DELIVERABLE

Project Acronym:	**PEPPOL**
Grant Agreement number:	**224974**
Project Title:	**Pan-European Public Procurement Online**

Deliverable 2.2
Specification of architecture and components enabling cross-border VCD

Revision: 1.01

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Project co-funded by the European Commission within the ICT Policy Support Programme		
Dissemination Level		
P	Public	X
C	Confidential, only for members of the consortium and the Commission Services	

Revision History

Revision	Date	Author	Organisation	Description
1.0	20100430	Maria Wimmer	UKL	First version (pending EC approval)
1.01	20101001	Klaus Vilstrup Pedersen	DIFI	EC Approved

Statement of originality

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[1] From 29th December 2009, CNIPA will be renamed DigitPA (Legislative Decree 1st December 2009, n. 177)
[2] English: Agency for Public Management and eGovernment

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1 Introduction

1.1 Reading Instructions

This document is targeted to different reader groups.

Project managers and strategic decision-makers, who have to plan and decide on the introduction of a VCD solution in their country, are addressed. It is recommended that they first read deliverable D 2.1 for basic understanding. In this report, this target group should read the processes, the governance and sustainability chapter as well as the overall concept for the technical implementation.

Legal experts, who will have to take care of the legal mapping (ontology) and legal compliance of the PEPPOL solution and the national legal environment, are recommended to read the legal chapter, the sections on the ontology development in the European VCD specification as well as the governance and sustainability chapter.

Those who will be responsible for organisational implementations are recommended to specifically read the chapters on processes, pilot planning and governance and sustainability. The technical chapters are especially for the experts responsible for the technical implementations.

To get full understanding of the specifications described the document at hand, it is recommended to read PEPPOL Deliverable D 2.1. Further recommended readings are the eProcurement directive as well as the studies issued by the EC DG Markt.

1.2 Deliverable Objective

This document represents Deliverable 2.2 (D2.2: Virtual Company Dossier Specifications) of the PEPPOL project (Pan-European Public Procurement Online).

The aim of this deliverable is to support the implementation of the PEPPOL Virtual Company Dossier pilots by specifying the building blocks needed. These specifications are applicable to both Contracting Authorities and Economic Operators and their technology and/or service providers.

These specifications were prepared by PEPPOL Work Package 2 as an outcome from PEPPOL's Proof-of-Concept for Virtual Company Dossier (D2.1). It is anticipated that updates will be required during the Test and Production Pilot phases of the PEPPOL project as part of PEPPOL's overall support and governance policy.

1.3 Deliverable Summary

According to the Description of work of PEPPOL, the overall aim of work package 2 (Virtual Company Dossier – VCD) is "to provide interoperable solutions for economic operators in any European country to utilize company information already registered somewhere and to submit this information electronically to any public sector awarding entity from a different Member State when these economic operators decide to apply for public contracts".

Based on the status quo report, the insight into existing company dossier structures and the specific VCD requirements, a consolidation of existing solutions with the PEPPOL needs will be performed. This will consequently lead to the formal technical specification of the VCD for pan-European eProcurement. The technical specification will be enriched with an organizational and a legal specification for the pan-European VCD implementation and application. The specification of the VCD will be mutually agreed upon at least by the participating partner countries. An agreement procedure for application on Europe-wide scale will be specified, too. The following subtasks are summarized in Task 2.2.

- Formal technical specification of the VCD [1]
- Organizational specification of the VCD [1]
- Legal specification of the VCD [1]

1.4 Deliverable Structure

D 2.2 at hand documents technical, legal and organisational specifications, structured along the following contents:

- Chapter 2 introduces the extensions to the requirements specification reported in D 2.1.
- Chapter 3 describes the overall approach as well as the specific methodologies deployed to drive the specifications in terms of organisational, legal and technical specifications.
- Chapter 4 details the processes of the VCD services with regard to the four stages of the VCD concept.
- Chapter 3 puts forward the legal specifications of the VCD concept in terms of mutual recognition, legal mapping of criteria to evidences, trust in the services and liability.
- Chapter 4 introduces the reference implementation of the Virtual Company Dossier

Besides the report at hand, D2.2 consists of technical specifications, which are attached to this document and which are accessible online via http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/process-specifications-1/folder_contents. Among them are

- for the European VCD System: the ontology, the reasoner components;
- the interface specification between the National VCD System and the European VCD System in terms of WSDL interface;
- the VCD viewer mock-ups describing the user interface and navigation through a VCD instance;
- detailed process models for the different stages in the VCD vision;
- the VCD schema specification.

1.5 The PEPPOL Project

PEPPOL (Pan European Public Procurement On Line) is a 42 Month (May 1st 2008 – October 31st 2011) pilot project under the European Commission's CIP (Competitiveness and Innovation Programme) initiative.

The project aims to align business processes for eProcurement across all Government Agencies within Europe. The vision is that any company and in particular small and medium-sized enterprises (SMEs) in the EU can communicate electronically with any European governmental institution for the entire procurement process.

On May 1st 2010, following a specification phase and a development phase, PEPPOL entered its test pilot phase and from November 1st 2010 will be supporting production pilots.

The PEPPOL consortium comprises of the leading public eProcurement agencies in Austria, Denmark, Finland, France, Germany, Italy, Norway and Hungary. These have recently been joined by agencies from Greece, Portugal, the UK and Sweden.

The scope and structure of the PEPPOL project is shown in Figure 2. In addition to the work packages shown, WP6 provides project administration and WP7 supports awareness, training and consensus building.

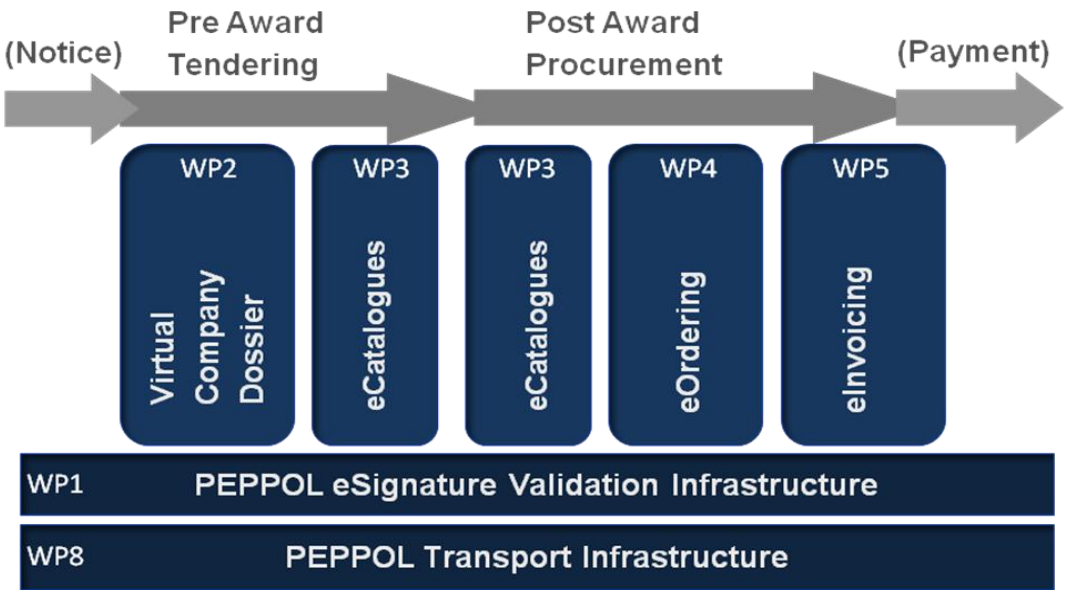

Figure 1-1: Structure of PEPPOL project

PEPPOL eProcurement Objectives

The broader vision for PEPPOL is that any company (incl. SMEs) in the EU can communicate electronically with any EU governmental institution for all procurement processes.

The objectives for eProcurement are set by PEPPOL stakeholders. These include:

- Project owners: The sponsors of PEPPOL i.e. EU commission and the beneficiary Member States.
- WP participants: Member States participating in specific PEPPOL work packages.
- Non-beneficiary Member State: stakeholders that gain benefits from the pilot i.e. EU member countries not participating in PEPPOL WP X.

The project owner objectives can be deduced from the I2010[3] strategy, CIP ICT PSP[4] project call and country specific reasons for joining the project. Collectively this can be viewed as supporting a single European market, competiveness and innovation by...

- Removing barriers for cross-border eProcurement
- Learning through implementation and operation of eProcurement pilot systems
- Raising awareness of eProcurement benefits through a pilot

PEPPOL has adopted a broad definition for cross-border eProcurement. In a typical case a Contracting Authority and an Economic Operator (who may be an SME) are situated in different member states. However, there are also cases where an eProcurement platform is operated in a country different from either the Contracting Authority or the Economic Operator. In the scope of PEPPOL these are also considered as cases when the “cross-border” characteristic can be a barrier to interoperability.

Pilot participant objectives can be deduced from country specific reasons for participating in the project:

- Leveraging existing solutions to handle cross-border eProcurement
- Create traction on interoperability model, thereby securing the investment in the chosen eProcurement interoperability model
- Influence on standardization activities in such a way that they meet the requirements of the participant

There is a strong desire by both Contracting Authorities and Economic Operators for automation and efficiency across the procurement process. This requires good interoperability - that is an information and

[3] http://ec.europa.eu/information_society/eeurope/i2010/strategy/index_en.htm
[4] http://ec.europa.eu/information_society/activities/ict_psp/index_en.htm

process model ensuring a flow of information between different parts of the process and ensuring a common understanding of that information. As mentioned above these interoperability requirements have been analyzed according to the European Interoperability Framework.

Non-beneficiary Member State objectives can be deduced from country specific reasons for joining the reference group, for example:

- Leveraging and building upon the experience of the PEPPOL eProcurement project.
- Cost saving by adopting a proven eProcurement interoperability model

Two separate outcomes for PEPPOL deliverables have been identified:

- Interconnecting the eProcurement platforms of Contracting Authorities in participating countries for engaging Economic Operators in other countries.
- Making available open source software together with tools to deal with eProcurement both for Contracting Authorities and Economic Operators (especially SME's).

PEPPOL has built upon existing work in these areas and continues cooperation with current initiatives.

1.6 PEPPOL Virtual Company Dossier

The overall aim of PEPPOL Work Package 2 is to provide interoperable solutions for economic operators in any European country to utilise company information already registered somewhere, to assemble this company information into an electronic package and to submit this package electronically to any public sector awarding entity in Europe when these economic operators decide to apply for public contracts.

To achieve this goal, deliverable 2.1 (D2.1) provided an analysis, synthesis and assessment of existing company dossier structures of individual Member State countries (AT, DE, IT, NO, etc.) and of other standard specifications. Therewith, it fulfilled the respective goal laid down in the technical annex. The deliverable also described the overall vision of the VCD, which was conceptualised throughout the first phase of work package 2. Besides that, the legal, organisational and technical requirements for the VCD solution to be implemented were elaborated.

Deliverable 2.2 (Specification of architecture and components enabling cross-border VCD) embarks on the VCD vision and requirements specified in D 2.1 and further details the VCD overall concept. It implements the second– more detailed – goal expressed in the technical annex, i.e. "consolidating existing solutions with the PEPPOL needs, and develop a technical specification of the VCD (in a standard schema format)". The specifications of the VCD components form the interoperability architecture for cross border VCD, which addresses all interoperability layers in EIF 2.0.

Putting it into the overall PEPPOL context, the VCD addresses the pre-award phase as indicated in Figure 1-2. The VCD specification and pilot implementation form a key building block for pan-European eProcurement through its uniquely described data to be exchanged between tenderers and contracting authorities across Member State countries.

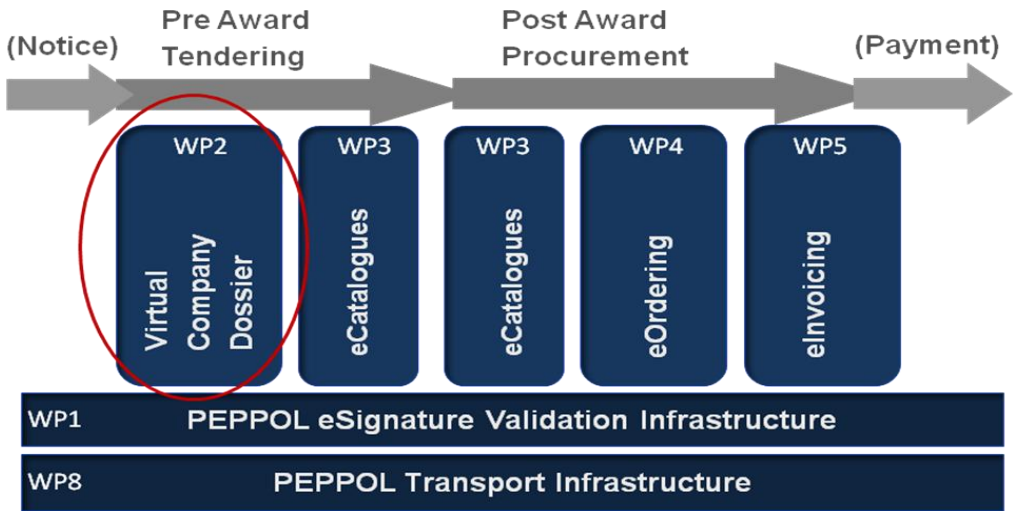

Figure 1-2: Scoping the VCD within the PEPPOL overall context.

In phase two of the WP 2 activities, the organisational, semantic and technical specifications of the overall VCD concept are realised. The elaborations are based on the status quo report, the insights into existing company dossier structures and the specific VCD requirements as defined in D2.1. The activities in phase two are comprised of (a) a consolidation of existing solutions with the PEPPOL needs, (b) a formal technical specification of the VCD concept for pan-European eProcurement and (c) organisational and legal specifications for the pan-European VCD implementation and application. The specification of the VCD is mutually agreed upon by the participating partner countries[5].

The process describing the overall VCD scenario has already been introduced in D2.1 on a high level. For overall understanding and making the VCD vision (stages 1-4) more vivid, a more detailed description of the status quo process is required.. All further process models of stages 1-4 are created accordingly and are enhancing this model via VCD specific elements. Figure 1-3 shows the overall process.

A readable Version of this process model can be retrieved from: http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1. The process models are created using the Business Process Modelling Notation (BPMN). All tasks referenced in the process models are numbered according to the following structure [Business Partner.Task.Stage.Number]. This means that [EO.T.0.5] refers to [EconomicOperator.Task.Stage0.5]

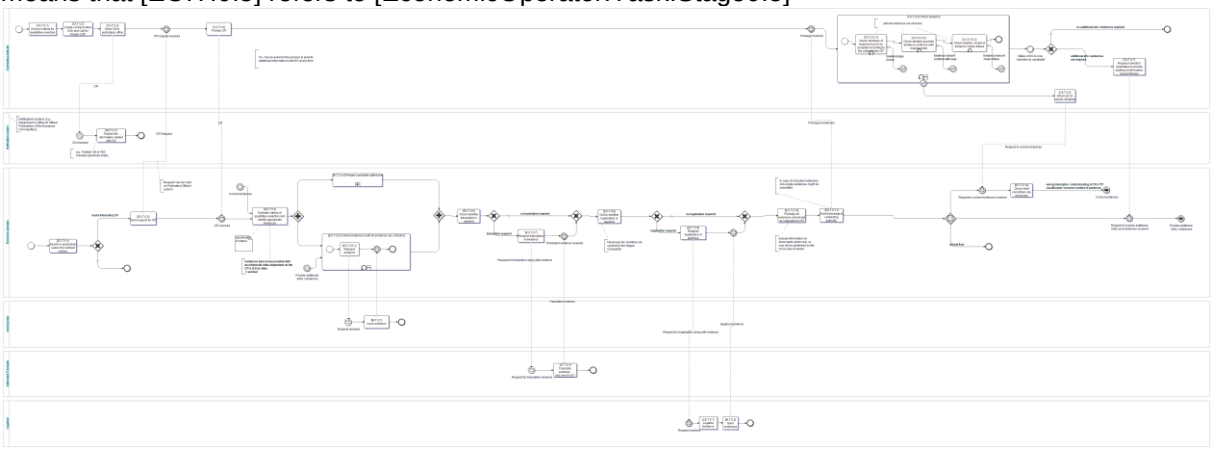

Figure 1-3: Detailed process model of the status quo

[5] An agreement procedure for application on Europe-wide scale (as stated in the technical annex) will be specified in phases 3 and 4 of the project

A Contracting Authority prepares a contract notice and the contract documentation, specifications, descriptive documents, contract documents and conditions, supporting documents and other information, together also referred to as the call for tender (or the invitation to tender in the case of restricted procedures, negotiated procedures with a publication of a contract notice, and the competitive dialogue) [CA.T.0.1; CA.T.0.2].

The contract notice is produced and transmitted to the official gazette such as the Tenders Electronic Daily (TED) when due [CA.T.0.3; NS.T.0.1]. It should be noted that a Contracting Authority who wishes to award a public contract or a framework agreement covered by the scope of Directive 2004/18/EC, inter alia above certain threshold values, the publication in the Official Journal of the European Union (TED) is, with a few exceptions, mandatory in accordance with Article 36 of the Directive.

Contracting Authorities may publish notices of public contracts in accordance with Article 36 which are not subject to the publication requirement laid down in the directive, inter alia below that threshold, or they may use other channels for the contract notice (depending on national legislation; e.g. contract notices may be mandatory in national official gazettes). Also other national tendering platforms can be used by the Contracting Authority. The steps of publishing the contract notice are part of the “eNotification” phase of public procurement.

An Economic Operator can use means such as the TED system, existing tendering platforms or official national gazettes to search for contract notices and to retrieve the relevant information about (active) tenders [EO.T.0.1]. Contract notices shall include the information mentioned in Annex VII A of the Directive, including the selection criteria regarding the personal situation of Economic Operators that may lead to their exclusion, and required information proving that they do not fall within the cases justifying exclusion; selection criteria and information concerning the Economic Operators' personal situation, information and any necessary formalities for assessment of the minimum economic and technical standards required of the Economic Operator, and where applicable, the legal form to be taken by the grouping of Economic Operators to whom the contract is to be awarded [CA.T.0.1].

Contract notices shall be published fully in an official language of the Community as chosen by the CA, this original language version constituting the sole authentic text. A summary of the important elements of each notice shall be published in the other official languages. The mandatory publication of contract notices in TED is a means to ensure transparency for public procurement throughout Europe and to enable a well functioning single market. For contract notices below threshold, TED can also complement existing national sources through widespread information across borders. Sometimes, the information on a contract notice provided in TED is not complete. Hence, the Economic Operator must directly get the authentic contract notice and exact conditions from the Contracting Authority (Call for Tender) in order to avoid a failure on interpreting the requirements for participation [EO.T.0.2; CA.T.0.4].

If an Economic Operator decides to participate in a cross border public tender, the appropriate selection and exclusion criteria have to be evaluated [EO.T.0.3]. This means that the Economic Operator has to match these criteria set out in the contract notice of the country the Contracting Authority with the evidences (attestations, candidate statements and certificates) of its own country in order to prove compliance. The evidences can be retrieved from the appropriate issuing bodies such as certifiers, source registers, banks, public authorities, etc. in the country where the Economic Operator is established [EO.T.0.5.; IB.T.0.1] or they have to be issued by the Economic Operator himself [EO.T.0.4]. Criteria to be proven and evidences are affected by various influencing factors such as the legal form of the Economic Operator, the specific structure of the Tenderer (e.g. whether he is part of a consortium or acting as a single tenderer) and of course both – the nationality of the Contracting Authority and the Nationality of the Economic Operator, all together leading to a very complex rule set of how to derive the relevant criteria and the appropriate evidences to prove them.

The step of retrieving these proofs of suitability and non-exclusion and collecting documents for the receiving entities becomes a necessary task and may take place at different times. In some Member States the “self-declaration” (a statement issued by the Economic Operator) is adopted to claim an initial suitability for applying and attending a tender. In this case, Economic Operators may retrieve the evidences only at a later stage if necessary at all.

In most cases an official translation of the documents submitted by the Economic Operator is required [EO.T.0.6; EO.T.0.7]. Some European countries are also imposing the submission of legally attested documents. In this case, accredited official translators, lawyers or notaries have to issue such legally attested translations of evidences [AT.T.0.1].

The following flows of documents have to be considered specifically:

- documents that cannot be generated in the target language by the originating authority;
- documents produced by the Economic Operator such as self declarations;
- documents that must be accessed by the Contracting Authority from the official source.

The Economic Operator may also be requested to produce legalized documents for countries that are not covered by the Hague convention [EO.T.0.8]. The Hague Convention is overcoming the burden of legalisation for public documents. It specifies modalities through which documents can be certified for legal purposes in countries that have signed the convention. Such a certification is called an apostille which is comparable to a notarisation [EO.T.0.9; LE.T.0.1; LE.T.0.2]. The apostille is often added to documents. Sometimes two countries have a special treaty concerning the recognition of each others documents.

Finally, the translated documents are submitted as a package together with the offer to the Contracting Authority [EO.T.0.10; EO.T.0.11]. In some countries, the initial submission covers only the application with a set of self-declarations (two-phased tendering). At a later stage and following an explicit request, the submission of the evidence documents follows.

The Contracting Authority checks their compliance with the appropriate (legal) requirements [CA.T.0.5]. The formal legal check of evidence is usually carried out in three separated checks:

- The first check concerns the type of evidence that has to be accepted according to the rules and criteria described in CFT and national legislation [CA.T.0.5.3].
- The second check identifies whether the evidence provided meets the defined requirements [CA.T.0.5.3].
- The third check evaluates the content of the evidence and whether the criteria specified in the CFT [CA.T.0.5.3] are actually met.

The step of submitting evidence (EO) and checking them (CA) might be performed through separated incremental cycles in cases where the evidence provided is formally not compliant, does not conform with the requirements or does not meet the criteria specification. In these cases it has to be corrected and the Economic Operator will be informed by the Contracting Authority about necessary corrections [CA.T.0.6]. The Economic Operator in turn has to check which corrections are necessary [EO.T.0.12] and might be able to identify appropriate evidence [EO.T.0.3].

If all checks on evidence are done and no errors are identified the status of Economic Operator is changed to a “selected candidate” – depending on the specific procurement process (one-phase or two-phase). Afterward changing the status of the Economic Operator the Contracting Authority can still request additional information and evidences [CA.T.0.7] which then have to be provided by the Economic Operator [EO.T.0.5].

1.7 PEPPOL VCD Approach

Figure 1-4 provides an overview of the main PEPPOL VCD components (in grey rectangles), which shape the VCD concept.

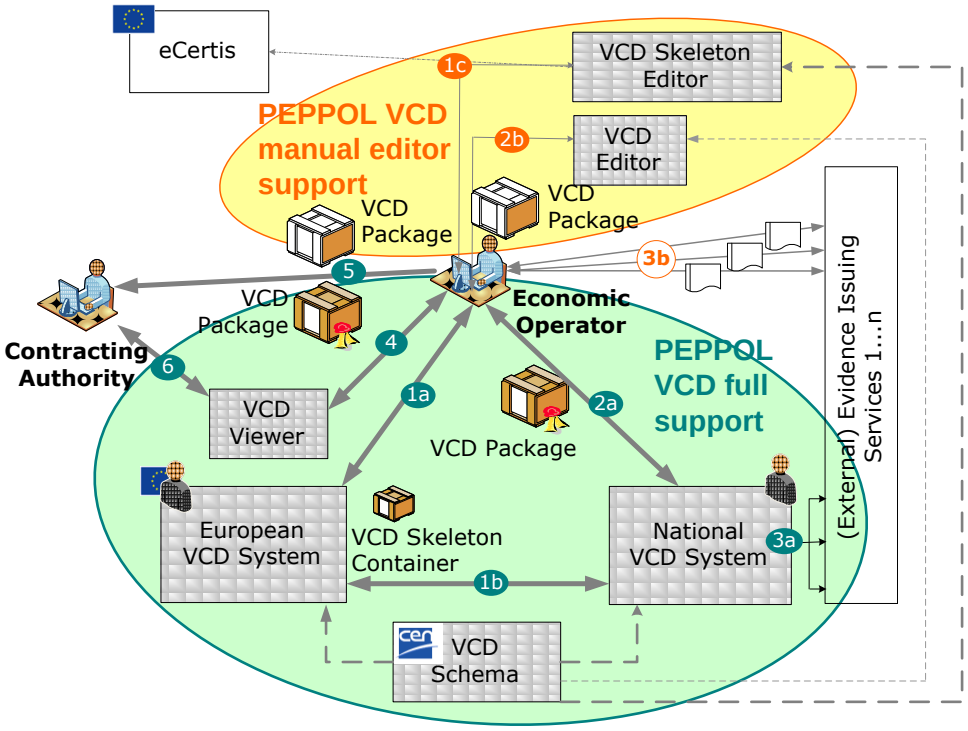

Figure 1-4: PEPPOL's overall VCD solution – components (in grey rectangles) of the VCD full support solution and manual editor solution

The PEPPOL VCD full support solution represents the highly advanced and comprehensive solution for the VCD concept. The main components of this PEPPOL VCD full support solution are

(1) the **European VCD System**, a central component, which provides an ontology-based mapping of criteria to evidences across countries, taking into account the different implementation of the respective EU directives in each country's national public procurement acts – resulting in different national legal rule sets – as well as specific tenderer constellations and generates a VCD Skeleton Container. The European VCD System can either be approached directly by the Economic Operator (1a) or by his National VCD System (1b).

(2) The **National VCD System**, which provides the compilation service of the VCD Container for the Economic Operator (2a). This component may directly interact with external issuing bodies to collect relevant evidences on behalf of the Economic Operator (3a). The National VCD System may also interact with the European VCD System, if a direct interface between the National VCD Service and the European VCD System exists (1b).

(3) the **VCD Schema** specification, which consists of standardised document and container schema specifications for VCDs, VCD packages and VCD containers that are used by the European VCD System and National VCD Systems at distinct VCD Container production stages.

(4) The **VCD Viewer**, a component to view and navigate through the content of any VCD Container without having the possibility to edit or change content. This component is dedicated for Economic Operators (4) and (6) Contracting Authorities.

The Economic Operator can send the VCD Container to a Contracting Authority (5) either by using the PEPPOL WP 8 infrastructure or by directly submitting it to a tendering platform or any other means of electronic communication accepted by Contracting Authority.

As not all EU Member States will have their corresponding national rule set defined in the ontology of the European VCD system from the beginning, the "PEPPOL VCD manual editor" supports Economic Operators with a **VCD Skeleton editor** and/or a **VCD editor** as a simplified quick start solution having no compilation support, but optional some decision support. The VCD manual editor support can be used by Economic Operators in the following two cases:

a) in EU Member States, where the legal mapping (national ontology) is already introduced to the PEPPOL European VCD Service (hence, the economic operator can receive the VCD Skeleton Container – 1a), but the National VCD System has not yet been established: The VCD editor

component provides a VCD Container creation support to Economic Operators in any EU Member State which does not have a PEPPOL VCD full support solution in place. The VCD manual editor supports Economic Operators to manually create a VCD Container on his own based on the VCD Schema by adding the necessary evidences as derived from querying the European VCD System to the VCD Container manually (2b). Those evidences are collected by the Economic Operator himself (3b); in this scenario the economic operator gains some decision support by using the relevant national rule sets from the European VCD system.

b) In Member States, where no legal mapping (national ontology) exists at all. In this case, the Economic Operator may query the eCertis information system (provided by DG Markt) in order to identify the relevant evidences proving the selection and exclusion criteria set out in the contract notice. He or she then adds the criteria and evidence names fully manually to the VCD Container Skeleton by using the VCD skeleton editor (1c). The VCD skeleton editor develops the VCD Container Skeleton according to the VCD schema. Thereafter he or she can add the evidences using the VCD editor (2b). The economic operator is fully responsible for the quality and trustworthiness of the VCD (including the mapping of criteria to evidences across borders).

In the PEPPOL VCD manual editor solution, the generated VCD Container content has a different quality. The submission of the VCD package to a Contracting Authority is planned to use the same channels as within the PEPPOL VCD full support solution (4). Likewise, the contracting authority uses the VCD viewer to view and navigate through the VCD Container generated by the VCD editor (6).

Stage 1 of the PEPPOL specifications introduces a European VCD System that provides a semantic interoperability model of European criteria and evidences available in the Member States[6]. Both Contracting Authorities and Economic Operators will be able to use the European VCD System for legal consultancy and usage of commonly defined criteria.

- A Contracting Authority prepares a contract notice and the call for tender outside the PEPPOL WP2 context [CA.T.1.1].
- The Economic Operator uses the European VCD system to define his tenderer structure and his nationality on the one hand and nationality of the Contracting Authority on the other hand.
- The European VCD system uses the legal rule sets from the VCD ontology to render the suggestion for the criteria which the Economic Operator has to approve or to revise having the criteria of the CN/CFT at hand[7].
- The tool than renders the relevant evidences by using the national rule set of the Economic Operators in the VCD ontology [ESP.T.1.1.1] and presents the results to the user [ESP.T.1.1.2].
- The user has to approve or revise this suggestion[7].
- Afterwards a VCD Skeleton Container is being delivered to the Economic Operator [ESP.T.1.1.3] or is passed to the (national) VCD System, which,
- Adds relevant data like the evidence documents.

The VCD Skeleton Container is an artefact created by the European VCD system which contains structured and well defined information about the tenderer(s), the Contracting Authority, the call for tender, the relevant criteria and possible evidences for a specific call for tender.

The subsequent processes are carried out in the same way as described in the status quo process (above).

[6] The process model can be retrieved on http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1.

[7] The Economic Operator may alter the recommendations made by the European VCD System. He may not understand the recommendations made by the tool or he has the opinion that some evidences are not necessary according to their own legal advice. If this is the case he should ask for clarification to the Contracting Authority at any time

A simple VCD editor will be provided and can be used in Member States that have only defined the national ontology for the European VCD System, but no national VCD service implemented yet and in Member States that have not defined their national ontology at all.

The VCD editor can be used by any Economic Operator to Create a VCD Container manually. At the time of awarding the Contracting Authority may use the European VCD System to check which foreign types of evidence have to be accepted [CA.T.1.5]. It can send a request to the tool in order to find evidence related information [ESP.T.1.2; ESP.T.1.2].

Afterward the Contracting Authority can use the retrieved information to check and assess provided evidence [CA.T.1.6].

The VCD aims to support Economic Operators in collecting evidences via national VCD service providers and to submit them assembled as information packages to any Contracting Authority. Furthermore it aims to support contracting authorities for proving suitability of Economic Operators.

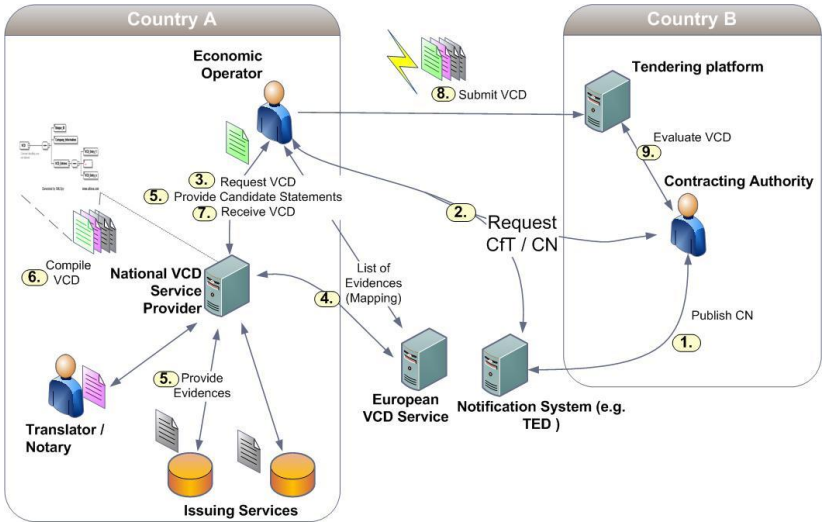

Figure 1-5 : VCD piloting scenario

The overall VCD scenario can be described as follows. A Contracting Authority in country B publishes a contract notice (CN) on notification system (1) and Economic Operator from country B wishes to participate by requesting the Call for Tender (CFT) and CN (2). The CN/CFT must specify formal documentation that has to be submitted by Economic Operator or more precisely the criteria of qualitative selection and non-exclusion that have to be fulfilled by the Economic Operator (1.- 2.).

Economic Operators can query the European VCD service for standard criteria on European and national level and map them to related evidences available in their Member states (4.). Accordingly they can create an electronic information package (VCD) consisting of the required evidences for responding to public tenders including attestations, candidate statements and other relevant data (3-5). In order to create the VCD, an implemented IT system at a national VCD service provider will have to collect evidences from existing registries. It also enables the Economic Operator to add candidate statements or other documents of formal qualification (5.).

National VCD service providers enable Economic Operators in compiling a VCD from this (6) which can be submitted to any Contracting Authority in Europe (8.). In the same way the VCD will enable contracting authorities or their e-Tendering systems to interpret and accept the documentation submitted by the Economic Operator (9.). For all parties (Economic Operator, intermediary, Contracting Authority, issuing bodies) it will be of high importance that the VCD Services are trustworthy; this implies that the services are precise, up-to-date, available and reliable.

Processes related to national VCD System

Stage 2 and 3 introduce the concept of a national VCD service provider which hosts a VCD System in order to provide Economic Operators with the services necessary to create a full VCD Container. The national VCD service provider operates a system to create VCD Containers and takes the role of a trusted third party (TTP) whose services can be trusted by Contracting Authorities. There are two distinct scenarios depending on the level of integration between the European VCD system and national VCD system.

In the first scenario, Economic Operators request support from the national VCD System having the necessary CFT/CN at hand. The national VCD System has to forward the request from the Economic Operator to interact with the European VCD System [NSP.T.2.1] in order to retrieve a VCD Skeleton Container as described in the previous section. When the national VCD System receives a VCD Skeleton Container it decides which evidences can be retrieved from the issuing bodies through direct interfaces [NSP T.2.3.1]. In this scenario the national VCD System acts as single point of contact for the Economic Operator or the requester and issuing bodies create requested evidences [IB.T.2.1.1] and sent them back to the national VCD System [IB.T.2.1.4]. Also the national VCD System will send a list of evidences to the Economic Operator that cannot be directly retrieved or that have to be issued by the Economic Operator himself [NSP.T.2.2].

In the second scenario the Economic Operator uses the functionality of the European VCD system directly to create and receive a VCD skeleton Container first. Then he submits/uploads this container as input to the national VCD system. The remaining process is the same as in the first scenario.

Stage 3 also introduces the concept of context specific data. Context specific data are being collected at several points according to the national model applied and on dependence of the type of evidence. Usually they should be directly provided by the issuing body [IB.T.2.1.2]. Alternatively they are either being filled into the VCD by the Economic Operator [EO.T.2.6] or they are being extracted by the national VCD System [NSP.T.2.4] which may leads to different levels of trust. When the national VCD System has received necessary translations and legalized evidences the national VCD system will be able to compile the entire VCD container [NSP.T.2.5] and provided it to the Economic Operator [NSP.T.2.6]. Subsequent processes are carried out in accordance to the stage 1 and status quo process description.

VCD networked package

As described already in D2.1 Stage 4 introduces a set of ideas and possibilities how further value can be added to a Virtual Company Dossier. The key idea of Stage 4 is to create a network for the VCD that allows retrieving attestations in a more flexible way. Potentially a direct exchange from issuing bodies to Contracting Authorities could therefore be implemented. The Virtual Company Dossier then consists of some references to issuing services which mandate a Contracting Authority to obtain information directly, e.g. as a predefined query to the specific evidence.

Our analysis has brought up some challenges when applying the VCD networked package in cross border scenarios. Obviously the biggest challenge is the creation of translations, legalization and context specific data at the time of awarding. The Contracting Authority requires the availability of the entire documentation at the time of awarding in order to perform the necessary checks. Assuming that a direct exchange between issuing bodies and Contracting Authorities is established it is very unclear how production of translations, legalization and context specific data can be done in time. This timing problem would result in the need to collect part of the evidence data earlier, which would violate the “one point in time information” approach. In addition cross border access to national registries holding legitimate data like criminal records carries certain amount of legal questions such as data protection and a political dimension that has to be dealt with.
A potential scenario could be to collect evidences including translations, legalizations and context specific data beforehand and storing them in a secure database (electronic repository) at the national VCD service provider. In this scenario the Contracting Authority needs to access the local database at the national VCD service provider to check the evidences at the time of award. However this scenario firstly requires further investments on the side of the national VCD service provider in order to ensure secure access to the database and reliable transport of documents. Secondly it leads to further uncertainty for both the Contracting Authority and the Economic Operator since internet access has to be available at any time. One of the questions arising will be who to make responsible for an unavailable service or an unsuccessful request. One problem could be that a Contracting Authority fails to connect successfully. Another problem

could be that a national VCD service provider fails to provide continuous services. In these cases the Economic Operator could be punished for something that has not been under his control.

In order to support Contracting Authorities in an optimal way the exact process of evidence validation by the Contracting Authority should be taken into consideration. Having the documentation at the time of award distributed among several systems requires extra efforts on the side of the Contracting Authority. In order to check the documentation the Contracting Authority firstly has to access different systems established in several countries. These systems probably will have different access mechanisms which have to be managed by a Contracting Authority. Comparing the documentation received from different Economic Operators' in criteria wise manner may require accessing single systems at multiple times one after another. Also archiving of the documentation retrieved through the VCD for traceability of decision making and legal certainty may lead to further complexity on the side of the Economic Operator.

Overall the scenario of a VCD networked package seems to raise the complexity and costs dramatically while having limited perspective to create an added value for the actors involved. WP2 may further elaborate a scenario of a VCD networked package however this will not be the major focus for implementation as currently there are only some partners involved that wish to implement such functionally.

PEPPOL VCD Development Methodology

This section introduces the design approach followed when developing the PEPPOL post-award eProcurement specifications.

Overall, WP 2 has used the SCRUM method to develop the specifications of the VCD. It thereby divided work into five task force groups:

- Pre-VCD task force: This task force took care of the technical specifications of the mapping resulting in the ontology specifications and the specifications for the European VCD service. The resulting specifications are to a major part detailed in chapter 7.
- VCD pilot task force: This task force took care of the specification and architecture concept for the national VCD systems, including the specification of the common components. The resulting specifications are detailed in chapters 9 (specifications) and 10 (national components).
- VCD schema task force: This task force elaborated the VCD schema specifications thereby trying to align already as much as possible with CEN BII and UBL in order to pave the way for standardising the VCD schema specifications.
- Legal task force: This task force investigated legal aspects of the VCD concepts. Foremost, this group took care of mapping the national criteria and evidences with the European criteria of the EC directive via so-called Mapping tables (see chapters 5 (legal chapter) and 7 (ontology derived from the mapping tables)).
- Organisational task force: This task force developed the process models (see chapter 6) and it investigated the Governance and Sustainability plans (see chapter 13).

The groups were organised as follows:

- Task force leader
- Task force rapporteur
- Task force quality controller
- Further members of the task force

Each group had ad minimum five participants and it had frequent telephone calls scheduled every week since October 2010 thereby discussing the key elaborations of the last week and planning the next week's ones.

Every month, a plenary telephone conference was organised to report back from the task forces to the plenary group and therewith inform the other groups of the advancements and common issues to be addressed.

The elaboration of specifications was done mostly using the subsequently described methodical instruments and word documents using track changes, which were shared through a common collaboration space.

The sharing of specification and the regular plenary telephone conferences as well as joint meetings approximately every second month were crucial to coordinate works among the groups and to ensure the necessary interaction between groups such as among legal and technical task forces, legal and organisational task forces and the pre-VCD (ontology) and legal experts.

Feil! Fant ikke referansekilden. describes how the PEPPOL project is divided into three phases. Each follows the processes specified in PEPPOL Deliverable 2.1 using a SCRUM[8] based approach. A SCRUM based approach creates a fast, flexible and agile way of creating specifications and enabling software building blocks through each phase of the project:

- **Proof of Concept Pilot** (**PoC**) – Simulated operations (artificial participants, artificial data in a closed environment).
  This phase was mainly for research and conducting feasibility studies for addressing various eProcurement issues on one or more of the interoperability levels.
- **Test Pilots** – Involve actual Contracting Authorities and their Suppliers using their actual business applications but with test data (i.e. not operational business transactions).
  This phase was for testing the participant's readiness for a production pilot. During this stage PEPPOL deliverable 2.2 are published for external review and beta testing.
- **Production Pilots** – Involve actual Contracting Authorities and their Suppliers using their actual business applications and actual data (i.e. true operational business transactions).
  This phase was mainly for research and conducting feasibility studies for addressing various
  Together with evaluation plans (based on deliverable 5.1) this matures and quality assures the PEPPOL community e.g. governance, participants, specifications, software.

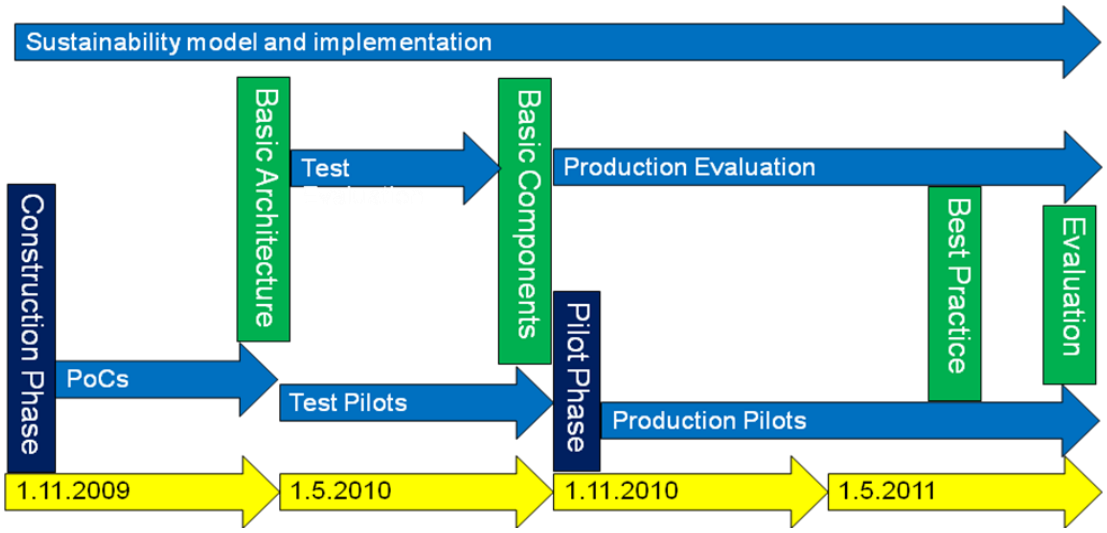

Figure 1-6: Main PEPPOL Schedule

New specifications and software based on new requirements emerging from the Test Pilot and Production Pilot may be produced. These new specifications and software will go through the same cycle that is a PoC Pilot, Test Pilot and Production Pilot. Note that all participants regardless of timing of their Production Pilot phase have to go through a Test Pilot Phase following the PEPPOL conformance testing methodology.

[8] SCRUM reference needed

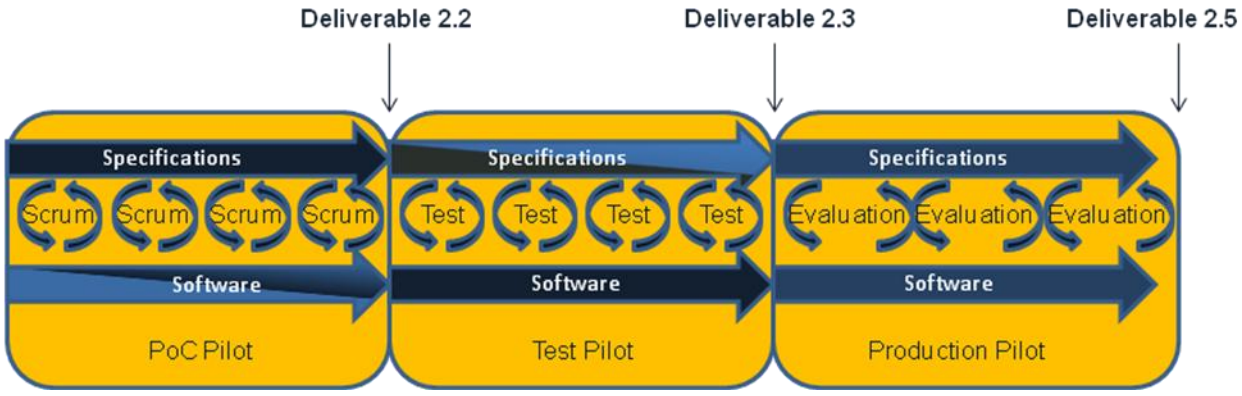

Figure 1-7: PEPPOL Development Methodology

1.8 Ontology Engineering Methodology

Concepts and "rules" for mapping "Contracting Authority National Criteria", as stated in the respective National Public Procurement Act and further specified in a tender an economic operator wants to respond to, to "Economic Operator National Evidences" (therefore the evidences a specific economic operator applying for a specific tender in a certain constellation has to provide) via EU Criteria as an intermediary are formally represented as an ontology. Please refer to chapter 7 for further information regarding the ontology.

Finding a generic machine interpretable representation level of the very complex and heterogeneous topic was a rather big challenge. An iterative approach was chosen to cope with this complexity and detangle the diverse concepts. The hierarchical structure of the modelled ontology with a very generic upper level ontology layer supported the strategy of iterative modelling regarding the process as well as the outcome.

Those topmost concepts and relations actually had to be altered only slightly during the modelling process. One of the biggest challenges was reaching a common understanding between the legal and the technical experts, together forming a powerful joint modelling competence. This again was made possible by an iterative approach with phases of intense exchange as well as phases of homework for each group and common access to the ontology in an easily comprehensible way.

Ontology Modelling Process

Due to the above mentioned challenges, the ontology was modelled in an iterative process, involving the different experts and stakeholders step by step.

In a first step, the National Public Procurement Acts of Austria, France, Germany, Italy and Norway where closely analyzed with regard to their relations to the European Directives in a joint venture of the legal and the technical task force. The basis upper level concepts have been derived, like Criteria, Evidences, Tenderer Structure Elements, Criteria Requirements and Evidence Restrictions. Those concepts have been formalized using OWL and RDFs in an "upper level ontology".

In parallel, a spreadsheet for filling in the respective national Criteria and Evidences as well as possible "influencing" factors and rules (mapping information) was delivered and spread to the national legal experts[9]. Iteratively, those sheets provided the base for the ontology task force to refine upper level concepts and augment the ontology with EU Criteria (instances). Subsequently, first versions of the national ontologies were integrated into the whole ontology.

[9] See http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1

In the course of face to face workshops, each country's national ontology characteristics were refined. The resulting information was directly entered into the ontology so that legal as well as technical experts where speaking a common language. In the course of the workshops, further legal and organisational questions were raised and were jointly passed to the corresponding task forces. Again, the results of the workshops as well as the answers to the questions had to be worked into the ontology representation and had to be agreed upon.

As one of the final steps, every nation reviewed their national ontology (for example refining wording and references), the underlying ontology rules were finalised, the rule language agreed upon. In a final step the whole ontology will have to be approved.

Ontology Modelling Tools and Methodologies

In order to decrease complexity, a spread sheet was produced, with basic concepts like EU Criteria, National Criteria and National Evidences as column headers, and the Atomic EU Criteria already being prefilled. Each nation filled out the sheet with their national concepts. This spread sheet was the base for further complex ontology work.

Figure 1-8: Screenshot of upper level concepts shows a screenshot of the modelling system. The system was provided by PEPPOL.AT for the course of the project and is run centrally on a server in order to commonly work on one single base and avoid versioning confusion (e.g. when harmonizing different ontology files) , in a later phase, everybody from the modelling group can access the ontology in an user friendly way.

In order to reach common understanding between experts of different backgrounds, individual two days face-to-face-workshops where organised for each national ontology. The results were directly put into the ontology within the course of the workshops.
On line meetings and telephone conferences were chosen to communicate and align during working phases.

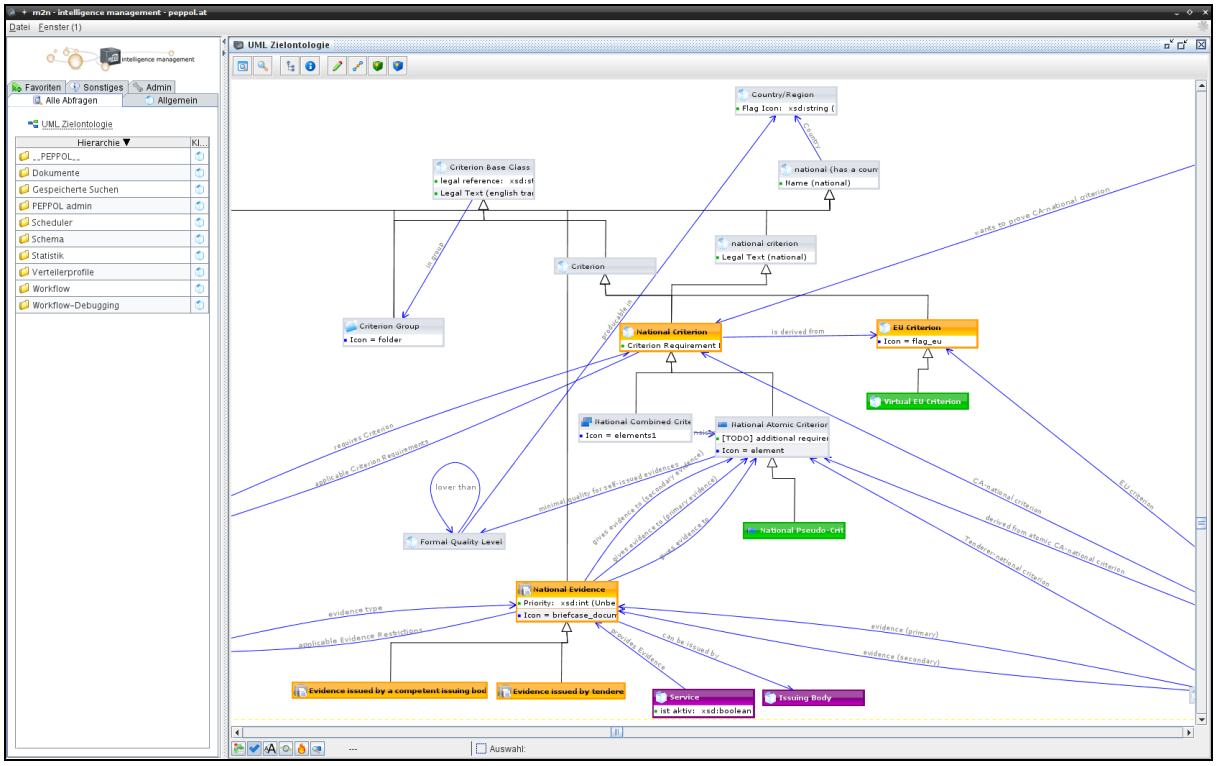

Figure 1-8: Screenshot of upper level concepts

Software engineering methods

The following modeling notations were used for the elaboration of the technical specifications and system design:

- Component diagrams/architectural charts
- Use-case diagrams
- Use-case descriptions
- Activity diagrams
- Sequence diagrams
- Functional descriptions
- Technical descriptions

Besides the technical notations for software engineering, Business Process Modelling Notation (BPMN) was used to detail the overall processes for stages 1, 2 and 3 of the VCD vision.

Component diagrams/architectural charts

This modeling technique is used by the technical task forces to display the component architecture of the several systems.

Use-case diagrams

This modeling technique which is defined by the UML 2.0 modeling methodology uses the concepts of actors and use-cases to model the interaction of different users with an IT system. The technical task forces use this methodology to enlist the interaction scenarios with the existing users of the European Service with the European Service IT application.

The use-case descriptions contain the relevant detailed information about the interaction scenarios enlisted in the use-case diagrams. Each use-case is described by the aspects depicted in Table 1-1.

Aspect	Description
Objective	What is the use case good for
Results (post conditions in case of success)	What is the desired outcome in case of success (=post condition in case of success)
Precondition	Which preconditions have to be met in order to start the use case
Post condition in case of failure	What's the system status in the case of a failure
Actor(s)	Which actors are involved in the use-case
Initiating event	What is the initiating event (transition from precondition to use-case interaction)
Description of interaction procedure with European VCD Service	Listing of single steps of the standard interaction sequence of the actors within the system, including the system reaction
Alternative runs	Listing of single steps of alternative interaction sequences of the actors within the system, including the system reaction
Extension(s)	Interrelation with other use-cases

Table 1-1: Description of use cases

Activity diagrams

This modeling technique which is defined by the UML 2.0 modeling methodology is used by the technical task forces to visualize the user-system-interaction-flow described in a use-case description. These diagrams contain the standard sequences as well as the alternative sequences. For each use case description an activity diagram is modeled.

Sequence diagrams

This modeling technique which is defined by the UML 2.0 modeling methodology is used by the technical task forces to visualize the logical and physical program flow between the system users and the system components The following color code is use throughout these diagrams (if not specified separately): green boxes represent open source components, blue boxes represent back ground system components..

Functional description

A functional description block contains the description of a certain system functionality, which has to be implemented in order to realize the use-case descriptions. The description is noted as a textual outline and is optionally augmented by an activity diagram.

Technical description

Each sequence diagram and component diagram/architectural chart is explained using a technical description containing details about the program flow or the component interaction. Additionally technical descriptions are used by the technical taskforces to specify system behavior in addition to graphical notation.

Process modelling using BPMN diagrams

The process models were developed using Business Process Modeling Notation (BPMN) [10]. The process models are detailed in chapter 4 and can be accessed under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1.

1.9 VCD schema design

Requirements on the Virtual Company Dossier identified in the working group have leaded the definition of a specific conceptual domain data model. This data model cannot be described with any standard document model already defined in the "CEN BII Workshop" and that is why business processes and document models for the transactions dealing with Economic Operators' qualification data in the pre-awarding phase of the public procurement have been defined within this group.
The structure and content of the document models have been created from the conceptual domain data model using the following process:

[10] A good introduction into BPMN models can be found on http://diveintobpm.org

Production of Profiles

To produce the required VCD Schemas the first step has been to create the hierarchical tree structures of the main document models, identifying the root node in the conceptual data model and creating the structure required to define a document. These models are also known as neutral models as they are not expressed in terms of a particular syntax.

This task has been done with the two relevant documents identified during the analysis:

The Virtual Company Dossier, document where a particular Economic Operator specifies its capabilities and identifies how to fulfil the criterion established in the Call For Tenders by the Contracting Authority by means of identifying and referring to particular evidentiary documents.

The Virtual Company Dossier Package, collection of links to Virtual Company Dossiers of the partners bidding to a particular Call For Tenders, where the structure of the consortium is defined.

The classes and properties identified during this step have been named and described to achieve a semantic uniqueness of every particular data element, aligned with the conceptual data model terms.

XSD Schemas should be generated following the CCTS principles. Using Dictionary Entry Names (DEN), Basic Business Information Entities (BBIE), Aggregate Business Information Entities (ABIE), Association Business Information Entities (ASBIE) and reusing the Core Component Data Types defined in the ISO 15000 specification is a PEPPOL requirement

At this step, the original spreadsheet created in point 1) has been enlarged with all the relevant information to enable the automatic production of XSD Schemes. To allow that automatic production of XSD Schemes, the OASIS UBL TC methodology has been used. OASIS is an international standardization body and their UBL TC has defined a template spreadsheet from which document XSD Schemes can be created following their Naming and Design Rules. Columns have been added to allow the definition of the required elements for automatic XSD Scheme production. The main columns added in this process are:

- Dictionary Entry Name, CCTS unique identifier for the element.
- Class name column
- Property column and its qualifiers
- Representation term column, identifying the proper Core Component Data type and its qualifiers
- Tag name, calculated column out from the class, property and representation term specified for the component.
- Cardinality of the element.

Alignment of components

Third phase in the production process is to identify reusable patterns and align them with the CEN BII library of components. VCD project is not an isolated enterprise; the pilots run in WP2 have to fit in a broader ecosystem where other business processes such as sourcing, ordering and invoicing will take place.

PEPPOL's commitment to be conformant to CEN BII profiles will be a major advantage when trying to reuse elements from one process to another one, speeding up the learning curve for IT workers and smoothing the path to future adoption.

The identification of common patterns has been done with CEN BII document models and the main components identified as reusable are:

- Party class, with information about parties
- Document reference class, with information about a document.
- Signature class, carrying information about a signature.

The alignment of these components will be a major benefit to deploy generic pilots covering more than just a single business process.

Creating XSD Schemas

Last step is the automatic production of XSD Schemas. Due to the use of the UBL TC architecture and naming and design rules, this step has been run automatically, producing the XSD Schemas from the spreadsheets without human intervention.
The final schemas for the VCD and VCD Package follow the architecture depicted in the picture below:

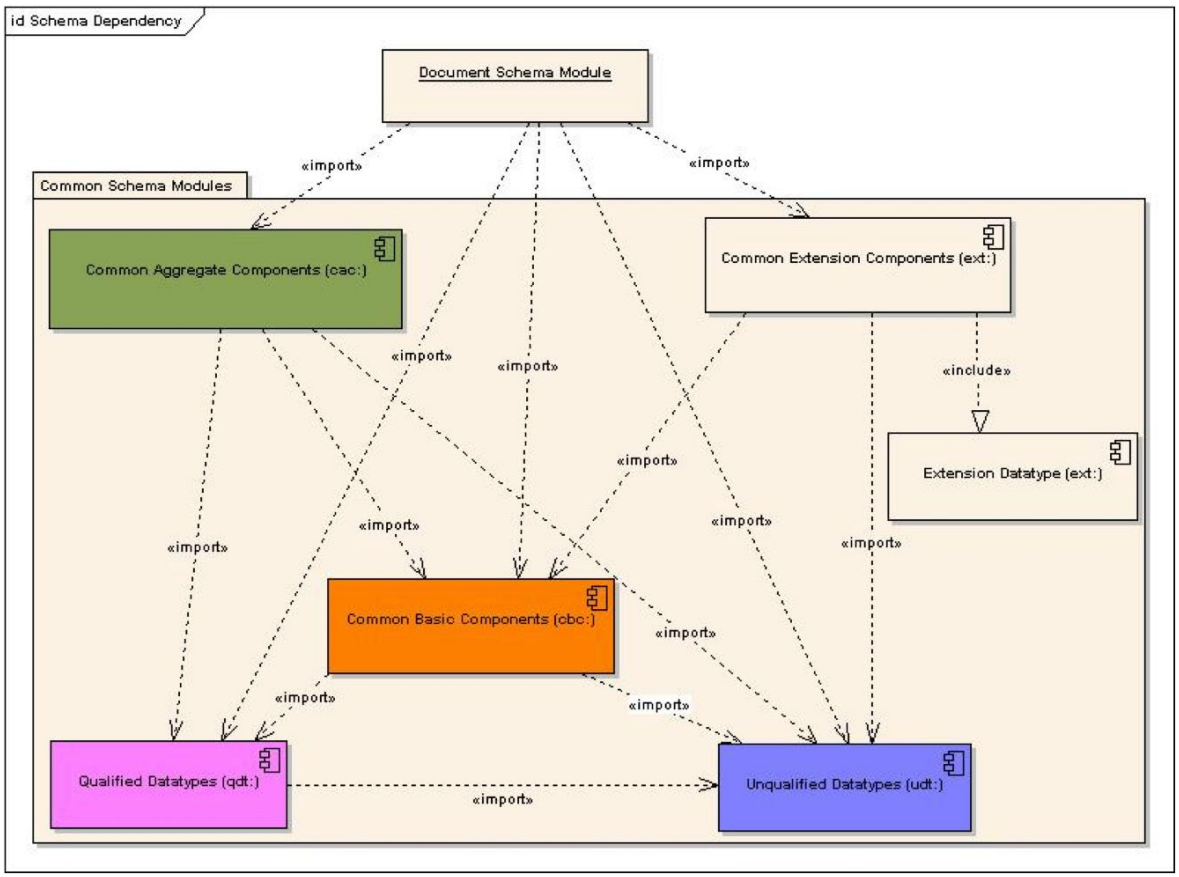

Figure 1-9: Schema Dependency

Every main document has its own XSD Schema fragment that imports both the common classes schema fragment, also known as Common Aggregate Components or library of ABIEs, and the common properties schema fragment, known as Common Basic Components or library of BBIEs. These two schema fragments are common and hold the reusable classes for the different main documents. They import the Qualified and Unqualified data type schema fragments where the core data types are specified.

1.10 Alignment with PEPPOL infrastructure

The PEPPOL infrastructure is specified as BUSDOX 1.0 (Deliverable 8.2).
BUSDOX 1.0 specifies identifiers needed for use of the PEPPOL infrastructure; these are needed to find addresses of different endpoints. Identifiers used by the VCD systems then need to identical or mapped to those of the infrastructure's Service Metadata Publishing database.
The infrastructure identifiers are ISO 15459 compliant; they consist of two elements:

- Identifier of ID-Scheme
- Identifier issued by ID-Scheme

–

The PEPPOL implementation and use of the standard is also explained in PEPPOL Identifier Schemes (Deliverable 8.2).
When needed, VCD systems will be using endpoint identifiers for Economic Operators, Contracting Authorities, Evidence Issuing Bodies and VCD Service Providers, and they need to be aligned with those used by the infrastructure operator.
The alignment need to cover the quality of the identifier, code lists for schemes and requirements to maintenance and testing.

2 Extensions / revisions to deliverable D 2.1

In D 2.1, the overall VCD concept has been introduced with a four-stage maturity model as shown in Figure 2-1. The report at hand details this VCD concept in terms of technical, organisational and legal specifications.

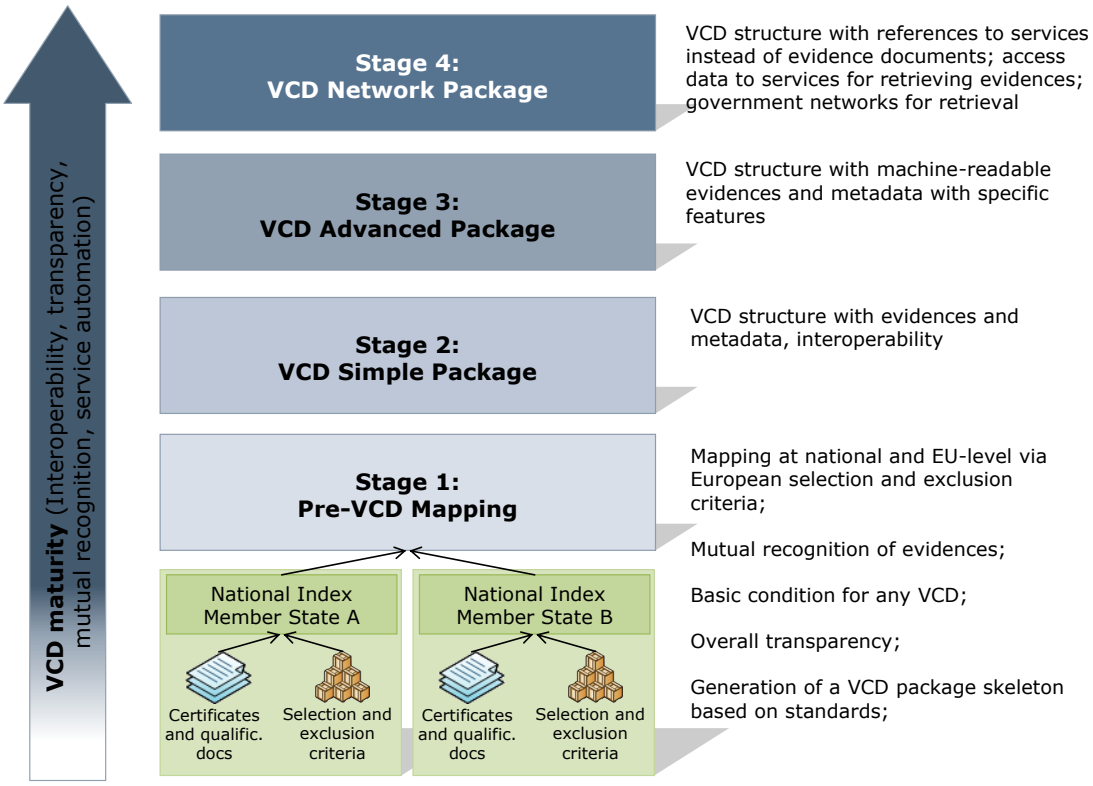

Figure 2-1: Vision of VCD concept - staged maturity model as specified in phase 1 of PEPPOL's WP 2 activities

In general, the specifications at hand realise to a major part the VCD vision as specified in D 2.1. However as with getting more and more into the details, some extensions and revisions have been made to the requirements and the overall vision of the VCD concept specified in D 2.1. These extensions and revisions are summarised below along the following aspects: pre-VCD mapping (stage 1), VCD packages (stages 3 and 4), and Levels of support and completeness.

Revisions / extensions to stage 1 of the VCD concept

The pre-VCD mapping introduced in D 2.1 was an abstract concept. The specification of the European VCD System in this report has matured to a high-sophisticated concrete solution plan for stage 1 of the VCD concept.
The VCD skeleton container is the concrete output of the European VCD System, which bases on the VCD schema structure. It is further used by the National VCD System or the economic operator to fill in the individual evidences. The VCD skeleton container hence describes the mapping of criteria and evidences from the two different countries on the basis of a common standard. As the pre-VCD mapping was an abstract concept in D 2.1, the VCD skeleton container could not be thought of.
Another component not thought of in D 2.1 is the VCD pre-skeleton container. This component represents the VCD structure communicated from the National VCD System to the European VCD System via the specified interface. It contains basically the tenderer structure data therewith following the respective VCD

Schema specification (i.e. it is a subset of the VCD schema). Like the VCD skeleton container, this component has not been thought of in D 2.1.
The TED interface as indicated in D 2.1 has been further investigated but no specification has been included here, as this interface will not be implemented at this point in time through the PEPPOL VCD solution. The reason is that from the side of TED there is no clear specification available that is useable for PEPPOL. TED is currently working on a new specification. Hence it is currently not reasonable to work on an old version of a specification which is expected to be replaced with a revision in about one year in time.

Revisions / extensions to stages 3 and 4 of the VCD concept

The VCD schema task force within work package 2 has developed a white paper (internal document) for how to specify the context-specific data. Throughout the activities, some drafts of context specific data have been elaborated, but these are still under intense discussions. The lesson learnt from the discussions is that on one hand it is necessary to establish a structured process in a wider context, which enables cooperation between groups on context-specific data specifications. On the other hand, this process should start with a detailed investigation of the real needs of contracting authorities, i.e. what exactly are the elements they assess of evidences, and what can be brought up to the level of standardised context-specific data collected in the XML structure of the VCD concept). Due to the ongoing unfinished discussions and for prioritization reasons (ensuring that the main elements of the VCD concept are implemented), the context-specific data have not been included in this deliverable.

It is planned to include the specification of context-specific data in the VCD schema foreseen in D 2.1 for stages 3 and 4 in the upcoming software-oriented deliverable D 2.3. To spur the discussion and consensus finding, the specification of the context-specific data is handed over to the CEN BII workshop 2 after it has been discussed and agreed upon in the WP2 team.

Besides the context-specific data, the organisational and legal analyses have resumed from intense investigations that stage 4 – VCD networked package – is at this point in time too complex especially in cross-border scenarios. Hence, it has been put on lower priority and has not been detailed and specified further. Yet, the overall VCD Schema specification does support a stage 4 VCD package.

Level of support and level of completeness

In respect to the concepts of level of support as detailed in D 2.1, the following specifications have been done:

- **Information support** is fully provided by the European VCD System. It is realised through an ontology and a rule set that maps the European Directive's criteria to national procurement laws and further to evidences available at national level. The mapping also includes the peculiarities on what evidence to provide in a specific case (e.g. if no corresponding evidence exists in a country). Besides that, it provides a first compilation support by generating the VCD package skeleton;
- **Compilation support** is tackled through the specifications of the national VCD System and the VCD package skeleton.
- **Decision support:** The European VCD service gives guidance to the economic operator by identifying the evidences that should be provided to prove the criteria laid out in the contract notice of the cross-border tender. The decision support through the ontology provides a qualified support as the peculiarities of e.g. cascading rules, tenderer constellations and structures, evidences specific to peculiar person-types (natural persons, organisations) are taken into account[11]. The European VCD Service therewith provides an interactive means of support to find the right evidences for the given situation complying with the legal conditions in both countries. Hence, the output of the European VCD System is tailored to the specific call for tender issued in country A and a specific tenderer from country B with its individual situation (tenderer constellations and structures). While the decision support for the economic operator is fully realised, the context specific data supporting decision making of contracting authorities is not part of these specifications (reason is the lack of context-specific data specification).

[11] See chapter 7.

The concept of level of completeness as detailed in D 2.1 is fully reflected in the VCD concept as specified in D 2.2. All relevant articles of the EC directive and their corresponding implementations in national public procurement acts can be covered with the VCD specifications provided in this report.

3 Legal specifications

The specifications that define the legal scope of the VCD system are elaborated in this chapter. Most of the legal specifications relate to the European VCD service in particular the legal conditions enabling these. Therefore general principles are introduced such as the principle of mutual recognition. Also this section introduces the legally specified mapping mechanism. Therefore WP2 has developed a mapping template to collect the national inputs for the European VCD service in consistent manner. The mapping template is introduced as well as conformance and adaptability requirements that have to be considered when carrying out tests on the European VCD system. Furthermore the legal specifications address trust and confidence in the European VCD Service which is considered from legal viewpoints in order to ensure adoption and reliability of the of the European VCD service. The last section finally analysis legal condition with regard to validity of documents, requirements on copy and translation quality.

3.1 Mutual Recognition

This section introduces some general principles concerning mutual recognition. In order to get an overview we introduce an example clarifying the concept which the directives are based on.

A German Contracting Authority (CA) issues a Call for Tender and an Austrian Economic Operator (EO) wishes to participate in the tendering procedure. The German CA asks for evidence that proves absence of conviction typically evidenced by criminal record. In Germany, it is sufficient that the economic operator submits criminal record of one representative. According to Austrian law, criminal records have to be provided for *all* representatives of the EO. What legislation is now applicable, i.e. how many criminal records have to be submitted to the CA?

It seems that this example reveals a need to define the law applicable in cross-border cases of public procurement in the EU. The question of applicable law may appear in different phases of public procurement: The production and the acceptance of evidences.

The production of evidences, statements, declarations, certificates, documents and other evidences may be produced by issuing bodies and/or economic operators. Issuing bodies are entities governed by public law. They are bound by their national provisions of public law. Therefore they apply their national law (lex fori). These national provisions may be:

- National rules without any international dimensions
- EU law implemented into national law
- EU law directly applicable in EU member states
- International agreements implemented into national law.

Also Economic Operators are able to produce candidate statements. These can be in many cases produced according to the (foreign) law of a Contracting Authority.

The decision whether certificates, documents and other evidences presented in a tender are in conformity with the criteria of the tender is made by the Contracting Authority. Like issuing bodies, Contracting Authorities are entities governed by public law. They are also bound by their national provisions of public law and therefore apply their national law (lex fori).

Part of this law in EU Member States is the principle of mutual recognition of diplomas, certificates and other evidence of formal qualification: If Economic Operators are required to submit certificates, diplomas or other forms of written evidence of formal qualifications, documents from other Member States offering an equivalent level of guarantee have to be accepted. These rules originate from sectorial directives implemented in national law and directly applicable case law.

In the example above the German Contracting Authority applies German law which includes EU law directly applicable in Germany. If German rules only require to prove the criteria “absence of conviction” for one legal representative of the Economic Operator the Austrian Economic Operator will have to provide criminal record (as evidence for the required criterion) for only one legal representatives since the Economic Operator must fulfil the criterion in terms of the legal rule set of the nationality of the Contracting Authority. He is doing so by providing evidences according to his national law.

If in term an Austrian Contracting Authority requires to prove the criteria “absence of conviction” for all representatives – as defined in the Austrian NPPA - a German Economic Operator will have to present criminal statements for each of his legal representatives.

It is important to note that the mapping done in PEPPOL will help Contracting Authorities to assess whether evidences presented by an Economic Operator can be accepted. But the mapping does not produce legally binding rules for Contracting Authorities to accept certain evidences.

3.2 Substitution Rules for Evidences

This section explains the general approach when evidences have to be substituted because no equivalent evidence issued by a competent issuing body exists within another country. Equivalent evidence means that this evidence is issued by a corresponding competent issuing body and covering the same scope of criteria. It is assumed that rules with regard to substitutes do exist in the different countries as the directive 2004/18/EC is introducing them as well. The national law provides for substitution rules on how to prove criteria if the usually accepted evidence cannot be provided. In some countries these are “cascading” rules which rank evidences according to their quality.

These rules for substitution are typically part of the national legislation and they are often implemented as cascades. A cascade is a series of alternative (evidence) that occur in successive stages, each of which is dependent on the preceding one. The cascade is indicating in a ranking what evidences should and which alternatives could provide a legally accepted proof of a certain criterion. These are rules on general classes of evidences to be accepted. Within a national tendering procedure, the Contracting Authority will apply its national law to find out which evidence to accept. The substitutes are defined in descending order and can be used when evidences in higher order cannot be provided. These rules should be considered in the following way when evidences will be mapped:

- Legal Basis: The rules of the Contracting Authority apply, in particular the cascading rules. The rules of the Contracting Authority will be used to justify whether evidence will be accepted or not.
- Recommended action: If the Economic Operator (in justified cases, i.e. requested evidence not available) provides an alternative evidences in the highest category level available (according to the descending order of the cascading rules) in his country, these evidences have to be accepted as substitute evidences.
- Additional action: It would be helpful for the Economic Operator if the VCD system would offer the possibility to communicate that the use of substitute evidence is justified.

- Example1:

A Contracting Authority requests to prove a certain criteria requiring specific evidence which exists in the country of the CA only (e.g. anti-mafia declaration in Italy). In this example the anti-mafia declaration is unique for Italy. To identify the appropriate evidence in the Economic Operator’s country of origin, the rules of the national procurement law of the contracting authority (Italy) apply and have to be taken into consideration including the cascading rules which provides information about appropriate substitutes for anti-mafia declaration. It is important to notice that the national procurement law states what a Contracting Authority has to accept and not what an Economic Operator has to provide. In this example (anti-mafia declaration) no equivalent document may exist in other countries but the Italian law allows for substitutes which are defined in the Italian cascade. In this example the Italian cascade is small and defines only one alternative for the anti-mafia declaration, a declaration on oath. Thus a declaration on oath would be sufficient to prove this specific Italian criterion.

- Example 2:

A slightly different example can be developed for a Contracting Authority in Germany that requests to prove absence of conviction through a criminal record from a Norwegian Economic Operator. In this example the German procurement law and in particular the German cascade for criminal records defines possible evidences and substitutes for criminal records in the following priority:

1. Criminal record of any competent registry
2. an equivalent document issued a by competent judicial or administrative authority
3. a declaration on oath (to be declared under the presence of a judicial or administrative authority, notary or professional organisation)
4. a solemn statement certified through authority or notary

If the Norwegian Economic Operator would only provide a self declaration as substitute of the criminal record he would risk failing with its qualification since the German procurement law defines the solemn statement as the lowest level of quality a substitute for a criminal record could have. The recommendation for the Norwegian Economic Operator would be to provide an available substitute with the highest level of quality according to the national cascade (if 1 does not exist) defined in the German public procurement law. In this case it might be argued that 2 may also not exist in Norway but an Economic Operator should at least be able to provide 3. If an Economic Operator only provides 4 an additional argumentation might be necessary why 3 could not be provided.
In the European VCD service, we have introduced rules reflecting substitution principles by defining minimum substitution level. For this example the minimum substitution level would be to provide a solemn statement certified through authority or notary (4). The EO has to check under his own responsibility what the appropriate substitution level of evidence is according to predefined categories of evidences introduced in the next section.

3.3 Categories of evidence and substitution levels

In order to differentiate evidences, the following four categories of evidences have been identified:

1. Evidence created by competent issuing body
2. Declaration on oath
3. Solemn Statement
4. Self declaration

Table 3-1 provides an overview of the differences and qualities of the distinct evidence categories.

Category	Short name	Definition
1	Evidence created by competent issuing body	A document issued by an authority or trusted third party (public and private) that has the competence for providing statements in this particular domain. A competent issuing body is any entity or organization (either public or private) that has the capacity or power to perform a designated function. Whether an authority is competent or not depends upon the domain or more specifically the criteria to be proven.
2	Declaration on oath	A candidate statement to be declared under the presence of a judicial or administrative authority, notary or professional organisation. False declaration on oath is itself a criminal offence.
3	Solemn Statement	Solemn Statements are candidate statement where a competent body (e.g. notary) confirms (as a witness) the identity of the person making the self declarations. This raises credibility but does not have further legal implications than a self declaration.
4	Self Declaration	A self-declaration is an informal candidate statement which has in principle no further legal consequence apart from offences like fraud etc

Table 3-1: Overview of categories and differences among evidence types

The categorization shown in Table 3-1 is implemented in the European VCD service for all countries to describe the different possible substitutes. Thereby, categories 2 till 4 are specific types of candidate statements that are created by the Economic Operator and act as a general substitute.

In contrast, the category “evidence created by competent issuing body” describes any authority or trusted third party (public and private) who has the competence for providing statements in a particular domain. The following examples of evidences are to be classified according to category 1:

- Example 1: Tax certificate
- Example 2: Evidence of professional risk indemnity insurance
- Example 3: Quality assurance certificate

The descending order introduced by the different categories is the basis for finding the best possible match. Thereby two different contexts have to be taken into consideration:

- The first context is that the rules of the Contracting Authority apply and provide the information about the minimum standard or requirements and which category would be accepted by the Contracting Authority (Cascading rules)
- The second context is the available options (categories: 1-4) in the country of the Economic Operator.

The first context (Cascading rules) has to be taken into consideration when looking at the second context (Options). If the cascading rule defines 1-3 as accepted proof of evidence then it has to be checked against the options an Economic Operator has. If (1) is available in the country of the Economic Operator it has to be taken. If the Economic Operator only could provide option (2) it has to provide this option.

This approach also applies for cases where no match to European criteria exists (e.g. Anti-mafia declaration). In this case Italy has to provide the translation of the national criterion (into a virtual criterion) and the cascading rules for this criterion. Most of the European countries in this case have no mapping

national criterion at all thus they have to state that this criterion and rule is not applicable – (NA). However they have to define the possible production options that an Economic Operator may have (categories 2-4).

3.4 Legally specified mapping template mechanism

In order to define the national input for the European VCD Service, WP2 has developed a mapping template. The template reflects rules and principles with regard to mapping between criteria at European and National levels and the corresponding evidences that prove these criteria. The following subsections describe the way how the template is designed and how the national inputs can be defined accordingly.

When filling in the template the focus should be set on the majority of cases which hold true for a general legal proof. The focus is not to solve all possible cases (e.g. initial criterion proof with set of self declarations in two phased tendering).

The mapping of criteria and linking to evidences are a comprehensive legal supporting system a part of which is used according to the requirements set in each call for tender. The interpretation of the Call for Tender (CfT) with regards to criteria is the Economic Operator's responsibility.

The VCD System and the European VCD System should assist Economic Operators in creating a valid VCD Container. Thereby an "ideal" list of proofs/evidences should be proposed to the EO. However, the Economic Operator has to make the final decision on which proofs/evidences to include into the VCD Container.

No new legal rules will be created by the mapping procedure. The mapping is solely based on the existing national and European legal framework.

Mapping between European criteria and national criteria

Table 3-2 shows a screenshot of the table containing the mapping between European criteria and national criteria.

Criteria on EU Level			Criteria on National/Local Level		
Criterion Group	Legal Reference	Subcriteria	Criterion Group	National Legal Reference	Subcriteria
Personal situation >absence of conviction < (sec. 45 §1 and §2 (c, d, g))	sec. 45 §1 (a)	has been convicted by final judgment of the participation in a criminal organization	**rechtskräftige Verurteilung wegen:**	§ 7a Nr. 2 Absatz 1 lit. a VOL/A	Bildung krimineller oder terroristischer Vereinigungen im In- oder Ausland
	sec. 45 §1 (b)	has been convicted by final judgment of corruption		§ 7a Nr. 2 Absatz 1 lit. e, f VOL/A	Bestechung, Bestechung
	sec. 45 §1 (c)	has been convicted by final judgment of fraud		§ 7a Nr. 2 Absatz 1 lit. c, d VOL/A	Betrug, Subventionsbetrug
	sec. 45 §1 (d)	has been convicted by final judgment of money laundering		§ 7a Nr. 2 Absatz 1 lit. b VOL/A	Geldwäsche, Verschleierung unrechtmäßig erlangter

Table 3-2: Mapping between European criteria to national criteria (1:1)

On the left hand side the Criteria on EU Level are split up into different Criterion Groups (in this case Personal situation – absence of conviction sec. 45 § 1 and § 2 (c,d,g)) each of which has several atomic legal references to the Directive 2004/18/EC assigned including their textual description. On the right hand side the correlating German criteria that are taken from the German national procurement act (VOL/A) can be found. The first row for example is connecting the European criteria “has been convicted by final judgment of participation in a criminal organization” (sec. 45 § 1 (a) of the European directive) to the equivalent German criteria “Bildung krimineller oder terroristischer Vereinigung im In- oder Ausland” (§ 7a Nr. 2 Absatz 1 lit. a VOL/A).

A slightly different mapping methodology is implemented in the example shown in
Table 3-3. The example is taken from the Austrian implementation of the mapping table. In this case the Austrian legislation is more specific regarding the European criteria sec. 45 § 1 (c) “has been convicted by final judgment of fraud”. A 1:n mapping is implemented accordingly as the Austrian legislation distinct the cases of:

- Betrug (fraud),
- Untreue (breach of trust),
- Geschenkannahme (accepting inappropriate gifts)
- Förderungsmissbrauch (violation of sponsorship).

Criteria on EU Level			Criteria on National/Local Level	
Criterion Group	**Legal Reference**	**Subcriteria**	**Criterion Group**	**Subcriteria**
Personal situation >absence of conviction < (sec. 45 §1 and §2 (c, d, g))	sec. 45 §1 (a)	has been convicted by final judgment of the participation in a criminal organization	**Keine Ausschlussgründe § 68 Abs 1 Z 1, 4, 5, 7** iVm § 70 Abs 6 iVm § **72** Abs 1, 2, 3 iVm § 73 Abs 1 > keine rechtskräftige Verurteilung <	Mitgliedschaft bei einer kriminellen Organisation
	sec. 45 §1 (b)	has been convicted by final judgment of corruption		Bestechung
	sec. 45 §1 (c)	has been convicted by final judgment of fraud		Betrug
				Untreue
				Geschenkannahme
				Förderungsmissbrauch
	To be Done	has been convicted by final judgment of money laundering		Geldwäscherei

Table 3-3: Mapping between European criteria to national criteria (1:n)

Linking (national) evidences to national criteria

The second step when filling in the mapping table is to interconnect the criteria identified on the national level to the evidences issued by competent (national) issuing bodies – see Table 3-4. In Germany, the European criteria introduced in the tables above (sec. 45 § 1 (a-d)) are typically proven by the “Auszug aus dem Bundeszentralregister” which is equivalent to a criminal record. The number “1” displayed in the table indicates two distinct aspects:

- First, the document is a valid proof for a specific (national) criterion;
- Second, the document has to be handled as first priority evidence (category 1).

Documents issued by competent issuing bodies are category 1 documents. It is possible that two different documents provide equivalent proof in a country. In this case, it has to be assessed whether both documents have the same validity (in this case both should be category 1 evidences) or whether one document is being preferred or favoured for proofing a specific criterion (in this case, document 1 and document 2 should be distinguished in terms of priority).

Criteria on National/Local Level			**Evidences issued by compentent issuing body Defintion: A document issued by an authortiy or trusted third party (public and private) that has the competence for providing statements in this particualar domain.**				
Criterion Group	**National Legal Reference**	**Subcriteria**	Auszug aus dem Bundeszentralregister	Auszug aus dem Gewerbezentralregister	Erklärung des zuständigen Insolvenzgerichts, das das Insolvenzregister führt	Bescheinigung des Finanzamtes	Bescheinigung der Sozialversicherungsträger (gesetzliche Krankenkassen, Berufsgenossenschaften, gesetzliche
rechtskräftige Verurteilung wegen:	§ 7a Nr. 2 Absatz 1 lit. a VOL/A	Bildung krimineller oder terroristischer Vereinigungen im In- oder Ausland	1				
	§ 7a Nr. 2 Absatz 1 lit. e, f VOL/A	Bestechung, Bestechung	1				
	§ 7a Nr. 2 Absatz 1 lit. c, d VOL/A	Betrug, Subventionsbetrug	1				
	§ 7a Nr. 2 Absatz 1 lit. b VOL/A	Geldwäsche, Verschleierung unrechtmäßig erlangter	1				

Table 3-4: Linking the evidences to national criteria

Linking evidence to cascading rules

After having identified primary evidences issued by competent issuing bodies, cascades for substituting such evidences have to be identified in order to sort out which alternative evidences will be accepted according to the legislation of the country of the Contracting Authority. Evidences - precisely the quality of the issuer of evidences – should be generically expressed in the mapping in the four defined categories - see extract of the mapping table shown in Table 3-5.

The categories should enhance the understanding, quality and credibility of the mapping. Beside the first category (evidence issued by competent issuing bodies), three substitution categories have been defined : declaration on oath, solemn statement and self-declarations. Again a priority can be assigned to the evidences or substitutes according to the cascading principles in the national law (1. High priority and quality to 5. Lower priority and quality).

Criteria on EU Level			Cascading Rules for substitution evidences and production options			
			Cascading Rules for substitutional evidences: Which evidences have to be accepted by the Contracting Authority? (please provide priorities **according to national legal basis**)			
Criterion Group	**Legal Reference**	**Subcriteria**	A declaration on oath has to be declared under presence of a competent authority. False declaration on oath is itself a criminal offence.	Def: Solemn Statements are declaration where a competent body (e.g. authority or notary) confirms (as a witness) the identity of the person making the self declarations. This raises credibility but does not have further legal implications than a self declaration.	Def: A self-declaration is an informal statement which has in principle no further legal consequence apart from offences like fraud etc.	Def: This field can be used to place addtional information and comments
Personal situation >absence of conviction < (sec. 45 §1 and §2 (c, d, g))	sec. 45 §1 (a)	has been convicted by final judgment of the participation in a criminal organization	2	3		
	sec. 45 §1 (b)	has been convicted by final judgment of corruption	2	3		
	sec. 45 §1 (c)	has been convicted by final judgment of fraud	2	3		
	sec. 45 §1 (d)	has been convicted by final judgment of money laundering	2	3		

Table 3-5: Fill in cascading rules for evidences

Identification of "complexity drivers"

A complexity driver is a rule that is part of the mapping and defines either which criteria are relevant in a certain case or which evidences are relevant in a certain case. Two examples including screenshots are provided in order to clarify what a complexity driver is and how to describe a complexity driver within the template. The first example (see Table 3-6) includes complexity drivers relating to the field of profession, legal form and role of Economic Operators. The second example (see Table 3-7) includes complexity drivers relating to the natural person and legal form.

Criteria on EU Level			Influence-factors for criteria mapping (EC->NC)				Influence-factors for evidence mapping (NC->NE)		
Criterion Group	Legal Reference	Subcriteria	Atomic contractor has to prove criteria	Subcontractor (Partner) has to prove criteria	Bidding consortium	xxx	Legal form	Field of profession	XXX
Suitability to pursue professional activity (sec. 46)	art. 46 paragraph 1	has official enrolement on one of the professional or trade registers in its member state	YES	Generally yes, but depends upon the part of the contract that is beeing fulfilled by the subcontractor	no		Most official enrolement evidences depend upon the field of profession and the legal form. In gerenal every economic operator is regsitered in the Handelsregister, for certain fields of profession and legal forms there are specific registers like Handwerksrolle and Partnerschaftsregsiter. In contrast associations are registered in the Vereinsregister. However not all economic operators are offically registered (e.g. single entrepreneurs). Legal from depended evidences are: "Auszüge aus dem Vereinsregister" and partially "Auszüge aus dem Partnerschaftsregister"	cf. description in legal form (cell K27) Field of profession specfic evidences are: "Auszüge aus Handwerksrolle", "Mitgliedsverzeichnisse" and partially "Partnerschaftsregisterauszüge"	
	art. 46 paragraph 2	is member of a particular organisation in order to perform the service.	Generally yes, but depends upon the part of the contract that is beeing fulfilled by the subcontractor	Generally yes, but depends upon the part of the contract that is beeing fulfilled by the subcontractor	no		no	yes, evidence for this criteria depends on the field of profession and reference to large diversity of evidences	this criteria is not implemented in the national law. If the contracting authority asks for a proof of memebership in a specific organisation, they will accept equivalent evidences of membership in the equivelent foreign organisations.

Table 3-6: Complexity Drivers - Field of Profession, Legal form and role of economic operator

- Influence-factors for criteria mapping (European criteria to national criteria)

  This part of Table 3-6 and Table 3-7 identifies whether a certain evidence is generally mandatory, optional or not required. This often depends on the role (contractor or subcontractor) that Economic Operators play in public tenders. Some evidences also refer to a bidding consortium. Optional provision mostly depends on the terms of the contract and the parts of the contract that an Economic Operator fulfils.

- Influence-factors for evidence mapping (national criteria to national evidence)

  There are different evidences and issuing authorities for criteria art 46 paragraph 1 (cf. Table 3-6). The evidence that an Economic Operator may choose depends on the Economic Operators' profession and legal form. In this example the mapping table includes five different evidences issued by competent issuing bodies, all of them being priority 1 documents:
  - Handelsregister (general),
  - Handwerksrolle (field of profession specific),
  - Partnerschaftsregister (field of profession and legal form specific),
  - Vereinsregister (legal form specific) and
  - Mitgliedsverzeichnisse (field of profession specific).

  This complexity driver differentiates between two distinct aspects. There is a cause (different professions, legal forms) and a consequence (different issuing authorities and evidences). This influence on the one side the decision of the Economic Operator to choose the right evidence and on the other side the contracting authority that needs to evaluate provided evidence.

  Also art 46 paragraph 2 refers to a set of documents which depends on the field of profession. In cell XXX additional information is provided concerning this specific mapping as shown in Table 3-6 and Table 3-7.

Criteria on EU Level			Influence-factors for criteria mapping (EC->NC)				Influence-factors for evidence mapping (NC->NE)		
Criterion Group	Legal Reference	Subcriteria	Atomic contractor has to prove criteria	Subcontractor (Partner) has to prove criteria	Bidding consortium	xxx	Legal form	Field of profession	XXX
Personal situation >absence of conviction < (sec. 45 §1 and §2 (c, d, g))	sec. 45 §1 (a)	has been convicted by final judgment of the participation in a criminal organization	YES	YES	NO		no	no	only natural persons can be convicted; conduct of this person must be attributable in terms of law to the economic operator
	sec. 45 §1 (b)	has been convicted by final judgment of corruption	YES	YES	NO		no	no	see above
	sec. 45 §1 (c)	has been convicted by final judgment of fraud	YES	YES	NO		no	no	see above

Table 3-7: Complexity Drivers - Natural Person and Legal entity

The criteria with regard to personal situation of a candidate (art 45 §1 and §2 (c,d,g,) – Personal situation - absence of conviction) are in many cases only attributable to natural persons and not to the legal entity itself. Thereby conduct of a person must be attributable in terms of law to the economic operator (e.g. CEO, Technical Director Etc.). In this example the cause is that criminal records are issued for natural persons only. The consequence following from that is that different criminal records could be issued for economic operators and the EO will have to choose which natural persons have to provide one. These criteria typically have to be proven by every Economic Operator including subcontractors as shown in Table 3-7.

Cases of no corresponding EU-criteria (Virtual Criteria)

Sometimes national criteria exist, that don't map to a corresponding criteria in the EU-directives. This section clarifies how to manage these specific exceptions in the mapping template. As example we introduce the Italian national criterion "not sentenced in connection with mafia-activity". Courts or registries in Italy provide certificates to prove this criterion. Two different questions arise and are to be handled:

1) How are those cases defined and represented within the spreadsheet?
2) How does an economic operator from another country prove this criterion in a national (e.g. Italian) tendering procedure?

It should carefully be checked whether it is possible to relate such criterion to an EU criterion. The Italian criterion "not sentenced in connection with mafia-activity" for example seems to be closely related to the EU criterion "conviction for participation in a criminal organization". However the Italian criterion does not only request from an Economic operator to show non-conviction with regard to participate in criminal organizations but additionally to show that there are no connections to the mafia.

In order to assess the different possibilities it has to be questioned whether a criminal record would be a sufficient equivalent for foreign economic operators to prove this "anti-mafia criterion" and whether Italian contracting authorities will have to accept this according to heir national legislation. In this case the Italian legislation clearly defines a cascading rule for alternative evidences for the anti-mafia criterion as well. If no anti-mafia declaration can be provided from a competent issuing body then a declaration on oath is a sufficient replacement according to Italian legislation.

In order to make a clear semantic distinction on criteria level a "virtual criteria" on the European level has to be created. The national criterion and evidence information will be included according to the national

legislation into the Italian spreadsheet. As a valid substitute the declaration on oath will be selected. Other countries have to declare within the mapping for this criterion whether they have similar legislation applicable or if this is not applicable. In the former case they have to do the mapping in the spreadsheet while in the latter case they have state NA (not applicable). In this case the Italian spreadsheet holds all required information needed to find equivalent evidence.

3.5 Conformance and adaptability of mapping

The criteria for qualitative selection and non-exclusion as defined in the Directive 2004/18/EC are the common ground for building the European VCD System. Mapping evidences to the criteria stated in Articles 45 and 46 may be regarded as sufficient for a first step since these can be further described within sub criteria and related atomic criteria. The personal situation of a candidate (Article 45) can be for example further described by:
Criterion Group: sec. 45_Personal situation of the candidate or tenderer …
Subgroup: with regard to absence of conviction (sec. 45 §1 and §2 (c, d, g))
Atomic criteria:

- sec. 45 §1 (a):_has been convicted by final judgment of the participation in a criminal organisation
- sec. 45 §1 (b)_has been convicted by final judgment of corruption
- sec. 45 §1 (c)_has been convicted by final judgment of fraud
- sec. 45 §1 (d)_has been convicted by final judgment of money laundering
- sec. 45 §2 (c)_has been convicted by a judgment what has the force of res judicata in accordance with the legal provisions of the country of any offence concerning his professional conduct
- sec. 45 §2 (d)_has been guilty of grave professional misconduct proven by any means which the contracting authorities can demonstrate
- sec 45 §2 (g)_is guilty of serious misinterpretation in supplying the information required under this section or has not supplied such information

Subgroup: …with regard to non-bankruptcy and financial status (sec. 45 §2 (a-b))
Subgroup**:** … with regard to compliance with fiscal and social obligations (sec. 45 § 2 (e-f))
Criterion **Group:** sec. 46_Suitability to pursue the professional activity
…

A detailed mapping between criteria and evidence will enable a precise comparison between different tender tender specific requirements within the Member States enabling wide information support for both, economic economic operators and contracting authorities. The European selection and exclusion criteria are being derived from the European Directive 2004/18/EC and can be considered as reference criteria. The national national legislation relates to both European reference criteria on the one side and evidences that fulfil this this criteria on the other side as shown in

.

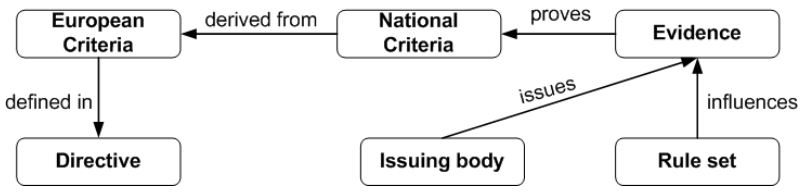

Figure 3-1: General mapping methodology

However some problems may occur when relating national legal frameworks to European criteria in particular when specific national criteria are not precisely addressed by the directive. In these cases a correct assignment is getting difficult in terms of semantics and traceability within the mapping mechanism. The following section provides an example for this and explains the problem to greater detail.

The following section provides an overview about the challenges that may occur when interconnecting evidences and criteria. In order to ensure that the mapping of evidence to criteria is done in a conformant way across the different countries there are some requirements that have to be taken into consideration. Thereby a particular focus has to be set on the underlying semantics that are used to do the interconnection between criteria and evidences. It has to be ensured that the national ontologies are constructed with same semantics in terms of interpreting European criteria and assigning evidence. If the underlying semantics are used differently across national ontologies, the mapping will deliver wrong results.

As a starting point it will be important to define problems that may occur with different interpretation of the underlying semantics. There are specific types of evidences which only can be assigned to given atomic criteria with a loss of semantics.

Example – Illegal work: In some countries there exists evidence to proof that an economic operator has fulfilled obligations related to the fight against illegal work. Currently no specific criteria addressing illegal work exists but many vague (broad) criteria can be identified, which could be related to this aspect as shown in the list below:

- has not fulfilled obligation with regard to the payment of social security contributions (sec. 45 § 2 e)
- has not fulfilled obligations relating to the payment of taxes (sec. 45 § 2 f)
- has been convicted by a judgment what has the force of “res judicata” ("a matter [already] judged") in accordance with the legal provisions of the country of any offence concerning his professional conduct (sec. 45 §2 c)
- has been guilty of grave professional misconduct proven by any means which the contracting authorities can demonstrate (sec. 45 §2 d)

In this example none of the listed criteria entirely reflects the requirement of illegal work. Criteria a) and b) could be seen as indicators for illegal work since illegal work may lead to unsatisfactory payment of social security contributions and taxes. Other national ontologies may relate documents that certify non-conviction in illegal work to criteria c) since this criterion if formulated very broad reflecting any conviction. Another possible assignment could be criteria d) in countries where contracting authority are enabled by a specific national system to prove professional misconduct.

In order to ensure conformance we propose to handle these specific cases through virtual criteria as explained in section 0 . However the decision whether to introduce a virtual criteria or not has to be made after carefully considering the different options provided by the directive first. This requires some legal analysis on the existing criteria in order to find a common basis as well as general agreement on the virtual criteria on European level. Any maintenance mechanism of the European VCD system that will be specified during the project run-time requires taking this specific requirement into account in order to ensure conformance and adaptability of the different national ontologies involved. Legal advisory thereby plays an important role as European and national legislation has to be carefully checked from legal point of view.

3.6 Addressing Trust and Confidence

At present (status quo situation), the economic operator is responsible for identifying the evidences that shall be submitted to the Contracting Authority in order to meet the criteria set out in the CFT (call for tender).

With the VCD concept, it is envisaged that the European VCD System, which implements the criteria evidence reasoning, will assist the economic operator in identifying the requested evidences. For the European VCD System to be successful and considered useful, it is vital to ensure confidence in using the tool. The subsequent two sections give an overview of the approach to ensure trust and confidence in pre-VCD mapping performed by the European VCD System.

Step 1: During the PEPPOL project

The economic operator should be assured that his or her application or tender will not be rejected because of irregularities as regards submitted evidences in accordance to the recommendations of the European VCD System.

The contracting authority should clearly specify in the CFT:

- that the contracting authority promotes the use of the European VCD System
- that the economic operators may not understand the recommendations made by the European VCD System or have the opinion that some evidences are not necessary according to their own legal advice. If this is the case, they should ask for clarification to the contracting authority hereof as authorized by the CFT,
- that the contracting authority usually will not reject an application or a tender on the basis of irregularity as regards evidences provided in accordance with the recommendations of the European VCD System, but will usually (except in urgent cases) give the economic operator a possibility to submit correct evidence.

Step 2: After PEPPOL

The issue of ensuring confidence in the European VCD System is to be addressed also after PEPPOL. Whether solutions proposed for step 1 can be retained also after PEPPOL must be considered. It is up to PEPPOL's consortium to submit proposals to the EC, including whatever necessary suggestions of measures and means to change behavior of CAs – for example to use standard sets of criteria in calls for tenders – or to secure the process further through supporting amendments to the existing directives – for example to recognize the European VCD Service as legally valid supporting system.

3.7 Legal validity of documents

This chapter will give answer to the following question: How does the contracting authority verify whether a document provided by the economic operator is issued by someone authorized to issue this document or not? There are two different questions involved. The first relates to the competence of an authority to issue documents. The second question would be to ask who actually has issued a document provided in a particular tender.

Which authority is competent to issue documents, certificates or declarations?

a. For documents, certificates or declarations described in Art 45 Directive 2004/18/EC: The authority or body listed with the Commission according to Art. 45 (4) Directive 2004/18/EC.
b. For documents, certificates described in Art 46 Directive 2004/18/EC: The authority or body listed in Annex IX to Directive 2004/18/EC.
c. References described in Art 47 Directive 2004/18/EC
d. Documents and certificates described in Art 48 Directive 2004/18/EC

Who has actually issued a document provided in a particular tender? The contracting authority has to assess which authority actually has issued a certain document in order to find out whether it is issued by a competent authority.

a. **Communication on paper:** In communication on paper this is done in two steps. First it has to be verified which authority actually has issued a certain document. In a second step one has to verify if the issuing person acting on behalf of the authority has the capacity to issue the document.
   - **Which authority has actually issued the document?** In the paper world an authority is identified by seal or stamp. The contracting authority has to verify identity of seal or stamp according to the rules laid down in The Hague Convention of 5 October 1961 Abolishing the Requirement of Legalisation for Foreign Public Documents. That means that a so-called apostille has to be on the document. See the model of apostille in Figure 3-2.

Annex to the Convention

Model of certificate

The certificate will be in the form of a square with sides at least 9 centimetres long

APOSTILLE

(Convention de La Haye du 5 octobre 1961)

1. Country: .....

This public document

2. has been signed by .....

3. acting in the capacity of .....

4. bears the seal/stamp of .....

.....

Certified

5. at ..... 6. the .....

7. by .....

.....

8. N° .....

9. Seal/stamp: 10. Signature:

....

Figure 3-2: Model of apostille according to The Hague Convention of 5 October 1961 Abolishing the Requirement of Legalization for Foreign Public Documents

- **Is the issuing person authorized to act on behalf of the authority?** In the paper world a person is identified by written signature. Whether a person is authorized to act on behalf of a certain authority is a question of capacity. The contracting authority has to verify the signature and capacity according to the rules laid down in The Hague Convention of 5 October 1961 as well. The apostille on the document certifies signature and capacity.

b. **Electronic communication:** eSignature or other solutions establishing trust in electronic communication are conceivable. The 1st company law directive offers a solution based on eSignature. Art 3 (3) stipulates: Member States shall take the necessary measures to ensure that certification of electronic copies guarantees both the authenticity of their origin and the integrity of their contents, by means at least of an advanced electronic signature within the meaning of Article 2(2) of Directive 1999/93/EC (1). In PEPPOL the term trust model has been introduced. A possible solution, based on the discussions regarding chain of trust in BRITE[12], could be the following. National service providers within PEPPOL establish a network of trust. In addition, each national service provider provides an assurance regarding issuing bodies in the respective country.
   - **Which authority has actually issued the document?** Legal entities may be identified by eSignature without the need to identify a person authorized to act on behalf of an entity.
   - **Is the issuing person authorized to act on behalf of the authority?** In countries without eSignature for legal entities a person has to use his/her eSignature and the receiving

[12] BRITE (Business Register Interoperability Throughout Europe) was an Integrated Project co-funded by the European Commission, DG Information Society & Media. It aimed to develop and implement an innovative interoperability model, ICT service platform and management instrument for Business Registers to interact across the EU. http://www.briteproject.eu/

authority would have to assess whether this person is authorized to act on behalf of an entity.

The questions mentioned in this paragraph need further elaboration. They are partially addressed for example through the VCD System or the directives which might indicate or not the competent issuing body (bodies) for a certain document. Whether and how we address these issues has to be clarified because of the complexity of the questions involved, Several means – for example the directives, signatures, chain of trust - could potentially give answer to sub-questions. Further elaboration might either lead to additional value of the VCD system or to recommendations for the post PEPPOL phase.

Implications of the Service Directive 2006/123/EC

The service directive provides a general framework for WP2 solution as it addresses some difficulties that often occur in public procurement procedures such as the need to certify translations or the additional need for an apostille or different requirements on copy quality.

Preamble (42) of the Service directive states that rules relating to administrative procedures should not aim at harmonising administrative procedures but at removing overly burdensome authorisation schemes, procedures and formalities that hinder the freedom of establishment and the creation of new service undertakings there from. Preamble (43) in addition faces one of the fundamental difficulties, in particular by SMEs, in accessing service activities and exercising them is the complexity, length and legal uncertainty of administrative procedures.

Article 5 introduces simplification of procedures whereas Member States shall examine the procedures and formalities applicable to access to a service activity and to the exercise thereof. Where procedures and formalities examined under this paragraph are not sufficiently simple, MS shall simplify them (§1). The Commission may introduce harmonised forms at Community level, in accordance with the procedure referred to in Article 40 (2). These forms shall be equivalent to certificates, attestations and any other documents required of a provider (§2). Where MS require a provider or recipient to supply a certificate, attestation or any other document proving that a requirement has been satisfied, they shall accept any document from another MS which serves an equivalent purpose or from which it is clear that the requirement in question has been satisfied (§3).

MS may not require a document from another MS to be produced in its original form, or as a certified copy or as a certified translation, save in the cases provided for in other Community instruments or where such a requirement is justified by an overriding reason relating to the public interest, including public order and security. The first subparagraph shall not affect the right of MS to require non-certified translations of documents in one of their official languages.

Paragraph 3 of Article 5 shall not apply to the documents referred to in Directive 2005/36/EC on the recognition of professional qualifications, in case of Article 7(2) (if EO moves), or Article 50 (on establishment). They also shall not apply in Articles 45(3), 46, 49 and 50 of Directive 2004/18/EC on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts.

The service directive shows that differences with regard to requirements on translations and copies exist even if procedures shall be simplified for specific case. The following sections address different requirements with regard to translation and copies that may be requested by some contracting authorities in public procurement procedures.

Translation of evidence

As the law of the CA applies, evidences have to be submitted in the language of the CA but are most often originally issued in the language of the EO. CA may therefore define different requirements with regard to quality attribute of the produced translation.

The following three qualities of translation have been identified:

- **Certified Translation**: A translation carried out and verified by a certified translator.
- **Notarised Translation: a certified translation** that is additionally authenticated by a Notary. Notarised translations are often required by formal governmental and legal bodies. The process of notarisation is more formal than that required for certification. Notarisation of translation involves the translator of the document/s attending the offices of a Public Notary and declaring both on oath and in writing that the translation is a true and honest translation. The Notary will then mark the translation accordingly with a certified stamp. Confirmation of that the translation was carried out by a certified translator.
- **Legalisation/Apostille:** Apostilles may only be issued by a *Competent Authority* designated by the State on whose territory the public document has been executed.

As the third quality of translation represents a specific means, the **Apostille Certificate**[13] is subsequently described in more details. An Apostille Certificate is an official certificate issued to documents so they will be recognised in member states without further Legalisation.[14] Typically the Apostille Certificate is issued by the State from which the document originates although in some cases another state can issue the Apostille. Once a document has had an Apostille Certificate attached to it confirming the authenticity of signatures and seals it can be presented to any country which recognises the Apostille. The authority receiving the document should then accept the seals or signatures as true and valid without requesting further evidence or proof. The Apostille Certificate follows a prescribed format (see Figure 3-3) and must include the following information:

1. Country of issue
2. Who has signed the document
3. The capacity in which the person signed the document
4. Details of any seal on the document
5. Place of issue
6. Date of issue
7. Issuing authority
8. Apostille Certificate number
9. Stamp of issuing authority
10. Signature of representative of issuing authority

Figure 3-3: Example of Apostille Certificate taken from www.apostille.org.uk

Copies of evidences

Contracting authorities may require different qualities of copies due to their transformation into electronic format. A copy is a reproduction of an original document. While the original document may be signed, the copy only reproduces the signed document.

[13] http://www.hcch.net/index_en.php?act=text.display&tid=37
cf. www.apostille.org.uk
[14] See also the following links: http://hcch.e-vision.nl/index_en.php?act=text.display&tid=1; the "electronic Apostille Pilot Program - Explanatory documents" http://hcch.e-vision.nl/upload/e-app-fnl.pdf , see http://hcch.e-vision.nl/index_en.php?act=publications.details&pid=4945&dtid=49

Duplicates have to be distinguished from copies as these are documents identical to an original document, e.g. in the context of a contract made and signed in duplicate or in two copies.

A hard copy is a tangible document (original, paper copy, printout, or any record) that can be read (by humans) without the use of any device.

Electronic document is identified as having the capability of being stored, copied, communicated, and visualised by electronic means, as well as being reproduced as hard copy. In regards to this, a distinction is to be made between scanned copies and soft copies as follows:

- Scanned Copy: a copy read by electronic means and stored as an electronic document.
- Soft Copy: From electronic version to electronic version of document.

Table 3-8 provides an overview of input formats and output formats of copies. For example, from a paper based document either a hard copy in paper or an electronic copy in form of a scanned copy can be produced. From an electronic file, either a hard copy (print-out) or a soft copy (electronic copy) can be produced.

Input format	Paper	Electronic document
Output format	hard copy (paper)	
	Electronic copy (electronic document)	
	Scanned copy	Soft Copy

Table 3-8: Types of copies produced in output formats from specific input formats

Table 3-9 shows the qualification of copies in regards to the original for both, hard copy (paper) and electronic copy (electronic file). A certified copy is authenticated or guaranteed as a true copy by the issuing body itself or a competent third-party (e.g. public notary).

Output format of copy	Hard copy	Electronic copy
Unqualified	copy	
Qualified (Either by the issuing authority or competent third party)	certified copy	

Table 3-9: Respective qualification of copies in regards to original

In public procurement procedures economic operators need to carefully check the terms set out by the contracting authority concerning the requirements with regard to the quality of a copy. While some countries allow the usage of unqualified copies other countries require the usage of certified copies. The European VCD may be extended with some further rules on their usage. However this is currently not implemented.

4 Reference Implementations of Virtual Company Dossier Specifications

As noted above, PEPPOL also provides Reference Implementations[15] of the Virtual Company Dossier specifications that...

- Were developed concurrently with the specification
- Verify that specification is implementable (proving the concepts)
- Enable testing
- Serve as reference against which other implementations can be measured
- Help to clarify the intent of the specifications

As such they implement the PEPPOL specifications with enough functionality to support test pilots but are not intended to be for production use. Reference Implementations are also provided to the IT industry for incorporation into their own platforms and systems and provide the embryo of open source tools that the PEPPOL user community can adopt and evolve over time.

4.1 Introduction

This chapter is focussing on the overall technical concept of the VCD. The section “Overall architecture” describes the roles of the national VCD System and the European VCD System as well as the four interaction-scenarios possible between these components. Successively, the high level components of the National VCD System and the European VCD System are introduced from a functional perspective.

4.2 Overall architecture

The two main components involved when creating a VCD container are the National VCD System and the European VCD System.

The **European VCD System** as a centralised system is responsible for deriving the proper evidences for an Economic Operator in a specific tenderer situation, taking into account the role of the Economic Operator within the tenderer setting (e.g. a consortium), his legal form and his national legal framework as well as the national legal framework of the Contracting Authority. The European Service Provider is performing reasoning tasks and is delivering the information about the appropriate Criteria and Evidences in form of a VCD Skeleton Container either to the Economic Operator or directly via System Interface to the National Service Provider. The European VCD System is a “virtual” System within the Austrian National System and is operated by PEPPOL.AT during the course of the project.

The **National VCD System**, operated by an VCD Service Providers in a Member State individually, is supplementing the information the European VCD System provides, by adding the Evidence Documents and further Evidence relevant Data from the (national) Evidence Issuing Bodes, resp. Services, is creating a VCD Container and is delivering it to the Economic Operator. There are two possible ways, how the National VCD System is involved:

1) Either it is acting as the single point of contact for the Economic Operator and exchanges the relevant data with the European VCD System (VCD Pre-Skeleton Container to the European VCD System and VCD Skeleton Container from the European VCD System) via a service interface (full integration scenario), or
2) the Economic Operator acts as a “data bridge” between the two Systems, calling first the European VCD System and then (manually) calling the National VCD System with the VCD Skeleton Container assembled by the European VCD System as input.

[15] Curran, Patrick (2003). Conformance Testing: An Industry Perspective. Sun Microsystems

The **VCD Viewer** is an autonomous tool to view the final VCD Container. Alternatively, the VCD Systems (like the European VCD System) also provide means of showing the data included in the VCD.

For Economic Operators from Member States who do not have a National VCD System established and/or do not have their national ontology included in the overall Ontology (and therefore in the European VCD System), a **VCD Editor** as a low level XML-Editor is offered. When using the VCD Editor, all missing data has to be filled in manually by the Economic Operator. In case of a national Ontology being provided within the European VCD System, the Economic Operator just manually adds the Evidence Documents and data suggested by the European VCD System. If there is no national Ontology in place, no information and decision support as well as assembly support can be provided. The Economic Operator has to intellectually derive the needed Evidences and collect them manually. This Editor only serves as a first entrance point for those countries, which have not reached PEPPOL compliance yet.

To sum it up, four high level scenarios are supported by the VCD Systems, showing descending System Support for the Economic Operator:

Scenario	Description
1) Interaction Scenario 1: Fully automated Interaction between European VCD System and National VCD System	The Economic Operator is interacting with the National VCD System as a single point of contact, which in turn calls the European VCD System via service interface and supplements the data to a full VCD Container.
2) Interaction Scenario 2: Interaction between European VCD System and National VCD System via Economic Operator	The Economic Operator is interacting with both Systems, acting as a data-bridge between them.
3) Interaction Scenario 3: Semi manual VCD Assembly by the Economic Operator (only European VCD System)	The Economic Operator is calling the European VCD System and is filling in the Evidence data and Documents into the VCD Container manually using the VCD Editor without further support.
4) Interaction Scenario 4: Fully manual VCD assembly by the Economic Operator	The Economic Operator has no decision and information support at all and is filling in all data manually using the VCD Editor

Table 4-1 The further sections provide a further insight into the interaction steps of the four scenarios.

Interaction Scenario 1: Fully automated Interaction between European VCD System and National VCD System

Figure 4-1 shows the interaction in case of the National VCD System acting as a single point of contact for the Economic Operator. The European VCD System is called via service interface by the National VCD System fully automatically. This scenario offers the most support to the Economic Operator and is the highest integration level of the different components:

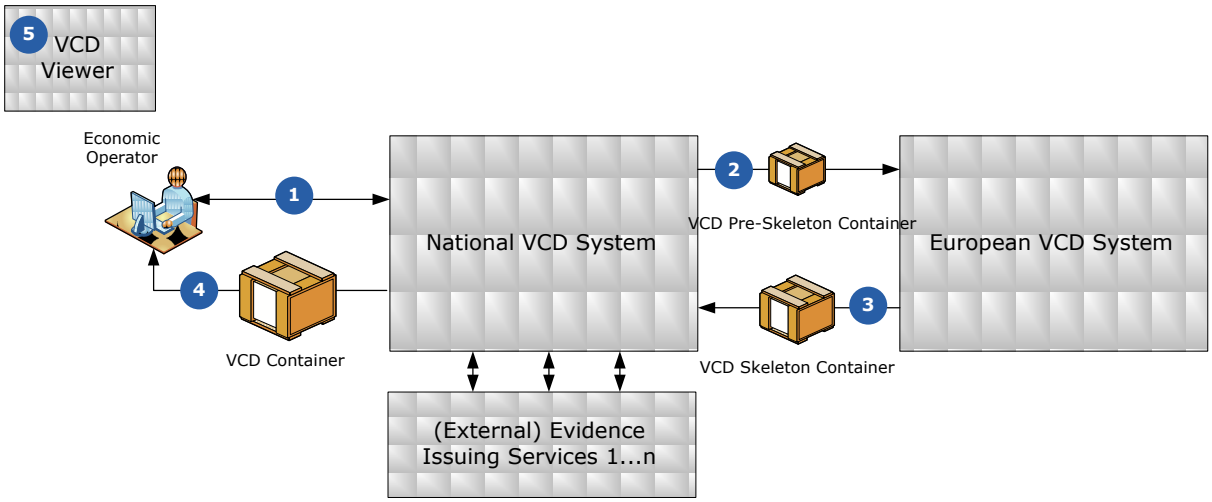

Figure 4-1: Interaction Scenario 1: Fully automated Interaction between European VCD System and National VCD System

Nr.	Interaction
1	The Economic Operator is initiating the VCD assembly process by placing a VCD request at his National VCD System and is interactively entering the necessary data (e.g. tenderer data, nationality of the Contracting Authority, ...).
2	The National VCD System creates a VCD Pre-Skeleton Container and is passing it via a service interface to the European VCD System.
3	The European VCD System is deriving the Evidences according to the rule set (ontology), is creating a VCD Skeleton Container and is passing this container back to the National VCD System via a service interface.
4	The National VCD System is in charge of supplementing the data, e.g. entering Evidence Documents by calling (national) Evidence Issuing Services, creates the full VCD Container and is passing it back to the Economic Operator.
5	The Economic Operator might view the VCD (contents) by using the National VCD System (if providing corresponding functionalities), the European VCD System or the VCD Viewer.

Table 4-2 Interaction scenario 1

Interaction Scenario 2: Interaction between European VCD System and National VCD System via Economic Operator

Figure 4-2 depicts the interaction in case the National VCD System has not implemented a service interface to the European VCD System. The Economic Operator is interacting with the European VCD System and is receiving a VCD Skeleton Container, which he uploads manually to the National VCD System. The further interaction processes are the same as in the first interaction scenario explained above.

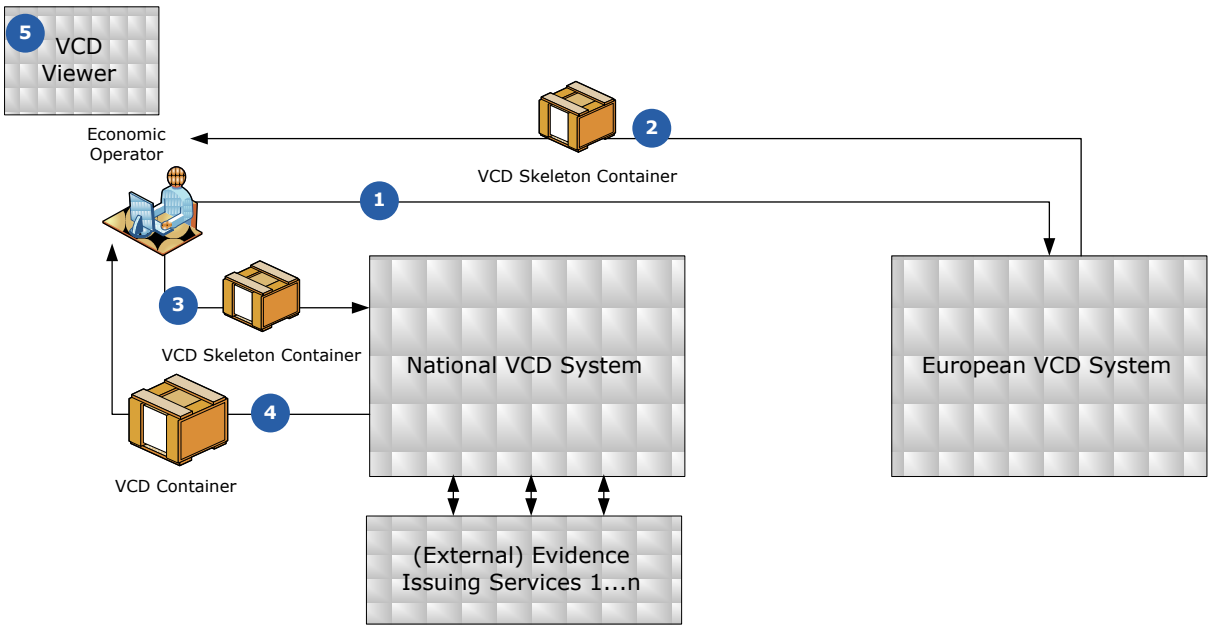

Figure 4-2: Interaction Scenario 2: Interaction between European VCD System and National VCD System via Economic Operator

Nr.	Interaction
1	The Economic Operator is initiating the VCD assembly process by placing a VCD request at the European VCD System and is interactively entering the necessary data (e.g. tenderer data, nationality of the Contracting Authority, ...).
2	The European VCD System is deriving the Evidences according to the rule set (ontology), is creating a VCD Skeleton Container and is passing this container as a zip back to the Economic Operator.
3	The Economic Operator is then uploading this VCD Skeleton Container to the National VCD System.
4	The National VCD System is in charge of supplementing the data, e.g. entering Evidence Documents by calling (national) Evidence Issuing Services, creates the full VCD Container and is passing it back to the Economic Operator.
5	The Economic Operator might view the VCD (contents) by using the National VCD System (if providing corresponding functionalities), the European VCD System or the VCD Viewer.

Table 4-3 Interaction scenario 2

Interaction Scenario 3: Semi manual VCD Assembly by the Economic Operator

The third interaction scenario is shown in Figure 4-3**Feil! Fant ikke referansekilden.**. Like above, the Economic Operator is interacting with the European VCD System and is receiving a VCD Skeleton Container, including the possible Evidences for his specific instance. Since there is no National VCD System in place at all, the Economic Operator has to use the VCD Editor to manually input the needed Evidence Documents and Evidence Data. The Economic Operator himself is therefore in charge of collecting all Evidence Documents from the appropriate sources.

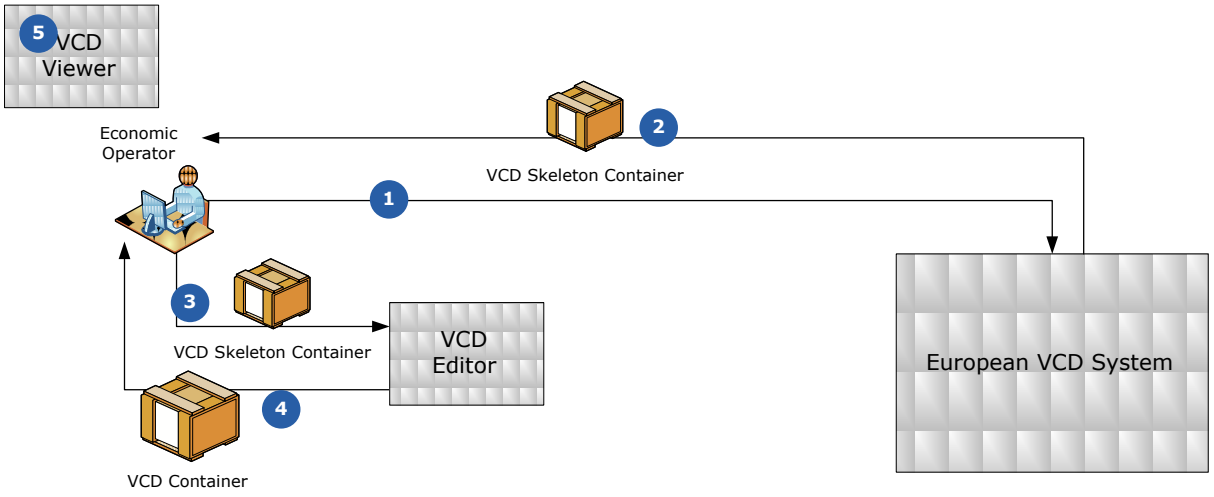

Figure 4-3 : Interaction Scenario 3: Semi manual VCD Assembly by the Economic Operator

Nr.	Interaction
1	The Economic Operator is initiating the VCD assembly process by placing a VCD request at the European VCD System and is interactively entering the necessary data (e.g. tenderer data, nationality of the Contracting Authority, ...).
2	The European VCD System is deriving the Evidences according to the rule set (ontology), is creating a VCD Skeleton Container and is passing this container as a zip back to the Economic Operator.
3	The Economic Operator imports this VCD Skeleton Container into the VCD Editor and successively inputs the Evidence Documents and Evidence Data with support of the VCD Editor,
4	The VCD Editor creates the VCD Container and is passing it back to the Economic Operator.
5	The Economic Operator might view the VCD (contents) by using the European VCD System or the VCD Viewer.

Table 4-4 Interaction scenario 3

Interaction Scenario 4: Fully manual VCD assembly by the Economic Operator

In the forth interaction scenario shown in Figure 4-4, the Economic Operator is completely manually assembling a VCD Container via the VCD Editor. He has to know, which Evidences he needs in order to fulfil necessary criteria and he will have to collect and input the Evidence Documents by himself. This interaction scenario is only recommended for those countries, whose rule sets (national ontologies) have not been included yet in the overall ontology the European VCD System is operating on and can therefore be viewed as an intermediary step on the way to PEPPOL compliance.

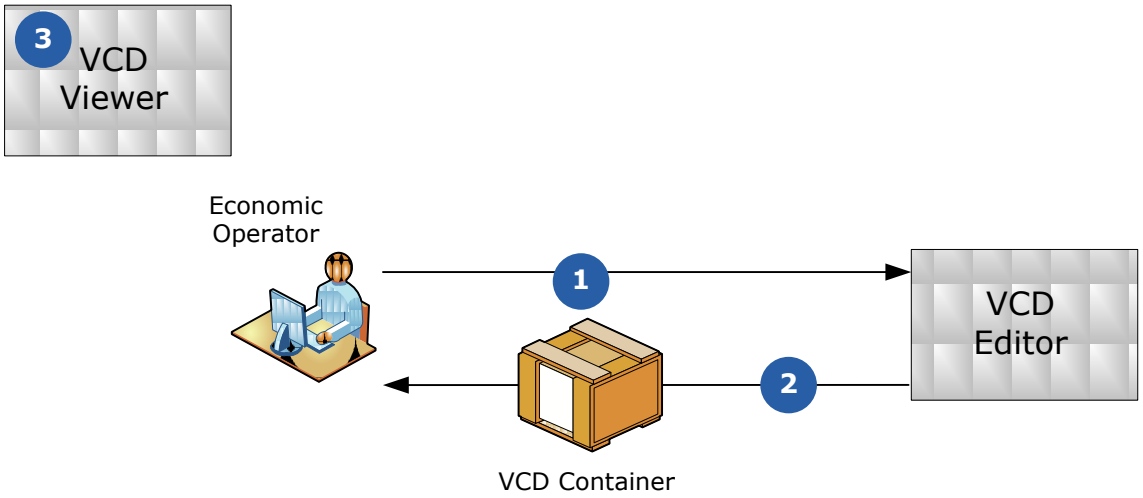

Figure 4-4: Fully manual VCD assembly by the Economic Operator

Nr.	Interaction
1	The Economic Operator is calling the VCD Editor and is entering all necessary data (including the needed Criteria, Evidences and Evidence Documents) by using the VCD Editor.
2	The VCD Editor creates the VCD Container and is passing it back to the Economic Operator.
3	The Economic Operator might view the VCD (contents) by using the European VCD System or the VCD Viewer.

Table 4-5 Interaction scenario 3

4.3 Detailed Interaction between National and European VCD System

Sequence diagrams of interaction scenario 1: Fully automated Interaction between European VCD System and National VCD System

This section explains the interaction scenario drafted in chapter “Interaction Scenario 1: Fully automated Interaction between European VCD System and National VCD System” in more detail. Furthermore some major components of the European VCD System are introduced and the data flow between them is also sketched in the sequence diagram.

The following major components of the European VCD System are shown in figure 4-5 and will therefore be described briefly:

ESP Service Interface:
This interface is responsible for interacting with the National VCD Systems, as described below.

User Interaction Service:
The User Interaction Service builds the graphical Interface to interact with the user. It acts as an "intelligent" Service within the osSso Machine and is assembled on the fly according to the underlying Ontology.

Transformer:
This component transforms the XML-input data (e.g. the VCD Pre-Skeleton Container) into its semantic (graph-) representation (RDFS) and vice versa. The VCD (Skeleton) Packager makes use of this component.

Reasoning Services:
The Reasoning Services enhance the input graph via applying the underlying rule set (represented in the ontology). Several Reasoners are operating within the European Service Provider (e.g. the Rule Based Reasoner and the OWL-DL Reasoner) at several stages. The reasoners are responsible for calculating the needed Evidences out of the input of the Economic Operator according to the Ontology.

osSso Machine:
The osSso Machine is an intelligent service assembly and execution layer, which detects missing information and fills in this missing data by calling the appropriate services in time. The User Interaction Service (and its fragments), the Reasoner Services, the Packager (wrapped Transformer) are examples of Services, orchestrated by the osSso Machine.

Ontology Manager:
The Ontology Manager handles the different data repositories and assembles the data to a virtual application graph, the whole European VCD System is operating upon. The Ontology Manager is also responsible for graph management functionality like persistency, querying and access control.

Application Controller:
The Application Controller is in charge of the program and data flow within the European VCD System.

Further Components:
A couple of further components act as background components for different tasks like Access and User Management, etc.

The components will be explained in greater detail in section 10.1.

While the Economic Operator is interacting with the National VCD System, the selection of criteria and inference of possible evidences is performed by the European VCD System. This leads to a complex way of interaction between Economic Operator/User, National VCD System and European VCD System as depicted in

Figure **4-** 4-5 below (this Figure can be obtained for better readability at:
http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1):

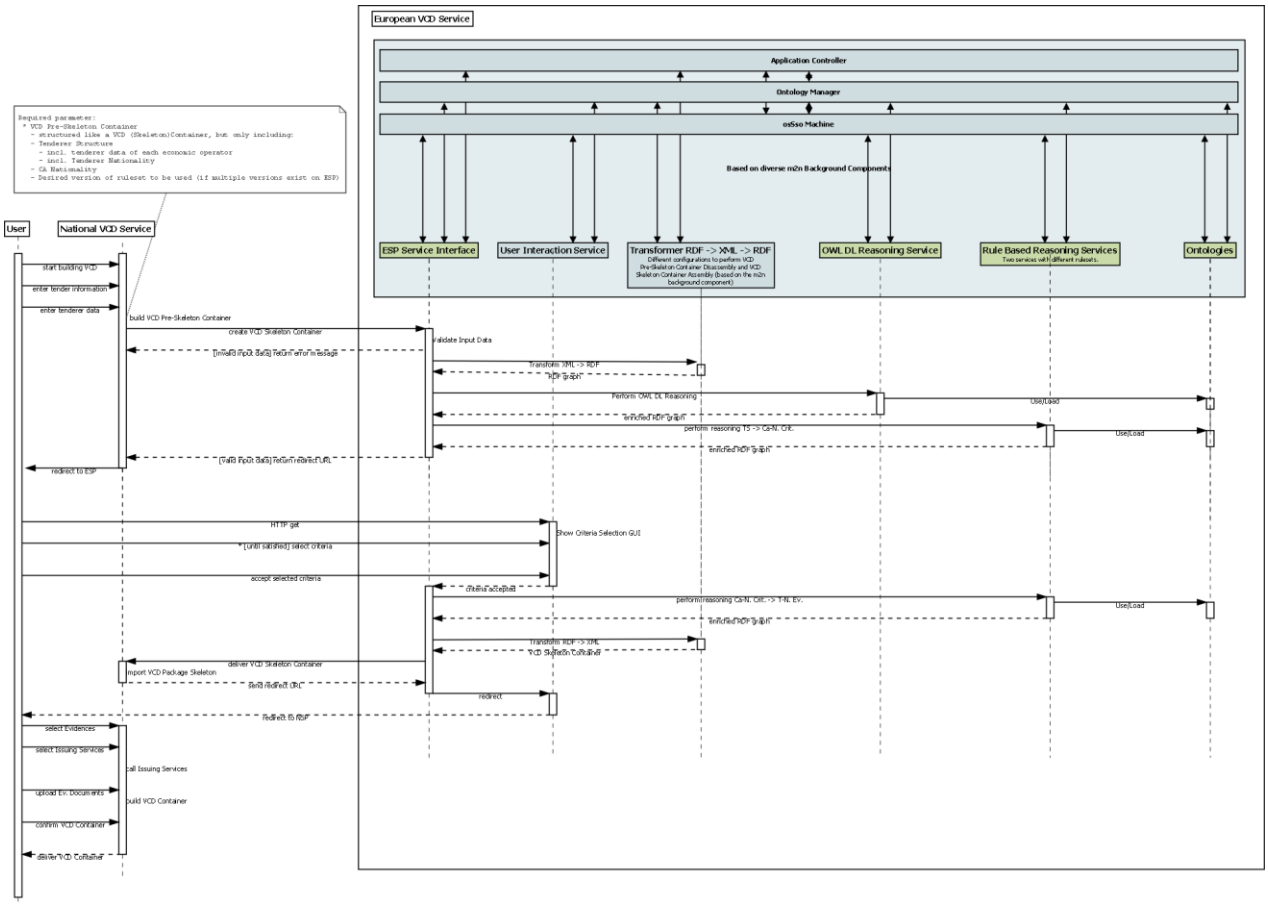

Figure 4-5: Sequence Diagram User-National VCD System-European VCD System

The basic flow of control contains the following steps:

- The Economic Operator enters all necessary data to generate the VCD Pre-Skeleton Container (e.g. Tenderer structure and Data and Contracting Authority nationality) at “his” national National VCD System (e.g. an Austrian Economic Operator turns to the Austrian National Service Provider).
- The National VCD System assembles the data into a VCD Pre-Skeleton Container
- The National VCD System sends this VCD Pre-Skeleton Container to the European VCD System, along with the address for the callback and a token to identify this request.
- The European VCD System analyses the received data and replies with an error message in case of error, or with a redirect-URL in case of success.
- In case of success, the National VCD System redirects the User to the URL returned by the European VCD System.
- The European VCD System calculates the suggested criteria and displays them to the user. The user interacts with the European VCD System to select/confirm the criteria to be proven for the individual Tenderer Structure Elements.
- When the Economic Operator is satisfied with the criterion selection, the European VCD System calculates the possible Evidence and creates a VCD Skeleton Container.
- The European VCD System sends the VCD Skeleton Container to the National VCD System, using the callback address and token supplied by the National VCD System in step 2. The National VCD System replies with a redirect URL.
- The European VCD System redirects the Economic Operator to the redirect URL from step 7.
- The Economic Operator now interacts with the National VCD System again.
- The National VCD System collects Evidence Documents and further Data by calling national Issuing Services and ...

- ... is finally passing the VCD Container back to the Economic Operator

Therefore, interactions between the National VCD System and European VCD System take place at steps 3 and 7. For the interaction in step 3, the European VCD System acts as a service and the National VCD System as its client. In step 7, the National VCD System acts as a service and the European VCD System as its client.

The service interface of the European VCD System in step 3 is named “European VCD System Interface”, the service the National VCD System is providing in step 7 is named “National VCD System Interface”.

- ## Sequence diagrams of interaction scenario 2 and 3: Direct Interaction between European VCD System and Economic Operator

This section explains the interaction scenario of the Economic Operator with the European VCD System drafted in chapters “Interaction Scenario 2: Interaction between European VCD System and National VCD System via Economic Operator” and “Interaction Scenario 3: Semi manual VCD Assembly by the Economic Operator (only European VCD System)” in more detail.

In both of these scenarios, the user directly interacts with the European VCD System as depicted in figure 4-6 below (This Figure can be obtained for better readability at: http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1):

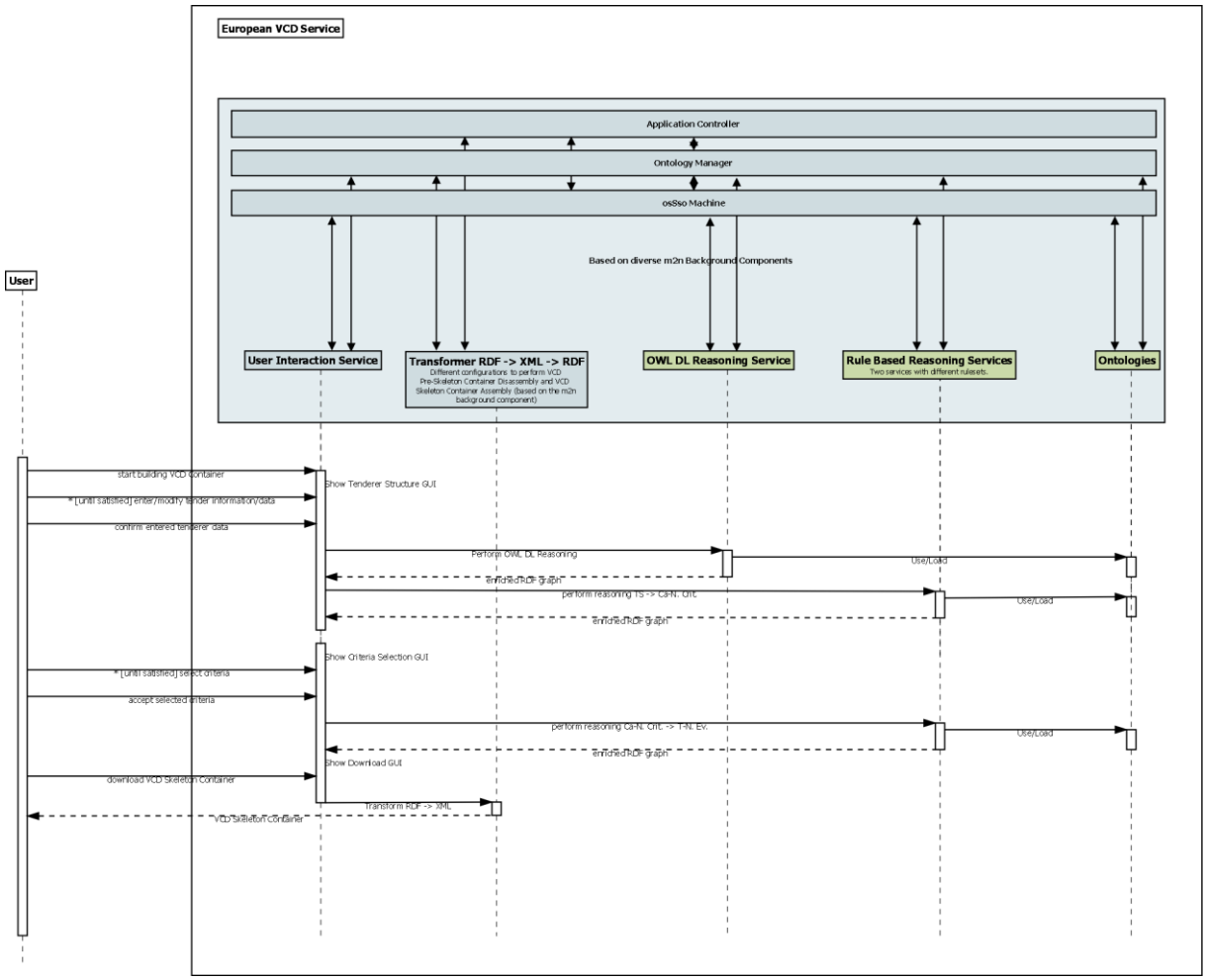

Figure 4-6: Direct User Interaction with the European VCD System (without National VCD System)

- The Economic Operator enters all necessary data required by the European VCD System (e.g. Tenderer structure and Data and Contracting Authority's nationality) directly at the European VCD System.
- The European VCD System calculates the suggested criteria and displays them to the user.
- The Economic Operator interacts with the European VCD System to select/confirm the criteria to be proven for the individual Tenderer Structure Elements.
- When the Economic Operator is satisfied with the criterion selection, the European VCD System calculates the possible evidence, creates a VCD Skeleton Container and allows the Economic Operator to download it.
- The Economic Operator downloads the VCD Skeleton Container and manually or with the help of other applications obtains evidence documents to finalize his VCD Container.

4.4 High level components of European VCD System

The following figure 4-7 shows the high level components of the European VCD System from a functional perspective.

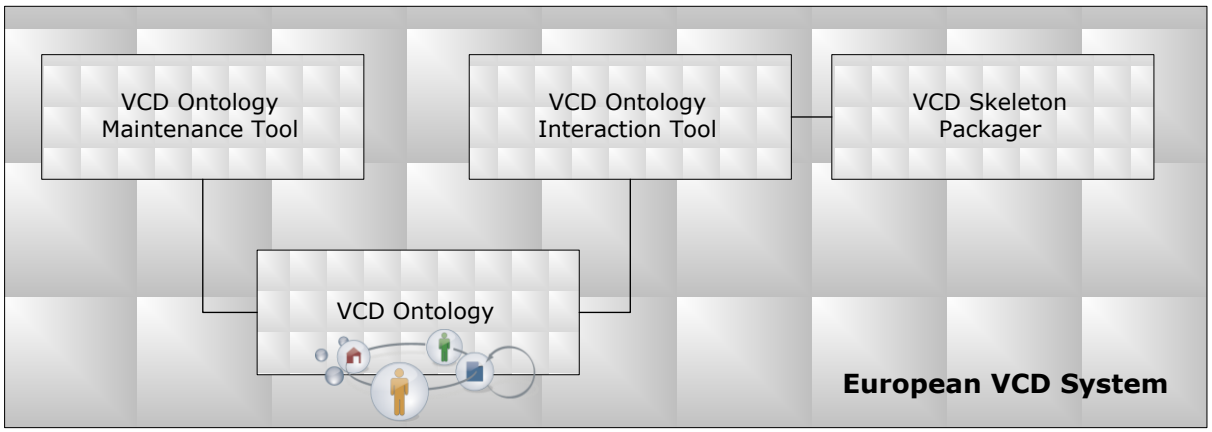

Figure 4-1: High level components of the European VCD System

VCD Ontology Interaction Tool and VCD Skeleton Packager
The system parts of the European VCD System, which have been already briefly described in chapter "Sequence diagrams of interaction scenario 1: Fully automated Interaction between European VCD System and National VCD System" are grouped together into a high level component "VCD Ontology Interaction Tool". This component is responsible for interacting with the National VCD Systems and the Economic Operator during the process of VCD Container creation and is in charge of calculating the proper Evidences according to the specific instance. For creating the VCD Skeleton Container the VCD Ontology Interaction Tool makes use of the VCD Skeleton Packager.

VCD Ontology Maintenance Tool
The VCD Ontology Maintenance Tool provides functionality to keep the Ontology up to date on a national and international level. It includes a user interface for Ontology maintenance as well as a system interface to integrate ontology parts, which have been changed by external systems (e.g. National VCD Systems).

VCD Ontology:
The VCD Ontology (represented in the standardized language OWL-DL) is the machine interpretable formalization of the rule sets of the Member States as well as the common European concepts. The Ontology is the ground base for the VCD Ontology Interaction Tool as well as the VCD Ontology

Maintenance Tool. The VCD Ontology as well as the Reasoning Services and the reasoning process are described in detail later in this document.

5 Technical specification of European VCD System

This chapter provides an overview over the European VCD System System, its components and the functional and non-functional specifications.

5.1 Purpose and Scope

The first stage of the VCD staged maturity model (cf. D 2.1) introduces a pre-VCD mapping tool. Economic operators are to be supported in identifying evidences serving as suitable proof of conformance to a set of qualification criteria defined by a contracting authority respectively the national public procurement act of a member state issuing a call for tender. The overall scenario of stage 1 is shown in

Figure 5-1 – the mapping queried either by the Economic Operator or by a National VCD System.

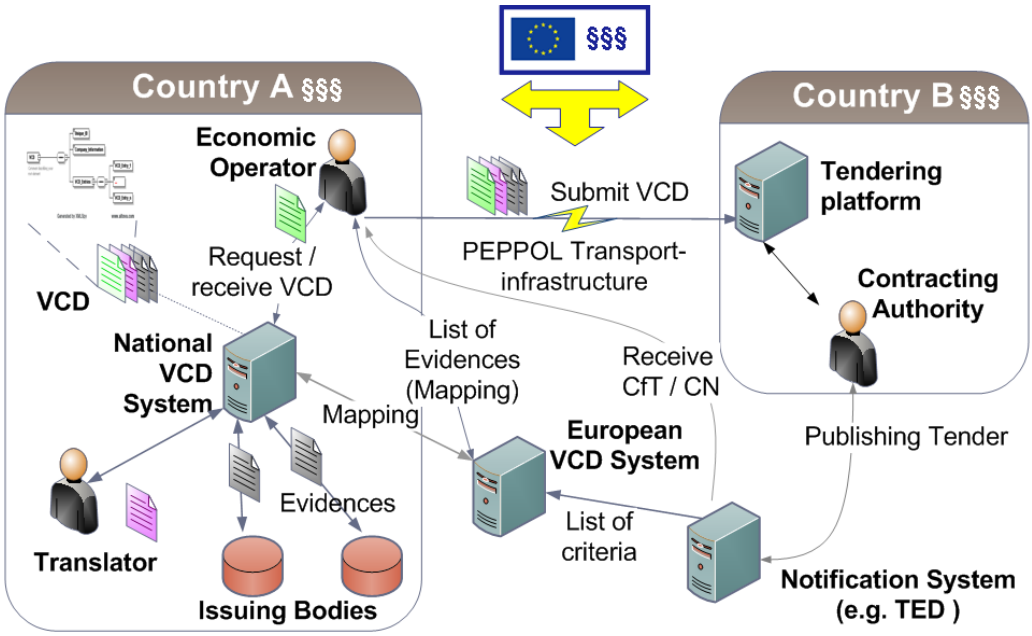

Figure 5-1: VCD overall concept with mapping through a European VCD System

5.2 The need for a European VCD System

Deliverable 2.1 of WP2 indicated in the implementation of the stage one the operation of a European VCD System (in D 2.1 called “pre-VCD mapping tool”). According to D2.1, the service could be hosted by a single European Service Provider (ESP), multiple European Service Providers. Another alternative consists in a service provision by the procuring agencies and organizations. Profound analyses have led to the introduction of the European Service Provider as central entity for hosting and operation of the European VCD System, due to a number of advantages of this alternative:

- The installation and initial operation of a centrally hosted tool is considered easier and less error-prone than that of a distributed solution.
- Updates and changes, which may be particularly necessary in the primary phase of operation, need only to be performed in a single location.

- Maintenance is much simpler, easier and more efficient if applied to one single “centralized” service.
- Appropriate support for the installation and operation of this European Service Provider will be given by the project management respectively the European Commission.
- From a governance perspective, a centralized European VCD System can be much easier steered and managed than if the individual national ontologies and service components are distributed across different remote servers. The efforts for service level agreements and individual policy agreements among those who host decentralized components would be rather high. Also, liability is much easier to maintain and ensure in the centralized solution.
- In economic terms, the total costs of one centralized European VCD System are by far less than if each national service provider would have to maintain a replication of the whole European VCD System.
- The managerial as well as operational efforts to keep each distributed component of a decentralized European VCD System up to date with any changes in any component or piece of the ontology (new procurement laws, changes in the procurement laws, revisions in the evidences; all at national scope) would be extremely complex and resource intensive, while at the same time mechanisms would need to be implemented to inform each decentralized component about the changes, and to trigger updates at the replicated ontologies[16] (governance processes).

5.3 Component Architecture of the European VCD System

A number of components were identified constituting the European VCD Ontology Interaction Tool. These components are a *VCD ontology*, a *VCD ontology manager*, a *VCD ontology interaction tool*, a *VCD skeleton packager* and optionally a *TED interface*. A high level overview of the interrelationships between these components is provided in Figure 5-2.

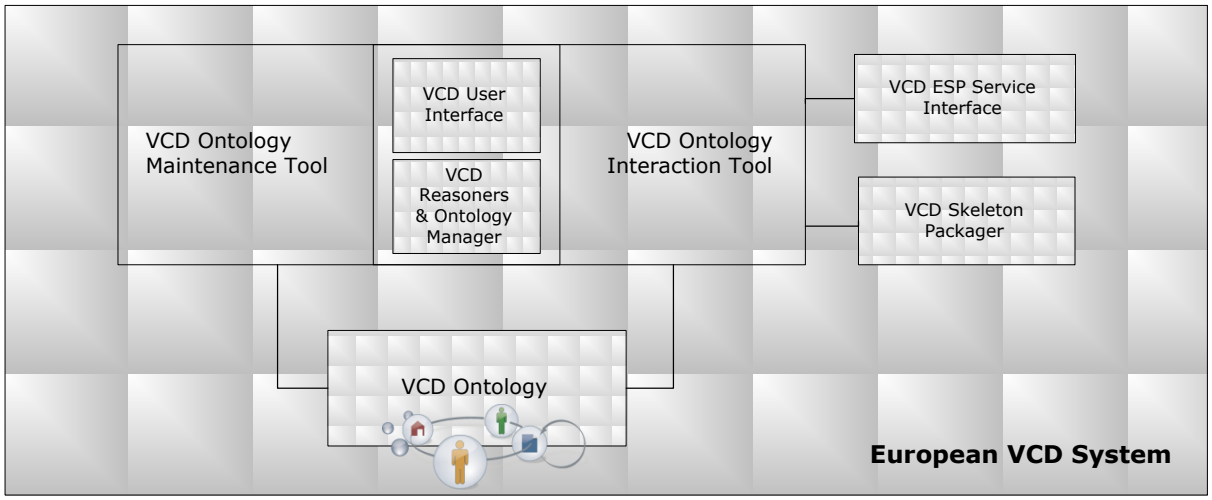

Figure 5-2: Components of European VCD System

VCD Ontology
The VCD Ontology is the machine interpretable formalization of the rule sets of the Member States as well as the European and common concepts. The Ontology is the ground base for the VCD Ontology Interaction Tool as well as the VCD Ontology Maintenance Tool.
The Ontology can be logically divided up into different levels: while the top level ontology contains general concepts like “Criteria” and “Evidences”, “Criteria Requirements” and “Evidence Restrictions”, the European ontology is defining the common European (legal) framework (e.g. European Criteria defined in articles 45-51 of the directive). On a third level, the relevant concepts of the different national legislations are included.

[16] In the decentralized case, each national VCD service provider would need to maintain a replication of the overall ontology

The Ontology is therefore representing national legislation and European legislation as well as the mappings of national criteria to national evidences via European criteria.

VCD Ontology Interaction Tool
The VCD Ontology Interaction Tool is providing the core functionality of the European VCD System. It is deriving the evidences suitable to proof conformance to a set of qualification criteria according to the underlying rule set represented in the VCD Ontology. For doing so, the Interaction Tool is accessing the VCD Reasoners and the Ontolgoy Manager. Furthermore this component is interacting with the National VCD Systems and the Economic Operator during the process of VCD Container creation utilizing the VCD ESP Interface Service.The component is detailed in the subsequent section **Feil! Fant ikke referansekilden.**.

VCD Ontology Maintenance Tool
The VCD Ontology Maintenance Tool provides functionality to keep the Ontology up to date on a national and international level. It includes a user interface for Ontology maintenance as well as a system interface to integrate ontology parts, which have been changed by external systems (e.g. National VCD Systems). Like the VCD Ontology Interaction Tool, this component is operating on top of the VCD Reasoners and the Ontology Manager. The VCD Ontology Maintenance Tool is specified in more details in 8.5

VCD Reasoners and Ontology Manager
The functionality for the management of the ontology and its contained data is provided by the component *VCD Ontology Manager*. The Reasoners are deriving new out of existing data according to their underlying rules etc. – see section 5.4 Both, the VCD Ontology Interaction Tool and the Ontology Maintenance Tool utilize this component bundle.

VCD User Interface
Similar to the VCD Reasoners and Ontology Manager, the VCD User Interface provides functionality for the VCD Ontology Interaction Tool as well as the Ontology Maintenance Tool. This subcomponent generates and provides the appropriate (intelligent) GUI for the given tasks, directly building upon the Ontology.

VCD Skeleton Packager
For creating the VCD Skeleton Container the VCD Ontology Interaction Tool makes use of the VCD Skeleton Packager. This component creates a VCD Skeleton Package according to the agreed upon XML Schema including for example the selected qualification criteria and suitable evidences to be delivered by an Economic Operator.

VCD ESP Service Interface
The VCD ESP Service Interface provides functionality for the National VCD System to interact with the European VCD System. The relevant data provided by the Economic Operator is passed from the National VCD System via a VCD Pre-Skeleton Container to the European VCD System. There the possible evidences are derived and packed and an enriched container (VCD Skeleton Container) is passed back to the National VCD System via this Service-Interface.

5.4 Specification of the Upper Level Concepts of the VCD Ontology –

The Ontology is the machine interpretable representation of the relevant national and European rule set defining which criteria a specific Economic Operator in a certain tenderer constellation most likely has to meet and which evidences are suitable to prove these criteria. The “mapping”, as pointed out in chapter 8 is not a one-to-one mapping between criteria of the different countries but has to take the criteria stated in the EU directive as an intermediary step into account in order to solve the problem of different granularities of criteria in the Member States on one hand and the specific (national) restrictions of which criteria and – in turn – Evidences are suitable for an Economic Operator in a specific role on the other hand. Also complexity drivers like for example the “quality level” or “substitution level” have to be taken into account when formulating the ontology – always with regard to the legislative framework of both involved nationalities – the one of the Contracting Authority and the one of the Economic Operator.
As stated above, the Ontology is subdivided into different layers: topmost, the upper level concepts are defined. Acting as mapping references, the regulations out of the EU directive are modelled as instances of the ontology (“European Ontology”), as well as the relevant regulations out of each Member State on the

third layer (“National Ontologies”) linked to the European Ontology. This chapter is focussing on the schema-parts, that is on the upper level concepts of the whole Ontology.

The upper level concepts of the Ontology are split into five logical parts as shown in “Figure 5-3: Ontology parts”.
Three of those parts (Criterion Schema, Tenderer Schema, Tenderer Criterion Schema) contain the ontology concepts for specifying criteria, evidences, tenderer structure and the relationships between them.
The fourth part (Collector Schema) contains the concepts for specifying input and output for the reasoning steps.
The last part (common, not included in the illustration) contains some common classes and properties used by the other four.
These five parts are provided as separate RDF/XML files in conjunction with this document. There are additional files included as examples.

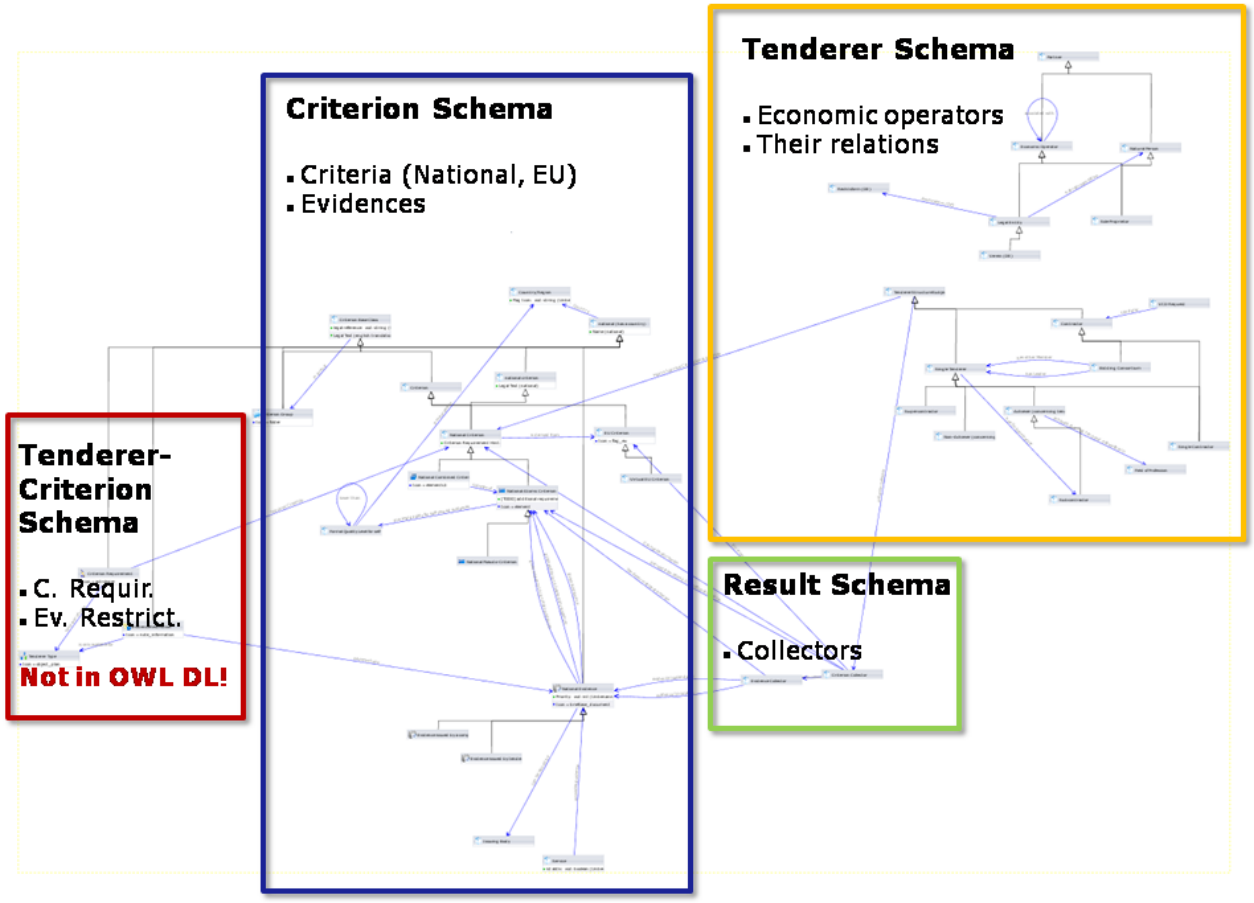

Figure 5-3: Ontology parts

Common

This schema contains some classes and properties that will be used throughout the rest of the ontology.

- Abstract vs. Instantiable

The classes owlx:AbstractClass and owlx:InstantiableClass, both being subclasses of owl:Class, are used to distinguish between classes for which instances are expected to exist and classes for which any instances are not expected (except for inferred type statements).

- Classname and Propertyname

The properties owlx:className and owlx:propertyName are both subproperties of rdfs:label and are used to give human-readable names to classes and properties in the ontology.

- Named

The class peppol:Named is intended to be subclassed by classes whose instances have a simple name. This reduces the amount of re-occuring „Name“-properties and corresponding subproperty relationships to rdfs:label.

- Annotating Open Tasks

The properties peppol:TODO, peppol:assignee, peppol:TODOAnswer and peppol:finished are provided to allow simple and easy annotations of open tasks, the responsible party, their remarks regarding the task and whether the task is finished respectively.

- National Objects

The class peppol:Country is provided to track countries/regions/“ontology domains“. The abstract classes peppol:NationalThing and peppol:NationalCriterionThing allow tying other entities to a country. NationalThings have a special property for their name in the national language. NationalCriterionThings additionally have a property for the legal text (of the national criterion) in the national language.

Criterion Schema

Figure 5-4: The Criterion Schema depicts the part of the ontology relevant for the criteria schema modelling.

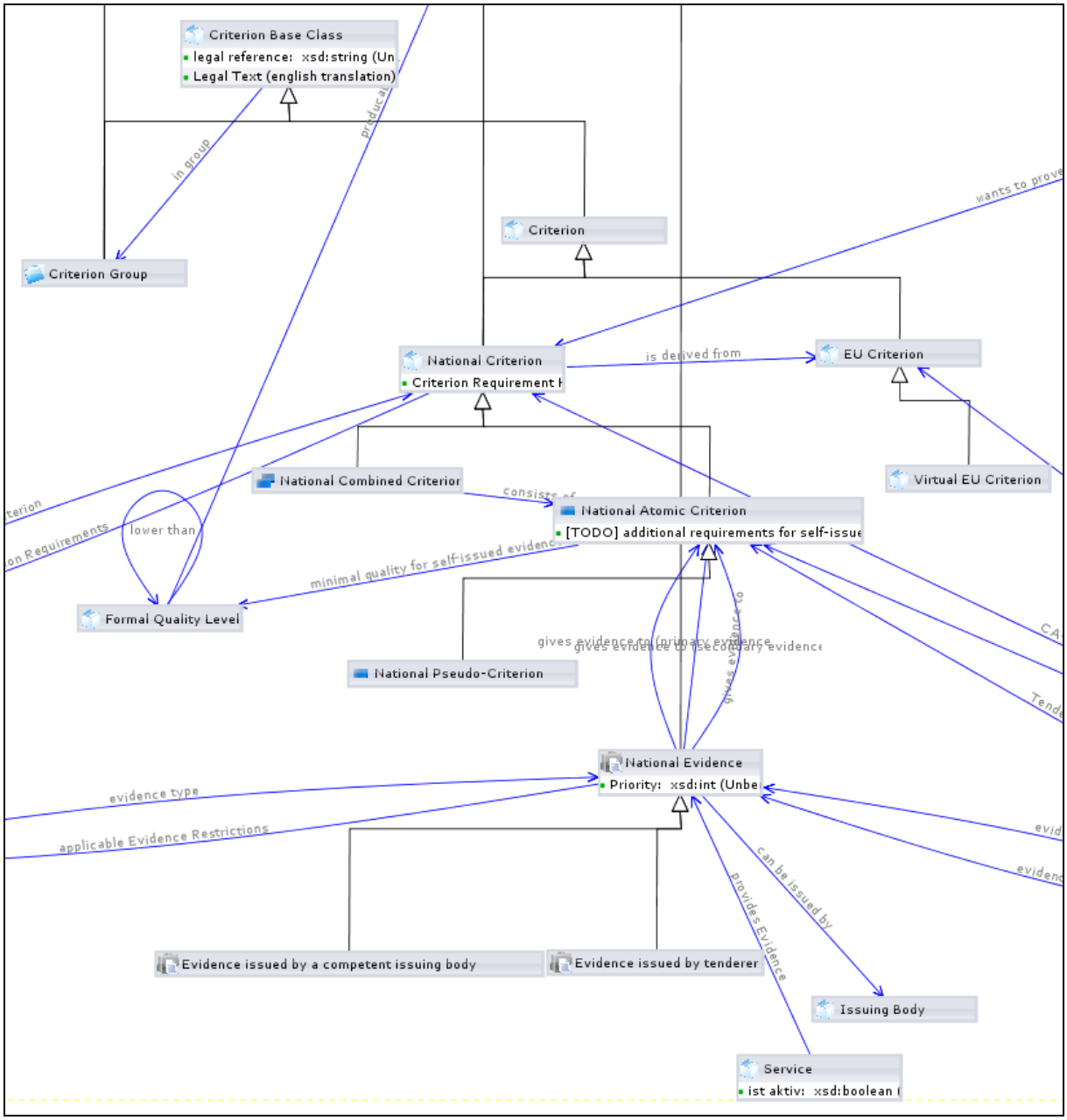

Figure 5-4: The Criterion Schema

This file defines the schema for criteria and evidences.
Criteria can be grouped hierarchically – using the class CriterionGroup – to model the structure of a legal document corpus. References into such corpora can be given at any level of the structure.
There are five instantiable classes for criteria in this schema: EUCriterion, NationalAtomicCriterion and NationalCombinedCriterion as well as VirtualEUCriterion and NationalPseudoCriterion.

Virtual EU Criteria are Criteria that are not reflected in the EU directive and are only included to allow mapping of national criteria that could not be mapped otherwise.
National Pseudo-Criteria are used where there's no correspondence in the national law, but there is still an EU Criterion that might need to be proven.
Combined Criteria are only possible on a national level. In order to prove a combined criterion, a tenderer always has to prove all of its subcriteria. So in combination with multiple evidences suitable for proving a single criterion, three cases can be modelled:

- Subcriteria of Combined Criteria are always AND (all subcriteria have to be proven)
- Multiple Evidences on one Criterion are always OR (exactly one of them has to be delivered in order to prove the criterion).

It is possible to combine those cases: Given a Combined Criterion CC, consisting of Atomic Criteria AC1 and AC2, where AC1 can be proven by Evidences E11 or E12, and AC2 by Evidences E21 or E22. Suitable combinations to prove CC would therefore be (E11, E21), (E11, E22), (E12, E21) and (E12, E22).
Evidence can be distinguished into two types:

- Evidence issued by a competent issuing body
- Evidence issued by the tenderer

Evidences can be assigned a priority. If several evidences would work in a given situation, the highest-priority one should be used, if possible. This works well in conjunction with Evidence Restrictions (see section Error: Reference source not found), for example if there is an Evidence A that can only be provided by Economic Operators satisfying some criterion X, and an Evidence B that can be provided by everyone.
We also distinguish between primary and secondary evidence, where primary evidence is „backed by law“ whereas scondary evidence is NOT backed by law but often still accepted by Contracting Authorities. The two properties „gives evidence to (primary evidence)“ and „gives evidence to (secondary evidence)“ are subproperties of the more general „gives evidence to“. To reduce visual complexity, this has been omittet from the diagram.
Tenderer-issued evidence can be issued on several different quality levels:

- Declaration on Oath
- Solemn Statement
- Self-Declaration

A solemn statement can also be used in place of a self-declaration, and a declaration on oath could be used in place of any of the other two.
If a tenderer can't produce third-party-issued evidence for a required criterion – for example because there is no such evidence in his country – he will instead substitute self-issued evidence.
(CA) countries can define for each criterion the „Substitution Level“ required for tenderer-issued evidence to be acceptable as proof for that category. If a tenderer can't provide third-party-issued evidence for the category, he will instead provide self-issued evidence of that level (or higher, e.g. if the CA country requires a solemn statement, the tenderer could also provide a declaration on oath).
We also provide a property „Criterion Requirement Hint“, where hints for the User as to when certain criteria will typically be required can be provided for cases when the business logic cannot be easily modelled with CriterionRequirements.

Tenderer Schema

Figure 5-5: The Tenderer Schema depicts the part of the ontology relevant for the criteria schema modelling.

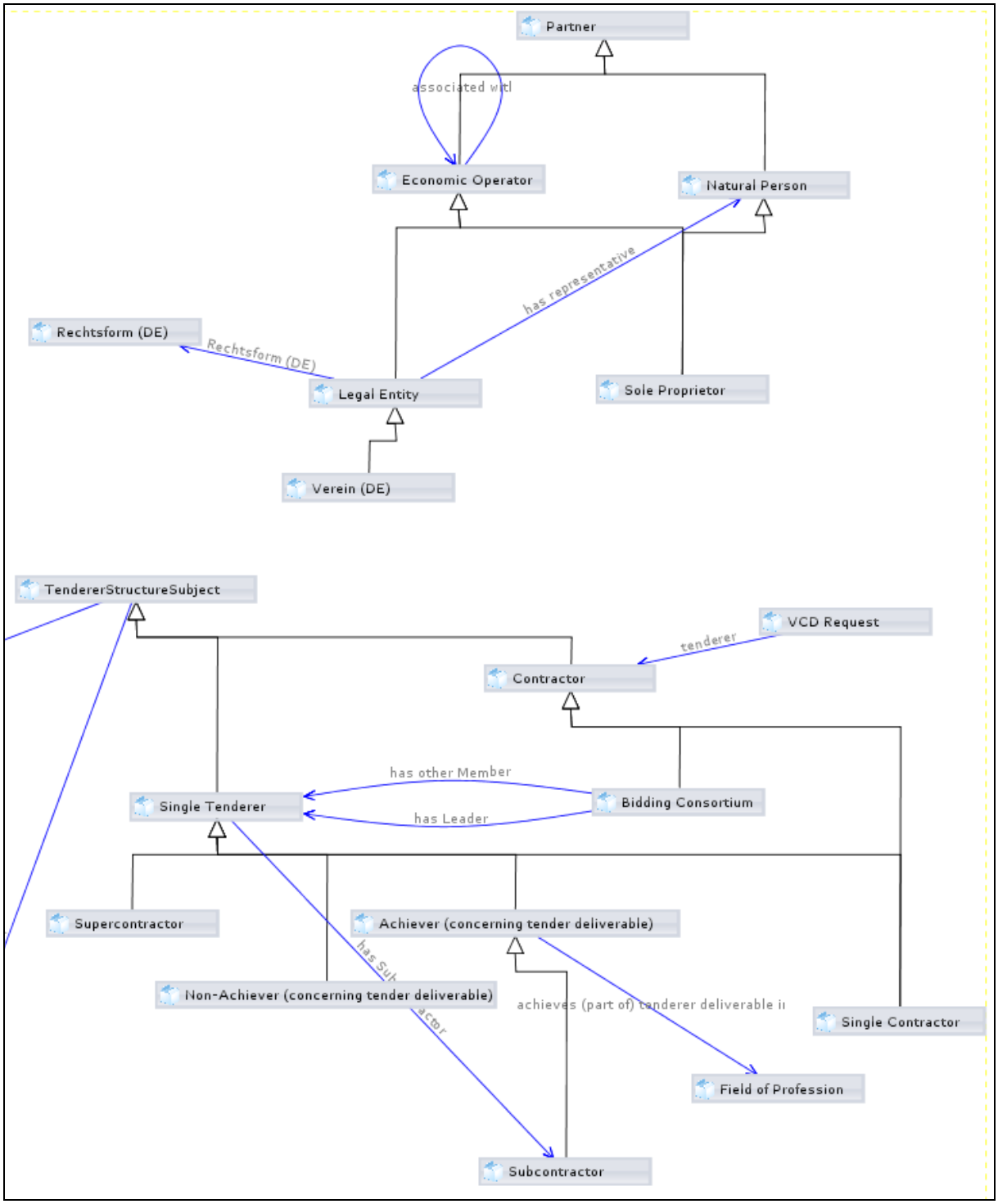

Figure 5-5: The Tenderer Schema

The Tenderer Schema specifies how a tenderer structure is represented in the ontology.

Different aspects of a tenderer are modelled in distinct classes here. As denoted, every instance of (a subclass of) TendererStructureSubject has to have a second asserted type which must be a subclass of Partner.
The Tenderer Schema models the two orthogonal dimensions of companies in the tendering process. One the on hand, they have characteristics that describe them as a company (e.g. their representatives), on the other hand they have characteristics that describe their role in the whole tender (eg. they can be leader of a consortium, or they could be a subcontractor to some other company).
The fact that someone wants to create a VCD is modelled by the class VCD Request.
The structure of a tenderer – Consortia, Subcontractorships, Fields-of-Profession relevant for the tender – are modelled by the class TendererStructureSubject and its subclasses. This part of the schema describes how different companies (plan to) cooperate for the tender at hand.
The structure of companies is modelled by the class Partner and its subclasses. These classes are concerned with different types of companies (mainly SoleProprietor vs. LegalEntity), associations between companies and the natural persons representing those companies.
All the classes in this schema are instances of the class TendererType specified in the tenderer-criterion-schema so they can act as Instances for the tenderer-criterion-schema.
It is highly probable that this schema will be extended individually for specific Evidence Restrictions. The system should provide OWL reasoning to allow the expressivity that is probably required for this. Based on our experience so far, we assume that Criteria Requirements are more general and can be expressed in terms of the common European Tenderer Schema.
Components dealing with instances of the Tenderer Schema (especially user interaction components) will have to deal with these national extensions reasonably.

TendererCriterion Schema

Figure 5-6: The Tenderer Criterion Schema depicts the part of the ontology relevant for the criteria schema modelling.

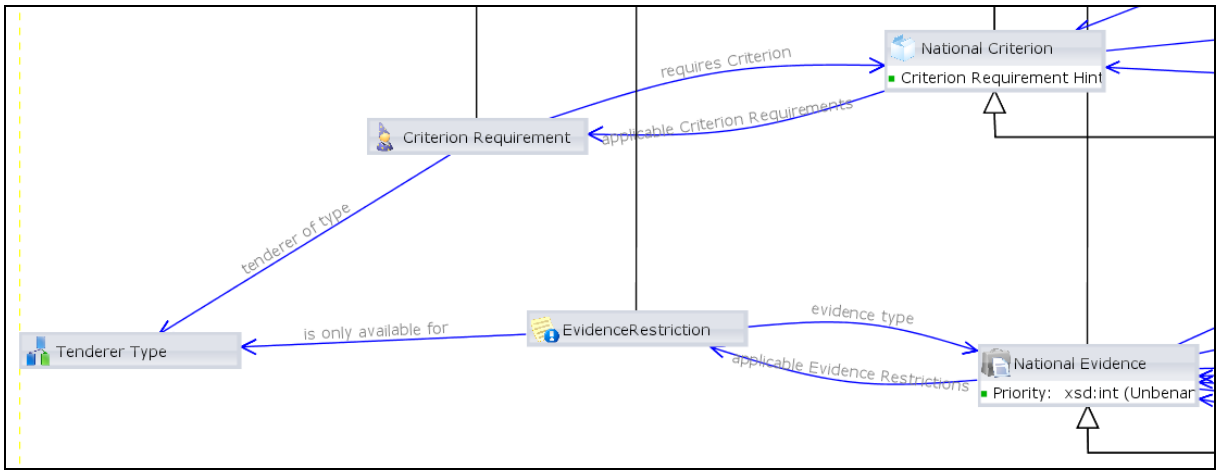

Figure 5-6: The Tenderer Criterion Schema

This is the schema for two distinct kinds of rules.

This schema includes rules that govern which criteria have to be proven by whom. Those are called the criterion requirements and are represented by the class CriterionRequirement. These are only required if a suggestion of probable criteria based on tenderer data has to be provided; they are not needed if the tenderer provides the criteria he wants to prove by himself.
The second kind of rule specified by this schema governs limitations of availability of evidences. For example, criminal records may only be available for natural persons, but not for legal entities. These rules are called evidence restrictions and are represented by the class EvidenceRestriction.

The class TendererType used in this schema is the class of which all the classes in the tenderer-schema are instances. This fact (classes as instances of classes other than owl:Class) breaks a OWL DL restriction discussed in http://www.w3.org/TR/2004/REC-owl-guide-20040210/#DesignForUse. Hence, theontology as described ends up being OWL Full compliant.

The classes NationalCriterion and NationalEvidence referenced in this schema are specified by the criterion-schema.
Extending the tenderer-schema by providing for example more specific subclasses is probably neccessary to specify exact tenderer types for these rules.

Examples

A set of examples for the different schemas described so far is provided in this section. These examples are intended to show how the schema would be applied to instances and how those instances would be related to each other in terms of the schema.

- criteria-and-evidences-example.owl

This example shows how the classes defined in the criterion-schema are used to model both the EU directive and national public procurement acts (NPPAs) down to the level of EU Criteria and National Atomic Criteria, as well as Evidences.
The example also includes criteria requirements and a simple limitation of availability for evidence types so it also demonstrates the usage of the tenderer-criterion-schema.

- Reasoning Example

Attachment C gives a simple example that shows how the entities are used to infer criteria and evidences for a given tenderer structure.

Reasoning on Instances

In this chapter we present rules that formalize the intended reasoning for different use cases.
In any case, OWL reasoning is required to allow specification of specialized tenderer schema subclasses for specific Criteria Requirements and Evidence Restrictions.
While it is technically possible to provide all reasoning we want in pure OWL by providing suitable meta schemas, this would lead even further away from OWL DL being usable and would add further complexity. Instead, this chapter will specify simple rules that govern reasoning steps for deriving possible Evidences from Criteria according to the nationality of the Contracting Authority.
The output of one reasoning step can acts as input for the next one, with possible further modification of the intermediary results by the user. An example for such an interaction would be a selection (and possible addition) of criteria intended to be proven from a set of suggestions.
This can be viewed as the invocation of different reasoning services that extend the supplied input data with inferred triples. The arrangement of calls to those services and of steps of user interaction into a meaningful sequence is then called the „Reasoning Workflow“ and detailed in attachment C.

The use cases and more details specifications are in attachment C.

6 VCD Data Model and Schema Specification

6.1 Target and application area of the VCD

The Virtual Company Dossier (VCD) is an electronic document container which enables suppliers to hold attestations and candidate statements, collected from existing registries and sources in their home country and to submit them electronically to a contracting authority. The VCD does not only carry information in regard to an economic operator but also information respective to the call for tender and the contracting authority. Furthermore the VCD allows holding information not only for single economic operators but also for more complex setups with sub-contracting economic operators, consortia, etc. Economic operators can use the VCD data model to respond to public tenders and present their qualifications but not the bid itself.

The VCD **firstly provides a means to create a structure of the grouping of economic operators** each of which has its own VCD. The VCD firstly provides a means to create a structure of the grouping of economic operators each of which has its own VCD.
The VCD data model describes a conceptual view of the structure and distinguishes between several VCDs and one VCD Package. Each VCD thereby is economic operator specific while the VCD package bundles several VCDs together for a specific call for tender and contracting authority. That said, the VCD Package information may be seen as the cover letter for the VCDs.
This structure is shown in Figure **6**-1.

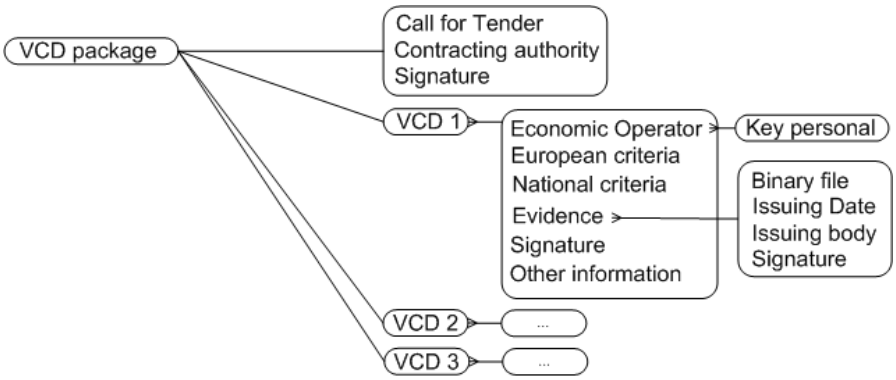

Figure 6-1: Structure of VCD Package Container

Each VCD **secondly holds evidences and other documents** related to one economic operator and its staff (information about relevant key personal of the economic operator(s) that may be related to evidence). The VCD includes several types of documents which can be grouped into Evidences. Evidences can either be based on attestations (where the issuer is not the candidate) and/or statements by a candidate (where the issuer is the candidate). Furthermore evidences itself can be interpreted as a set of multiple documents (record) which may be required in cross border procedures such as: the document itself, a translation of that document, an apostille (if needed) or legalization for that document and inter-related context specific data in computable format (e.g XML). The final outcome will be compiled into a physical VCD Container for storage or delivery. The VCD Container includes evidences that ensure legal interoperability and mutual recognition on the basis of European and national legislation. Therefore the national procurement domains are linked to a single European common domain within the PEPPOL VCD system. The European selection and non-exclusion criteria defined within Articles 45-51 of the European Directive 2004/18/EC thereby are to be considered as reference criteria, while the national criteria which are the basis for individual public tenders in respective countries are considered the local criteria. The figure below shows the semantic interoperability model that is reflected in the VCD data model as well as the European VCD system relating the European directive to the national laws and the national contexts.

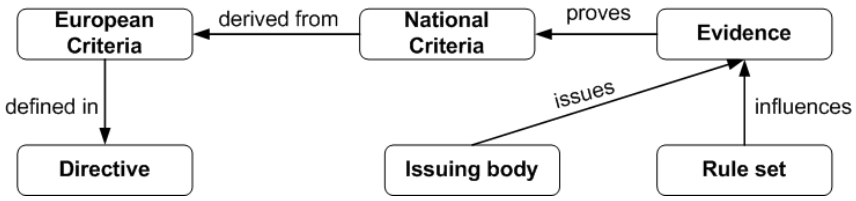

Figure 6-2: Semantic interoperability model of the European VCD service

In this context the VCD does not only include the evidence but also related information: the issuing body of an evidence document which may be verified through electronic signature as well as the issuing date and further related information.

VCDs and VCD package **thirdly include other relevant information** which are needed in the context of providing qualifications in response to call for tender e.g.

- information about the economic operator or consortium responding to the call for tender
- information about relevant key personal of the economic operator(s) that may be related to evidence such as CEO or technical directors
- information about the contracting authority which will receive the VCD
- information identifying the respective call for tender

6.2 Semantic Specification

The grounding of the technical specification of the VCD is laid by the data model, which is independent from implementation of the VCD in XML schema or other means of implementation. It describes a conceptual view of the structure and contents of the VCD.

The basic idea is to allow for the reuse of the economic operator specific information in more than one instance of VCD artefacts. To support that, the data model distinguishes between the VCD itself, the VCD Package which carries additional, tender and contracting authority specific information and also CSD – Context Specific Data which provide structured document content information.
Both VCD Package and VCD hold an unique identifier, information on the country the VCD or VCD Package was originally created for (the country where the contracting authority is seated) and the possibility for a signature.

From the Content Base Class (from data model diagram) the maturity level (which refers to the VCD maturity level as specified in D2.1), the version of the VCD rule set (a reference of the ontology the objects base upon), and the compilation date and time are inherited. Furthermore both content classes include the issuing service (the organisation which produced VCD or VCD Package), and the related requesting organisation (the economic operator who ordered the VCD or VCD Package).

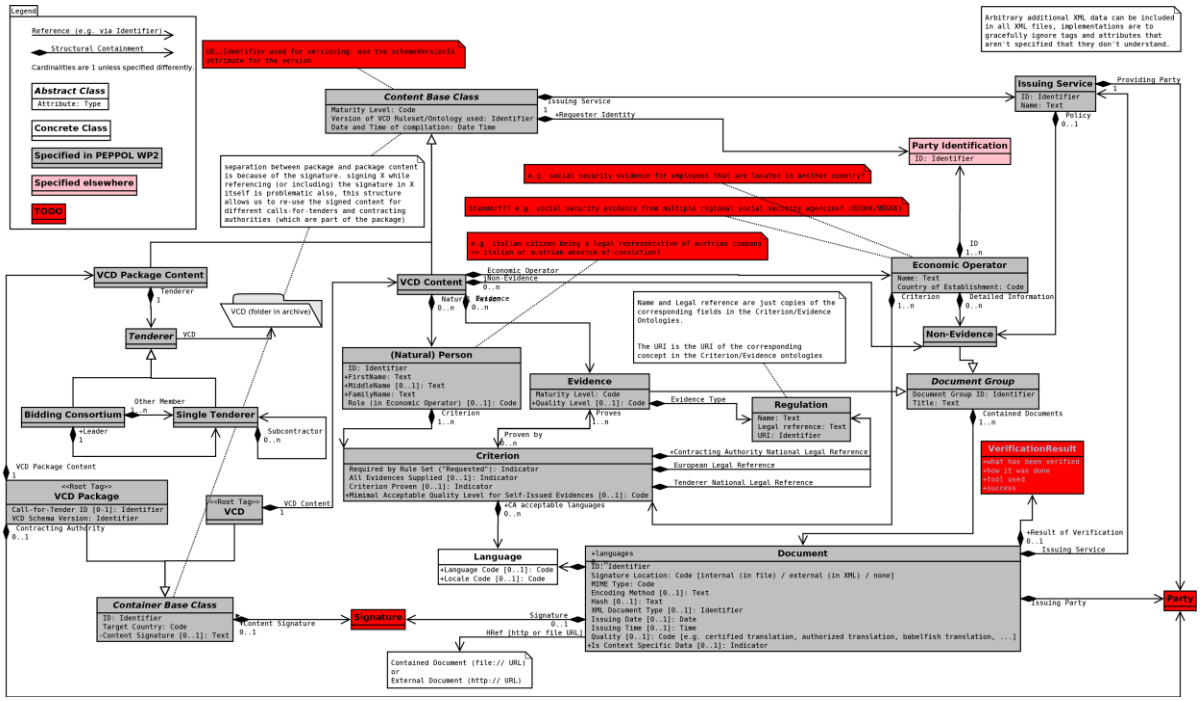

Figure 6-3: VCD and VCD Package data model in UML

VCD Package

VCD Package holds common information related to a certain call for tender which are valid for all economic operators involved in one application for that call. This is the version of the VCD schema (VCD and VCD Package data model share a common version numbering), an identifier of the respective call for tender and the structure of the tenderer or the bidding consortium. The latter is also available/included in the VCD Package, if only a single economic operator applies for the tender. The structure as depicted in the data model allows for complex bidding consortia setups including subcontracting.

VCD

VCD is economic operator specific but may be re-used in further VCD Packages. Thus it additionally includes information on the economic operator and information on relevant responsible personnel at the economic operator's organisation. Besides this direct information on the economic operator, the VCD carries references on different kinds of documents. For the VCD, evidences and other documents (non-evidences) are differentiated. Each evidence and non-evidence is not regarded as a single document but as a group of documents conveying the same meaning or being closely related. Such a group of documents (class "Document Group") is an evidence, it consists of core documents and alternative representations. In case of translations they are depicted by Language code and information related to different issuers. A typical example would be translations or Context Specific Data: a German-language evidence document, its Italian translation, a certificate on the authenticity of that translation and its machine-interpretable Context Specific Data would all be contained in the same Document Group.
Documents (class "Document") are composed of information like issuing date and time, the defined quality level of the document or a flag identifying the document as the special type of context specific data. Context Specific Data are machine interpretable versions of the content of those documents. Additionally the physical document files are referenced by a URL pointing to a location relative to the VCD or an absolute URL pointing to some location outside the VCD Container.

Evidences prove one or more tendering exclusion/qualification criteria which are related to the economic operator or one or more related responsible person (in a m:n relationship, so Evidence A could prove Criterion X, Evidence B Criterion Y and A and B together Criterion Z, all in a single VCD).

In contrast to the representation of criteria in the VCD ontology, criteria in the data model are not put into relation in some kind of hierarchy. Instead each criterion in the data model reference respective CA-national, EU and EO-national criteria in the ontology and the respective ontology version as well as to legal texts for those criteria. This decision was made to keep the model (and the resulting XML structure) simpler. The distinct concepts are still referenced through the references to Regulations, which in turn reference the exact concepts in the ontologies by URI. This structure implicitly conveys the chain of reasoning.

6.3 VCD Profile

From the semantic specification of the VCD information a technical implementation was carried out by utilizing XML Schema Language as basis. The resulting schema has been created by defining new structures and reusing UBL existing constructs. The outcome will become the basis for the VCD Profile as candidate data model applying for standardization by the CEN/BII workshop.. The schema documents serve as blueprint for production and basic validation means for instances of VCD Package and VCD in XML.
The presence of the schema enables a large set of operations that the system designers will possibly activate to improve documents handling and quality enhancement operations.

VCD Container Format

For the time being, only a basic specification for the VCD container which will finally be the file sent from tender applicant to contracting authority, can be provided.
The VCD Container is structured as shown below. On the root level, there is an instance of VCD Package and one folder per economic operator. Each VCD folder is structured in a similar way: a single instance of a VCD based on the VCD XML Schema, containing the VCD metadata, and several other files, the document binaries of the different documents (evidences and non-evidences) referenced in the VCD.
The files in the above described directory structure are packed into one file format for distribution. This may be a tar file, zip archive or similar means.

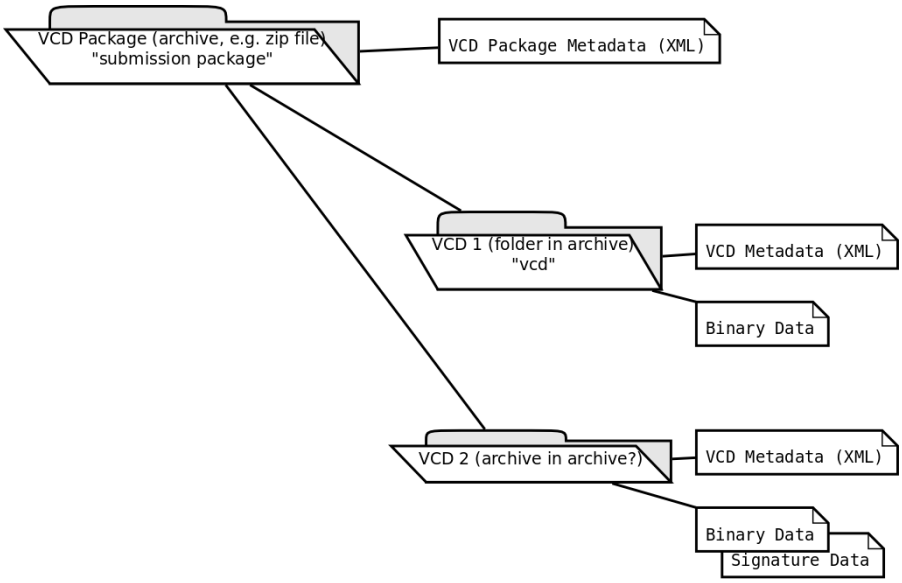

Figure 6-4: VCD Container Structure

Code lists

The VCD systems need shared code lists in order to exchange information in machine interpretable formats in the VCD XML instances; some of them need to be used by different implementations of VCD systems,

and others will be subject to collective interpretation with other systems as well. Further, the different systems processing VCD packages and their contents will need lists specifying evidential documents and versions from issuing bodies in order to be enabled to process them correctly. This will be a code list that needs to be kept available and up-to-date by a party responsible for maintenance.

The authorization of natural persons is important for business work processes; the UBL system opens for the definition and implementation of VCD PersonRoleCode, a parameter that can be used to assign a person's role. Such a code list is needed to make the components specified work. However, it can only be taken in use when the appropriate code list has been developed and taken under maintenance by a responsible operator.

The different internal and external code lists will have various stakeholders, but all PEPPOL specific ones should be maintained in similar ways, and it must be decided how they should be kept up-to-date and available from a common source.

Identifiers

The VCD systems need identifiers for several objects, some are needed internally only, and others need to be shared for addressing and retrieval.
Endpoint identifiers will be used by VCD systems and infrastructure applications for VCD Service Providers, for contracting authorities, economic operators and evidence issuing bodies; they will also be used by other PEPPOL systems including those of the infrastructure. WP 8 has developed the infrastructure and concluded that identifiers from different issuers will be used according to ISO 15459; This solution is documented in PEPPOL Identifier Scheme (Deliverable 8.2) .
However, it implies that identifiers from different issuers, like national and regional business registries, GLN and others can be used. The different issuers need to be assigned unique codes for use by the infrastructure systems; such codes have not been standardized and listed in publicly maintained code lists. The endpoint identifier scheme code list therefore needs to be maintained centrally and shared between users of PEPPOL applications.
Identifiers for evidential document types represent an example of identifiers used within PEPPOL that are not endpoint identifiers. In order to apply a modern and recognized principle ISO 15459 should be used for all PEPPOL specific identifier schemes; such a practise would also ease the maintenance, but it creates yet undefined work-load to PEPPOL.
Identifiers are normally connected to values in code lists which need to be maintained according to the requirements of their users. Endpoint identifiers will be shared between different PEPPOL systems, but some shared ones might be subject to varying maintenance requirements from the various system owners. It is therefore important to secure up-dating and republishing in a way that satisfy all users of each identifier.

UBL terminology uses the term Party for entities and persons, and the following have been found applicable in systems for VCD:

- **Requester** – Party requesting the VCD or the VCD Package
- **Providing Party** – Party providing a service
- **Issuing Party** – Party issuing a document
- **Single Tenderer** – Party in a structure of Economic Operators on the VCD Package. Points to the VCD in the VCD Container
- **Relevant VCD Person** – Natural person from an Economic Operator organization that has some criterion to fulfil
- **Economic Operator** – Economic Operator information
- **Contracting Authority** –Buyer for public procurement

Some party identifiers will need to be shared with or mapped to those of other systems, like those of the infrastructure of WP 8. It has to be decided which of these identifiers should be shared and which ones should be established and maintained by its own ESP.
The PEPPOL Policy and Recommendations for the use of Identifiers provide the following list of Issuing Agency Identifier Values:

Scheme ID	Scheme AgencyID	Agency name / description	Comments
DUNS	16	Dun & Bradstreet	Maintenance to be evaluated.
GLN	9	GS1	Well maintained and regulated in some countries.
IBAN		International Bank Account Number	No general look-up services.
ISO 6523	5	BSI British Standards	Registration authority BSI is not supporting any more.
DK:CPR		Ministry of the Interior and Health	Danish Person Registry.
DK:CVR		The Danish Commerce and Companies Agency	Danish Business Register.
DK:P		The Danish Commerce and Companies Agency	
DK:SE	105	Danish Ministry of Taxation, Central Customs and Tax Administration	
DK:VANS		Danish VANS providers	
IT:VAT		Italian VAT number	
NO:ORGNR	82	Norwegian Organization Number, Enhetsregisteret ved Brønnøysundregisterne	Norwegian Business Register.
NO:VAT	82	Norwegian VAT number, Enhetsregisteret ved Brønnøysundregisterne	Norwegian Business Register.
HU:VAT		Hungarian TAX Identifier	
ZZZ		Included for bilaterally agreed use	Could be relevant for communication under a contractual relationship.

Table 6-1: Issuing Agency Identifier Values

(SchemeAgencyID is the code value allocated by PEPPOL WP 8 to identify the scheme in the infrastructure systems)
The list needs to become subject to evaluation, extension and maintenance by the owners of VCD and other PEPPOL systems that will need to interface and use it in order to obtain endpoint identifiers. It could be emphasised that WP 8 is enforcing the use of ISO 15459, whereas ISO 6523 is proposed in the list above.
The term Party can be used for the **Relevant VCD Person**, a natural person that has a certain role specified by a VCD PersonRoleCode. In procurement the role will be the more important attribute than the person's identity parameters. In order to be able to process tasks that require known authorization, however, code list with code values and their meanings for the VCD Person Roles needs to be addressed.

6.3.1 VCD Package XML Schema

VCD Package XML Schema is the XML Schema implementation of the data models parts for VCD Package. It heavily utilizes UBL for the precise and standard conform definition of the various elements. Only those VCD Concepts which are not reflected appropriately in UBL are specified separately.
The full documentation of the VCD Package XML Schema is available on the PEPPOL.eu Website under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1.

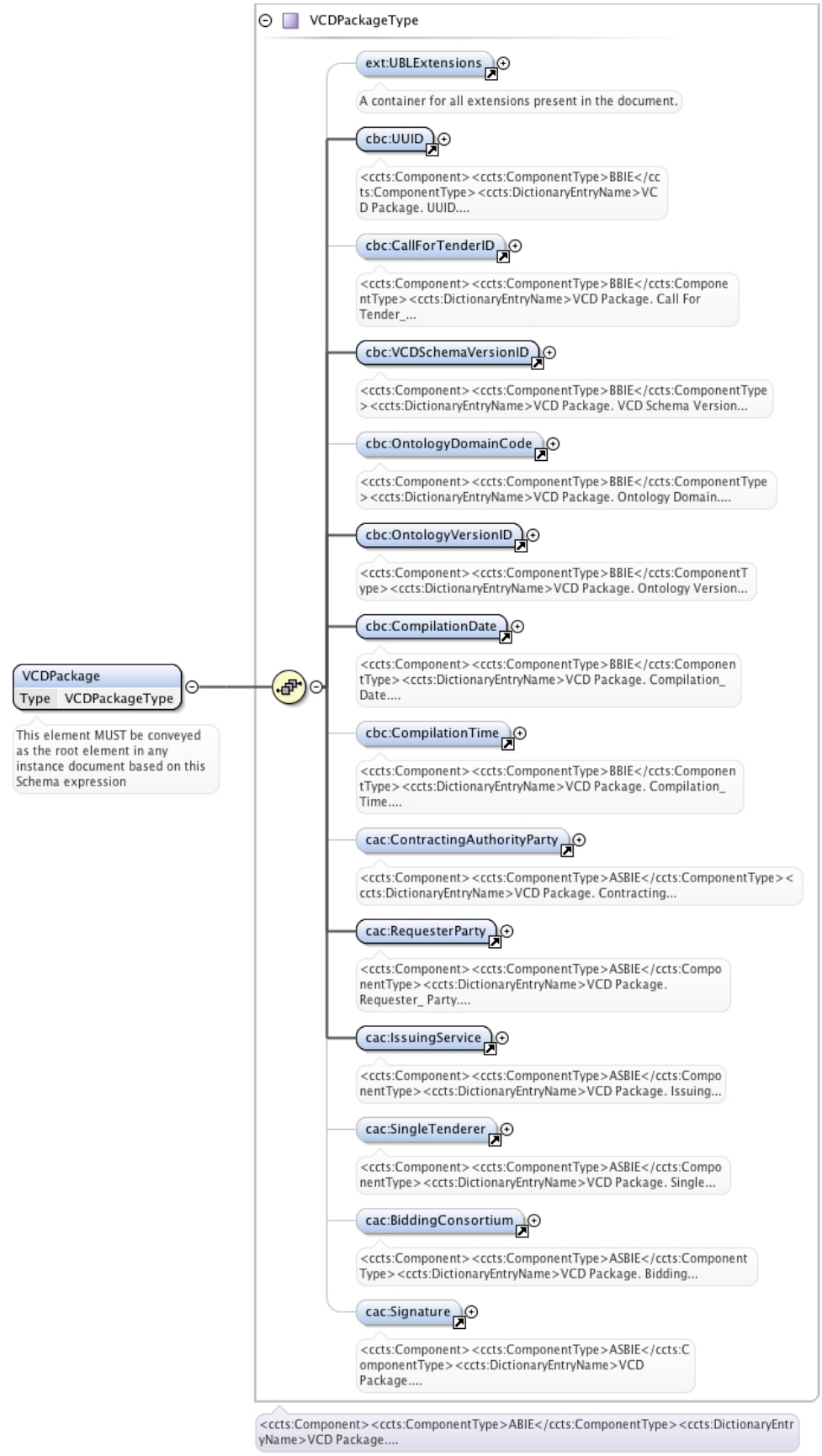

Figure 6-5: VCD Package XML Schema

VCD XML Schema

VCD XML Schema is the XML Schema implementation of the data models parts for VCD Package. It heavily utilizes UBL for the precise and standard conform definition of the various elements. Only those VCD Concepts which are not reflected appropriately in UBL are specified separately.
The full documentation of the VCD XML Schema is available on the PEPPOL.eu Website under
http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1

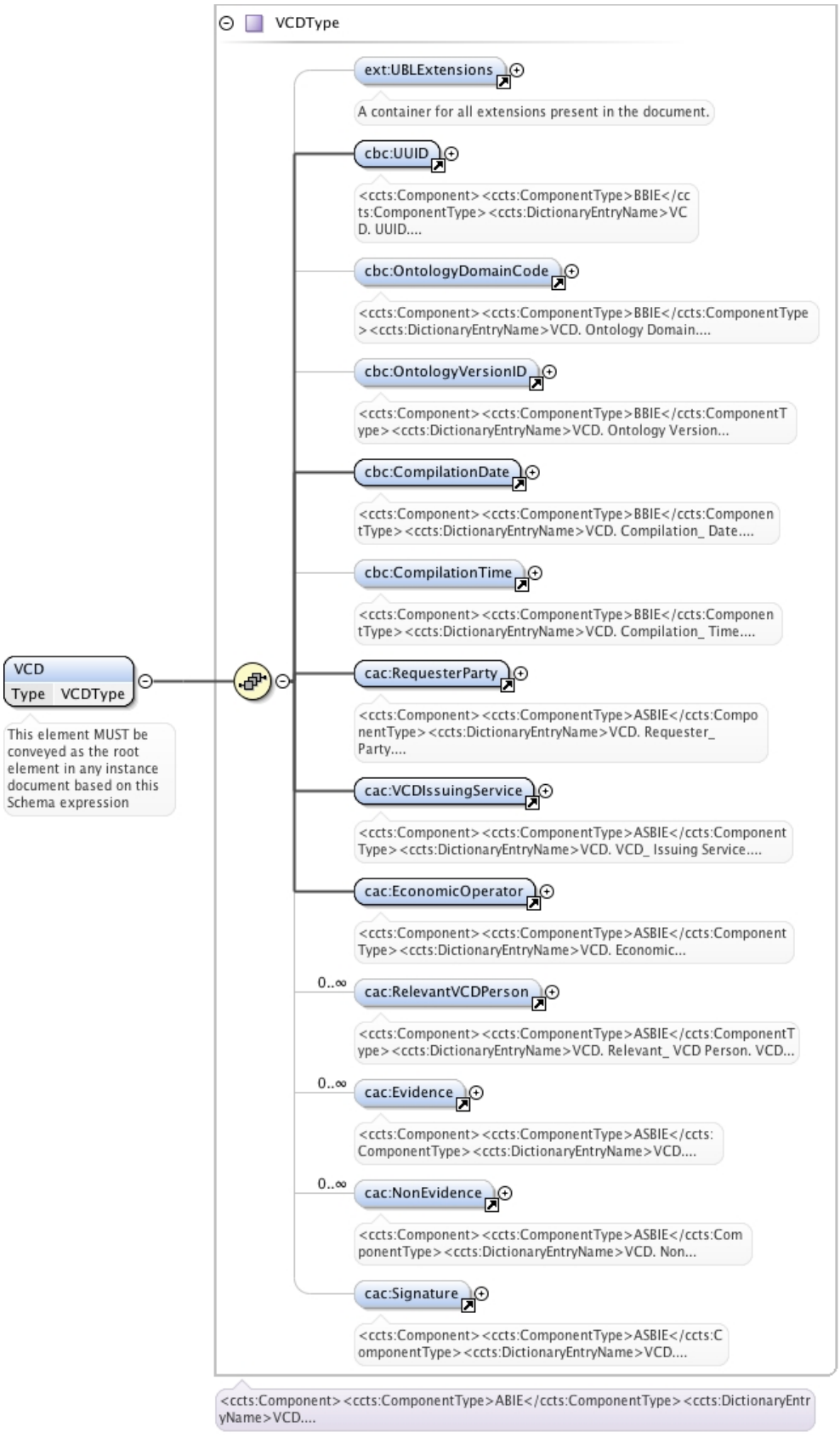

Figure 6-6: VCD XML Schema

Context Specific Data

The scope of the work on the CSD topic is made up of the following objectives

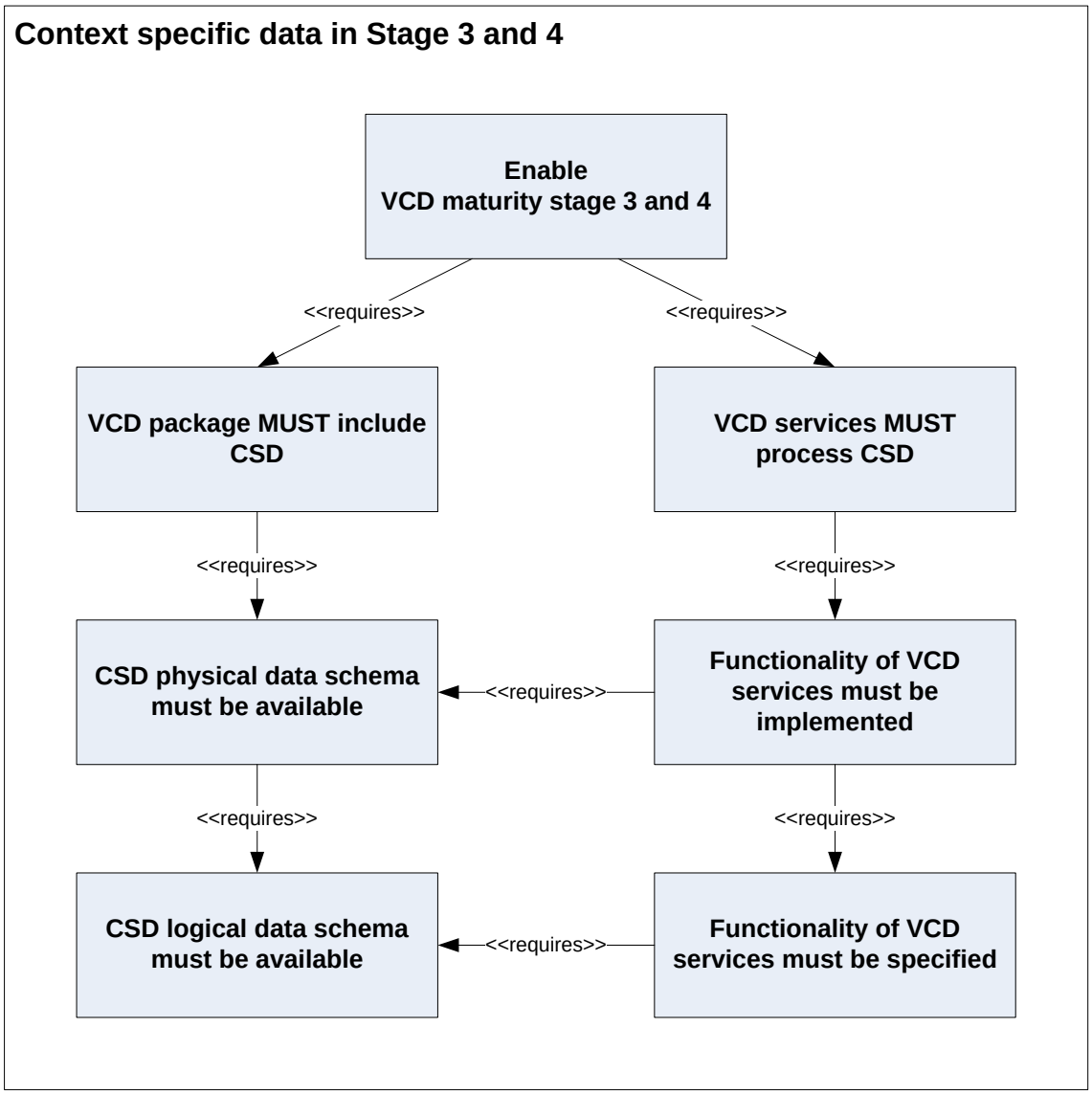

Figure 6-7: Hierarchy of CSD objectives

These objectives lead to a series of activities in several PEPPOL WP2 taskforces with regards to the time planning and future implementation.

6.4 CEN BII alignments

The VCD XML Schema at its current version has not achieved the status of BII supported profile. There are big chances that the forming BII2 workgroup will push forward this improvement.

7 Technical specification of the VCD service – common specifications

7.1 General overview

VCD Services are performed by the collaborative work of systems and sub-systems. The present specification covers a portion of the main construction dealing with the core tasks of assembling a VCD, a VCD Package and a VCD Container through the execution of compiling and packaging functions. These operations are performed by different implementations of the National VCD System in cooperation with the European VCD System described on chapter 5 and attachment C,

The following section provides an overview of the VCD systems architecture. This representation combines different system entities to form a reference modelling framework that every WP2 piloting partner will implement in a locally customized way, therewith implementing its National VCD System. The reference model is based on systems, sub-systems and packages.

7.2 High level components of National VCD System as reference architecture

The following sub chapters describe different reference system architectures which can be constructed by combining the defined components of the National VCD System components specification.

Reference System 1 – Desktop VCD System

This reference system architecture combines components which are needed to assemble a VCD Container using data which is fully provided by the Economic Operator without interfaces to Issuing Bodies.

The following Figure shows the high level components of this architecture.

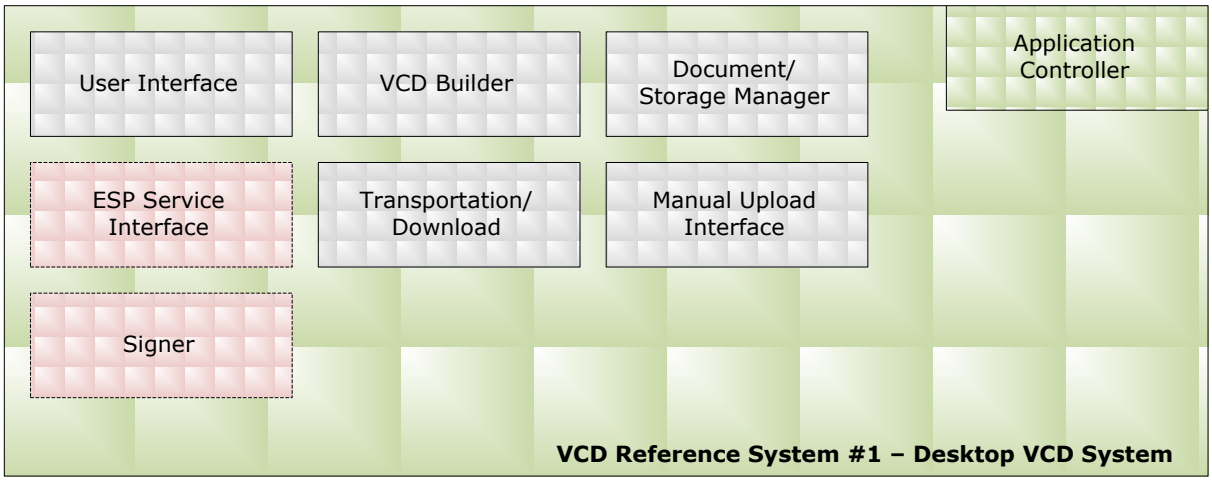

Figure 7-1, Components of the Reference System #1 - Desktop VCD system

User Interface
The User Interface provides functionality to allow the user to interact with the other system parts. Providing user input forms and displaying system feedback are the two main functionalities of this component.

VCD Builder
The VCD builder is the component which assembles the data collected from the Manual Upload Interface, the User Interface and the Document/Storage Manager into a VCD Container. It therefore performs the creation of the following artefacts in accordance to their specifications (cf. Chapter 8):

- VCD Package XML file
- VCD XML files
- VCD Context Specific Data XML files
- VCD Container file

Document/Storage Manager
The Document/Storage Manager acts as a temporary or permanent storage for the data which is collected via the Manual Upload Interface and the User Interface.

Transportation/Download
This component provides functionality to deliver a VCD Container, which has been constructed by the VCD Builder. There are two possible ways of delivering a VCD Container:

a) The user downloads the VCD Container from a defined (temporary) download space, provided by the system
b) The system delivers the VCD Container to an PEPPOL End Point, which has be defined by the Requester in advance by using the PEPPOL BusDox infrastructure.

Manual Upload Interface
The Manual Upload Interface provides functionality to allow the user the upload of documents into the Document/Storage Manager and to input additional data which is needed for VCD Container assembly.

Application controller
This component is responsible for the process and data flow between all other components.

ESP Service Interface (optional)
This optional interface is the National side of the ESP/NSP Service Interface which can be used to receive a VCD Skeleton Container from the European VCD Service. The VCD Skeleton Container is then stored in the Document/Storage Manager and can be processed by the VCD Builder.

Signer (optional)
This optional component can be used to sign a VCD Container or contained artefacts (e.g. VCD Container, VCD Package XML, and VCD XML), by qualified existing means. This component may interact with the VCD Viewer or any other viewing component to allow for human validation of the artefacts before signing.

Reference System 2 – Online VCD System

This reference system architecture combines components which are needed to assemble a VCD Container as an online system, therefore having also an User and Access Management Component in place.

The following Figure shows the high level components of this architecture.

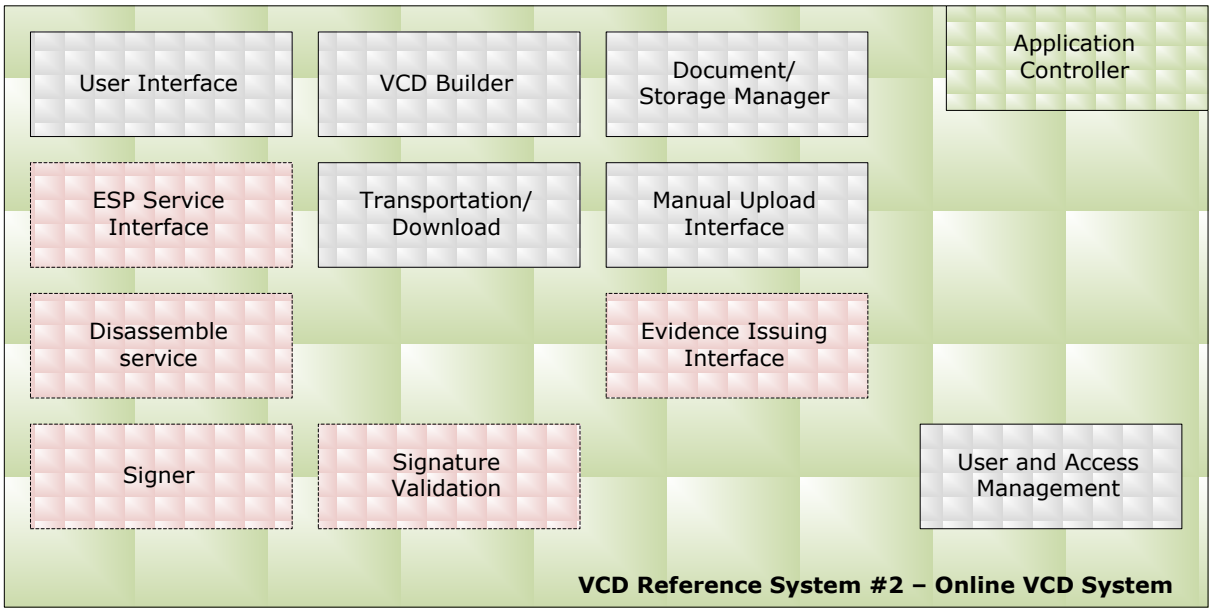

Figure 7-2, Components of the Reference System #2 - Online VCD system

User and Access Management
This component provides functionality for registering, storing and validating user credential and user access rights information. This component therefore implements a VCD System specific user and access database or uses existing data sources by implementing interfaces to them.

Disassembly Service (optional)
This optional component is capable of loading an existing VCD Container or VCD Skeleton Container and to extract the existing information from this artefact in order to reuse the data for a new VCD Container or VCD Skeleton Container instance.

Signature Validation (optional)
This optional component is responsible for validating signatures which are attached to external documents, either documents which are uploaded using the Manual Upload Interface or documents which are received via an Evidence Issuing Interface.

Evidence Issuing Service (optional)
This optional component(s) handle(s) the receipt of documents and other data from one or several evidence issuing services of issuing bodies. It interacts with the Document/ Storage Manager for storing received documents and data.

Reference System #0 – Editor only

This reference system architecture combines components which are needed to assemble a VCD Container manually without additional program logic. It is the reference system which implements the PEPPOL VCD Manual Editor Solution.

The following Figure shows the high level components of this architecture.

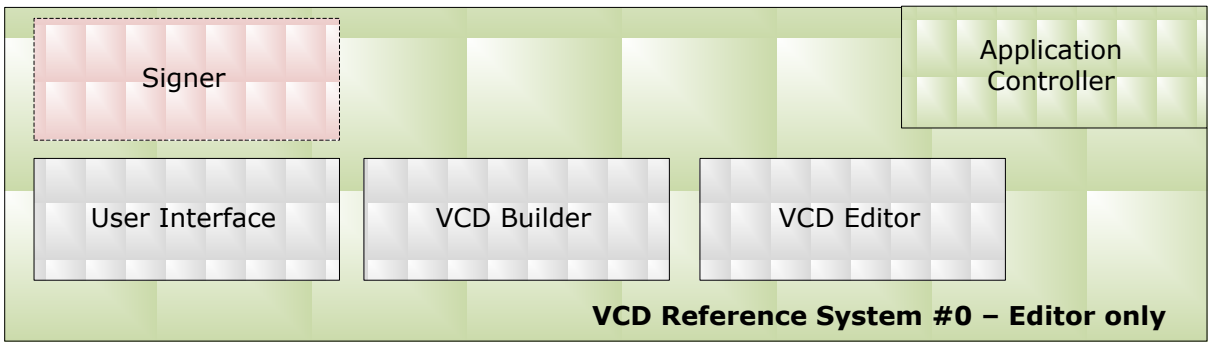

Figure 7-3, VCD Reference System #0 - Editor only

VCD Editor

This component is a low level XML editor which provides functionality to enable the user to edit the specific XML elements of the VCD schema and the VCD package schema.

Common specification on the National VCD System

The overall modelling strategy for the systems that will get local and centralized implementations adopts the multidimensional design possibilities given by the UML language through the coordinated production of Use-Case, Activity, Package and Sequence diagrams.

The common specification in UML is detailed in attachment A.

8 Proof of concept pilot components

The proof of concept components planned in phase 2 are part of the European VCD System. The phase for the European VCD System included the following tasks:

- Implementation of OWL/DL Reasoner
- Implementation of Rule based Reasoner
- Elaboration of test cases for OWL/DL Reasoner and Rule based Reasoner

The aim of the proof of concept phase was to ensure that reasoning upon the VCD ontology is possible und that the components performing the reasoning exist.
The result of this phase is an open source implementation of the reasoner components as well as a description of the test cases and test results. The components are available under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1.

The European VCD System is implemented by PEPPOL.AT. The European VCD System and the National VCD System of PEPPOL.AT share the same components. In fact the European VCD System is a virtual system instance of the PEPPOL.AT National VCD System. The proof of concept phase for the National VCD System therefore has the same aims and results as the European VCD System.

The results of the proof of concepts phase in Austria have met the expectations. The following artifacts have been elaborated:

- Open source implementation of OWL/DL Reasoner
- Open source implementation of Rule based Reasoner
- Test cases for OWL/DL Reasoner and Rule based Reasoner
- Report of successful reasoner tests

9 Pilot Planning and Key Success Indicators

9.1 Pilot Planning for WP2

The overall pilot planning of WP 2 is that each piloting partner in WP 2 identifies and collaborates with a Contracting Authority which will publish a European-wide tender during the production phase. This way, economic operators from the other WP 2 partners' countries can use the respective VCD services to generate the VCD (VCD package) and submit it to the CA in the other country. The scenario for pilot actors is planned as follows and is shown in Figure 9-1. The main actors in the piloting scenario are:

a) Contracting authority: to be identified, contacted and brought in for a public tender by a partner in PEPPOL WP 2. Each pilot partner implementing a VCD SP will bring in at least one contracting authority for the pilot.

b) eTendering platform: if the contracting authority works with a tendering platform, this intermediary has to be brought in as well by the respective partner.

c) Economic operators: from the other piloting partners, economic operators should be identified together with the partner having the CA which could potentially use the VCD service in a country when participating in the tender launched by a).

d) ESP: The European VCD Service to generate the VCD package skeleton for those VCD SP in e)

e) VCD SP per country other than the one of the contracting authority: providing the VCD service for the economic operators in c)

f) Access point in a country if the WP 8 infrastructure is used instead of direct submission to a tendering platform.

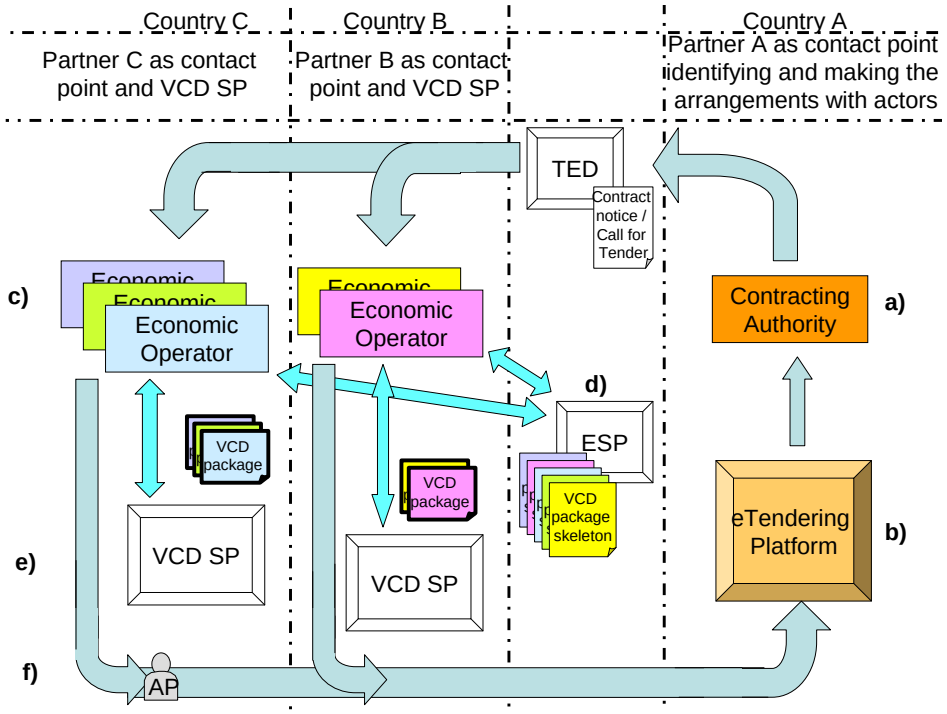

Figure 9-1: Pilot planning in WP 2 – overall concept

The piloting of the VCD solution will take place in three waves, with the following resources and timelines:

1. Wave One:
- Only 1-2 trading partner pairs per WP
- POO/PMT select based on criteria
- Use PEPPOL resources to enable suppliers
- Test from May 2010
- Production from November 2010

2. Wave Two:
- Beneficiaries select based on criteria
- Possible level 3 funding from PEPPOL
- Test from Nov 2010
- Production from May 2011

3. Wave Three:
- Open to any candidate
- No PEPPOL resources to enable
- Test from May 2011
- Production from November 2011

As PEPPOL WP2 is dealing with cases in the "pre-award-phase" of a tender, the requesting contracting authority is well defined but there is no detailed information about the participating/applying economic operators – these are mostly not known in advance. Hence it has to be ensured that in those WP 2 pilots, pilot economic operators are favoured in production pilots in order to ensure the principle of equal treatment (non discrimination) of economic operators as potential contract partners.
However contracting authorities shall promote the VCD in CFT/CN and request a VCD package container to prove the exclusion and selection criteria, as an option at least.
Pilot economic operators will always have the right to choose:

- To choose whether they respond to a call for tender or not,
- To choose to provide a VCD Container or to prove the requested exclusion and selection criteria differently.

This situation has essential impact on the testing of the pilot implementation. It is suggested to define the test cases stepwise:

1. Setup test cases with historical tenders, tenders already awarded and/or executed where the contracting authority and the economic operators are well known. This is to prove that the processes and applications are well defined and implemented.
2. Option: Setup test cases with real processes but fake data ("fake call for tender" and the participating economic operators know this fact).
3. Setup test cases with real data and processes.

The next challenge is to find pilot partners on both sides, contraction authorities and economic operators as well. The main challenge here is to find piloting partners for a cross-border scenario. Currently the PEPPOL Project Operations Office (POO) is organising the process for finding relevant cross-border piloting scenarios.
In PEPPOL WP2 pilot scenarios the use of BusDox (WP8 infrastructure) is not mandatory: It is up to the participating piloting partners (mainly the economic operators) to make use of the PEPPOL infrastructure.

9.2 Key Success Indicators (KSIs) for WP2

The Project Management Team (PMT) of PEPPOL has developed the following KSIs per WP for the Test Pilot phase and Production phase:

- KSI 1 : Number of solutions connected to the PEPPOL-infrastructure
- KSI 2 : Number of Contracting Authorities activated and enabled to use the solutions
- KSI 3 : Number of Economic Operators activated and enabled to use the solutions
- KSI 4 : Number of test cases carried out

These KSIs are not fully applicable to WP 2. Hence WP 2 members have developed the following KSIs according to WP2 needs:

- KSI 1 WP2: Number of national ontologies integrated in European VCD service (Project specific)
- KSI 2 WP2: Number of Contracting Authorities that give reference to and will use the VCD (Beneficiary specific)
- KSI 3 WP2: Number of Economic Operators used in the test cases (Beneficiary specific)
- KSI 4 WP2: Number of test cases carried out (Project specific)
- KSI 5 WP2: Number of VCD package skeletons created/requested (Beneficiary specific)

Table 9-1 gives an overview of the Key success indicators for WP 2.

	Members in WP	**1st of July 2010**	**1st of September 2010**	**1st of November 2010**
KSI 1 WP2	5	5 (Status quo)	6 (+Greece)	6
KSI 2 WP2	5	2 (equals to KSI 4 in test phase)	6 (equals to KSI 4 in test phase)	10 (equals to KSI 4 in test phase)
KSI 3 WP2	5	2 (Simple Tenderer Structure)	8 (AT and IT are testing Contractor - Subcontractor relationship, FR and GR simple Tenderer Structure)	16+ (Everybody tests Contractor – Subcontractor or higher relationship)
KSI 4 WP2	5	2 (1 IT / 1 AT)	6 (2 IT / 2 AT / 1 FR / 1 GR)	10 (3 IT / 3 AT / 2FR / 2 GR)
KSI 5 WP2	5	4 (one per country, excluding DE)	9 (two per country + 1 for Greece)	14 (3 per country + 2 for Greece)

Table 9-1: Key success indicators for WP 2

The KSIs will be measured three times during the test period:

- 1st of July 2010
- 1st of September
- 1st of November – Start of the Production phase (12 months required operations).

10 VCD service specifications and implementation plans per pilot

Attachment B describes the architecture implementation plan for every beneficiary participating in PEPPOL WP2.

These implementation architectures describe the PEPPOL beneficiary's operations and technologies, the business processes (PEPPOL Profiles) they will enable, connectivity methods and the timelines for their implementation.

It is important to recognize these implementation plans and resultant experience will be used as a guide for newcomers and other participants in the PEPPOL project.

11 Governance and Sustainability

11.1 Defining Governance in the Scope of PEPPOL VCD

Governance can be defined as "the establishment of policies, and continuous monitoring of their proper implementation, by the members of a governing body of an organization. It includes the mechanisms required to balance the powers of the members (with the associated accountability), and their primary duty of enhancing the prosperity and viability of the organization."[17]

This definition covers in particular the reference to policies. A policy can be defined as a set of basic principles and associated guidelines, formulated and enforced by the governing body of an organization, to direct and limit its actions in pursuit of long-term goals. In order to reach long-term goals in a large scale Pilot project like PEPPOL and to ensure sustainability it will be crucial to deal with the interest and the relationships among the stakeholders involved.

Thus a wider definition of corporate governance calls it the framework of rules and practices by which a steering committee ensures accountability, fairness, and transparency in the relationship with its stakeholders. Thereby maintenance plays an important role because systems involved have to be adapted frequently according to a changing environment. As there are so many different organisations and countries involved in the PEPPOL project we can assume that changes will occur on very frequent basis. From the PEPPOL perspective governance could be defined as the process to effectively operate the PEPPOL solutions and to propose how to keep them alive after the end of the Project (long-term sustainability). PEPPOL will settle a set of new concepts and standards, will involve several stakeholders, and will influence ways of working.

According to the EIF[18], governance is concerned with the ownership, definition, development, maintenance, monitoring and communication of the various elements (policies, standards, requirements, components etc).[19] In PEPPOL governance implies mastery of the technology, systems and organisations in question, ensuring that their combined activities serve the strategic goals and objectives set out by the EC, the governing board and the beneficiaries for the run-time of the project and beyond.

There are quite a few supporting references developed to guide the implementation of information technology governance. Four of the most well-known frameworks are EIF, CobiT, ITIL and ISO 27001/27002[20]. Taken together, these provide a comprehensive guidance and leading practices for IT Governance. Following the EIF approach on governance in a first step a Governance structure/model has to be defined, encompassing involvement of the stakeholders in the governance activities. This model should focus on the following aspects:

- Specifying decision rights: What has to be governed? Which kind of decisions need to be made? Who can make them?
- Specifying and managing the life-cycles for the artefacts and components of PEPPOL WP2 (VCD): This includes periodic reviews, top-down re-assessments, and taking into account paradigm shifts when they occur in respect to changing environment;
- Measuring effectiveness: Defining metrics (e.g. key success indicators) as well as using them to evaluate and monitor WP2 related artefacts and take appropriate actions whenever needed.

Those aspects mentioned above (decision-making, life-cycle management, monitoring) shall be looked at during and after the project. In particular after the project these aspects get an increased importance and new context. Processes and procedures would have to be established to deal with the application of the metrics, to ensure compliance and provide effective enforcement. In addition economic aspects of sustainable operation of PEPPOL solutions have to be clarified.

[17] http://www.businessdictionary.com/definition/governance.html
[18] The European Interoperability Framework (EIF) was developed within the Interchange of Data between Administrations (IDA) programme of the European Commission and presents a framework for a common understanding of interoperability.
[19] http://ec.europa.eu/idabc/servlets/Doc?id=31597
[20] Provide references and include abbreviation into Glossary

The objective of EIF is to support the European Union's strategy of providing user-centred eGovernment services by facilitating, at a pan-European level, the interoperability of services. In this context by adding the pan-European dimension, EIF supplements national frameworks, rather than replacing them. It offers a comprehensive set of principles for European cooperation in e-government by giving recommendations and guidelines with regard to legal, organisational, semantic and technical aspects of interoperability as well as the political context. Governance can be seen as an importance aspect to ensure interoperability in long term on the different layers introduced by the EIF.

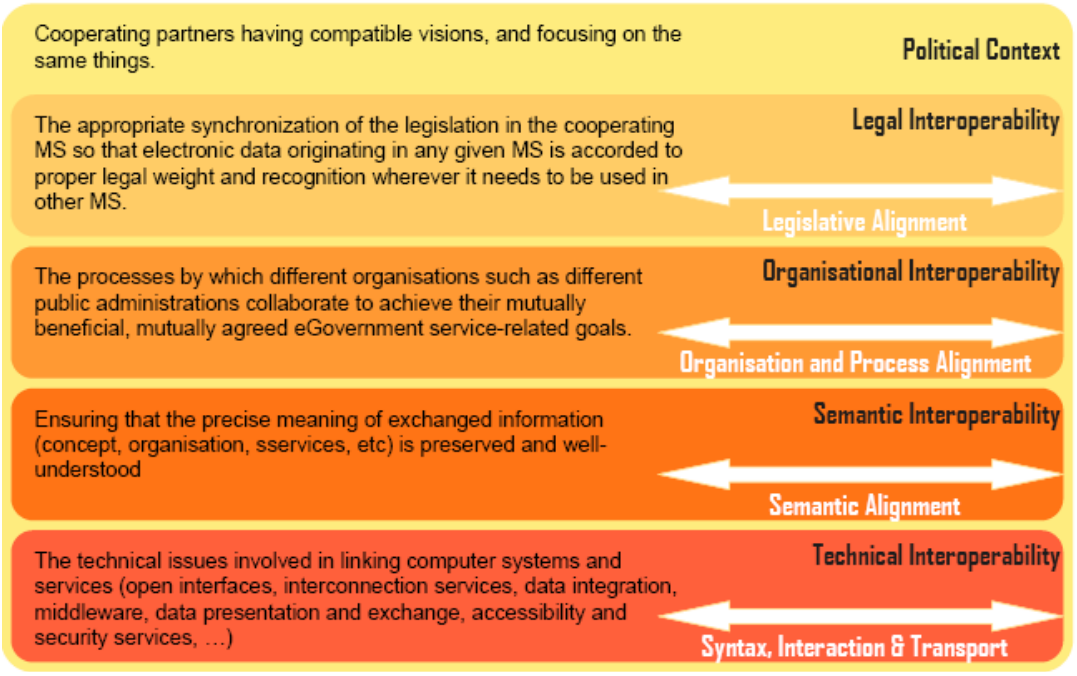

Figure 11-1: European Interoperability Framework – Draft v. 2.0

- Political aspects of Governance: There is political will to maintain compatible vision developed in PEPPOL and to facilitate the operation of PEPPOL solutions after the project.
- Legal aspects of Governance: The possibility to adapt new regulations on the European Level that will strengthen and support PEPPOL solutions. Also a consistent synchronization with legislation in the cooperating MS has to be ensured.
- Organisational aspects of Governance: The processes, roles and responsibilities necessary to enable decision making and cross border interaction have to be defined.
- Semantic aspects of Governance: Aligning terminology (e.g. to be found in data models, identifiers, code lists, UI) and ensuring the consistent usage across PEPPOL, in the community of procurement in Europe (e.g. CEN) and beyond (e.g. UNCEFACT).
- Technical aspects of Governance: To ensure that infrastructures and architectures (interfaces, components, artefacts) are maintained and monitored. This may include the interlinking of PEPPOL solutions with other computer systems.

11.2 Trust models

Figure 11-2 indicates in an initial stage, which actors and processes should be supported with trust models. The full elaboration of the trust models will be delivered in D 2.4 and D 2.5.

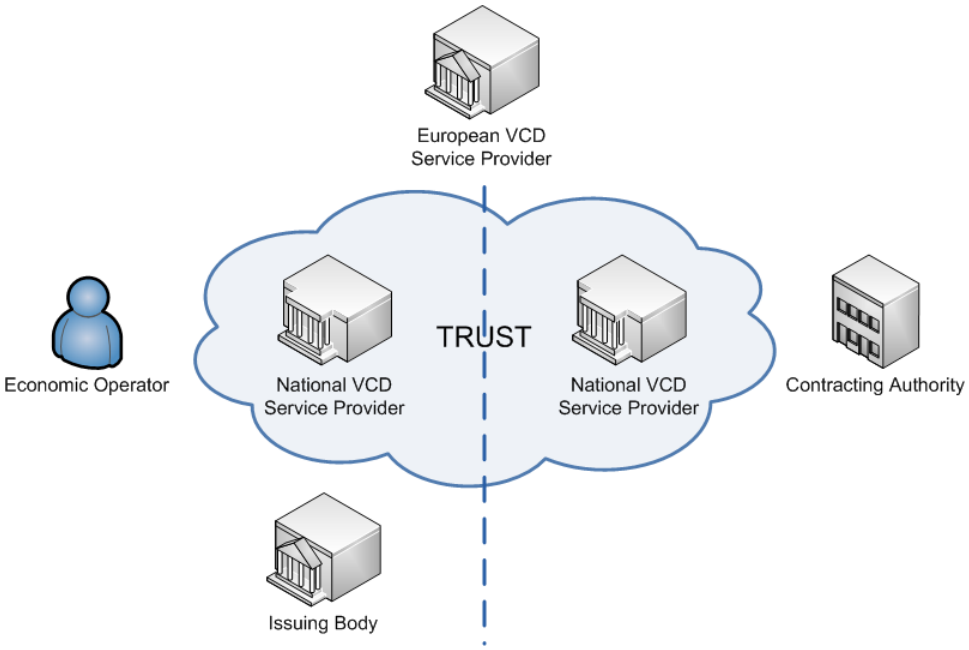

Figure 11-2: Actors to be addressed in the VCD trust model

12 Conclusions and outlook

The specification work performed during the phase 2 of the project program has performed a simultaneous activity over the three major dimensions that are driving the project, namely the Legal, the Organizational and the Technical aspects. The initial vision of the VCD and of the pre-VCD that were outlined in D2.1, have got a coordinated investigation in order to move from the gathering of the requirements into the feasibility assessment.

From the Legal perspective, the main activity in the Pre-VCD area has addressed the following key issues:

- Criteria mapping: allowing the control of the exclusion and selection requirements set by the different public procurement acts in operation by the affected Member States. Through this action it was possible to detect the correspondence levels between the different legal systems.
- Evidence linking: As direct consequence of Criteria mapping, the phase 2 of the project has generated a qualified list of evidences that are supposed, with a great level of certainty, to satisfy the requests of the Contracting authorities.
- Evidence substitution options: Substitution options have been identified as part of a common practice scenario in use by the MS of origin of Economic Operators. There is a pending assessment to be done by the receiving CAs to evaluate the level of confidence over this solution replacing document alternatives.
- Trust & Confidence: Initially based on the principle of the “mutual recognition” of practices and of the evidencing mechanisms, it is now in the framework of the Pre-VCD system demanding for a tangible recognition of procedures and of the generated results of those procedures.
- Quality principles based on editorial language: from the Pre-VCD perspective we MUST expect that the correct directions are given to the users approaching the system. The Pre-VCD is supposed to generate guidance and the hosting structure for the referencing to real evidences. Quality indicators are supposed to be highlighted and defined as “requested” during the Pre-VCD phase
- Quality principles based on authenticity: see previous statement

From the Organizational perspective, the process leading to the generation of the Pre-VCD artefacts has been specified along with the identification of roles in line with the basic assumptions identified during phase 1 of the project.
From the Technical perspective, a system specification activity has been carried out. The specifications of the European VCD System components and the National VCD System components can largely claim to be the response to the requirements gathered during phase1.

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Abbreviations

PEPPOL Glossary of Terms and Abbreviations can be found in deliverable 7.3b.

ANNEX I: Ontology

The ontology for the VCD is available under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1

ANNEX II: Legal mapping tables

Austria
The table for the Austrian Criteria to evidence mapping is available under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/process-specifications-1/folder_contents

Germany
The table for the German Criteria to evidence mapping is available under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/process-specifications-1/folder_contents

Greece
The table for the Greek Criteria to evidence mapping is available under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/process-specifications-1/folder_contents

France
The table for the French Criteria to evidence mapping is available under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/process-specifications-1/folder_contents

Italy
The table for the Italian Criteria to evidence mapping is available under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/process-specifications-1/folder_contents

Norway
The table for the Norwegian Criteria to evidence mapping is available under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/process-specifications-1/folder_contents

ANNEX III: VCD Schema specification files

The VCD schema specifications can be found under http://www.peppol.eu/work_in_progress/wp2-virtual-company-dossier/vcd-artefacts-1/the-vcd-schema

ATTACHMENT A: Use cases and other UML representations of the National VCD system

ATTACHMENT B: Implementation Architecture Plans for PEPPOL Beneficiaries to enable Cross-Border Virtual Company Dossier

ATTACHMENT C: Use cases and other UML representations of the European VCD system