sends to the tested National VIES application (MS-T) a request for Historical VAT Information. The tested National VIES application acting in the capacity of a Requested Member State (MS-R) provides the Applicant Member State (MS-A) with a corresponding reply to the received request. The VIES Test Application verifies correctness of the received message.

The VIES Test Application acting as a Requested Member State (MS-R) receives from the tested National VIES application (MS-T) a request for Historical VAT Information. This message is verified concerning its correctness. On the basis of test data present in a database, the VIES Test Application prepares corresponding to the request message and sends it to the tested National VIES application (MS-T).

### **Test Requested Exchange of Turnover Data (L1F1, L1C, L1CM, L1F2, L2F1, L2F2, L2F1\_3MS)**

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The VIES Test Application acting as an Applicant Member State (MS-A) prepares and sends to the tested National VIES application (MS-T) a request for Turnover data. The tested National VIES application acting in the capacity of a Requested Member State (MS-R) provides the Applicant Member State (MS-A) with a corresponding reply to the received request. The VIES Test Application verifies correctness of the received message.

The VIES Test Application acting as a Requested Member State (MS-R) receives from the tested National VIES application (MS-T) a request for Turnover data. This message is verified concerning its correctness. On the basis of test data present in a database VIES Test Application prepares corresponding to the request message and sends it to the tested National VIES application (MS-T).

In cases of several types of Turnover data (L1F1, L1C, L1CM) there takes place an exchange of additional message. Upon receipt of the response an Applicant Member State (MS-A) sends to a Requested Member State (MS-R) a message containing results of data control (O\_MCTL). Correctness of this message also undergoes verification in a Requested Member State (MS-R).

### **Test Spontaneous Exchange of Turnover Data (L1QD)**

The VIES Test Application, without a preceding request, on the basis of test data present in a database prepares and sends to the tested National VIES application (MS-T) Turnover data. In the response to that information, the tested National VIES application (MS-T) sends to the VIES Test Application a message containing results of data control (O\_MCTL). Correctness of this message is verified by the VIES Test Application.

The tested National VIES application (MS-T), without a preceding request, prepares and sends to the VIES Test Application Turnover data. Correctness of received message is verified by the VIES Test Application and afterwards a message containing results of data control (O\_MCTL) is sent to the tested National VIES application (MS-T).

### **Test Exchange of Control Data (O\_MCTL)**

The VIES Test Application prepares and sends to the tested National VIES application (MS-T) L1QD. The tested National VIES application (MS-T) responds with a message containing results of data control (O\_MCTL). Correctness of this message concerning data contained in L1QD is verified by the VIES Test Application.

The tested National VIES application (MS-T) prepares and sends to the VIES Test Application L1QD. The VIES Test Application responds the tested National VIES application (MS-T) with a message containing the results of data control (O\_MCTL).

The VIES Test Application acting as an Applicant Member State (MS-A) prepares and sends to the tested National VIES application (MS-T) a request for L1F1 Turnover data. The tested National VIES application acting in the capacity of a Requested Member State (MS-R) responds with a corresponding reply. The VIES Test Application responds the tested National VIES application (MS-T) with a message containing results of data control (O\_MCTL).

The tested National VIES application (MS-T) acting as an Applicant Member State, (MS-A) prepares and sends to the VIES Test Application a request for L1F1 Turnover

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data. The VIES Test Application, acting in the capacity of a Requested Member State (MS-R), responds with a corresponding reply. The tested National VIES application (MS-T) responds with a message containing results of data control (O\_MCTL). Correctness of this message concerning data contained in L1F1 Turnover data is verified by the VIES Test Application.

### 2.39.2.2 Domain vocabulary

The diagram presents main classes of information necessary to ensure correct exchange of VAT, Historical VAT and Turnover Data (Level 1 - Level 2).

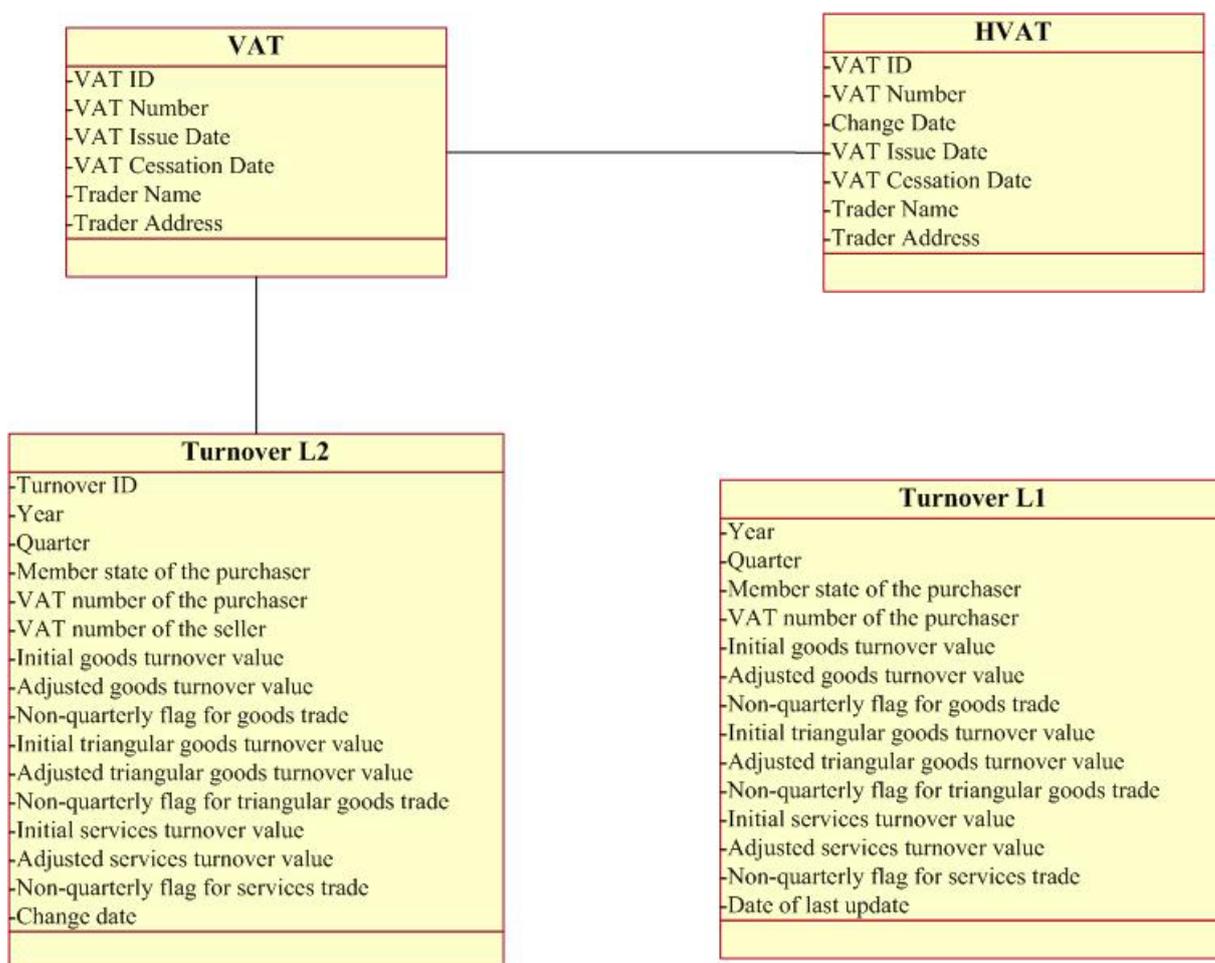


Figure 2-145: VIES Test Application Domain Vocabulary

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## **VAT**

This class presents the registration information of the taxable entities of the member state at the current moment. It is necessary for retrieval of the registration information per VAT Number.

## **HVAT**

This class presents the history of the registration information of the taxable entities of the member state (including the current status). It is necessary for retrieval of the history information of one VAT Number.

## **Turnover L2**

This class presents the turnover data of taxable sellers from the concerned Member State and purchasers from other countries of the European Union. It is necessary for retrieval of the turnover data:

- per quarter;
- per quarter and purchaser;
- per quarter and purchaser and seller;
- per quarter and seller.

## **Turnover L1**

This class presents the turnover data of a purchaser. It enables retrieval of the turnover data for a quarter or per quarter and purchaser.

### **2.39.3 Application perspective**

#### **2.39.3.1 Application structure**

The VIES Test Application consists of two separate components: a Test Server and a Test Client. Those components are used to test their counterpart of the tested MS VIES application: the Test Client tests the server part and the Test Server tests the client part.

The VIES Test Application use and assume, that the lower technical layers function correctly, e.g. the VIES Initial Application (Client and Server modules), CSI/CCN infrastructure and MS national infrastructure.

The following are the general components of the VIES Test Application, external applications and systems are placed on the diagram to provide supplementary information.

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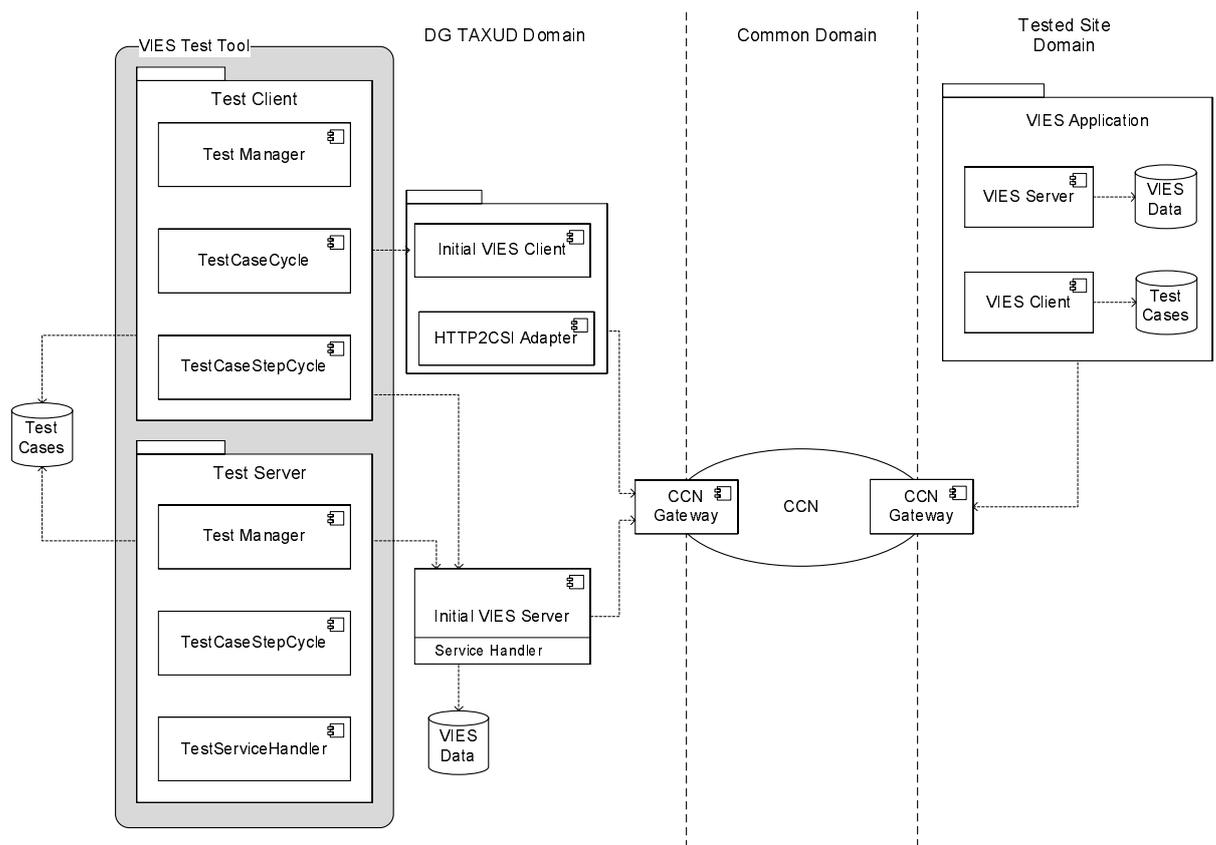


Figure 2-146: VIES Test Application – Application structure

Below is a short description of VIES Test Application modules and its core responsibilities.

### **Test Client**

The Test Client is used to verify the correctness of the implementation of the VIES Server application module, operated by the MS under test. This is archived by the Test Client playing a role of the VIES Client and issuing requests to the MS VIES Server under tests.

The test client encapsulates and uses the VIES Initial Client and Server modules. The Initial Client is used to send and receive VIES messages and to check the syntax of the reply. The Initial Server is used to check reply values for semantic correctness. In this sense, the Initial Server is connected to a semantically equal to tested MS VIES data (The VIES data must be provided by the tested MS) and simulates the requested MS. If both replies: received from the tested application and Initial Server, are equal, the tested application is considered to be correctly implemented. After completion of a step, the results are stored as an XML file at a configurable location on the file system

### **TestManager**

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Main application of the test client. Responsible for cleaning up the CSI queues, serialisation / deserialisation of data, loading of test suites and triggering of test suites.

### **TestCaseCycle**

Representation of the VIES interaction by test case steps.

### **TestCaseStepCycle**

Representation of a request, response or spontaneous VIES message. Executes a request and waits (synchronous) or checks for (asynchronous) a response. A request is compared with the response of the Initial VIES Server

### **Test Server**

The Test Server is used to verify the correctness of the implementation of the VIES Client application module, operated by the MS under test. This is archived by the Test Server playing a role of the VIES Server receiving requests and issuing replies to the MS VIES Client under tests.

The Test Server uses the Initial Server application to receive and respond to VIES messages. It uses the test cases to send related responses to the received requests. The VIES data must be provided to the tested MS and is used by the tested MS to create the request test cases.

The requests of the tested MS VIES Client are considered to be correct. The responses generated for these requests can be either correct or erroneous. For this, both parties have to agree on certain requests to which the test server responds with an erroneous or correct reply, the process of defining what reply should be sent, is realised by the TestServiceHandler.

### **TestManager**

Is responsible for cleaning up the CSI queues, loading and triggering of test suites.

### **TestServiceHandler**

The TestServiceHandler is responsible for determining how to respond to the certain received VIES request (sent by tested MS application). The component performs a lookup for defined corresponding erroneous responses and returns it, if the defined response is not found, it redirects the processing of the request to the Service Handler.

### **ServiceHandler**

The Service Handler generates corresponding and correct response according to the local VIES data. The component is called by the TestServiceHandler, in case, when no predefined response has been found.

### **VIES Initial Server application**

The Initial Server application implements the functionality of the VIES Server application. It is a J2EE Web Application running on the Tomcat Web Server. It is connected to VIES data semantically equal to the tested MS VIES server data. The application is capable of receiving VIES request message, and basing on the available data it can generate proper VIES response. In the context of the VIES Test Application, it is used to either, verify correctness of the response received from the tested MS VIES

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Server or prepare response for the correct request issued by the tested MS VIES Client application.

### VIES Initial Client application

The VIES Initial Client application is a reference implementation of the VIES Client application. It is a J2EE Web Application running on the Tomcat Web Server. In the context of the VIES Test Application, it is used to send and receive VIES messages to the tested MS VIES Server application.

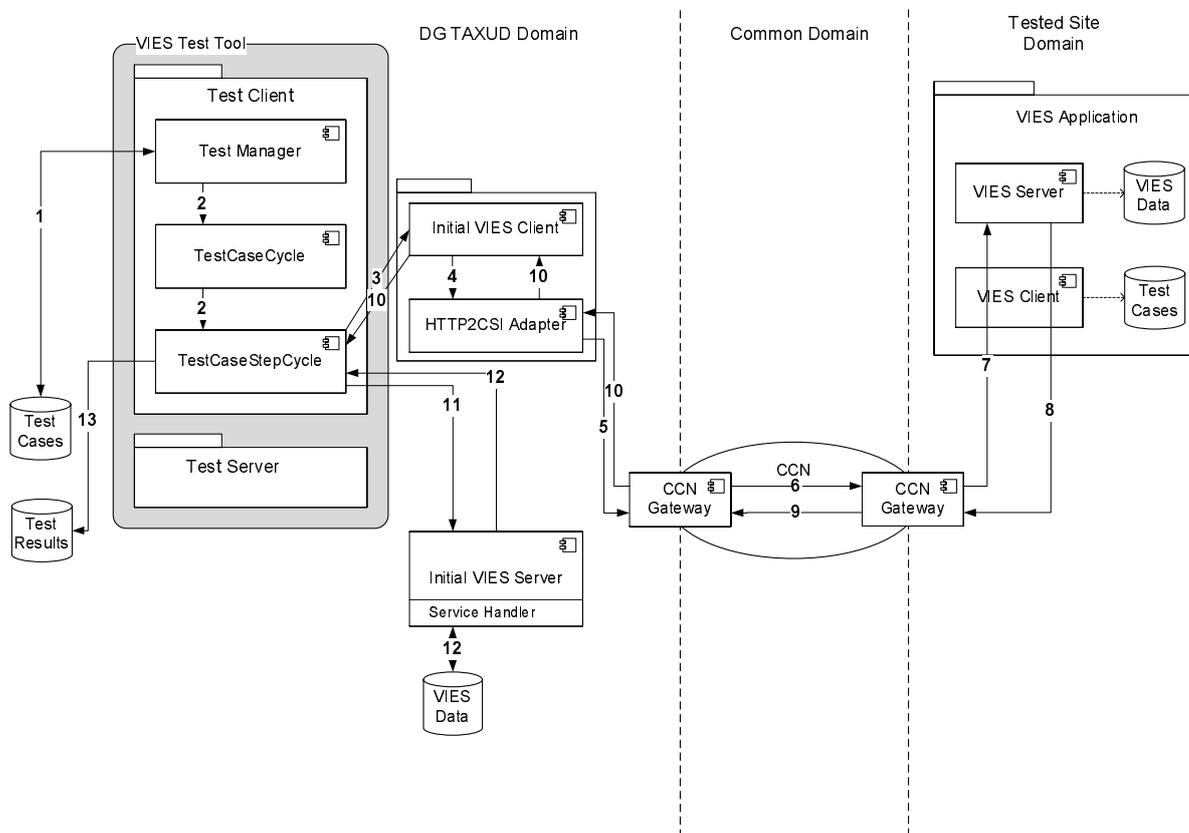
### HTTP2CSIAdaptor

The HTTP2CSI Adaptor is a component responsible for converting the received XML HTTP requests into CSI request messages, that can be further transported over the CCN Infrastructure. It is also capable of performing the conversion in the opposite direction: the CSI response messages are converted into XML HTTP responses.

#### 2.39.3.2 Application dynamics

The following process model describes the major interaction between the test components identified in previous section. The model abstracts from detailed API calls, and rather shows a high-level interaction between components taking part in processing flow. The interactions are shown from the point of view of test client and server.

### Sequence Diagram of Test Client



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Figure 2-147: VIES Test Application – Sequence diagram of Test Client

1. TestManager deserializes and loads into memory the Test Suite stored on the local XML file repository
2. The TestCaseCycle and TestCaseStepCycle are called, they will iterate over the Test Cases and Test Sequences, during the runtime of the testing application.
3. For the particular test case step, the message representing that step is passed to the Initial VIES Client Application. The message is transformed into XML HTTP request and sent to the HTTP2CSI Adapter.
4. The HTTP2CSI Adapter, transforms the XML HTTP request into proper VIES CSI message.
5. This message is send further to the local CCN/CSI Gateway.
6. The message is transported over the CCN Infrastructure.
7. Local CCN gateway receives the message and sends it to the tested application.
8. The Tested Application (MS VIES Server application) processes the request message, and prepares appropriate reply message, basing on the local VIES data. VIES CSI reply message is sent to the local CCN/CSI Gateway.
9. The message is transported over the CCN Infrastructure, to the appropriate gateway, responsible for issuing the request.
10. The Initial Client Application receives the reply message, transforms it into XML HTTP response, and forwards to the TestCaseStepCycle.
11. TestCaseStepCycle sends the VIES Request message to the Initial VIES Server application. The request sent contains the same request information that was previously sent to the tested application.
12. The Initial VIES Server application processes the request and prepares adequate reply basing on the available VIES data. The reference VIES data used, must be same data, as data located in the tested MS application.
13. The reply from the Initial Server application is compared to the reply received from the tested application. If properly implemented, both replies (from the Initial Server application and tested application) should contain the same data (due to the fact, that the queries were made on the same dataset, and Initial Server application is considered to be implemented correctly). The results of comparison are stored as an XML file.

### **Sequence Diagram of Test Server**

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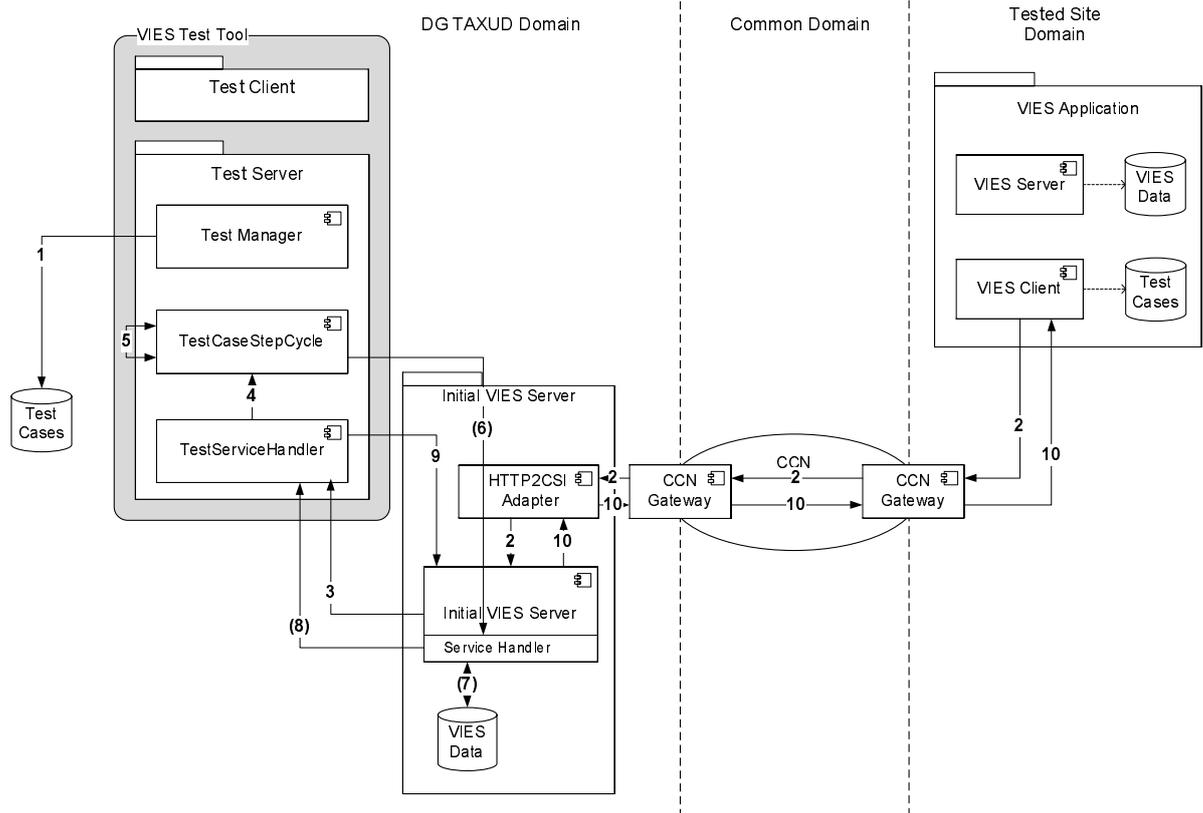


Figure 2-148: VIES Test Application – Sequence diagram of Test Server

1. TestManager deserializes and loads into memory the Test Suite stored on the local XML file repository
2. Tested VIES Client application sends, mutually agreed, VIES request message, to the national CCN/CSI Gateway. The message is transported over the CCN infrastructure to the desired local CCN/CSI Gateway, and further forwarded to the Initial VIES Server application.
3. The Initial VIES Server receives the message and dispatches its processing to the TestServiceHandler.
4. TestServiceHandler forwards the processing of the request message to the TestCaseStepCycle.
5. TestCaseStepCycle looks for a matching request in all test case steps to return an erroneous response to the request received. If the appropriate erroneous reply is found, it is returned.
6. If no appropriate erroneous reply was found, the request is then forwarded to the Service Handler component that is a part of the Initial VIES Server application.
7. The Service Handler processes the request, and prepares response message, basing on available VIES data.
8. The reply message is forwarded to the TestServiceHandler component.

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9. The TestServiceHandler forwards the reply message to the Initial VIES Server application.
10. The Initial VIES Server application receives the reply message and forwards it to the local CCN/CSI Gateway, the message is then transported over the CCN infrastructure to the desired MS CCN/CSI Gateway, and delivered to the tested VIES Client Application

## **2.39.4 Technical perspective**

### **2.39.4.1 Service access and delivery**

#### **Access Channels**

The test application itself provides no graphical user interface. Test suite and result data are XML files stored in a directory that can be accessed by any text editor, capable of reading and writing UTF-8.

The VIES Initial Application, used as a component of VIES Test Application, provides HTML Graphical User Interface (GUI), that can be accessed using standard Web browser.

#### **Delivery Channels**

The application can be accessed over the local network of DG TAXUD.

#### **Service transport**

The data exchanged during testing can be treated as regular VIES traffic, and is transported over the CCN infrastructure, using native CSI protocol. The communication with GUI client-side part (HTML Web browser) is realised using the HTTP protocol.

### **2.39.4.2 Service platform**

#### **General platforms**

The application is developed on basis of the Java technology. Basing of its core platform independency it can be run on any system supporting the Java Run-time Environment (JRE) version 1.3\_x. Additional programming libraries have been used:

JRegEx - Regular Expression parser for Java-1.2\_01

Log4J - Java logging facility.-1.2.8

XStream - Java Serialisation to XML-1.1

db4objects - Native object database to store Java objects to filesystem-4.3

The application needs the following external software components to function properly.

CCN/CSI environment

Initial Client VIES Phase V/Unicode application - 2.x

Initial Server VIES Phase V/Unicode application - 2.x

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### **Delivery servers**

The Testing Client and the Testing Server are regular Java applications that can be run from command line as separate processes.

The Tomcat Web Server is used to provide runtime environment for the VIES Initial and Server Applications.

### **Database**

All input and output data of the test application is primarily stored in a file system. Input and output data are stored in separated file system directories.

#### **2.39.4.3 Component framework**

### **User presentation**

For the Initial Server and Client Applications an HTML based user interface is available.

For data handling, the VIES specification foresees the usage of Unicode, i.e. UTF-8. However, the VIES specification defines an illegal UTF-8 byte, i.e. 0xFF in the TA field to separate the address lines.

The test suite also uses UTF-8, but replaces this illegal character in order to facilitate the editing of the test suite by common tools. In common tools, the encoding used for separating lines is not directly visible for the user. However, the separator is an element of the syntax of the VIES message.

### **Business logic**

For the Testing Client and Testing Server special components (TestCaseCycle, TestCaseStepCycle and TestManager) were implemented. Those components are responsible for managing the general flow of the processing and data across the application.

### **Data management**

The test suite, upon start up of the application, is completely loaded from stored XML files into operational memory. For this, the deserialisation and serialisation mechanism to XML is used (realised by the XStream serialisation framework).

The test suite for the acceptance test is below 1MB. However, the test results can reach a size bigger than the available memory in Java. Therefore, the test results and temporary processing data are stored in a system file. Only needed data is loaded on demand and saved after processing.

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## 2.40 VAT-on-e-Services Remote Test Application

### 2.40.1 Reference and Applicable Documents

Id	Title	Reference	Version
VOES _UG	VAT ON E- COMMERCE  User Guide	VAT on e-Commerce - UG_v1.0.doc	1.0
VOES _TS	VAT-on-e-Services Technical Specifications	VAT on e-services - TS_v5.2.doc	5.2

Table 2-40: VoeS RTA Reference documents

### 2.40.2 Functional perspective

VoeS System covers exchange of defined messages between National VoeS Applications. Each Member State maintains its own National VoeS application and electronic database. Therefore it is necessary to confirm that National Administrations have implemented correctly the rules governing the e-commerce functionality in the Common Domain into their local applications. **VoeS Remote Test Application (VoeS RTA)** is dedicated to test that the National VoeS application can process correctly messages coming from Member States of identification and to produce, based on correct input coming from the NETPS, the messages that must be sent to the Member States of consumption.

#### 2.40.2.1 Use cases view

VoeS Remote Test Application (VoeS RTA) emulates a Member State providing a tested National VoeS application with a party to exchange information with. When VoeS RTA acts as a Member State of identification the tested National VoeS application fulfils a role of a Member State of consumption. Accordingly, when VoeS RTA assumes role of a Member State of consumption, the tested National VoeS application acts as a Member State of identification.

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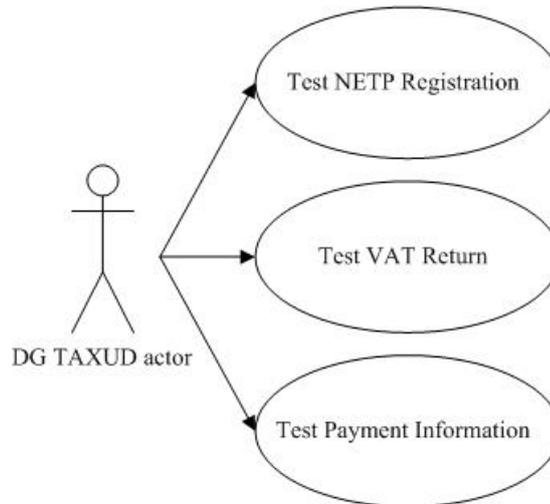


Figure 2-149: VoeS Remote Test Application case uses

### **VoeS Remote Test Application (VoeS RTA) as a Member State of identification**

#### **Test NETP Registration**

VoeS RTA, on the basis of test data present in a database, prepares NETP Registration and sends prepared NETP Registration to the tested Member State.

#### **Test VAT Return**

VoeS RTA, on the basis of test data present in a database, prepares VAT Return and sends prepared VAT Return to the tested Member State.

#### **Test Payment Information**

VoeS RTA, on the basis of test data present in a database, prepares Payment Information concerning VAT Return and sends prepared Payment Information to the tested Member State.

### **VoeS Remote Test Application (VoeS RTA) as a Member State of consumption**

#### **Test NETP Registration**

The tested National VoeS application acting as the Member State of identification sends to VoeS RTA NETP Registration. After delivery VoeS RTA checks if NETP Registration is equivalent to the provided reference file. Afterwards verified NETP Registration is uploaded into the database.

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### **Test VAT Return**

The tested National VoeS application acting as the Member State of identification sends to VoeS RTA VAT Return. After delivery VoeS RTA checks if VAT Return is equivalent to the provided reference file. Afterwards verified VAT Return is uploaded into the database.

### **Test Payment Information**

The tested National VoeS application acting as the Member State of identification sends to VoeS RTA Payment Information. After delivery VoeS RTA checks if Payment Information is equivalent to the provided reference file. Afterwards verified Payment Information is uploaded into the database.

#### **2.40.2.2 Domain vocabulary**

The diagram presents main classes necessary to ensure correct exchange of NETP Registration, VAT Return and Payment Information.

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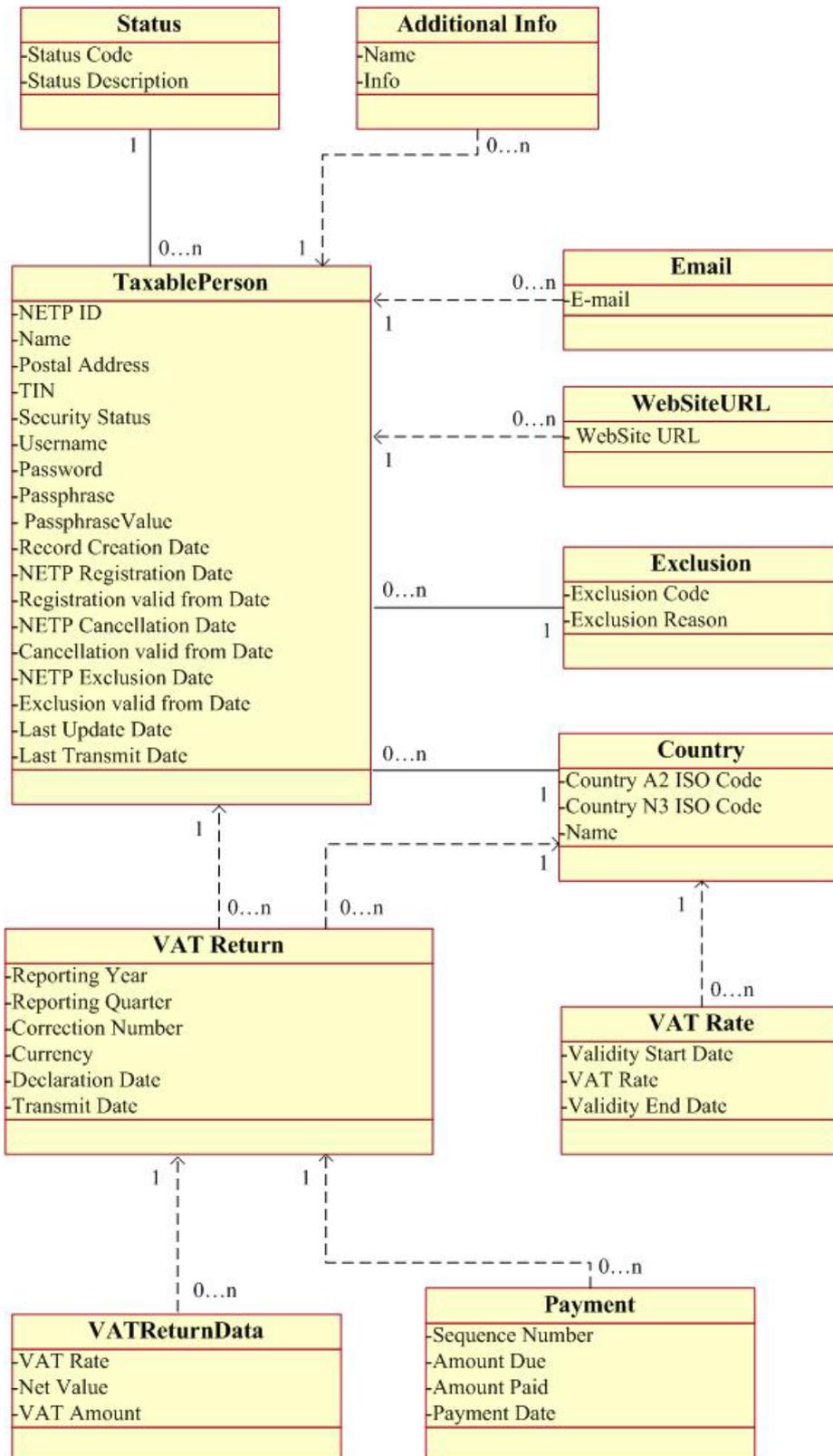


Figure 2-150: VoeS Remote Test Application data

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**TaxablePerson** contains the non-established taxable person main registration information.

**WebSiteURL** contains additional registration information concerning the non-established taxable person web site URLs.

**Email** contains additional registration information concerning the non-established taxable person e-mail address.

**Additional Info** contains additional registration information concerning the non-established taxable person.

**Status** stores the possible values for the non-established taxable person status (Submitted, Registered, Cancelled, Excluded and Rejected).

**Exclusion** stores the possible values for exclusion reason in the case when the non-established taxable person status has been excluded from VAT Return scheme.

**Country** contains information on the non-established taxable person's country or the Member State of consumption.

**VAT Rate** contains information concerning the applicable VAT rates in the Member States of consumption.

**VAT Return** stores all the non-established taxable person main VAT declaration data.

**VATReturnData** stores the non-established taxable person VAT declaration data concerning due VAT amounts.

## 2.40.3 Application perspective

### 2.40.3.1 Application structure

The Remote Test Application is made up of two parts:

- Initial Application.
- Testing Layer.

The two following sections explain in what consists this pre-processing, when acting as a Member State of identification or consumption.

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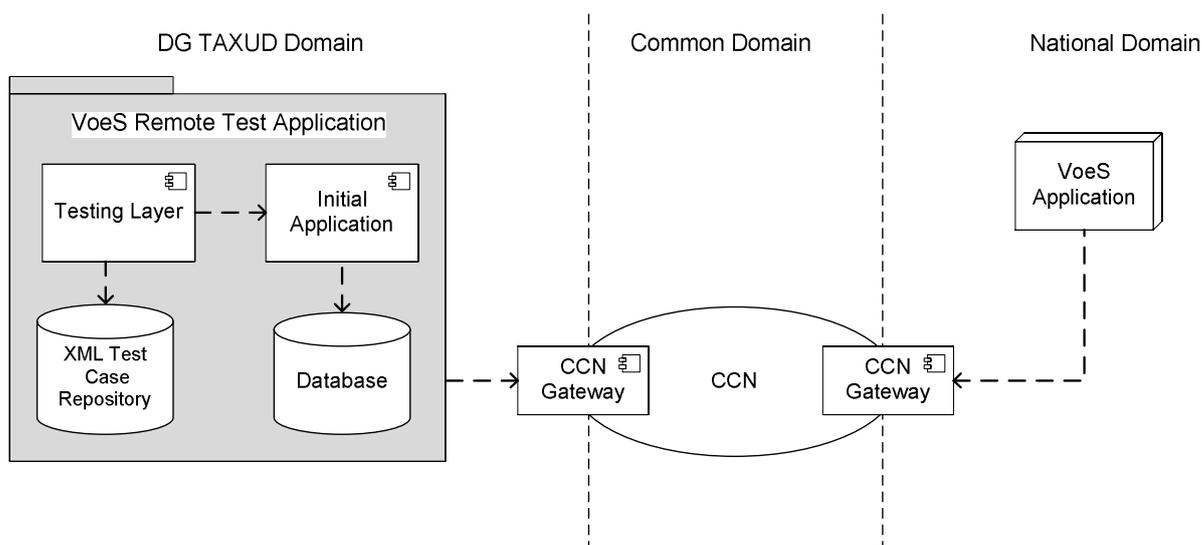


Figure 2-151: VoeS Remote Test Application structure

### **Testing Layer**

Performs pre-processing and pre-checking of the data, prior to forwarding it to the Initial Application. The data is stored separately for each test scenario, in the XML format.

### **Initial Application**

Implements the core functionality of a Member State application. It is able to send and receive VoeS messages, and process them appropriately. The Database, which is a part of an initial application, is used to permanently store the data used for testing.

#### **2.40.3.2 Application dynamics**

VAT on e-services Remote Test Application can act in two roles, and depending on them, two different communication schemas will take place. These two roles (and corresponding communication schemas) are:

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**VoeS RTA acting as a Member State of identification (MSID).**

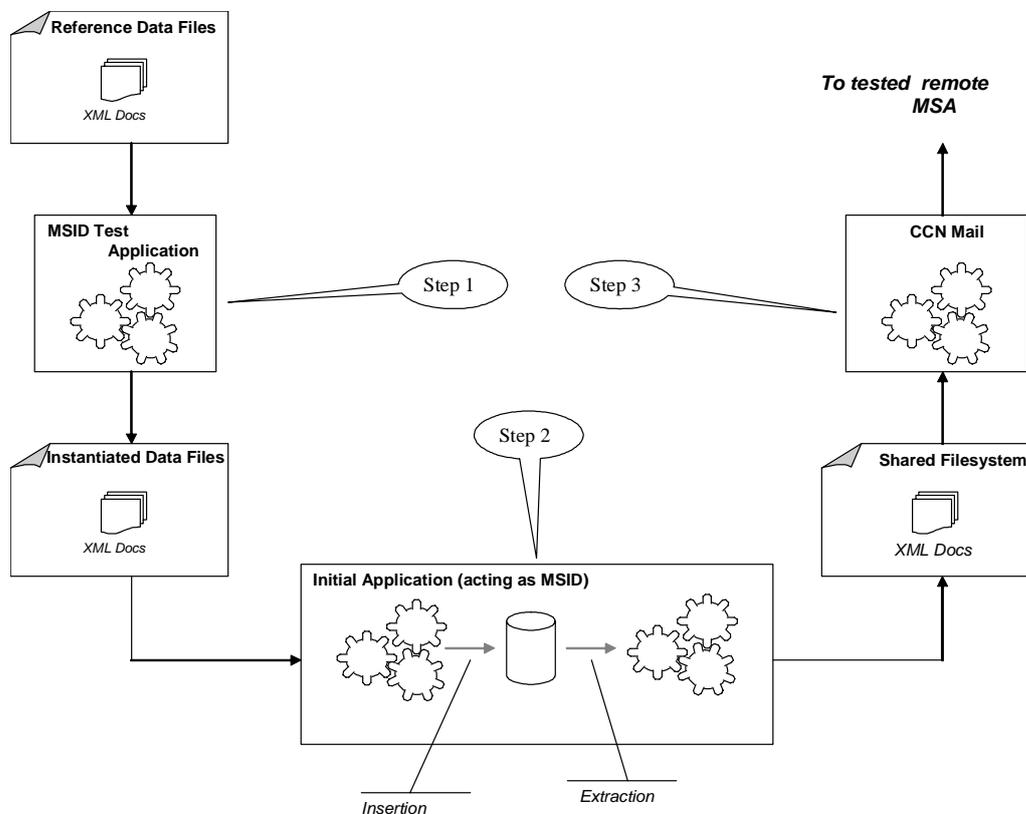


Figure 2-152: VoeS RTA acting as a Member State of identification (MSID).

1. MSID Test Application loads and pre-processes stored XML documents containing data for particular testing scenario executed. Pre-processed files are stored on disk.
2. Initial Application (playing role of MSID) loads the pre-processed files into its database. After this, the corresponding data is extracted from the database and placed in defined directories.
3. The documents placed in the defined directories are sent via CCN Mail to the MSCON under test.
4. {Externally to the RTA}MSCON, the Member State of consumption fills in its database with the document received and checks if the data has been correctly inserted in the database.

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**VoeS RTA acting as a Member State of consumption (MSCON).**

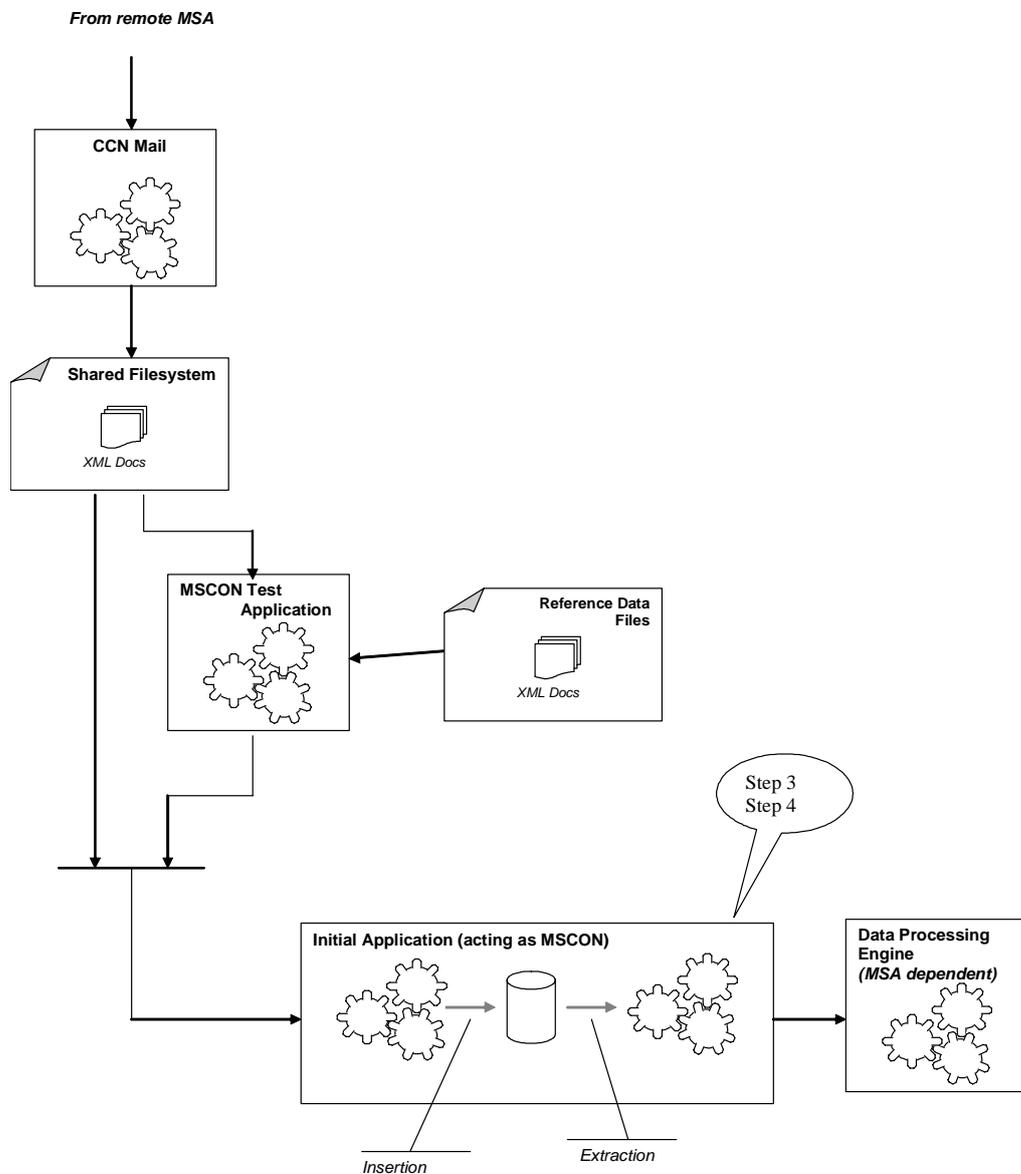


Figure 2-153: VoeS RTA acting as a Member State of consumption (MSCON).

1. {Externally to the RTA}The Member State under test fills in its database with the content of the reference test documents. This can be done via the Data Acquisition System dedicated to the NETP, via SQL scripts or via XML documents.
2. {Externally to the RTA}The data according to the scenario to be played is extracted from the database and sent to the RTA.
3. The RTA (acting as a MSCON) verifies whether the data received is equivalent to the expected data and inserts it, in its database. Any error that occurred during

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processing will be forwarded to the originating Member State that will take the appropriate actions to solve the problem.

4. The RTA sends an Acceptance Test Report to the MSID under test.

## **2.40.4 Technical perspective**

### **2.40.4.1 Service access and delivery**

#### **Access Channels**

The application functionality is available through operating system command line user interface. User can execute application commands and observe the results displayed on the screen.

#### **Delivery Channels**

The application can be accessed locally only (on the machine where application code is deployed and executed).

#### **Service transport**

As the results of application's work are observed locally, no specific transport protocol is utilized for communication with user. For data exchange with other Member States CCN mail protocol is used.

### **2.40.4.2 Service platform**

#### **General platforms**

The Initial Application and the Test Layer have been written in Java Programming language, for this Java 2 SDK, Standard Edition v1.3.1\_06 must be installed.

Applications have been fully tested under Windows NT SP4 and SP6. Nevertheless, completely written in Java, should work on any Java platform running JDK 1.3 or above and for which a supported database is available.

#### **Delivery servers**

The Initial Application and the Test Layer are stand-alone Java applications. They are run, by executing application code inside Java Virtual Machine (a part of Java Runtime Environment).

#### **Database**

MySQL database server version 3.23.52 is used on production environment.

Additionally application has been tested to work with PostgreSQL 7.3 database engine, but in case of using it, no support is available.

### **2.40.4.3 Component framework**

#### **Security**

On the Member State communication stage CCN/CSI security mechanisms are used.

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### **User presentation**

The application interface available is an operating system command line, where user can execute application commands.

### **Business logic**

The business logic embedded in the application is implemented as a regular programming language functions and method calls, no specific business rule engine is used.

### **Data management**

Java Database Connectivity (JDBC) API is used for accessing database. In particular, “MySQL Connector/J ver. 2.0.14” and “PostgreSQL JDBC2EE Driver” JDBC API implementations are utilized to perform communication with supported databases.

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## 2.41 Generic Test Tool

### 2.41.1 Reference and Applicable Documents

Id	Title	Reference	Version
GTT_ FS	Generic Test Tool Functional Specifications	FITSDEV-FS- GenericTestTool- V2.01.doc	2.01
GTT_ TS	Generic Test Tool Technical Specification	FITSDEV-TS- GenericTestTool- V2.01.doc	2.01

Table 2-41: Generic Test Tool Reference documents

### 2.41.2 Functional perspective

The Generic Test Tool (GTT) is a tool used to verify that rules governing exchange of information between various applications have been implemented correctly into one specific application. It is an application which is the basis of new test tools for various application domains (i.e. Taxation of Savings, E-Forms) and application protocols for the exchange of structured messages, i.e. XML.

#### 2.41.2.1 Use cases view

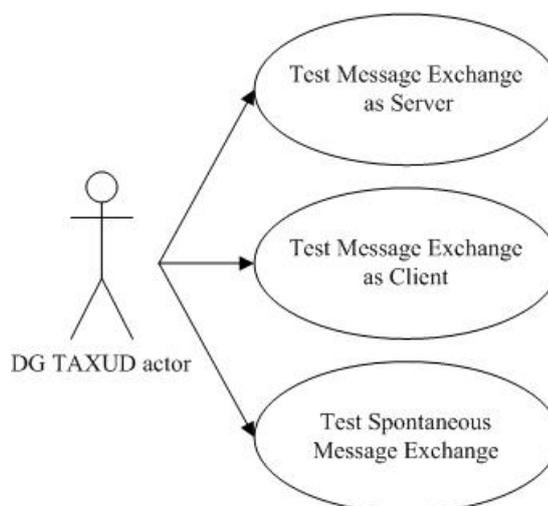


Figure 2-154: Generic Test Tool Use Case View

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The Generic Test Tool (GTT) emulates an operational application providing a tested application with a party to exchange information with.

### **Test Message Exchange as Server**

The tested application acting as an initiator of message exchange sends a request to the testing application (GTT). The testing application (GTT) verifies received message against reference data. As a response to the received request a proper reply is prepared and sent to the tested application.

### **Test Message Exchange as Client**

The testing application (GTT) acting as an initiator of message exchange sends a verified request to the tested application. As a response to the received request the tested application prepares a reply and sends it to the testing application (GTT). The testing application (GTT) verifies received message against reference data.

### **Test Spontaneous Message Exchange**

The tested application sends a spontaneous message to the testing application (GTT). As the message has a spontaneous character the tested application is not expecting any response. The testing application (GTT) verifies received message against reference data.

The testing application (GTT) sends a spontaneous message to the tested application. As the message has a spontaneous character the testing application (GTT) is not expecting any response. The tested application verifies received message against reference data.

#### **2.41.2.2 Domain vocabulary**

Not applicable.

### **2.41.3 Application perspective**

#### **2.41.3.1 Application structure**

The core principle of the Generic Test Tool (GTT) is to be extensible to allow specific functionality to be included for testing specific application domains. To meet this requirement an extendable 'plug-in' interface architecture has been implemented, where user defined set of plug-ins extend the basic testing capabilities allowing new applications or systems to be tested.

Depending on the setup of the GTT, it can simulate an MS-R (GTT acts as testing server waiting for an incoming request to produce the response) or MS-A (GTT acts as testing client to send messages to a server and waits for the potential response). The GTT can also simulate a MS-A sending a spontaneous message without waiting for a

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reply as well as simulating the MS-R waiting for a spontaneous message without sending a reply.

The core components of the system are as presented on the diagram:

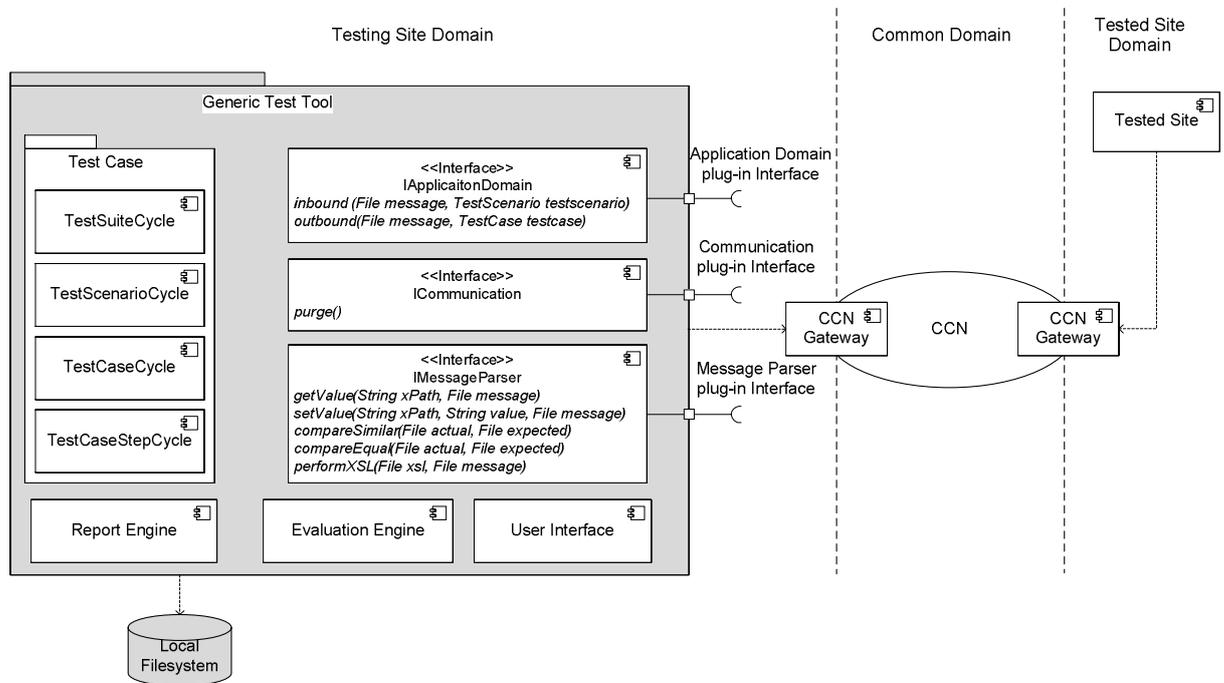


Figure 2-155: Generic Test Tool Application Structure

The following are the descriptions of the core GTT application components and its working environment.

The environment is divided into the following domains:

### Testing Site

#### **TestSuiteCycle**

Internal representation of the test suite. The test suite is stored externally in a repository as XML.

#### **TestScenarioCycle**

Internal representation of the test scenario. The end-user determines through the user interface a subset of the whole test suite to be executed. The sub-set is a test scenario. The configuration of the test scenario is stored externally in a repository as XML.

#### **TestCaseCycle**

Internal representation of the test case. The test case may resemble a request, response or spontaneous message scenario, depending on a flag in the test case description. If the GTT acts as a testing client, the first message of the test case is always sent out. Subsequent messages of the test scenario serve as the expected response. If the GTT

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acts as a testing server, the first message of the test scenario is expected to be received. Subsequent messages of the test scenario service as the reply being sent out.

### **TestCaseStepCycle**

Internal representation of the test case step. The test case step is a single message, which is either to be sent or expected to be received. All actually received and sent messages relating to this test case step are also stored inside the test case step.

### **Application Domain Plug-in Interface**

An interface for information exchange between the GTT and the component dedicated to the particular handling of an application domain.

### **Message Parser Plug-in Interface**

A component dedicated to the particular handling of incoming structured message types, e.g. XML, CSV. The module enables the digesting of structured messages and convert the data into a GTT internal format used for evaluation and reporting.

### **Communication Plug-in Interface**

A component dedicated to the particular handling of the desired communication channel, e.g. POP, SMTP and FTP. The plug-in will bridge between the local repository, i.e. file system and the communication channel given in the test case. Hence, the local file system is used by the other components for outbound and inbound messages.

### **Evaluation Engine**

A component that compares the actual received structured message with the expected message. This component will also produce a result code of the evaluation and persist the outcome, together with the received message in the repository.

### **Report Engine**

A component, that creates a cumulated report of the whole test run. This includes:

- Test Result of each test case step run;
- Test Result of each test case run;
- Test Result of the test scenario;
- Summary of passed and not passed messages.

### **User Interface**

A component, that renders the user interface on the end user's HTML browser. The user interface will allow to:

- Create a test scenario out of the test suite;
- Load and store the selection of the test scenario;
- Start, stop and resume the test execution;
- Show a cumulated result of the test execution:
  - Number of total test cases in the test scenario;
  - Number of so far executed test case;
  - Number of passed test cases;

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- Number of failed test cases.

### **Tested Site**

Tested Application Domain. This domain represents a peer, e.g. an application or human intelligence, which is able to receive from and/or send structured message to the common domain.

### **Common Domain**

Provides the means of communication between the two sites, e.g. FTP, POP(s) or SMTP(s). The Common Domain routes the structured messages between the peers without modifying its content.

### **GTT Plug-ins mechanism**

From the definitions placed above, it is visible that when adapting the GTT for testing of the particular application, besides preparing test data and the test cases, additional GTT plug-ins could be prepared (when needed):

- Application Domain Plug-In: GTT Provides API for the handling of application domain specific messages. For each particular tested application a plug-in has to be prepared allowing for specific business processing of the exchanged messages.
- Communication Plug-In: GTT Provides API for the handling of communication channels, e.g. SMTP / POP, FTP. For communication channels that are not supported by core components of GTT, additional plug-in can be implemented enabling communication over new channel.
- Message Parser Plug-In: GTT Provides API for reading, writing and comparing of structured messages. For each tested application, that uses unsupported message format, separate message parser plug-in will have to be written. The plug-in will enable the GTT to parse particular format of the messages exchanged and convert it to internal GTT format for further processing.

#### **2.41.3.2 Application dynamics**

The GTT can work in one of the following modes:

- GTT is a client and the tested application is the server
- GTT is a server and the tested application is the client
- GTT and tested application exchange spontaneous messages.

For every of those modes, the flow of processing and information between the GTT and the tested application will differ. This will imitate the GTT playing different roles in application conversation and therefore verifying different functional area of tested application.

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The following two scenarios: GTT processing outbound message and GTT processing inbound message, are a base to construct abovementioned testing modes (GTT acting as a client, server or exchanging spontaneous messages).

### GTT acting as a Testing Client – Outbound Message

The following sequence describes the behaviour of the GTT when acting as a testing server when sending (outbound) messages.

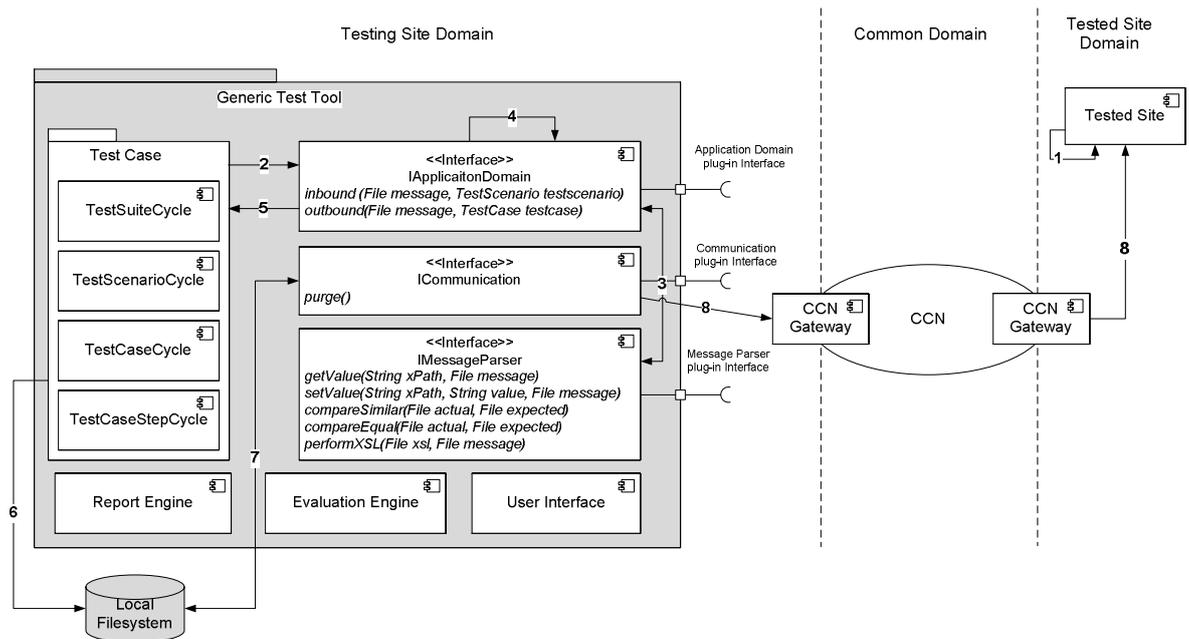


Figure 2-156: Generic Test Tool Application - GTT acting as a Testing Client: Outbound Message

### Tested Application

1. {External} The test data prepared for particular Test Scenario is loaded into tested application.

### TestCase

2. Create Physical Message: For the given Test Scenario, the component inserts prepared dynamic message data into the logical message to the extent known by the component. Additional placeholders, which are not known by the component will remain unchanged and are handled by the triggered application domain Plug-in component;

### Application Domain Plug-in

3. Parse Structured Message: The component triggers the particular Message Parser plug-in to receive an internal representation of the physical message, e.g. extract unique identifier from an XML or CSV message format for further processing. The internal format will give the component access to the placeholders that need to be replaced by the dynamic message data;

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4. Fill-in Dynamic Values: The component replaces placeholders with dynamic values. The dynamic values are application domain / business domain specific and cannot be created by the GTT;
5. Physical Message: The component returns a physical message, where all placeholders are replaced by actual values.

#### **TestCase**

6. Persists the Message on file system: The component persists the physical message on the file system. The file system serves as a application domain interface to the Communication component. The message is not passed through the internal API of the GTT to increase the transactional behaviour of the system and avoid waiting cycles of the Communication component

#### **Communication Plug-in**

7. Check file system for new messages: The component continuously checks the file system for new physical messages waiting to be processed. If a message is found, the component will continue with the next step;
8. Send Message: The component sends the XML body and registers a timestamp in the file system when the message was send. The send timestamp will serve for the calculation of adherence to the response time.

#### **Tested Application**

9. {External} The application user has to execute any necessary actions to reply to the message sent by the GTT;

#### **GTT acting as a Testing Client or Server – Inbound Message**

This section describes the behaviour of the GTT when acting as a testing client upon receiving (inbound) messages.

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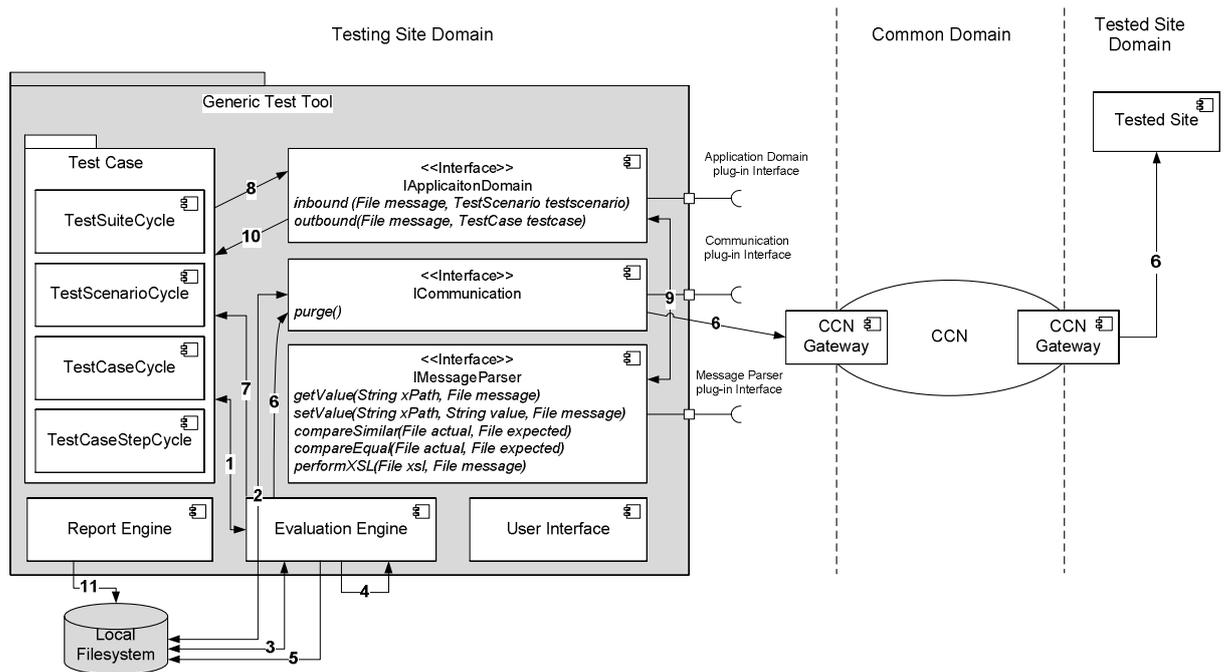


Figure 2-157: Generic Test Tool Application GTT acting as a Testing Client or Server :  
Inbound Message

## TestCase

1. **Return Test Case Step Signature:** The component assesses test case step and returns a list of signatures of all test case steps. With the help of the signature, an incoming message can be quickly associated with a test case. It allows to identify quickly an inbound message as a potential request or spontaneous message (GTT acts a server) or a reply to a previous request (GTT acts as client).

## Communication Plug-in

2. **Pull Message:** The component regularly pulls messages from a defined communication channel. When the message is received, the component persists the message in XML format on the file system.

## Evaluation Engine

3. **Check on File System:** The component checks the file system on a regular basis for new inbound messages. If a message is found, it is loaded for processing. To ensure transactional handling, the message is not deleted until it is made persistent in the linked test case step
4. **Identify Request Message or Response Message:** The component creates the signature of the inbound message. Defined values (dynamic values) are suppressed for calculating the signature. The resulting signature is compared to the list of signatures that reflect each available test case step (see call no. 1). The matching signature represents a certain test case step within a test case.
5. **Persist Message:** The test case step identified using the signature comparison will serve as container for the inbound message persistence. The message is attached to the test case step and deleted from the local file system.

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6. **Send Response Message:** After identification of the associated test case and test case step, the component decides if the inbound message is a request, response or spontaneous by using the information given in the test case and test case step. If the inbound message is identified as a request (GTT act as a server), the component renders the response using the underlying test case step and puts the message on the file system. Dynamic values of the test case step are replaced by using the inbound message, e.g. unique identifier of the request and run time dependent values, e.g. timestamp.
7. **Evaluate Inbound Messages:** On a defined regular basis, the component triggers the evaluation of the test run. This execution is prioritised at low level in order not to disturb the performance of the inbound and outbound message processing. In particular, for performance tests, this execution must have a low impact on the overall performance of the GTT.  
The evaluation is made on several levels (syntax, structure, completeness validity)

### **TestCaseStepCycle**

8. **Evaluate Inbound Message:** The component iterates through all unevaluated inbound messages. For each identified message, the expected message is created by using the template within the test case. This pair of messages (expected and received) is passed to the Application Domain Plug-in for further processing.

### **Application Domain Plug-in**

9. **Parse Structured Message:** The component further replaces dynamic values with actual values. The rules are specific to the application domain and are not known by the GTT base components. If necessary, the message is passed to a particular message parser for processing.

### **Message Parser Plug-in**

10. **Return Evaluation:** This component parses the message. Different parsers can be deployed depending on the context of the message type. The parsed message, which is either an internal object and resides in memory or just a handle to the file system, is returned.

### **Report Engine**

11. **Create Summary and Detailed Report:** This component will iterate regularly through all test cases and test case steps to collect the current status of results, sent and received messages. The collected information will then be persisted on the file system in a detailed and summarised way.

## **2.41.4 Technical perspective**

### **2.41.4.1 Service access and delivery**

#### **Access Channels**

The application provides rich HTML Graphical User Interface and can be accessed by standard HML Web browser.

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### **Delivery Channels**

The application can be accessed over the local network of DG TAXUD.

### **Service transport**

The application design, abstracts the transport layer handling from the application core itself, this is realised by the Communication plug-in mechanism, where custom plug-ins realise the functionality of communication over particular transport layer. By default, the GTT application is equipped with email communication plug-in, that allows for message exchange using POP and SMTP protocol.

#### **2.41.4.2 Service platform**

### **General platforms**

The GTT application is written in Java programming language and for running needs Java 1.5 Software Development Kit (SDK) to be installed. Additional libraries are utilized to manage testing flow, XML files operation and simplifying User Interface design. The libraries used are as listed:

ZK - Ajax Web framework v. 2.2

Log4J - Java logging facility v. 1.2.8

XStream - Java serialisation to XML v. 1.2.1

XMLUnit - XML unit testing framework for Java v. 1.0

JUnit - Unit testing framework for Java v. 4.1

Xerces - Parsing and manipulating XML with Java. v. 2.0

Xalan - Implementation of XSLT XML transformation language and the XPath XML query language for Java v. 2.7.0

DG TAXUD and MS can freely use the third party libraries as only Apache, BSD, and GPL license models are used.

The application can be run on Windows XP / 2003, Sun Solaris 9 or Linux operating system.

### **Delivery servers**

The application is run on Tomcat 5.x web container.

### **Database**

The test scenarios data, application configuration and results of tests are stored on a local filesystem.

#### **2.41.4.3 Component framework**

### **Security**

The message exchange security between Tested Application and GTT is on the side of the services provided by particular communication channel (CCN Mail, CSI stack). The GTT interfaces these services by calling custom Communication plug-in modules.

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### **User presentation**

The GTT uses “ZK” framework to provide Ajax based event-driven user interface to the HTML browser. The “ZK” is facilitated by the GTT to give access to the reports, configuration of the test suite and the execution control of the test run.

### **Business logic**

The business logic embedded in the application concentrates mainly on managing the flow of test steps executed, for this “XMLUnit” and “JUnit” frameworks are used. Additional business logic can be realised by writing custom Application plug-in that will manage specific business processing.

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2.42 - Taxation of Savings Test Tool (GTT Plug-in)	ISSUE DATE: 13/01/2009

## 2.42 Taxation of Savings Test Tool (GTT Plug-in)

### 2.42.1 Reference and Applicable Documents

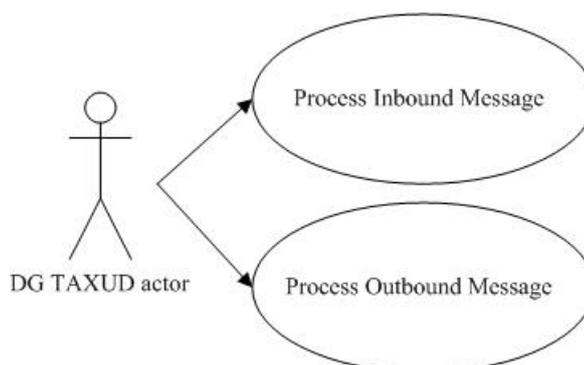
Id	Title	Reference	Version
TOS_ TT_FS	Taxation of Savings Test Tool Functional Specifications	FITSDEV-FS-ToS-TestTool-V1.00.doc	1.00
TOS_ TT_T S	Taxation of Savings Test Tool Technical Specification	FITSDEV-TS-ToS-TestTool-V1.01.doc	1.01
GTT_ TS	Generic Test Tool Technical Specification	FITSDEV-TS-GenericTestTool-V1.01.doc	1.01

Table 2-42: Taxation of Savings Reference documents

### 2.42.2 Functional perspective

Taxation of Savings System covers exchange of defined messages between proper authorities in Member States. Therefore it is necessary to confirm that National Administrations have implemented correctly the rules governing the message exchange in the Common Domain. Taxation of Savings Test Tool (GTT Plug-in) together with the Generic Test Tool (GTT) is dedicated to test that the National application can correctly create and process messages used for communication with other Member States. As described in the previous chapter the Generic Test Tool (GTT) functionality enables to assume the role of either a party sending a specific request (Applicant Member State MS-A) or a party receiving and processing a request from MS-A (Requested Member State MS-R). Taxation of Savings Test Tool is a plug-in to the Generic Test Tool (GTT) that provides Application Programming Interface (API) for the handling of the Taxation of Savings domain specific messages, both inbound and outbound.

#### 2.42.2.1 Use cases view



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2.42 - Taxation of Savings Test Tool (GTT Plug-in)	ISSUE DATE: 13/01/2009

Figure 2-158: Taxation of Savings Use Case View

### **Process Inbound Message**

Taxation of Savings Test Tool (GTT Plug-in) identifies the specific test case step that is related to the inbound message. Furthermore it performs additional evaluation (apart from the XML comparison) of the inbound message. The evaluation of the test run includes the computation of the technical and business result values. The technical values are limited to any failure, which can happen during communication. The business values are limited to the content of the message.

### **Process Outbound Message**

In the case of the outbound message Taxation of Savings Test Tool (GTT Plug-in) covers a replacement in the message of static to dynamic values dependent on the preceding test case steps. It is responsible for creation of a proper specific for Taxation of Savings domain message for the defined test case step.

#### **2.42.2.2 Domain vocabulary**

Not applicable.

### **2.42.3 Application perspective**

#### **2.42.3.1 Application structure**

The Taxation of Savings Test Tool is a software plug-in, designed to be used as a part integrated into the Generic Test Tool application. The plug-in adds to the functionality of the GTT, possibility to drive automated tests, which conform to the Acceptance Test Specifications of the ToS domain.

The plug-in extends the GTT Application Domain plug-in interface:

*eu.europa.ec.taxud.fiscalis.gtt.plugin.IApplicaitonDomain*

with the possibility to handle specific Taxation of Savings messages.

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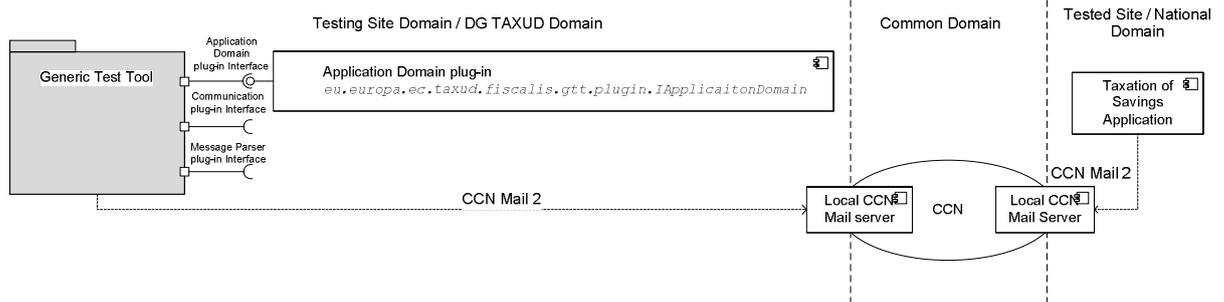


Figure 2-159: Taxation of Savings Application Structure

The plug-in is executed inside the GTT application control flow, therefore it inherits all the architectural principles, application dynamics and technical details of the GTT application, those dynamics are presented in the [Generic Test Tool](#) chapter.

## 2.42.4 Technical perspective

In this section, only details that are specific to the Taxation of Savings Test Tool will be covered, the remaining technical details are direct derivative of the GTT technical architecture, and are placed in the appropriate section of the [Generic Test Tool. Technical Perspective](#) chapter.

### 2.42.4.1 Service access and delivery

#### Service transport

The GTT Mail Communication plug-in is used to exchange messages by POP and SMTP protocol.

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2.43 - Exchange of Forms Test Tool (GTT Plug-in)	ISSUE DATE: 13/01/2009

## 2.43 Exchange of Forms Test Tool (GTT Plug-in)

### 2.43.1 Reference and Applicable Documents

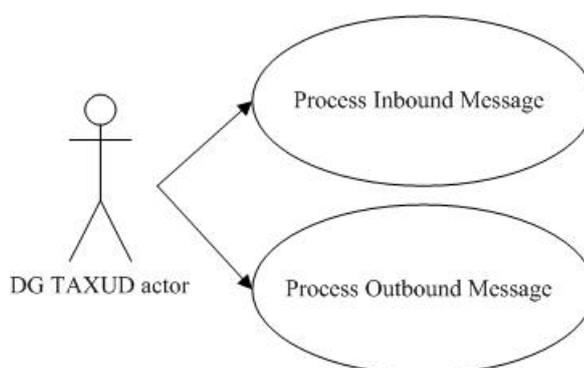
Id	Title	Reference	Version
EOF_ TT_FS	e-Forms Test Tool Functional Specifications	FITSDEV-FS-E- FormTestTool-V1.01.doc	1.01
GTT_ EOF	GTT Exchange of Forms System Manual	FITSDEV-SM-GTT-EoF- V1.00.doc	1.00
GTT_ TS	Generic Test Tool Technical Specification	FITSDEV-TS- GenericTestTool- V2.01.doc	2.01

Table 2-43: Exchange of Forms Test Tool Reference documents

### 2.43.2 Functional perspective

The E-Forms System covers exchange of defined messages between proper authorities in Member States. Therefore it is necessary to confirm that National Administrations have implemented correctly the rules governing the message exchange in the Common Domain. The E-Forms Test Tool (GTT Plug-in) together with the Generic Test Tool (GTT) is dedicated to test that the National application can correctly create and process messages used for communication with other Member States. As described in the chapter describing the Generic Test Tool (GTT) its functionality enables to assume the role of either a party sending a specific request (Applicant Member State MS-A) or a party receiving and processing a request from MS-A (Requested Member State MS-R). The E-Forms Test Tool is a plug-in to the Generic Test Tool (GTT) that provides Application Programming Interface (API) for the handling of the E-Forms domain specific messages both inbound and outbound.

#### 2.43.2.1 Use cases view



Architecture Reference: Annex A	REF.: ITS-IRPT-ARD-001A
DG TAXUD Information Systems	VERSION: 1.11
2.43 - Exchange of Forms Test Tool (GTT Plug-in)	ISSUE DATE: 13/01/2009

Figure 2-160: Exchange of Forms Use Case View

### Process Inbound Message

The E-Forms Test Tool (GTT Plug-in) identifies the specific test case step that is related to the inbound message. Furthermore it performs additional evaluation (apart from the XML comparison) of the inbound message. The evaluation of the test run includes the computation of the technical and business result values. The technical values are limited to any failure, which can happen during communication. The business values are limited to the content of the message.

### Process Outbound Message

In the case of the outbound message, the E-Forms Test Tool (GTT Plug-in) covers a replacement in the message of static to dynamic values dependent on the preceding test case steps. It is responsible for creation of a proper specific for Taxation of Savings domain message for the defined test case step.

#### 2.43.2.2 Domain vocabulary

Not applicable.

### 2.43.3 Application perspective

#### 2.43.3.1 Application structure

The Exchange of Forms Test Application is a software plug-in, designed to be used as a part integrated into the Generic Test Tool application. The plug-in adds to the functionality of the GTT, possibility to drive automated tests, which conform to the Acceptance Test Specifications of the E-Forms domain.

The plug-in extends the GTT Application Domain plug-in interface:

*eu.europa.ec.taxud.fiscalis.gtt.plugin.IApplicaitionDomain*

with the possibility to handle Exchange of Forms XML messages.

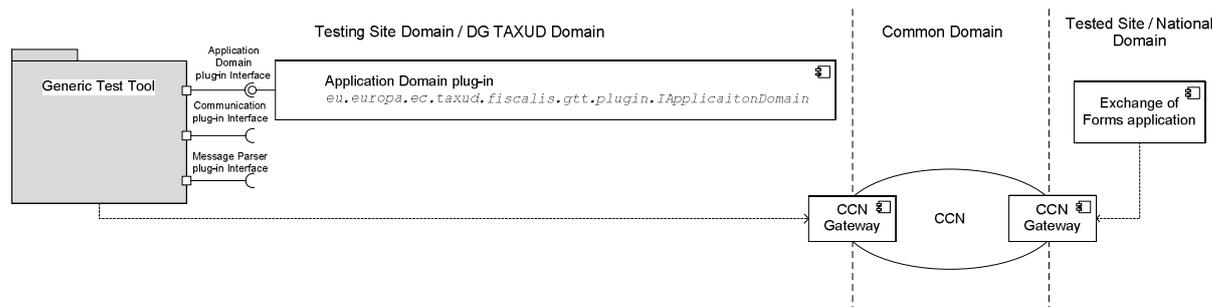


Figure 2-161: Exchange of Forms Application Structure

Architecture Reference: Annex A	REF.: ITS-IRPT-ARD-001A
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2.43 - Exchange of Forms Test Tool (GTT Plug-in)	ISSUE DATE: 13/01/2009

The plug-in is executed inside the GTT application control flow, therefore it inherits all the architectural principles, application dynamics and technical details of the GTT application, those dynamics are presented in the [Generic Test Tool](#) chapter.

## 2.43.4 Technical perspective

In this section, only details that are specific to the Exchange of Forms testing will be covered, the remaining technical details are direct derivative of the GTT technical architecture, and are placed in the appropriate section of the [Generic Test Tool. Technical Perspective](#) chapter.

### 2.43.4.1 Service access and delivery

#### Service transport

The GTT Mail Communication plug-in is used to exchange messages by POP and SMTP protocol.

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2.44 - VIES Monitoring	ISSUE DATE: 13/01/2009

## 2.44 VIES Monitoring

### 2.44.1 Reference and Applicable Documents

Id	Title	Reference	Version
MONI T_FS	VIES Monitoring Functional Specification Document	FITSDT-FS-MONIT (3.1).doc	3.1
MONI T_VIS	VIES Monitoring visualization Technical Specifications	FITSDEV-TS-VIES- MONIT-VIS-V1.02.doc	1.02
MONI T_TS	VIES Monitoring Technical Specifications Document	FITSDT-TS-MONIT (2.1).doc	2.1

Table 2-44: VIES Monitoring Reference documents

### 2.44.2 Functional perspective

The core of VIES system (VAT Information Exchange System) constitute maintained by Member States national VIES applications and databases, which should be able to provide "without delay" VAT information to various tax administrations and other authorized users. Therefore it is necessary to verify the accessibility of the different Member States VIES applications, for that purpose VIES Monitoring is used. The VIES Monitoring periodically sends preformatted VIES messages to each Member State in both synchronous and asynchronous modes. The response received is used to verify "on-line" the availability of the Member States VIES application.

#### 2.44.2.1 Use cases view

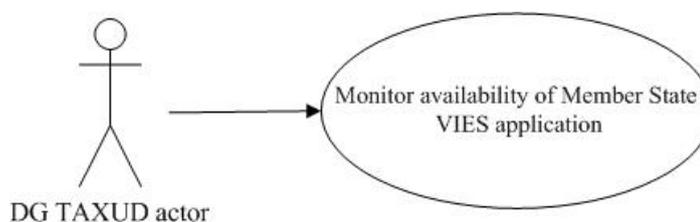


Figure 2-162: VIES Monitoring use case

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### **Monitor availability of Member State Vies application**

The VIES Monitoring application is composed of two modules the Monitoring Engine and the Display Module.

The first of them - the Monitoring Engine sends periodically VIES requests to each Member State (eight types of VIES Messages R\_VATR, R\_HVATR, R\_L2F2, R\_L1F2, R\_L2F1, R\_L1F1, R\_L1C and R\_L1CM). Information concerning response received from Member State is recorded in statistical log files. The purpose of this operation is check the availability of the VIES service and its response time, not to check the correctness of the response returned or the validity of the VAT number submitted. Therefore, the application does not parse completely the response returned.

The second module - the Display Module retrieves information from the statistical log files generated by the Monitoring Engine and displays graphically the current availability of the VIES services in the different Member States. The purpose of the second module is to provide the end user with a graphical display of the current availability of the different VIES services in different MS. However displayed are information related only to two types of messages R\_VATR and R\_HVATR.

#### **2.44.2.2 Domain vocabulary**

Not applicable

### **2.44.3 Application perspective**

#### **2.44.3.1 Application structure**

Two major modules: Monitoring Engine and Display Module (Visualization module) briefly described in the Functional Perspective section, are physically distinct components and are composed of other sub modules, realizing specific tasks.

The diagram describing major VIES Monitoring components is presented below:

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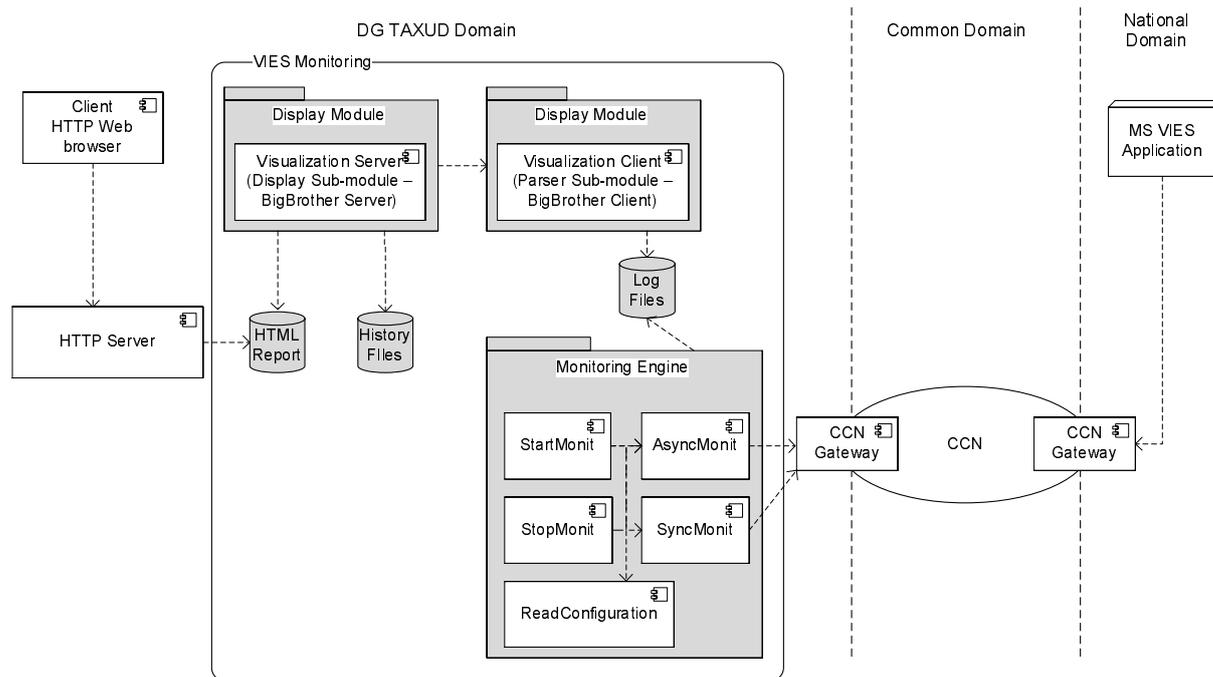


Figure 2-163: VIES Monitoring Application structure

As shown in the diagram above, the modules are as presented:

### **Monitoring Engine**

The purpose of the Monitoring Engine is to check the availability of the VIES services offered by Member States and report obtained availability data in the statistical log files, that are further presented by Display Module to the user.

The Monitoring Engine monitors both, the synchronous and asynchronous based modes of transmission (for details, see [VIES System](#) chapter).

The statistical log files that are created by the module are the interface with the second module (Display Module) that reads, parses them, and presents the availability information to the user.

The Monitoring Engine itself is composed of five different sub-modules that are as follows:

#### **StartMonit**

The module is an initial point of the Monitoring Engine. It is called from command line, and is responsible for starting other modules which from that moment will run separately in own threads realizing their tasks.

#### **ReadConfiguration**

The initial task of the Monitoring Engine is to read the configuration file that provides all information concerning the working conditions of the application.

#### **AsyncMonit**

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The Asynchronous monitoring mainly consists in sending VIES requests, in asynchronous mode, and getting the corresponding responses, or checking the absence of response in the CSI queue. The result of the request/response operation and the response time are recorded in a statistical log file for all queried MS in asynchronous mode.

### **SyncMonit**

The synchronous monitoring mainly consists of sending VIES requests in synchronous mode, and checking the response or the received CSI error code. The result of the request/response operation and the response time are recorded in a statistical log file for all queried MS in synchronous mode.

### **StopMonit**

Upon stop of the monitoring application, either due to user input, or because the monitoring encountered a severe error, the Monitoring Engine for each service is cleanly terminated. If the user input occurs when a monitoring loop is in progress, the started synchronous requests are completed before the actual stop of the Monitoring Engine, but no additional statistical information is written in the statistics files.

### **Display Module**

The purpose of this module is to display graphically in a synthesized manner the availability status of the different VIES services in the different Member States. The presented data is based on the information provided by Monitoring Engine via statistical log files interface.

The Display Module is based on Big Brother package, and consists of 2 main sub-modules: Visualization Client (Parser Sub-module – incorporating BigBrother Client) - parsing the log files generated by the monitoring tool, and Visualization Server (Display Sub-module – BigBrother Server) – presenting information through the GUI and storing it into the history database.

The more detailed information concerning those modules is presented below:

#### **Visualization Client (Parser Sub-module)**

The statistical log files are transformed by the parser sub-module, into BigBrother compliant message and passed to the BigBrother Client. The BigBrother Client is responsible for sending the message further to the BigBrother Server.

The module uses Big Brother client that is responsible for managing network communication between the Visualization Client and Server.

#### **Visualization Server (Display Sub-module)**

The Visualization server is part of the Big Brother package. It listens to the incoming messages from the Visualization client. Upon reception, the incoming messages are stored on the file system and are added to the history. The format of the files is defined by Big Brother and cannot be changed.

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The module, basing on the information received from the Visualization Client, generates HTML pages that are further presented to the user via HTTP server. The HTTP server used, is outside the scope of the VIES Monitoring application.

### **BigBrother software package.**

The BigBrother software package has been designed to provide uniform way of collecting various information from different sources, store it, and prepare (basing on prepared templates) reports that can be further served to the users. The package operates on Client-Server architectural paradigm, where the two types of components exist:

- BigBrother Client,
- BigBrother Server.

#### **BigBrother Client**

The Big Brother Clients (their instances) are responsible for handling the communication between distinct external applications and BigBrother Server component. External applications (information sources) must prepare BigBrother format compliant message and pass it to the BigBrother Client. The client will send the message to the specified BigBrother Server, where the information is stored and processed.

#### **BigBrother Server**

The BigBrother Server is responsible for gathering and rendering the information provided by BigBrother Clients. It continuously listens to the incoming messages from the Big Brother Clients, upon reception, the incoming messages are stored on the file system and are added to the history. The module, basing on the information received, generates HTML pages, presenting collected information and stores them in a defined directory on a local filesystem.

Those pages are further accessed and presented to the requesting user via the external HTTP Web server.

#### **2.44.3.2 Application dynamics**

The following diagram gives short overview of dynamics and information flow within application.

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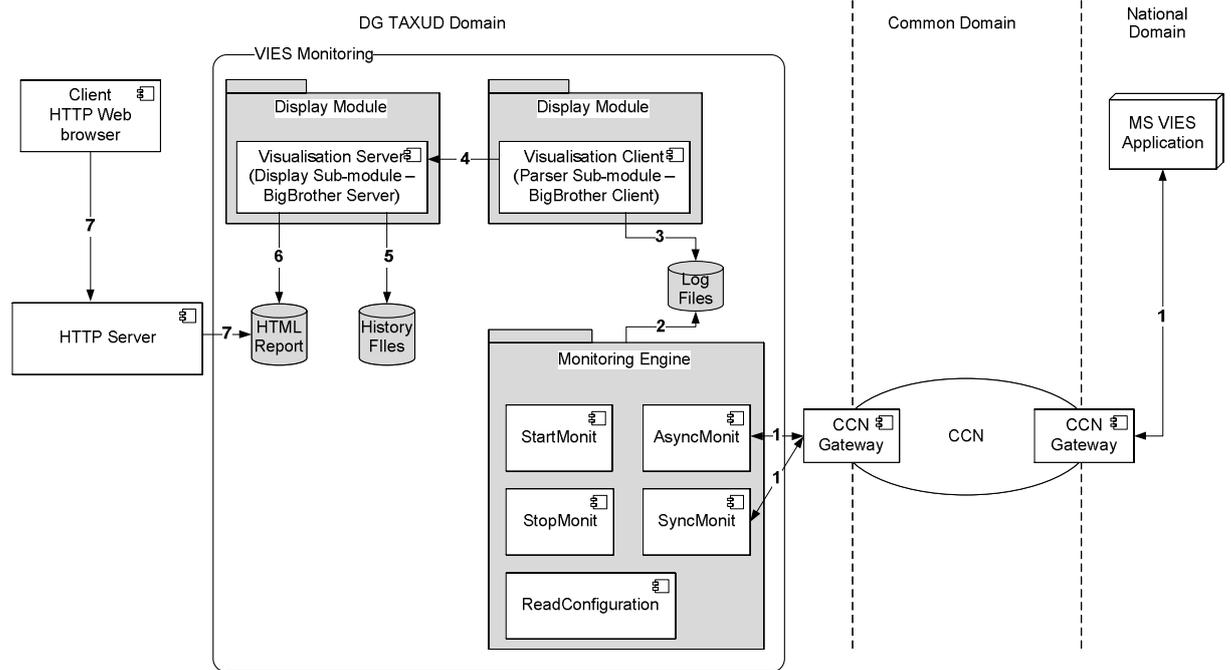


Figure 2-164: VIES Monitoring Application Dynamics

The information flow and interaction between different application's components is as follows:

1. The Monitoring Engine, particularly its sub-modules: AsyncMonit, SyncMonit are continuously querying observed Member States VIES Applications to check availability of VIES services offered by them.
2. The Monitoring Engine stores the availability information obtained in the statistical log files on the local file system.
3. The Visualization Client (Parser Sub-module) – a sub-module of Display Module, deployed on the machine where Monitoring Engine is running, periodically reads statistical log files created and parses them into defined Big Brother format.
4. The results of parsing are sent by Visualization Client to the listening for incoming messages Visualization Server (Display Sub-module).
5. Upon reception, the incoming messages are stored on the file system and added to the history.
6. The Visualization Server, basing on information received, generates HTML pages representing actual state of availability of each monitored Member State VIES Application.
7. {Outside the scope of the VIES Monitoring} The HTTP server serves the stored HTML pages to the user.

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Presented information flow within application is continuous, this means that the Monitoring Engine, until explicitly stopped or error encountered will continuously check the availability of monitored applications and update the statistical log files.

Also the Display Module will continuously, until explicitly stopped or error encountered, read the information contained in the statistical log files and on this basis update HTML files.

## **2.44.4 Technical perspective**

### **2.44.4.1 Service access and delivery**

#### **Access Channels**

The application functionality is available to the end-users by the HTTP Web Browser.

#### **Delivery Channels**

The application can be accessed over the local network of DG TAXUD.

#### **Service transport**

There are three points where different application elements exchange information, these points are:

- The communication between VIES Monitoring application and monitored Member States VIES Applications is realised through CCN/CSI specific infrastructure and protocols.
- The internal communication between application modules: Visualization Client and Visualization Server is realised using the Big Brother protocol, over a TCP connection.

The communication between the user and HTTP server {HTTP server not being a part of the application} is realised by the HTTP protocol.

### **2.44.4.2 Service platform**

#### **General platforms**

The VIES Monitoring application consists of two physically independent modules, that should be described separately. Besides its specific requirements, for both, the CSI stack must be installed and available.

#### **Monitoring Engine**

Monitoring Engine is build from several sub-modules, developed using different technologies, the module is designed to run on UNIX operating system.

- StartMonit is a stand-alone program written in C language.
- StopMonit is a stand-alone Unix shell script.
- AsyncMonit, syncMonit are routines written in C that use APIs of the CSI stack and that are run at regular time interval.

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## **Display Module**

Display Module is based on components provided by the Big Brother package:

“Big Brother Client version 1.9e” and „Big Brother Server V1.9e”. Additionally PERL (version 5.005\_3) scripts have been developed as a part of Parser sub-module. The display module is designed to work on AIX 4.3 and SunOS operating systems.

### **Delivery servers**

The final delivery to the user, of the content provided by the VIES Monitoring application (generated HTML pages) is out of responsibility of the application. For this external HTTP server must be used, capable of running CGI scripts.

### **Database**

No database is foreseen for the VIES Monitoring Engine. The result of monitoring is recorded in statistical log files that are flat files. A database can be used for the consolidation of the service availability statistics, but this is out of the scope of the current application.

#### **2.44.4.3 Component framework**

### **Security**

No identification/Authentication mechanism is put in place for starting or stopping the application besides the authentication of the user while logging onto the machine where application is hosted.

The VIES identification is performed by the login procedure of the operator, and the CSI identification is encoded in the monitoring configuration file.

### **User presentation**

For generating HTML pages, that are further served to the user, configurable Big Brother Visualization Server is used. All HTML pages are encoded using UTF-8 standard. The final delivery of the HTML pages to the user is out of responsibility of the application.

### **Business logic**

The business logic embedded in the application is differently implemented among different application modules.

- The Monitoring Engine module uses regular programming language instructions to enforce business processing.
- The Display Module uses customizable rendering rules to configure the way the stored statistical information is transformed into HTML pages.

### **Data management**

No database interface is foreseen for the VIES Monitoring Engine. The result of monitoring is recorded in statistical log files that are compliant with internal Big Brother file format. For management and extraction of data contained within these files, native Big Brother mechanisms are utilized.

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## 2.45 VIES-on-the-WEB Monitoring

### 2.45.1 Reference and Applicable Documents

Id	Title	Reference	Version
VIES WEB- MONI T_FS	VIES-on-the-Web Monitoring application Functional Specifications	FITSDEV-FS-VIESWEB- MONIT-V1 06.doc	1.06
VIES WEB- MONI T_TS	VIES-on-the-Web Monitoring Technical Specifications	FITSDEV-TS-VIESWEB- MONIT-V1 05.doc	1.05

Table 2-45: VIES-on-the-WEB Monitoring Reference documents

### 2.45.2 Functional perspective

**VIES-on the-Web Monitoring** is an application dedicated to control the operational status of the VIES-on-the-Web application. It checks if requests sent to the Vies-on the-Web application are processed correctly. Another role of the VIES-on-the-Web Monitoring is collecting information on load of the VIES-on-the-Web production server.

#### 2.45.2.1 Use cases view

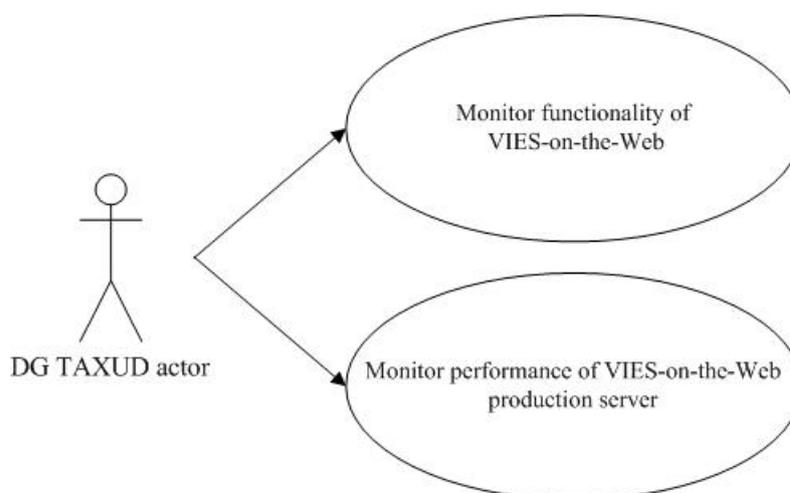


Figure 2-165: VIES-on-the-Web Use Case View

Architecture Reference: Annex A	REF.: ITS-IRPT-ARD-001A
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2.45 - VIES-on-the-WEB Monitoring	ISSUE DATE: 13/01/2009

### Monitor functionality of VIES-on-the-Web

The VIES-on-the-Web Monitoring (Web Engine Module) periodically sends requests to the VIES-on-the-Web. Those requests are directed by the VIES-on-the-Web to a proper addressee (Member State). Results of requests, an answer or an error, are recorded in log files. Received answers are verified, however the application does not check the correctness of the response returned, or the validity of the VAT number submitted. VIES-on-the-Web Monitoring does not parse completely the response returned, but checks that the response to a given request is the proper VIES-on-the-Web response message. Afterward a precise defined message is created and sent to an element of the VIES-on-the-Web Monitoring responsible for the display of results (Visualization Module). Beside visualization of the current monitoring status this part of the application also stores received messages which are accessible as historical data.

### Monitor performance of VIES-on the-Web production server

The VIES-on-the-Web Monitoring (Server Hardware Monitoring Engine) collects information concerning the state of the server where VIES-on-the-Web application is running (like CPU usage, size of log files, number of process). Monitoring results are formatted into a precise defined message and sent to an element of the VIES-on-the-Web Monitoring responsible for the display of it (Visualization Module).

#### 2.45.2.2 Domain vocabulary

Status message
-Type of request
-Severity color
-Date
-Member State
-VAT number
-Service's response
-Number of retries
-Response time

Figure 2-166: VIES-on-the-Web Domain Vocabulary

**Status message** represents a defined message directed inside the VIES-on-the-Web Monitoring from Web Engine Module to Visualization Module. All received by Visualization Module messages are stored and accessible.

Type of request - consists of an acronym of concerned Member State and also the element that depends if the request used SOAP or interactive mode.

Severity color - defines what color will be used by the Visualization Module.

Date - represents the current date.

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Member State - likewise the element of Type of request, represents the concerned Member State.

VAT number - the VAT number used by the process.

Service's response – constitutes a response to the sent request (valid, invalid, etc.).

Number of retries – states how many retries has it taken to proceed the request.

Response time - states how long has it taken to proceed the request.

## **2.45.3 Application perspective**

### **2.45.3.1 Application structure**

The VIES-on-the-Web Monitoring application is based on Big Brother (BB) software package. This package has been designed to provide uniform way of collecting various information from different sources, store it, and prepare (basing on prepared templates) reports that can be further served to the users.

The package consists of the Big Brother Client and Big Brother visualization Server. The Big Brother Clients are responsible for handling the communication between distinct applications gathering some information and Big Brother visualization Server – where the received information is collected, and basing on it, reports are prepared.

The VIES-on-the-Web Monitoring application, utilizing Big Brother technology, is built upon three physically distinct modules:

- The Monitoring Engine – responsible for collecting availability information of VIES services offered by different Member States through VIES-on-the-Web services and sending it to the visualization Server using Big Brother Client.
- Server Monitoring – responsible for monitoring run-time load parameters of the server where VIES-on-the-Web application is running. The information recorded is sent by Big Brother Client to the Big Brother visualization Server.
- Visualization Server – is a deployed Big Brother visualization Server, responsible for collecting the information received from two previous modules (Server Monitoring, Monitoring Engine), storing it, and preparing HTML reports that are further served to the user. The HTML report pages generated by the visualization Module are served to the user by an external HTTP server that is outside the scope of the application.

The diagram presenting the overall architectural view is presented below, the greyed components are a part of the Vies-on-the-Web Monitoring application.

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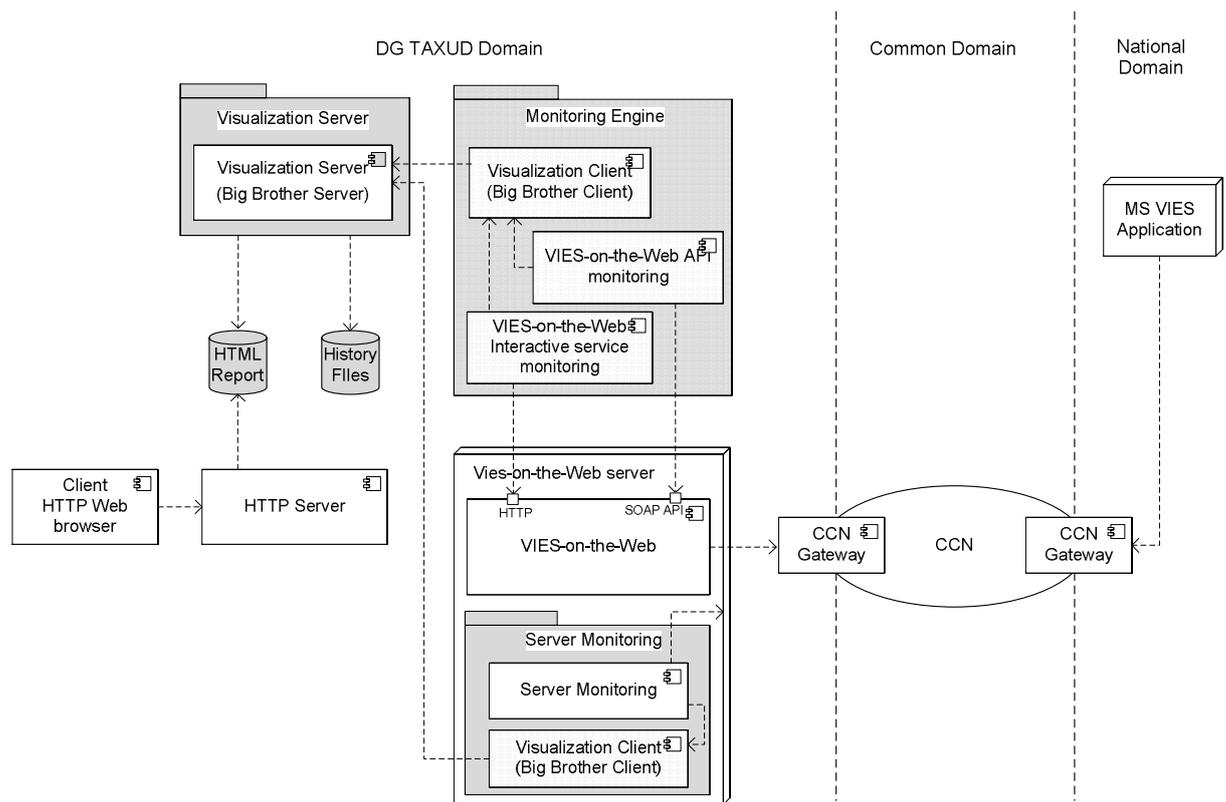


Figure 2-167: VIES-on-the-Web Monitoring Application structure

The detailed information concerning major application components is presented below.

### **Monitoring engine**

The Monitoring Engine is responsible for monitoring the availability of VIES services offered by different Member States through the services of the VIES-on-the-Web application. Both, the interactive and API service offered are tested, the detailed information concerning services offered by VIES-on-the-Web is placed in the by [VIES-on-the-Web](#) section of this document.

For monitoring, the module launches two separate internal processes: one for monitoring VIES-on-the-Web Interactive service and one for monitoring VIES-on-the-Web API. The processes continuously, for each country, send a request (using SOAP or HTTP POST method); analyze the result and compose an appropriate message that is send using Big Brother Client to the visualization Server.

### **Server Monitoring**

The Server Monitoring module, deployed on the machine where VIES-on-the-Web application is running, is responsible for collecting run-time load information of this machine. The collected information is among others: CPU usage, size of log files, number of process running, etc. The module additionally computes the number of requests sent per country.

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Obtained information is packed into a Big Brother message and sent using Big Brother Client to the visualization Server.

### Visualization Server

The purpose of this module is to display graphically in a synthesized manner the availability status of the different Member States VIES applications, obtained by querying VIES-on-the-Web services. The data presented, is based on the information provided by Monitoring Engine.

The visualization Server itself is a visualization Server module of a Big Brother package. It listens to the incoming messages from the Big Brother Clients. Upon reception, the incoming messages are stored on the file system and are added to the history. The module, basing on the information received from the Big Brother Clients, generates HTML pages that are further presented to the user via HTTP Web server.

The Web server utilized for serving the generated HTML pages is outside the scope of the VIES-on-the-Web Monitoring application, and can be any HTTP web server capable of handling CGI requests.

#### 2.45.3.2 Application dynamics

The following diagram gives short overview of dynamics and information flow within application.

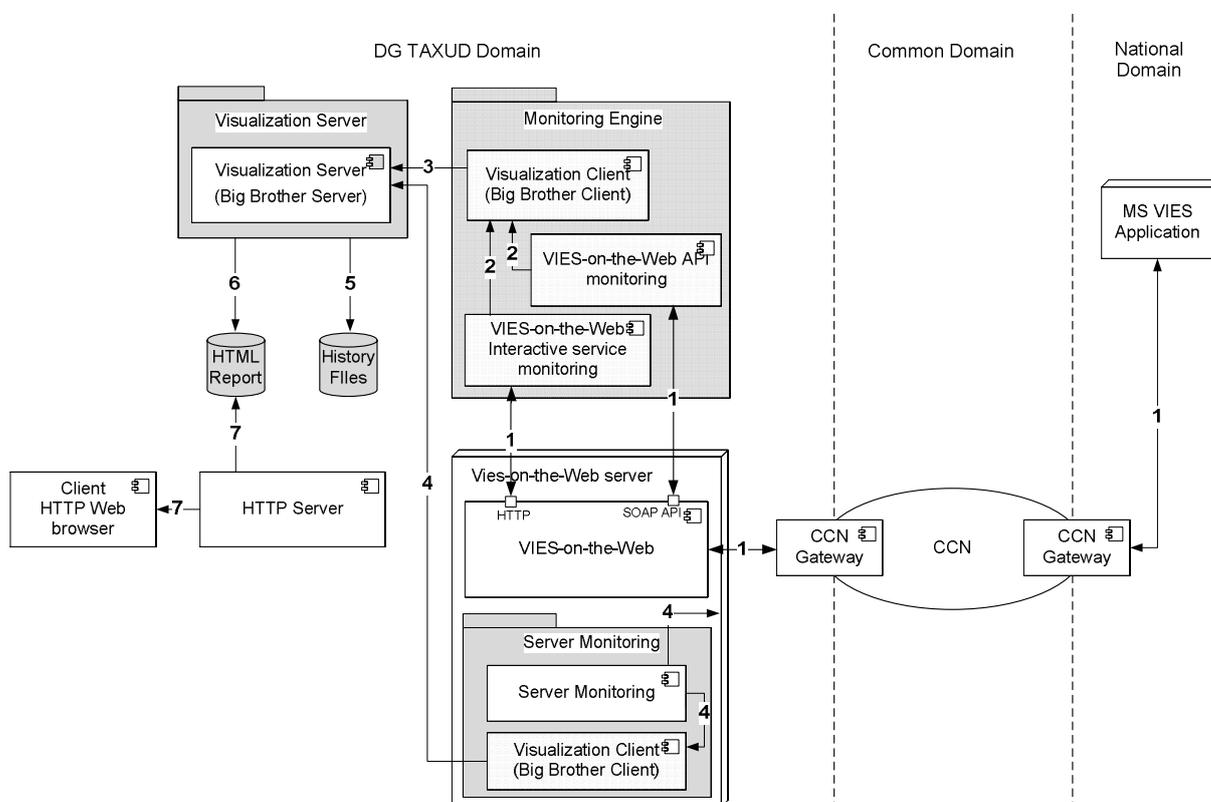


Figure 2-168: VIES-on-the-Web Monitoring Application dynamics

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The information flow and interaction between different application components is as follows:

### **{Monitoring Engine}**

1. The Monitoring Engine processes (using SOAP and HTTP POST method) are continuously querying the VIES-on-the-Web application for the observed Member States.
2. The Monitoring Engine, upon receipt of a response to the query sent in pt.1, generates a log file, which contains the following information: the process type, the tested MS, severity, message received by VIES, the colour used by Big Brother, count of retries (if applicable) and the response time.
3. If there is no error, a message is prepared and sent to the visualization Server. The message is sent to the server over a TCP connection, via Big Brother client.

### **{Server Monitoring}**

4. Server Monitoring continuously collects load-time information of the server where VIES-on-the-Web application is running, the messages are prepared and sent to the Visualization Server. The messages are sent to the server over a TCP connection, via Big Brother client.

### **{Visualization Server}**

5. Upon reception, the incoming messages are stored on the file system and added to the history.
6. The Visualization Server, basing on information received generates HTML pages representing actual state of availability of each monitored Member State VIES Application.
7. {Outside the scope of the VIES-on-the-Web Monitoring}The HTTP server is used to serve stored HTML pages to the user.

Presented information flow within application is continuous, this means that the Monitoring Engine, until explicitly stopped or error encountered will continuously check the availability of monitored applications and update the statistical log files.

## **2.45.4 Technical perspective**

### **2.45.4.1 Service access and delivery**

#### **Access Channels**

The application functionality is available to the end-users by HTTP Web Browser.

#### **Delivery Channels**

The application can be accessed over the local network of DG TAXUD.

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### **Service transport**

There are three points where different application elements exchange information, these points are:

- The communication between VIES-on-the-Web Monitoring and VIES-on-the-Web application is realised by calling VIES-on-the-Web services using SOAP and HTTP POST methods.
- The communication between application modules: Monitoring Engine, Server Monitoring and visualization Server is realised using the Big Brother protocol, over a TCP connection.
- The communication between the user and HTTP server {HTTP server not being a part of the application} is realised by the HTTP protocol.

#### **2.45.4.2 Service platform**

##### **General platforms**

The VIES-on-the-Web Monitoring application consists of three physically independent modules that should be described separately.

##### **Monitoring Engine**

Monitoring Engine is developed in JAVA programming language and can run on all platforms, for which Java runtime (1.4.x) is available.

Additionally Java AXIS library and the HTTPClient library must be available.

The computer, which runs the application, must have access to the europa web site and must be able to connect to Big Brother visualization Server.

##### **Server Monitoring**

Server Monitoring module is a set of korn shell scripts, that use the Unix utilities 'sar 1 1' and 'wc' for collecting the required information.

##### **Visualization Server**

Visualization Server is based on „Big Brother Server V1.9e.“. It can run on a Unix or Windows based server.

##### **Delivery servers**

The final delivery to the user, of the content provided by the VIES-on-the-Web Monitoring application (generated HTML pages) is out of responsibility of the application. For this external HTTP server must be used, capable of running CGI scripts.

##### **Database**

No database is foreseen for the VIES-on-the-Web Monitoring. The result of monitoring is recorded in statistical log files that are flat files.

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### 2.45.4.3 Component framework

#### **Security**

No identification/authentication mechanism is put in place for running the application besides the authentication of the user while logging onto the machine where application is hosted.

#### **User presentation**

Configurable Big Brother visualization Server is used for generating HTML pages, which are further served to the user. All HTML pages are encoded using UTF-8 standard. The final delivery of the HTML pages to the user is out of responsibility of the application.

#### **Business logic**

The business logic embedded in the application is differently implemented among different application modules.

The Monitoring Engine and Server Monitoring modules use regular programming language instructions or shell commands to enforce business processing.

The visualization Server uses customizable rendering rules to configure the way the stored statistical information is transformed into HTML pages.

#### **Data management**

No database interface is foreseen for VIES-on-the-Web Monitoring. The result of monitoring is recorded in statistical files that are compliant with internal Big Brother file format. For management and extraction of data contained within these files, native Big Brother mechanisms are utilized.

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## 2.46 VIES-on-the-WEB Configuration Tool

### 2.46.1 Reference and Applicable Documents

Id	Title	Reference	Version
VIES WEB- CONF IG_FS	VIES-on-the-Web - Web based configuration - Functional Specifications	FITSDEV-FS-VIESWEB-CONFIG-V2.05.doc	2.05
VIES WEB- CONF IG_TS	VIES on the Web - Web based configuration - Technical Specification	FITSDEV-TS-VIESWEB-CONFIG-V2.05.doc	2.05

Table 2-46: VIES-on-the-WEB Configuration Tool Reference documents

### 2.46.2 Functional perspective

The VIES-on-the-Web Configuration Management service is used to adjust parameters of the VIES-on-the-Web application in order to attain a desired level of performance and security. Also as the VIES-on-the-Web application according to the requirements is to be available in all European languages the VIES-on-the-Web Configuration Management service is exploited as a manager of translations.

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### 2.46.2.1 Use cases view

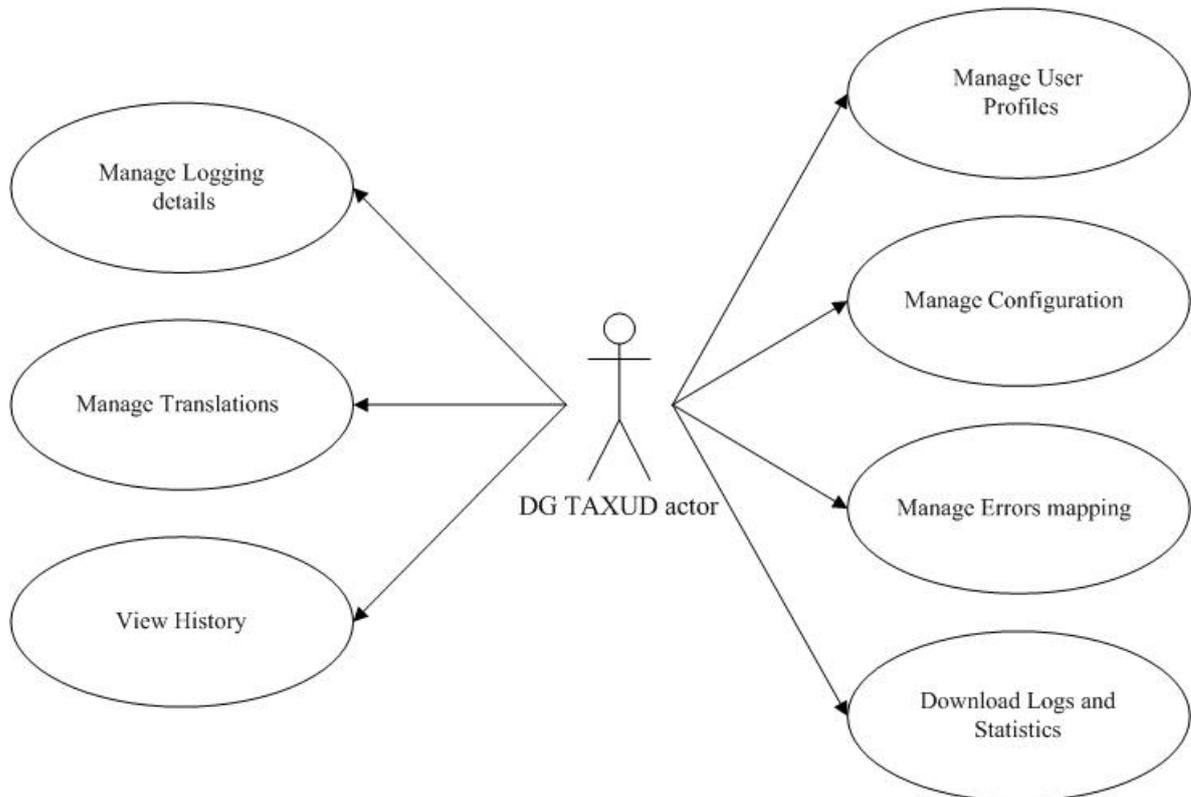


Figure 2-169: VIES-on-the-Web Configuration Tool Use Case View

#### Manage User Profiles

The VIES-on-the-Web Configuration Management service enables authorized users to manage the users and their rights. There are four available profiles that can be granted:

- Read - allows to read the configurations and the translations, and also to download the log and statistics files,
- Write Filters - allows to read/add/remove/edit the VAT filters and HTTP filters,
- Translator - allows to read/add/remove/edit text and languages used in the VIES-on-the-Web application,
- Admin - grants full access, including right to manage the users (create, delete, reset password).

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### **Manage Configuration**

The VIES-on-the-Web Configuration Management service enables authorized users to manage general settings of the VIES-on-the-Web such as e.g. URL, Port, Proxy, Proxy Port, maximum number of concurrent requests.

It also provides possibility of management of the VIES-on-the-Web connections with any of the National VIES Applications. MS Specific Configuration is used to define parameters which determine settings of those connections (e.g. Gateway, Service, Name, Time slot length).

The VIES-on-the-Web Configuration Management service contains modules that provide possibility to filter incoming requests. There exist two modules: HTTP filter and VAT that match arbitrary character sequences in incoming requests against the regular expressions.

### **Manage Errors mapping**

The VIES-on-the-Web Configuration Management service enables authorized users to define connections between the reason codes and error code. It provides possibility to create relationship between the range mapping (the first reason code – the second reason code) and the user error and the raw statistics error. It covers errors related to the VIES-on-the-Web and there are several types of them:

- CSI Errors
- VAT Validation Errors
- MS Errors
- Filter Errors
- Limit Errors
- Global List

### **Manage Translations**

The VIES-on-the-Web Configuration Management service provides possibility to manage several types of task concerning translation of contents in the VIES-on-the-Web application. Firstly users with the Admin rights are able to define existing languages. They can create relationship between language ID and its description.

Secondly the same group of users with the Admin rights is allowed to manage translation of tags existing in the VIES-on-the-Web application to defined languages.

Lastly users with the Translator rights have availability to manage all translations existing in the VIES-on-the-Web application.

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### **Manage Logging details**

Users with Write Filters rights are granted availability to change the logging level as they might need to verify the status of the API before adding a new VAT or HTTP Filter.

Users with Admin rights are allowed to fully manage logging properties file.

### **Download Logs and Statistics**

Users with Read rights are granted availability to download log files containing description of the performed tasks and raw statistics files containing the Statistic code, MS code, date, start time, end time, error code and reason code.

### **View History**

All changes resulting from a performed action are recorded in a history file. Each change is recorded in a separated value file. The VIES-on-the-Web Configuration Management service provides possibility to view the history file representing implemented changes.

#### **2.46.2.2 Domain vocabulary**

Not applicable.

### **2.46.3 Application perspective**

#### **2.46.3.1 Application structure**

The architecture of the VIES-on-the-Web Configuration Management depends on the infrastructure of the external systems with which the application will interface, in particular VIES-on-the-Web and the WEB service provider where the application will be hosted.

Especially the application requires access to the shared configuration file of the VIES-on-the-Web and to the translation database, so the application should be hosted on the server where VIES-on-the-WEB is deployed. VIES-on-the-Web monitors the file and will automatically reload it if it has been changed

The VIES-on-the-Web Configuration Management application structure is based on Thick Web Client architectural pattern. The Thin Web Client architectural pattern is useful for Internet-based applications, for which only the most minimal client configuration can be guaranteed. All business logic is executed on the server side. The Web client part is responsible for issuing requests to the server and displaying results of the computation performed on the server side. Application modules are deployed with the use of an Application Server, which provides environment for execution and management of the deployed modules.

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The vertical layering of the application follows the Model-View-Controller (MVC) pattern that is a variant of n-layer design model. In n-layer design model, in general, and in MVC in particular the application is split into  $n$  vertical layers, each one having sole responsibility for some aspect of working application, with well defined boundaries and services offered to other layers,.

The following diagram outlines the main architectural components (including MVC layers) of the working application and its closest environment.

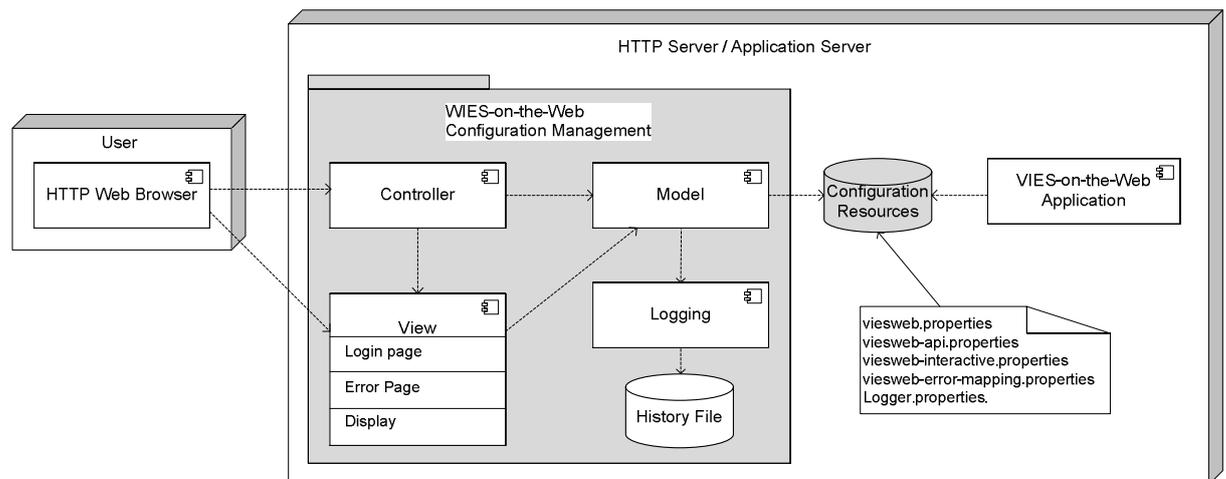


Figure 2-170: VIES-on-the-Web Configuration Tool Application structure

The parts of the application, grouped by the MVC layers they belong to, are presented below.

### View

The View layer components are the place where the business processes are initiated by the user. The view is responsible for presenting the GUI to the user, collecting user requests, and displaying processing results. The View components use the information provided by the Model components to create HTML pages that are sent back to the user. JavaScript is included in these pages to perform additional actions on the client side: checking the correctness of some input fields (like numerical value, not empty or maximum number of characters) and to display confirmation messages on critical actions (like delete).

### Controller

The Controller layer components are in charge of checking if the requests issued by the user are legitimate and dispatching the execution flow of the application to the appropriate Model layer components where actual business processing is performed.

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## Model

Model layer components perform the core business actions, like parsing and updating the VIES-on-the-Web configuration files, listing the files of a directory, reading the content of a file and keeping the history file up to date. After performing its core business action, the results are returned to the View layer components and displayed to the user.

## Logging (History Log)

All actions performed by the users are logged in a history file. The name and location of this file are part of the configuration of the application.

### 2.46.3.2 Application dynamics

The diagram below gives an overview of the main processing flow within the application.

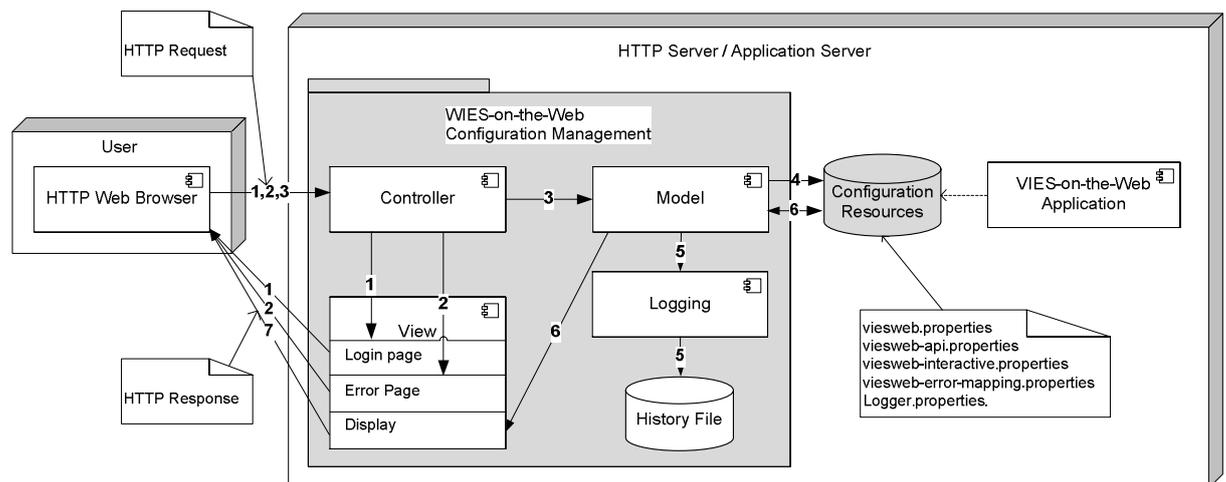


Figure 2-171: VIES-on-the-WEB Configuration Tool Application Dynamics

1. When a user submits a request, first the Controller checks if the user is logged in. If not, the user is redirected to the login page.
2. If the user is authenticated, the controller checks the user rights. If the user is not allowed to perform the requested action, an error page (Unauthorised action) is sent back to the user.
3. The request is then redirected, basing on configurable rules, to the appropriate Model layer component where business processing occurs.
4. The Model layer component performs the required business action. This will be reading the corresponding configuration, log, raw statistics, or users file, checking the current values of the data and the submitted values, updating the corresponding file and updating the history file.
5. The Model layer reads again the corresponding file and sends the result to the view layer.

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6. The view layer displays the updated information.

## **2.46.4 Technical perspective**

### **2.46.4.1 Service access and delivery**

#### **Access Channels**

The application functionality is available to the end-users by HTTP Web Browser.

#### **Delivery Channels**

The application can be accessed over the local network of DG TAXUD.

#### **Service transport**

The communication between the user and HTTP server is realised by the HTTP protocol.

### **2.46.4.2 Service platform**

#### **General platforms**

VIES-on-the-Web Configuration Management application is written in Java programming language. The application is running on “Sunfire 15K” hardware and “SunOS 5.9” operating system.

#### **Delivery servers**

The application is running on “BEA Weblogic 8.2” application server.

#### **Database**

The database utilized is the database used by VIES-on-the-Web application, its Oracle database.

### **2.46.4.3 Component framework**

#### **Security**

User authentication and authorisation mechanisms are utilized within the application to restrict actions performed by the user.

#### **User presentation**

User presentation is based on HTML/JavaScript pages. The “Struts” framework is utilized to manage communication flows with the user.

#### **Business logic**

The business logic embedded in the application is implemented inside Model layer components as regular programming language instructions.

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### **Data management**

The JDBC (Java Database Connectivity) API is utilized to manage communication between application and the database used.

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## 2.47 VIES & VIES-on-the-WEB Statistics

### 2.47.1 Reference and Applicable Documents

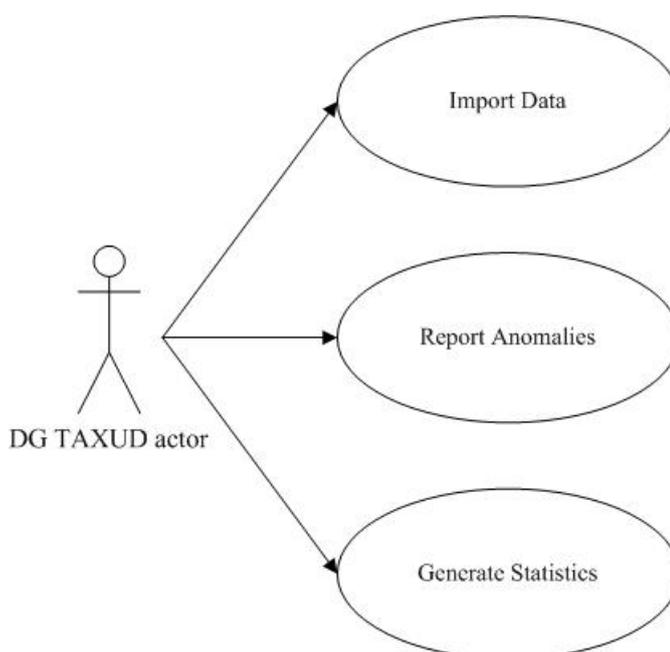
Id	Title	Reference	Version
VIES-STAT_FS	Functional Specifications for VIES Statistics System	FITSTC-VIES-STAT-FS.doc	8.01
VIES-STAT_TS	Technical Specifications for VIES Statistics System	FITSTC-VIES-STAT-TS.doc	7.01

Table 2-47: VIES & VIES-on-the-WEB Statistics Reference documents

### 2.47.2 Functional perspective

**VIES Statistics System** collects and processes differential information from various sources in several formats. On the basis of those information it provides consolidated statistics concerning VIES System and VIES-on-the-WEB.

#### 2.47.2.1 Use cases view



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Figure 2-172: VIES & VIES-on-the-WEB Statistics Use Case View

### Import Data

Importing Tools is a module of VIES Statistics System that performs import into the database of data from various sources:

- VIES traffic statistics files provided daily by CCN
- daily logs concerning availability of National VIES applications created by the VIES Monitoring
- monthly information provided by the Help Desk concerning calls created, closed and pending
- statistics concerning performed requests provided on the monthly basis by the VIES-on-the-Web
- web availability data provided monthly by DG TAXUD
- gateways availability reports provided daily by CCN.

### Report Anomalies

Any errors or abnormal values (e.g. missing/empty/incomplete/erroneous files) encountered during import of data are reported to an administrator by an e-mail.

### Generate Statistics

VIES Statistics System on the basis of imported data enables generation of defined statistic reports in chosen outputs formats (Excel, Pdf and XML) with an appliance of specified criteria.

#### **2.47.2.2 Domain vocabulary**

VIES Statistics System offers possibility to generate several statistical reports which can be assigned to five various groups.

**The first group** constitute **Validation Reports** which must be executed prior to producing the monthly reports for VIES or VIES-on-the-Web to make sure all the input data are available.

**-Availability Data Check** – (VIES) - provides information on number of tests performed per message type per paradigm for each day of the calendar month.

**-Traffic Data Check** – (VIES & VIES-on-the-Web) provides information on number of files of every type received per member state for a calendar month.

**-CCN Availability Data Check** – (VIES-on-the-Web) - provides information on number of Availability statistics files provided by CCN for each day of the calendar month.

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**-Web Availability Data Check** – (VIES-on-the-Web) - provides information on availability percentage provided for each day of the calendar month

**-Web Application Data Check** – (VIES-on-the-Web) provides information on the number of days by Member States and by Statistic\_Type (Interactive service or API) for the reporting month.

**The second group** of statistical reports provides information on amount of messages exchanged between National **VIES** applications and also about their unavailability.

**-Downtime Calendar** - provides information on time of R-VATR service unavailability for a given Member State in a chosen calendar month.

**-R-VATR Calendar** - provides information on monthly amount of outgoing R-VATR request from a chosen Member State to all others Member States.

**-Monthly Message Summary** - provides information on monthly amount of incoming requests, outgoing replies, outgoing request and incoming replies for every Member State.

**-Messages Sent/Received** - provides information on monthly amount of Valid Request Messages, Valid Response Messages, Valid Service Messages and Communication Errors directed by a selected Member State to all other Member States or directed by all other Member States to a selected Member State.

**-VIES Statistics For A Year** - provides information on aggregated amounts of messages for all Member States, in division on sent and received messages and also their types, for every month of a selected year.

**The third group** of statistical reports provides information on activities of **Help Desk**.

**-New Service Calls** - provides information on new service calls opened in a selected month for a given Member State.

**-Closed Service Calls** - provides information on service calls closed in a selected month for a given Member State.

**-Pending Service Calls** - provides information on service calls pending in a selected month for a given Member State.

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The **fourth group** of statistical reports provides information on the **VIES-on-the-Web** availability, its performance and quality of provided data.

**-Web Statistics Total** - provides information on the number of responses for a given statistic type (API or Interactive) or for all on every day of a selected month.

**-MS Consolidated Web Statistics** - provides detailed information on availability, performance and response quality of selected Member State VIES application on every day of specified month for a given statistic type (API or Interactive).

**-Global Consolidated Web Statistics** - provides detailed information on availability, performance and response quality of all VIES applications on every day of specified month for a given statistic type (API or Interactive) or for all.

**-Corrupted Input** - provides information on number of incorrect input data for a given statistic type (API or Interactive) on every day of a selected month.

The last **fifth group** of statistical reports provides information on availability of National VIES application in the context of **Service Level Agreement (SLA)**.

**-MS Server Day Availability for Synchronous VATR, HVATR** - provides information on an average of synchronous R\_VATR availability and an average of synchronous R\_HVATR availability between 7.00 AM and 7.00 PM GMT for every Member State in a specified calendar month.

**-MS Server Night Availability for Synchronous VATR, HVATR** - provides information on an average of synchronous R\_VATR availability and an average of synchronous R\_HVATR availability before 7.00 AM and after 7.00 PM GMT for every Member State in a specified calendar month.

**-MS Server Day Availability for Asynchronous VATR, HVATR, L2F2, L1F2, L2F1, L1F1, LIC and LICM** - provides information on monthly average availability of asynchronous VATR, HVATR, L2F2, L1F2, L2F1, L1F1, LIC and LICM between 7.00 AM and 7.00 PM GMT for every Member State in a specified calendar month.

**-MS Server Night Availability for Asynchronous VATR, HVATR, L2F2, L1F2, L2F1, L1F1, LIC and LICM** - provides information on monthly average availability of asynchronous VATR, HVATR, L2F2, L1F2, L2F1, L1F1, LIC and LICM before 7.00 AM and after 7.00 PM GMT for every Member State in a specified calendar month.

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## 2.47.3 Application perspective

### 2.47.3.1 Application structure

The application consists of two core components:

- The Importing Tool – responsible for extracting files from the mail server and the ftp server and importing them in to the database.
- The Reporting Tool - generating the reports in pdf, xls or xml format.

Additionally to this, two supplementing components were developed to support the core components;

- VIES Statistics Receiver Application – allowing for receipt of the files sent through the CCN/CSI infrastructure.
- PERL Consolidation scripts – used to consolidate daily request statistics files created by the VIES-on-the-Web application.

The overall view of the application and its surrounding environment is presented on a diagram below, the components marked with grey colour are the components of the application.

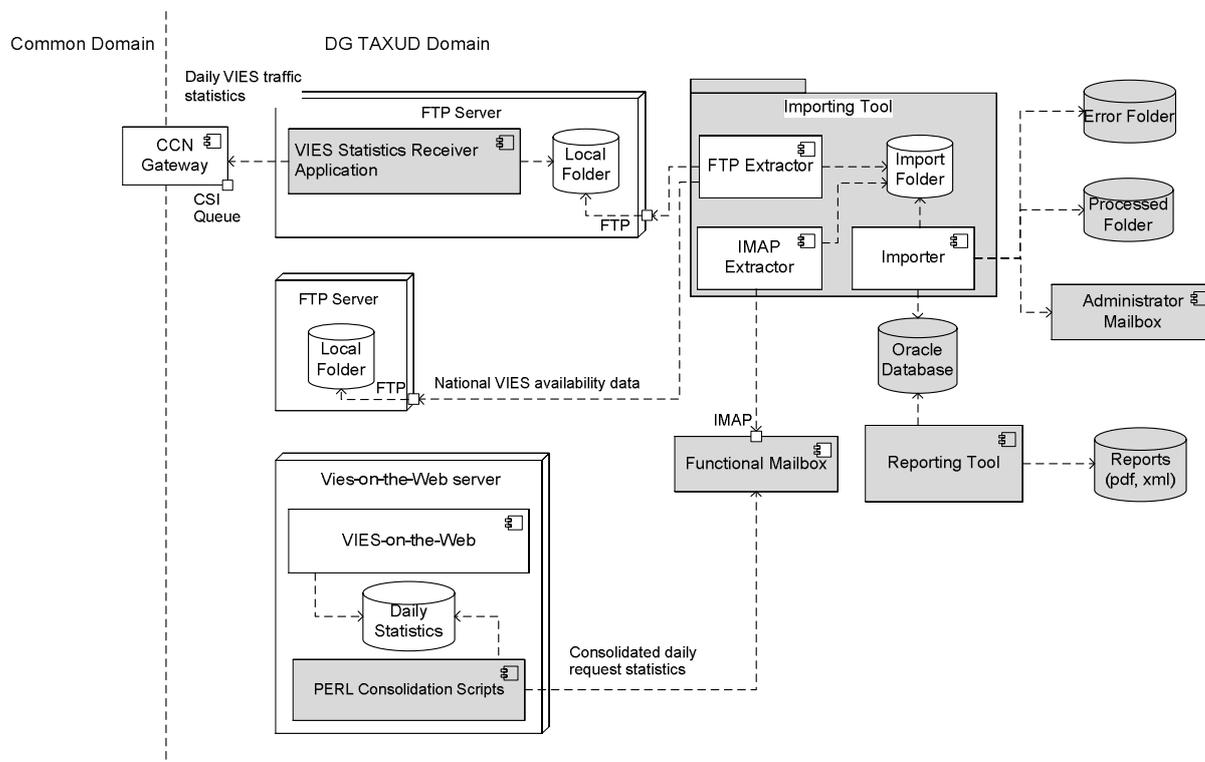


Figure 2-173: VIES & VIES-on-the-WEB Statistics Application structure

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The components of the application are as described below:

### **Import Tool**

The purpose of the Importing tool is to retrieve all the data needed for the VIES Statistics reports and to insert them into the VIES Statistics database.

The required data for is retrieved from two sources: email box and remote FTP file repository. For this separate modules have been written:

#### **IMAPExtractor**

Its responsibility is to extract e-mails and attachments from an email server and save them in the specified import folder. The extracted mail messages are not deleted from the server but are moved in an archive sub folder. The list of email accounts to process is defined in the configuration file.

#### **FTPEXtractor**

Extracts the available files from a file server, using FTP protocol, and saves them in the specified import folder.

#### **Importer**

Loops on all the files in the Import Folder and imports them into the Oracle database. It can process semicolon-separated text files, fixed size text file and excel files. The mapping between the original file and the database is defined in the configuration file. Dependant of the result of the importing process, the files are moved from the import folder to the error folder in case an error occurred, or to the processed folder in case of a successful import

The Import Folder is a directory on a local machine filesystem, where the files extracted by the Import Tool are temporary stored.

### **Reporting Tool**

The Reporting Tool extracts the data from the database and produces appropriate report, basing on the predefined templates.

The data aggregations and transformations used to produce report data are performed on the database side with the Views. The resulting reports are saved in Microsoft Excel 2003 spreadsheets. There's also a possibility to generate .PDF documents: the Excel report sheets are first printed to PostScript files. Then, the PostScript files are converted to pdf with Acrobat Distiller

### **VIES Statistics Receiver Application**

The purpose of the application is to get VIES traffic statistics messages from a CCN queue and store them on a local file system which can be accessed by FTP Extractor.

### **PERL Consolidation scripts**

The purpose of the script is consolidating into a single file the VIES/ VIES-on-the-Web raw statistics data files (Interactive or API) from the preceding month.

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### 2.47.3.2 Application dynamics

The general application dynamics is presented on the diagram below, external systems are also considered to allow for better understanding of the dynamics. The actions executed externally to the application are marked with {External} stereotype.

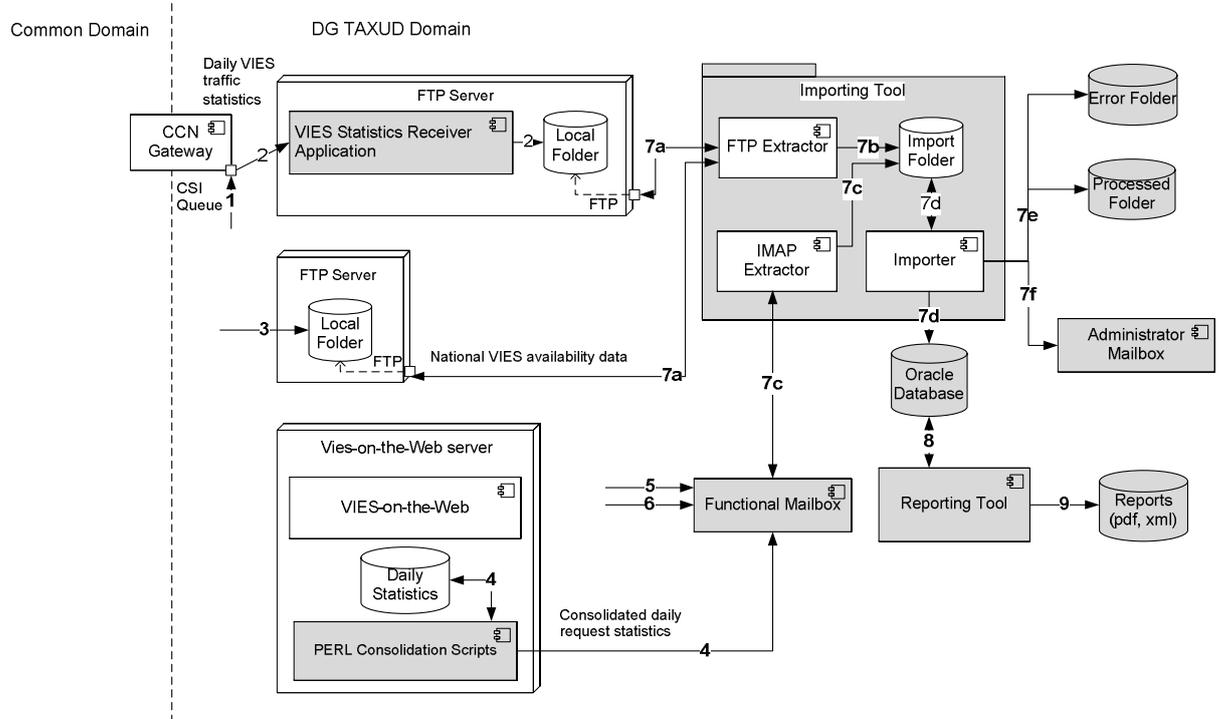


Figure 2-174: VIES & VIES-on-the-WEB Statistics Application Dynamics

1. {External} Executed Daily - The VIES traffic statistics files produced daily by the CCN/TC are sent to a CCN triggered queue on the CCN gateway used.
2. Upon arrival of the message in the queue, Statistics Receiver Application is triggered; the files are extracted from the queue and stored in the Reception Folder.
3. { External } Executed Daily - The VIES monitoring application stores collected daily availability data of Member States VIES Applications in the Monitoring Folder.
4. Executed monthly - PERL Consolidation script consolidates the daily request statistics data files, produced by VIES-on-the-Web. The mail, containing consolidated data, is sent to the specified functional mailbox.
5. { \_External } Executed Monthly - DG TAXUD sends the web availability data to the specified functional mailbox. The data is stored in a text file attached to the email.
6. { \_External } Executed Daily - The CCN/TC sends an Excel file containing the daily availability reports to the specified functional mailbox.
7. Executed Daily - The Import Tool is run daily in a batch mode. The tool imports the required data from two defined sources, parses it and loads into the database. Particularly:
  - 7 a. The FTPEXtractor extracts available files from a Monitoring Folder and Reception Folder located on a remote machine, using FTP access.

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- 7 b. The extracted files are stored in the Import Folder.
  - 7 c. The IMAPExtractor extracts emails and/or attachments from a specified functional mailbox and saves the files in the Import Folder. The email messages processed are moved from the Inbox to a configurable folder.
  - 7 d. The Importer loops on all the files in the Import Folder and imports them into the Oracle database.
  - 7 e. The processed files, depending on the results of loading are either moved to the Error Folder or Processed Folder.
  - 7 f. The report containing information about loading abovementioned files into the database is sent to the administrative mailbox defined in the configuration file.
8. The Reporting Tool extracts the report data from the database. The report is calculated in the background on the database side by the database View.
  9. The Reporting Tool saves the report in the Microsoft Excel 2003 file.
  10. {Optional} The PDF file can be created by calling a macro recorded in the report Excel file.

## **2.47.4 Technical perspective**

### **2.47.4.1 Service access and delivery**

#### **Access Channels**

Distinct application components are physically independent and incorporate different way of interfacing with user:

- Import Tool, Reporting Tool – The sub-modules are implemented as separate desktop applications with Graphical User Interface and command line interface.
- PERL Consolidation scripts – The tool is implemented as a command line utility.
- VIES Statistics Receiver Application – Is a background service and no user interface is available.

#### **Delivery Channels**

The application can be accessed over the local network of DG TAXUD.

#### **Service transport**

There are several points where application elements exchange information with external systems, these points are as listed:

- The interfaces between Import Tool and sources of statistics data use either FTP or IMAP protocols.
- VIES Statistics Receiver Application uses CSI stack and related protocols to receive the incoming messages from the queue.

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#### **2.47.4.2 Service platform**

##### **General platforms**

Different components of the application have been implemented using different tools and platforms, therefore should be described separately.

##### **Import Tool, Reporting Tool**

The applications are written in C# programming language, using “.NET 2.0” and developed with “Microsoft Visual Studio 2005”. For accessing the database” Oracle Data Provider for .Net (ODP.Net)” is required. “LumiSoft.Net.IMAP.Client” and “LumiSoft.Net.FTP.Client” libraries are used to encapsulate access to the email box and FTP repository.

For viewing the generated reports “Microsoft Excel 2003” is required, “Acrobat Distiller” is used to generate PDF reports.

##### **VIES Statistics Receiver Application**

The application written in C language and requires the latest version of the CSI stack available for the target environment.

##### **PERL Consolidation scripts**

The scripts are written in Perl (version 5.6.0 or higher) and use the modules “HTTP::Date, Net::SMTP” and “Benchmark”.

##### **Delivery servers**

The application is a desktop application, and can be run on any compatible machine.

##### **Database**

The Oracle database is used to store collected statistics information and compute reports.

#### **2.47.4.3 Component framework**

##### **Security**

The Reception Folder and Monitoring Folder are a part of the daily backup performed as described in the Security Plan.

##### **User presentation**

The application is a desktop application, and uses core .NET 2.0 platform GUI components to render the user interface.

The reports that are an outcome of application work can be viewed by any software capable of reading “Microsoft Excel 2003” file format or pdf format.

##### **Business logic**

The business logic embedded in the application is concentrated mainly on statistics report generation. For this, database Views have been prepared that aggregate source data and present the results of this aggregation in a database structure.

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### **Data management**

The access to the Oracle database is done with the “Oracle Data Provider for .Net (ODP.Net)”.

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## 2.48 VIES-on-the-Web

### 2.48.1 Reference and Applicable Documents

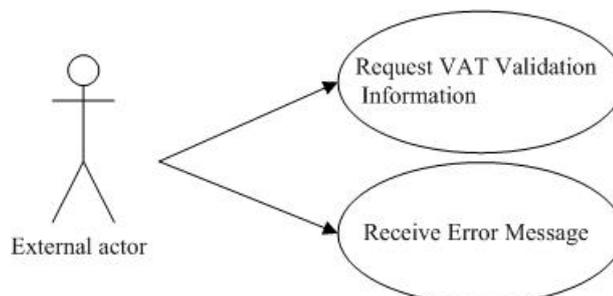
Id	Title	Reference	Version
VIES	Functional Specifications for VIES applications (VIES-FS-030)	VIES-FS-030 v1.9.doc	1.9
VIES WEB _FS	VIES-on-the-Web - Functional Specifications (FITSDEV-FS-VIESWEB)	FITSDEV-FS-VIESWEB-V6.05.doc	6.05
VIES WEB _TS	VIES-on-the-Web - Technical Specification (FITSDEV-TS-VIESWEB)	FITSDEV-TS-VIESWEB-V3.05.doc	3.05

Table 2-48: VIES-on-the-Web Reference documents

### 2.48.2 Functional perspective

VIES-on-the-Web is accessible from The Data Dissemination System (DDS) which is the public website. It enables anyone with Internet access to perform the validation of current EU VAT numbers. The validation has the form of a Yes or No answer, retrieved from the National VIES applications. VIES-on-the-WEB does not maintain its own database, it can only direct requests for information to the existing National VIES applications. The user is required to define in a request the country supposedly controlling that VAT number and the requesting VAT number. If authorized by the concerned member state, the more detailed information concerning the Trader associated with the VAT number, such as Name and Address may be provided.

#### 2.48.2.1 Use cases view



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Figure 2-175: VIES-on-the-Web use cases for External actor

### Request VAT Validation Information

Any interested person with access to internet can send through Vies-on-the-Web a request concerning validity of a particular VAT ID number to any Member State.

### Receive Error Message

In the case when a user is trying to send a request with missing or wrong input data he receives then an error message.

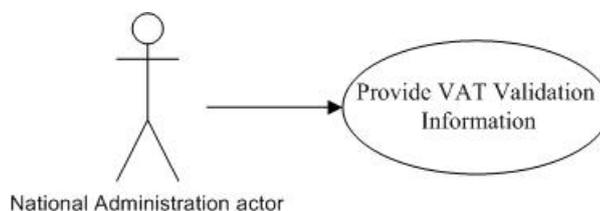


Figure 2-176: VIES-on-the-Web use case for National Administration actor

### Send Reply

National Administration (National Vies Application) sends a replay to a previously received request.

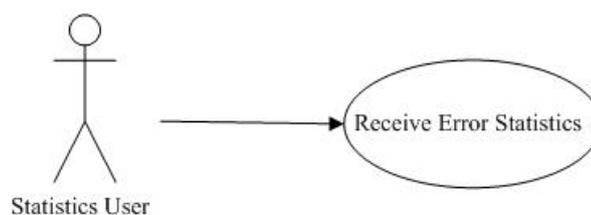


Figure 2-177: VIES-on-the-Web use case for Statistics User

### Receive Error Statistics

Any errors occurring (e.g. request errors, replay errors, communication errors) are regularly collected and accessible in a form of statistics for authorized users.

#### 2.48.2.2 Domain vocabulary

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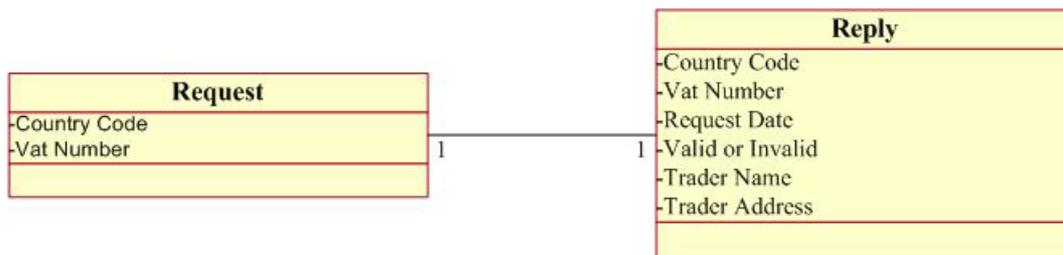


Figure 2-178: VoW VAT Information

**Request for VAT Information** contains only two elements that can be defined by user: Country and VAT number.

**Reply** always concerns only validity of a particular VAT number in a defined Country at specific date when Request was sent. There is no possibility to check VAT ID number at other than actual date. Reply contains mandatory information if concerned VAT ID number is valid or not (true or false). Trader's Name and Address are optional, they can be shown or hidden.

## 2.48.3 Application perspective

### 2.48.3.1 Application structure

The VIES-on-the-Web (VoW) is a centrally operated application.

Application structure follows well known Thin Web Client architectural pattern.

The Thin Web Client architectural pattern is useful for Internet-based applications, for which only the most minimal client configuration can be guaranteed. All business logic is executed on the server side. The Web client part is responsible for issuing requests to the server and displaying results of the computation performed on the server side. Application modules are deployed with the use of an Application Server, which provides environment for execution and management of the deployed modules.

The application structure is based on several worker components, working together to provide required functionality.

Two components are designated to provide external services available to the community:

**The Interactive service** - which is a web site aimed at end users;

**The API service** - an application interface.

These two services are the two entry points to the application core.

The Interactive service allows a user to submit a VAT number and a MS code. The main features of the API service are to perform the SOAP communication, and send the

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incoming requests to the application core. The answer is parsed and converted to the SOAP answer.

On the back-end, interface to Member States VIES Applications is implemented, transferring and receiving messages over the CCN network to the desired Member State.

The structure of the VIES-on-the-Web application, as well as its surrounding environment is presented on the following diagram.

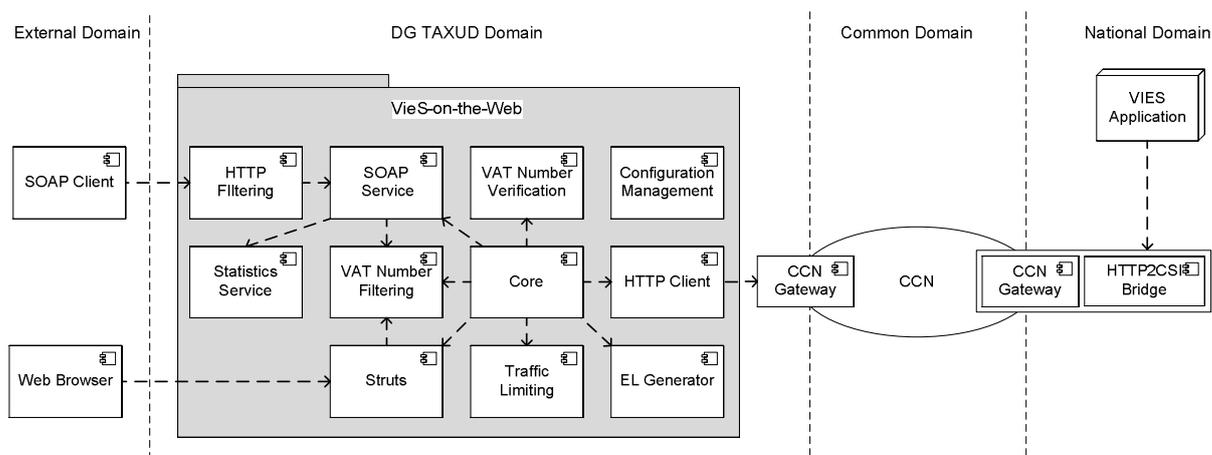


Figure 2-179: VIES-on-the-Web Application structure

The following modules are the part of the application.

### **Configuration Management**

This module loads the configuration of the services at start-up. It is also responsible for checking if the properties files have changed and if so, to update the configurations. There is a configuration file for the core, one for the API service and one for the Interactive service.

### **HTTP Filtering**

The API HTTP Filtering module, which is placed before the SOAP service, is in charge of filtering the incoming requests based on the content of the HTTP header. If one field of the header of the incoming HTTP request matches a configurable set of regular expressions for this field, then the request is rejected.

The Interactive HTTP Filtering module is part of the processing of the incoming requests (action classes of STRUTS).

### **SOAP Service**

The SOAP service provides the basic interface for the SOAP protocol.

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## **STRUTS**

The STRUTS service provides the basic interface for the HTTP/HTML protocol.

### **Core**

The core is responsible for performing VAT number checking, for generating the Enquiry Identifier (EI) for the VIES messages and for maintaining the session on the local gateway.

### **HTTP CSI Bridge**

The HTTP2CSI Bridge is a Web server component. It receives HTTP requests and transforms them to CSI synchronous requests. The CSI answers (including errors) are sent back in the HTTP responses.

### **VAT number Filtering**

This module is in charge of rejecting requests if the submitted couple (MS code, VAT number) matches a configurable set of regular expressions.

### **Traffic Limiting**

This module ensures that:

- There are no more than a configurable number of requests sent to a given MS code during a given period of time;
- There are no more than a configurable number of requests sent concurrently to a given MS code;
- There are no more than a configurable number of requests sent globally during a given period of time;
- There are no more than a configurable number of requests sent globally and concurrently.

### **Statistics service**

The SOAP Service provider and the Interactive service provider collect statistical data. These are written in a file. The name and the format of the raw statistics files are identical on both services. However they should be put in different directories (defined in the properties file of the services). So, tools available for the Vies-on-the-Web raw statistics file are used on the statistics of both services.

### **EI generator**

Each VIES message should have a unique identifier, unique to the sender over time and space. This module is in charge of building the EI identifiers, based on a prefix defined in the configuration file to identify the application and an algorithm to generate the remaining characters so that it is guaranteed that the sixteen characters generated are unique among DGTAXUD VIES application messages.

#### **2.48.3.2 Application dynamics**

The application dynamics gather around the Request/Reply communication with the VIES system.

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From the functional perspective, VIES-on-the-Web acts as an Applicant Member State VIES Client described in the VIES [2.35] chapter description, performing synchronous requests to the Requested Member State, to obtain VAT taxpayer information.

The diagram showing the communication between essential components involved in the data exchange is presented below:

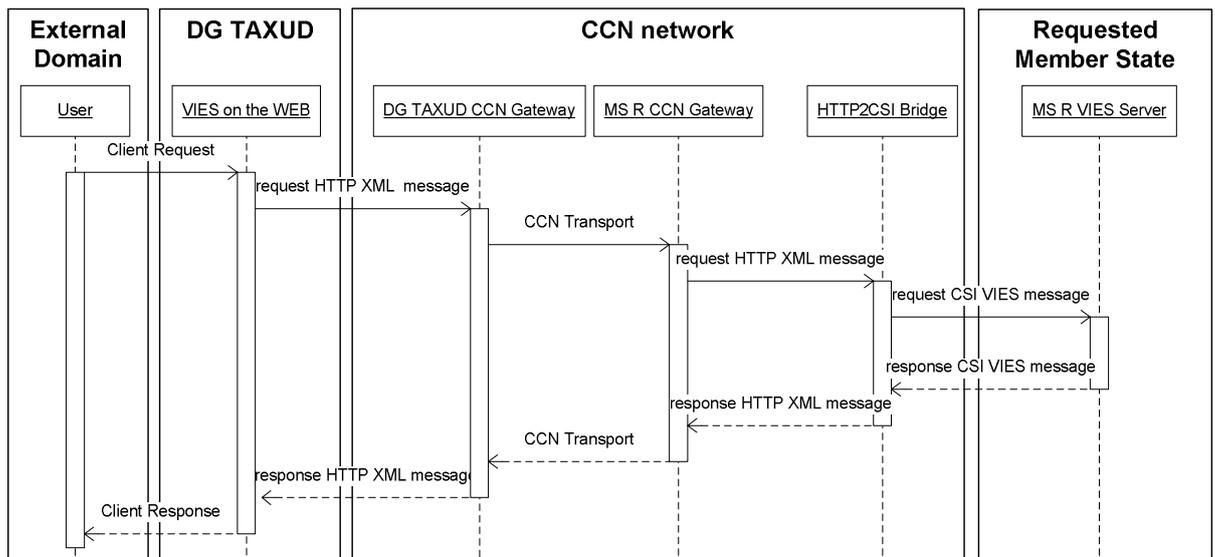


Figure 2-180: VIES-on-the-Web Application dynamics

1. The communication mechanism is similar to the one described in the [VIES System.Application Dynamics](#) section, and additionally uses a proxy layer between Member State CCN Gateway and Requested Member State VIES Server:
2. User submits a request to Vies-on-the-Web application.
3. The Vies-on-the-Web application, preprocesses the request, validates it and assigns unique identifier.
4. The request message is send further in HTTP XML format to the DG TAXUD CCN Gateway.
5. The request is transported to Requested Member State CCN Gateway over CCN network.
6. Prior to forwarding the request message to the MS R VIES Server, the message is transformed from HTTP XML format into CSI compatible message.
7. The MS R VIES Server, awaiting requests, receives and processes the request message and returns an appropriate CSI compatible format reply message.
8. The response message is converted by CCN HTTP2CSI Bridge from CSI to the HTTP XML message.
9. Converted response message is send over the CCN network to the DG TAXUD CCN Gateway, and then to the Vies-on-the-Web application.

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10. The Vies-on-the-Web receives the reply or, in the event of error (respectively problem of the remote application), the received error code and displays appropriate response to the User
11. The information concerning processed request is saved in the statistics file.

## **2.48.4 Technical perspective**

### **2.48.4.1 Service access and delivery**

#### **Access Channels**

The application can be accessed by the community, using standard HTTP Web browser. Additionally API (SOAP Web Service) is presented that can be accessed by external applications.

#### **Delivery Channels**

VIES-on-the-Web services are delivered to open public through Internet.

#### **Service transport**

The protocols used in information exchange are: HTTP, HTTP XML, SOAP (Simple Object Access Protocol) and CCN/CSI specific protocols.

### **2.48.4.2 Service platform**

#### **General platforms**

The application works on the following software/hardware platform:

Platform: Sunfire 15K

Operating System: SunOS 5.9

Programming Language: Java

The application has been developed with the use of the Java programming language, therefore for running, installed Java Runtime Environment is required

#### **Delivery servers**

The application has been prepared to run on the BEA Weblogic 8.2 Application Server. (No platform portability information has been placed in the available documentation).

#### **Database**

Oracle database is used for persistent storage of the data (no detailed information concerning version available). For the storage of statistical information, operating environment file system is used.

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### 2.48.4.3 Component framework

#### **Security**

Access to the application is protected by external firewall, filtering insecure requests incoming from the community users.

On the Member State communication stage CCN/CSI security mechanisms are used.

#### **User presentation**

Java STRUTS framework, version 1.2.9 is used to prepare HTML pages for User Interface.

The application is available in many languages. The different translations are stored in an Oracle database. The translations can be edited using dedicated application (VIES-on-the-Web Configuration Management). The utf-8 character encoding is used, to ensure proper handling of national characters.

#### **Business logic**

The business logic embedded in the application is implemented as a regular programming language functions and method calls, no specific business rule engine is used.

#### **Data management**

VIES-on-the-web is available in many languages. The different translations are stored in an Oracle database.

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## 2.49 Taxes in Europe

### 2.49.1 Reference and Applicable Documents

Id	Title	Reference	Version
TIE_FS	Tax Inventory Functional Specifications	FITSDEV-FS-TAXINVENTORY-V2.08.doc	2.08
TIE_TS	Tax Inventory Technical Specifications	FITSDEV-TS-TAXINVENTORY-V2.08.doc	2.08

Table 2-49: Taxes in Europe Reference documents

### 2.49.2 Functional perspective

**Taxes in Europe (Tax Inventory)** system enables anyone (citizens, Member States, Companies and any other institution or individuals) with Internet access to consult information on tax (e.g. Personal Income Tax, VAT) and non-tax (e.g. Social Contributions) liabilities, which are in force in any of Member States of the European Union.

#### 2.49.2.1 Use cases view

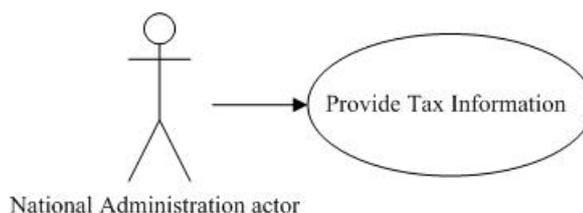


Figure 2-181: National Administration actor TiE use case

#### **Provide Tax Information**

National Administration provides DG TAXUD with a significant part of information in a defined format – Tax Form. Tax Form delivered by Member State contains practically all tax information with exception of three groups of data: Generic Tax Name, Tax revenue as % of GDP and Tax revenue as % of Total tax revenues.

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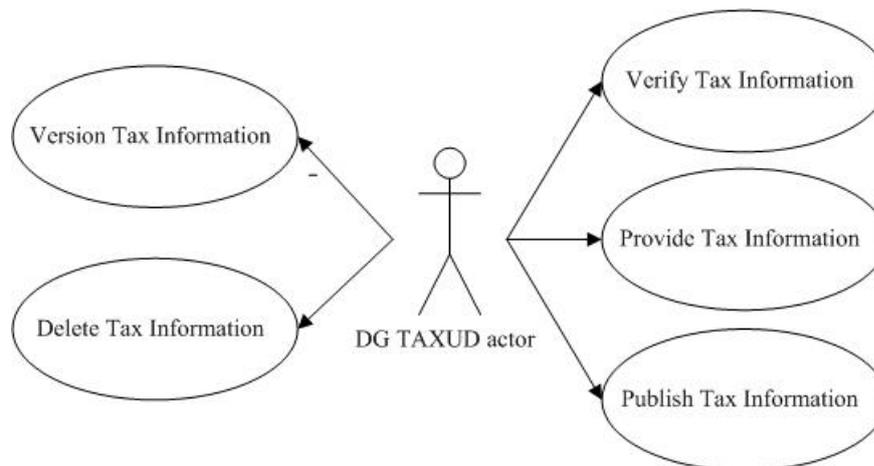


Figure 2-182: DG TAXUD actor TiE use cases

### **Verify Tax Information**

DG TAXUD verifies information contained in Tax Forms provided by Member States.

### **Provide Tax Information**

DG TAXUD fills in additional information - Generic Tax Name, Tax revenue as % of GDP and Tax revenue as % of Total tax revenues.

### **Version Tax Information**

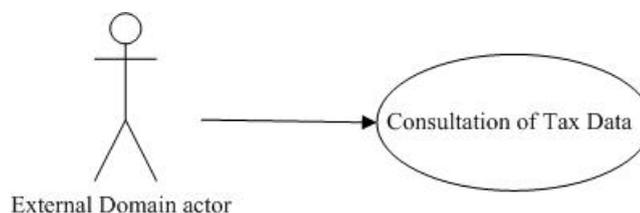
Information is versioned, each Tax Form receives a version number so when it is updated, the new version can be distinguished from older versions.

### **Publish Tax Information**

DG TAXUD publishes specific version of Tax Information making it official one. Only one set of information concerning specific tax and specific Member State can be available as official data in Taxes in Europe (Tax Inventory) system and it is practically always the latest available version of information.

### **Delete Tax Information**

If necessary, the information that is not published can be deleted by an authorized user.



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Figure 2-183: External Domain actor TiE use case

### Consultation of Tax Data

Anyone (citizens, Member States, Companies and any other institution or individuals) with access to Internet is able to consult published tax information.

#### 2.49.2.2 Domain vocabulary

The diagram presents all information contained in various formats of Tax Form. Those all information exists in TIE and can be therefore acquired from the application.

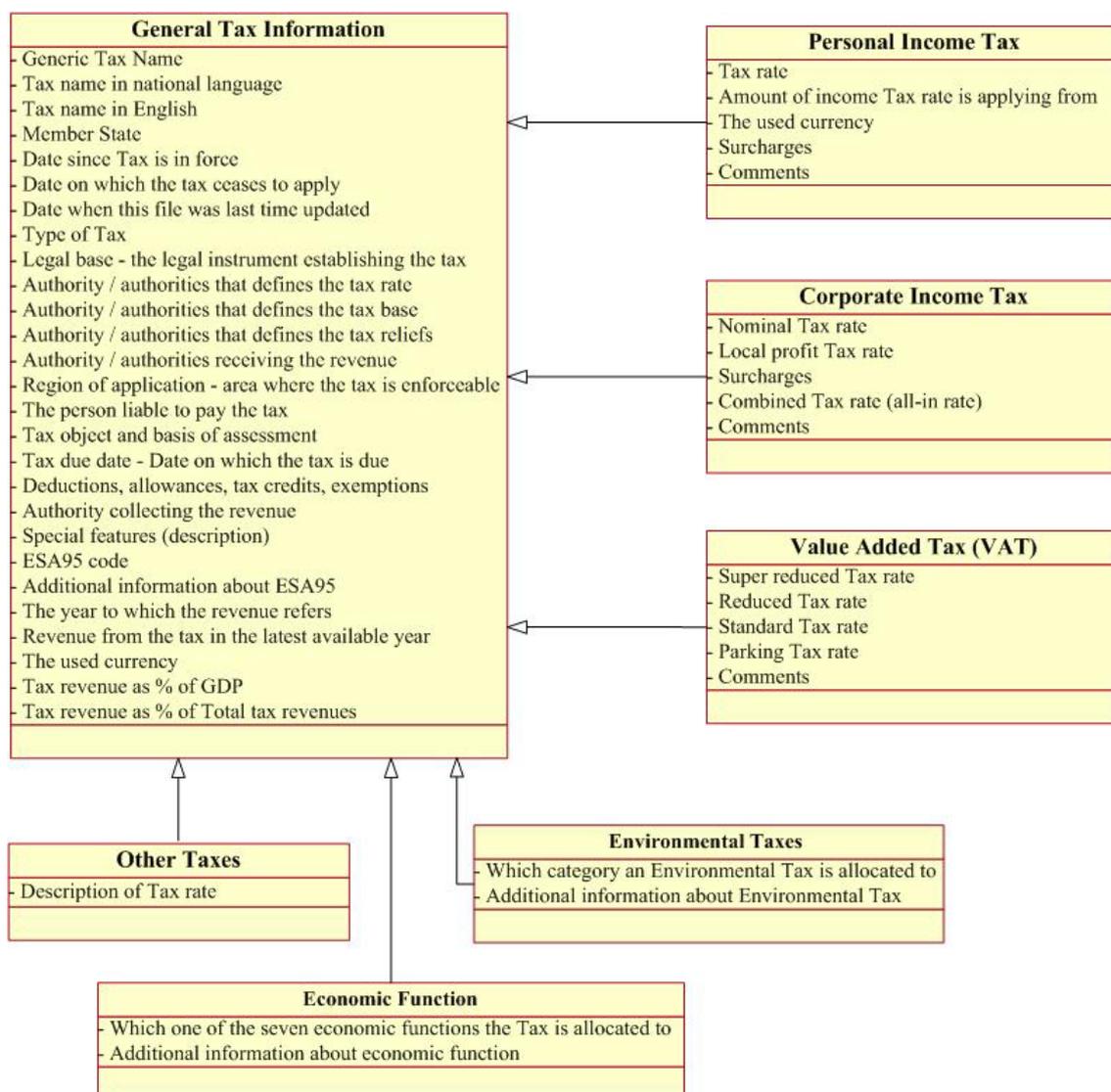


Figure 2-184: Tax Forms Domain Vocabulary

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**General Tax Information** represents common data available for all concerned forms of tax and non-tax liabilities and that information is present for any of them. There are six main classes representing various tax and non-tax liabilities and difference between them constitute details concerning applicable rate:

- **Personal Income Tax (PIT),**
- **Corporate Income Tax (CIT),**
- **Value Added Tax (VAT),**
- **Other Taxes,**
- **Economic Function,**
- **Environmental Taxes.**

Each one of those together with attributes contained in General Tax Information represents information characteristic for this particular tax or non-tax liability.

### 2.49.3 Application perspective

#### 2.49.3.1 Application structure

The Tax Inventory system is a client-server system. It follows the Thin Web Client architectural pattern, where the client interacts with the application through the HTML Web page. In addition, a back-end indexing server is deployed to relieve the front-end application server of heavy computational tasks (document index management and querying).

The main components of the system are shown below:

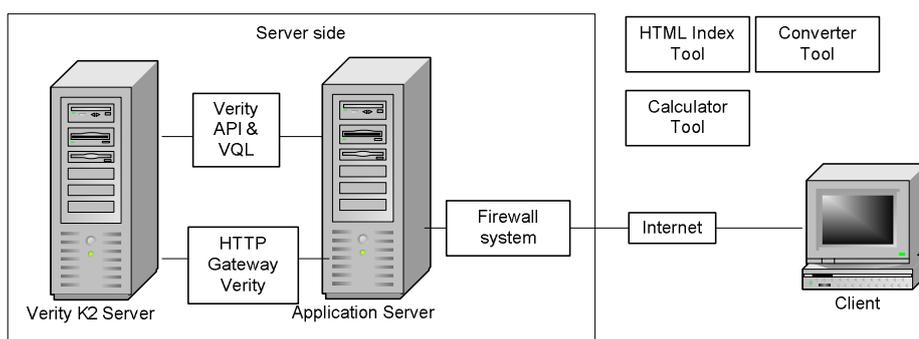


Figure 2-185: TiE Application structure

#### Server side components

**Verity K2 (back end server)** - Verity K2 is a client-server based product, used to index documents. From these documents, Verity creates one or more indexation files called “collections” which can be accessed by Verity clients. Verity K2 provides an

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administration tool (Dashboard) which can be used to manage the collections. This administration tool is accessible through a URL.

To index the files, different kinds of gateways can be used. A gateway is in fact a way for the Verity server to access the data. In the scope of TIE, the HTTP gateway is used. Verity checks an HTML index file containing the whole list of documents to index and creates or updates the collection in consequence.

The application server owns the XML indexation files. The Verity server uses an HTTP gateway to access and index the XML indexation files. The Verity server owns the collection (index of the XML indexation files).

The application server owns the search application that uses the Verity API and VQL to query the collection. VQL is a language that is used to query a collection.

Web application server - front-end server part of an application. The server is responsible for handling communication with client applications. The requests issued by the clients are mainly document searches against provided phrase.

There is no database. All XML and HTML files are directly stored on the local directories of the web server. The Verity Client is used to access back-end Verity K2 server API for issuing search requests.

A WordML/HTML converter is provided to convert Microsoft Word 2003 Forms (WordML files) delivered by National Administration into HTML files. This converter is based on the XSL provided by Microsoft. It also corrects the resulting HTML: checkbox, panel hide/show, etc. This converter is based on Java and is delivered as a stand-alone tool. It is used by DG TAXUD to convert all WordML documents into HTML documents. This conversion has to be done each time WordML files have been updated. The converted HTML files are then served by front-end server to the clients, as a result of search queries.

**HTML Index Tool** - An HTML index file is used by Verity to perform the indexation. This file is generated by the HTML Index Generator tool.

**Converter Tool** – The tool is used to perform migration of old Tax Forms to a new release of the Tax Form. It can also convert any Tax Form to WordML and Verity XML files.

**Calculator Tool** - This allows to update the fields “% of GDP” and “% of TTR” using a GDP and TTR entry files

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### Client side components

**Web Browser-** The client computer must have a web browser and must have access to the Europa site in order to use the new search module. The web browser must be able to execute JavaScript code as all displayed pages use HTML and JavaScript.

#### 2.49.3.2 Application dynamics

The main business function application realises, is grouping, storing and sharing information about different taxes applicable across Europe, therefore main communication paths between the application components will serve purpose of finding the required information and presenting it to the user. For this the following sequence diagram can be presented, modelling an abstraction of this process.

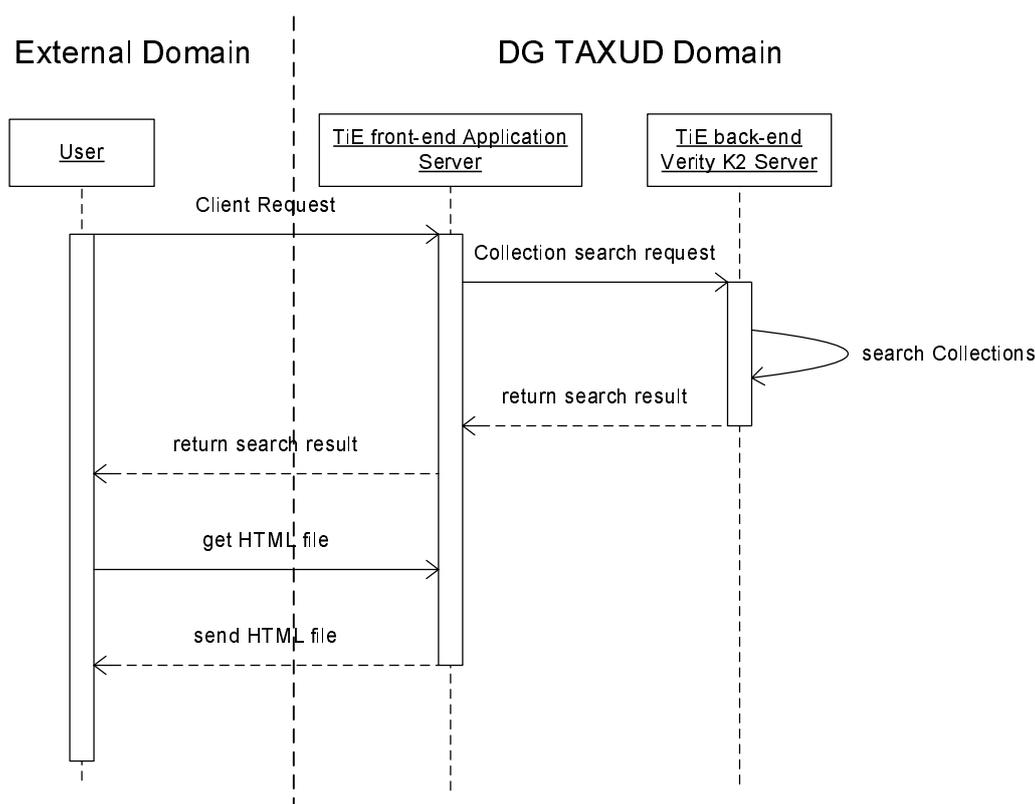


Figure 2-186: TiE Application dynamics

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## **2.49.4 Technical perspective**

### **2.49.4.1 Service access and delivery**

#### **Access Channels**

The application functionality is available to the end-users by thin web client application rendered in Web Browser.

A special Microsoft Word 2003 forms are available that are used as an input documents to be submitted to the Tax Inventory.

#### **Delivery Channels**

All connections between the front-end and back-end server are local intranet connections. End-user access to the application is realised through internet.

#### **Service transport**

The communication among server components (front-end and back-end servers) as well as communication with clients is realised using HTTP protocol.

### **2.49.4.2 Service platform**

#### **General platforms**

The front-end Web application server module - is a Java Enterprise application (J2EE application) written in Java programming language, and running on SunOS operating system.

The back-end server is Verity K2 server.

#### **Delivery servers**

The Web application server module is running on Weblogic 8.1 SP4 application server.

#### **Database**

There is no database. All XML and HTML files are stored directly on the local filesystem of the web server.

### **2.49.4.3 Component framework**

#### **Security**

The Tax Form has a password which only allows users to fill the fields. There is no control on the current user. That means that the Tax Form does not check who currently uses the form. It implies that fields marked with "to be filled by the commission" can be filled by any users.

No specific security functionality is developed. The application is based on BEA Weblogic 8.1 SP4 and Verity K2 and relies on the security features of these products.

Internet access is controlled by a firewall system composed of a firewall, a reverse proxy and then another firewall. The reverse proxy has a timeout set to 60 seconds

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### **User presentation**

The user presentation layer is based on Java Struts Framework that is responsible for handling incoming requests and static HTML pages containing the Tax Inventory data.

All interfaces are provided using UTF-8 encoding.

### **Business logic**

The business logic embedded in the application is implemented as a regular programming language functions and method calls, for full test search engine external Verity K2 components are used (Verity client, Verity Server).

### **Data management**

There is no database. All XML and HTML files are directly stored on the web server.