

Virtual Company Dossier: Vision and Concepts

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Agenda



- Status quo
- Maturity Model
- Introduction to Vision
- pre-VCD mapping tool
- VCD simple package
- VCD advanced package
- VCD networked package

2

Major Challenges for the application of a VCD on pan-European level



■ Organisational complexity:

- The large amount and diversity of certificates, attestations, public sector awarding entities and market players.

■ Technical / semantic complexity:

- Several interoperability issues including standardisation, agreed semantics, ease of deployment and the cross-border use of eSignatures.

■ Legal issues:

- Validity of certificates and attestations
- Other issues like cross-border information and data protection and the need for harmonisation of initiatives even on a national level.

■ Language barriers:

- Certificates should be translated into the target language and proof of authenticity should be guaranteed.

■ Financial consequences:

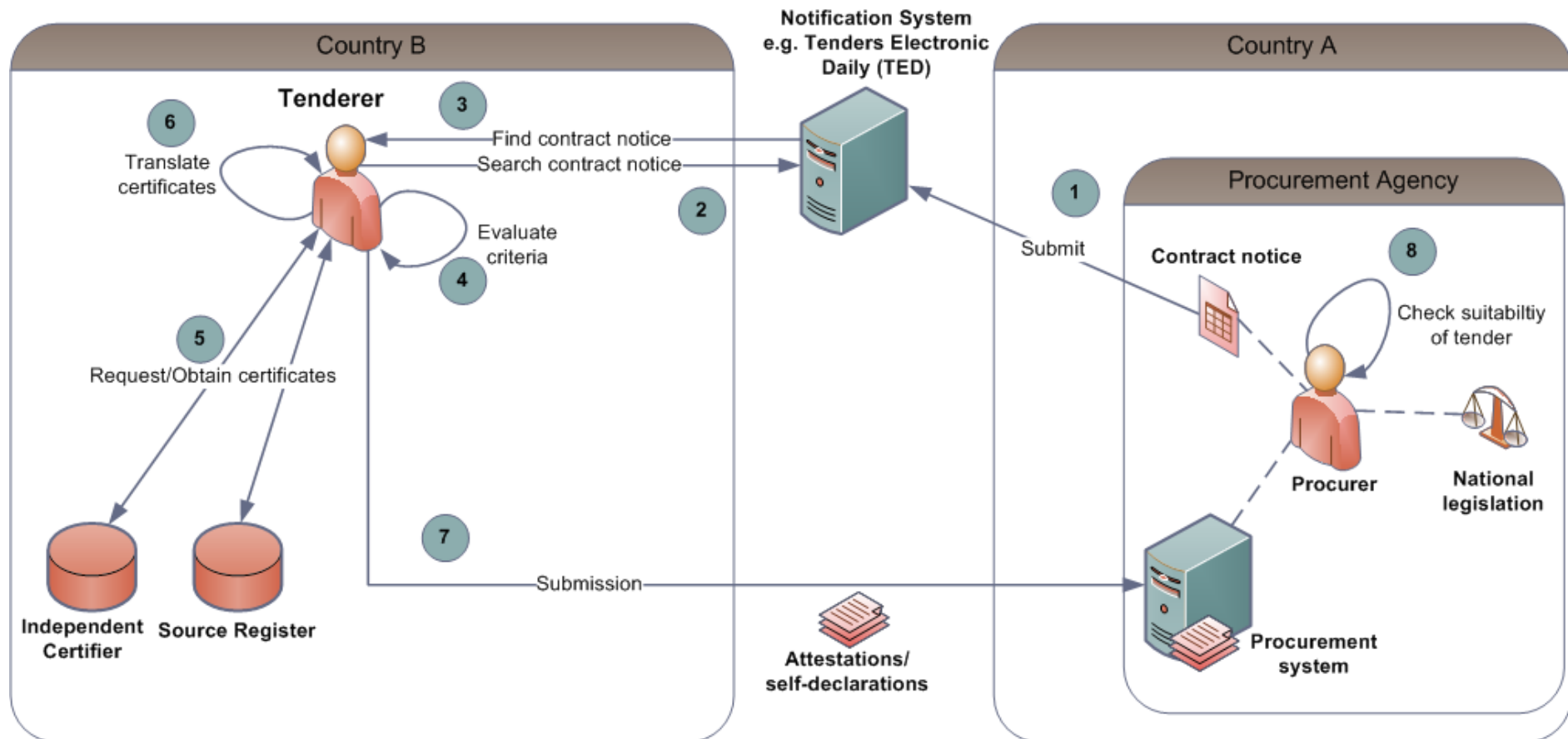
- The potential need for infrastructure changes may raise the expenditures for public sector awarding entities.

■ Political consideration:

- The Procurement competences of Member States are mostly allocated on a decentralised level thus a centralised infrastructure may not be wanted and cannot be applied.

3

Status quo



Definitions and Problem Scope

- **Criteria for qualification and selection** are in accordance with the Directive 2004/18/EC and are used to map among national requirements.
- **Attestations give evidence** for the fulfilment of one criterion or more criteria.
- Likewise, one criterion may require one or more attestations in order to be proved
- Documents may be **machine readable** (digital copies, unstructured contents) or **machine interpretable** (structured content, thus can be processed by machines)
- An **attestation is made up of one (or more) document(s)** including machine interpretable data that describes these attestation (e.g. issuing date)

Definitions and Problem Scope

- **VCD can provide direct access** to attestation if there is a mandatory rule for it in law.
- **VCD systems provide single point of contact** to attestations from public sources and information necessary to proof conformance to a given CFT.
- **A VCD Package may be linked to exactly one call for tender (CFT)** thus it is tender specific
- **A VCD Package may contain** self-declarations and several other documents provided by the economic operator.
- **The contracting authority analyses the evidences** provided by the economic operator

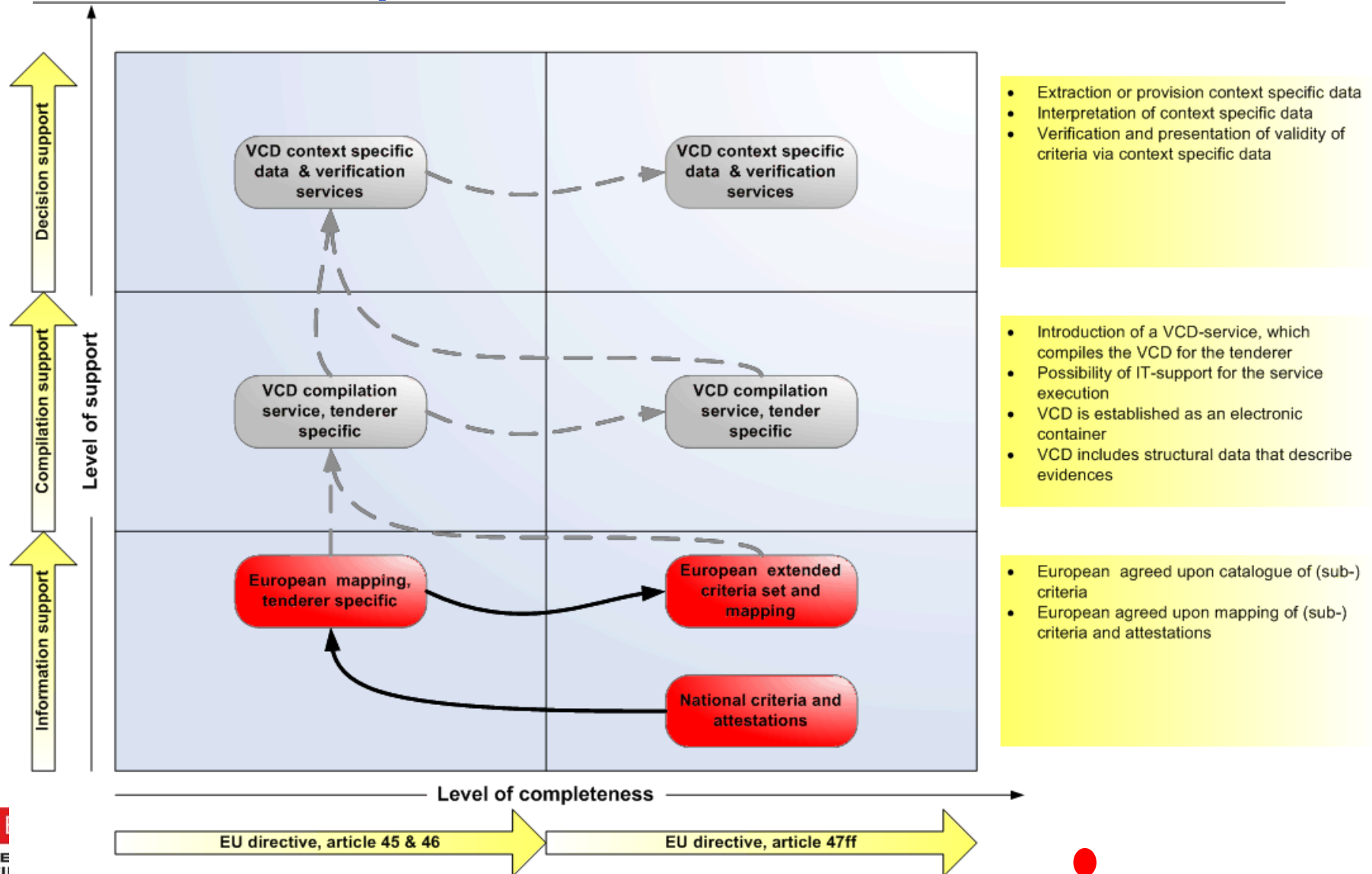
Vision and the goals of a VCD



- **Supporting** Economic Operators and/or Contracting Authorities in tendering procedures
- Future vision means a **paradigm shift** from handling of documents to the **electronic exchange of information** in order to establish interoperability on the basis of mutual recognition
- The real benefit could be gained when the **VCD Package** (which may be seen as a container for documents – structured or unstructured – and additional information) is **complete and accurate**.

Introduction to Vision

- Level of support
- Level of completeness



- Provides information about the relationship between attestations and qualification criteria of qualitative selection and non-exclusion.
- A VCD rule set is defined as a reference model which is manually or semi-automatically consulted by the economic operator and/or the contracting authority.
- There are no VCD Services established which compile, validate or deliver VCD-Packages.

Compilation Support



- Helps the economic operator to compile a VCD Package according to the defined definitions/regulations/rule set/model
- Uses specialized VCD Services
- The VCD Services provide several information (from structural metadata of evidence)
 - e.g. whether the VCD Package is complete or not
 - e.g. who is the issuer of a document
 - e.g. which attestations are valid or outdated.

Decision Support



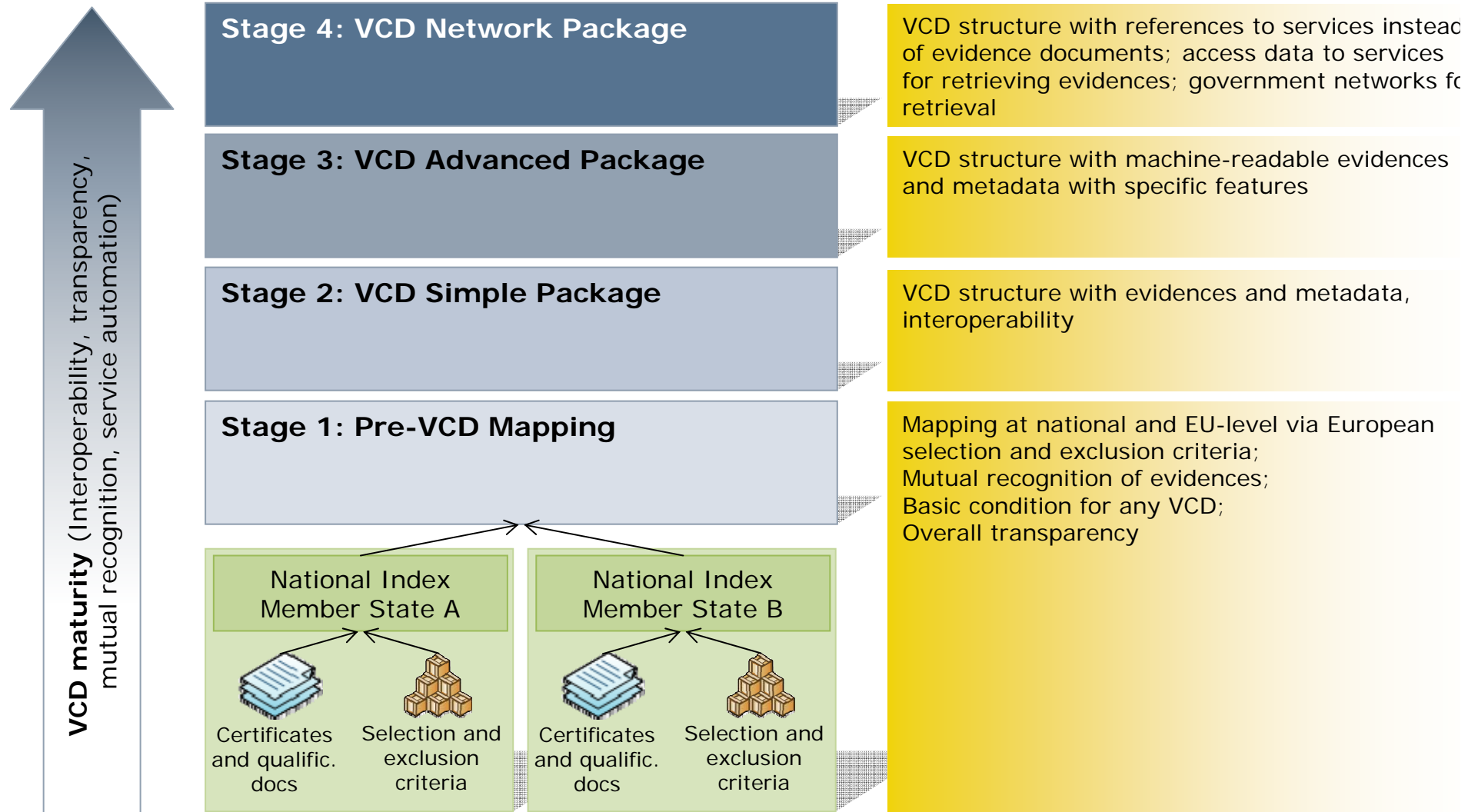
- Enhances the compilation support by processing content- and context-specific data.
- ALL necessary information (structural data of evidence and context specific data) of the included attestations are provided in machine interpretable format.
- On this basis the contracting authority is able to make a decision about the suitability of the economic operator.

Level of completeness



- A VCD Package will show its full potential when all the requested attestations are contained in it.
- The range of attestations varies from self-declarations to official attestations or certificates issued by public authorities.
 - subset of attestations
 - default package list independently of CFT
- VCD promotes a step wise approach in order to reach a sufficient level of completeness.
 - Create a VCD package
 - Focus on the evidences of criteria according to Articles 45 - 46 first.
 - Create tender specific VCD through interconnection of VCD and CFT
 - Develop possibilities to map and add other documents (self declarations or statements from banks etc.) according to Articles 47 - 50 later on

Vision of VCD (Staged Maturity Model)



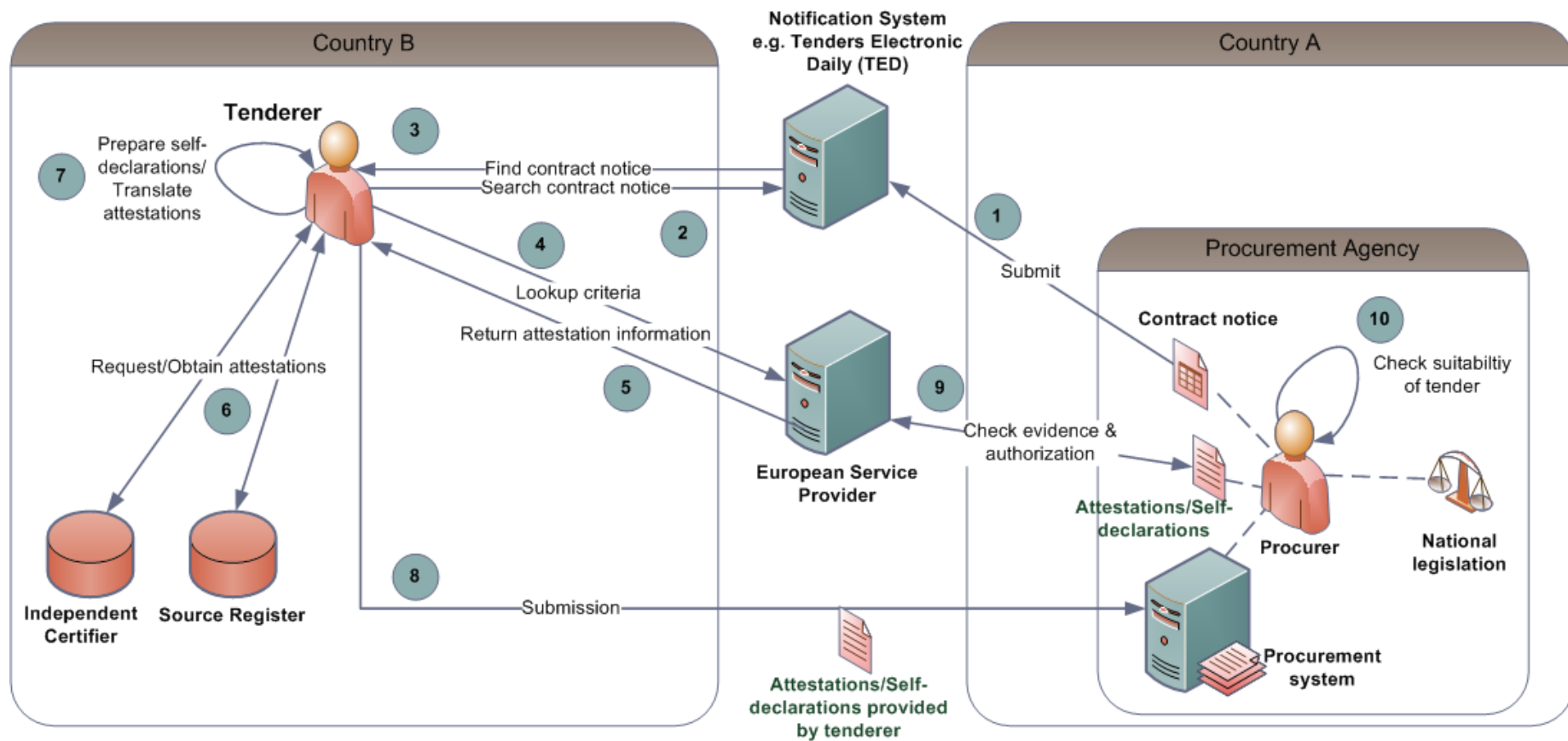
Pre VCD Mapping



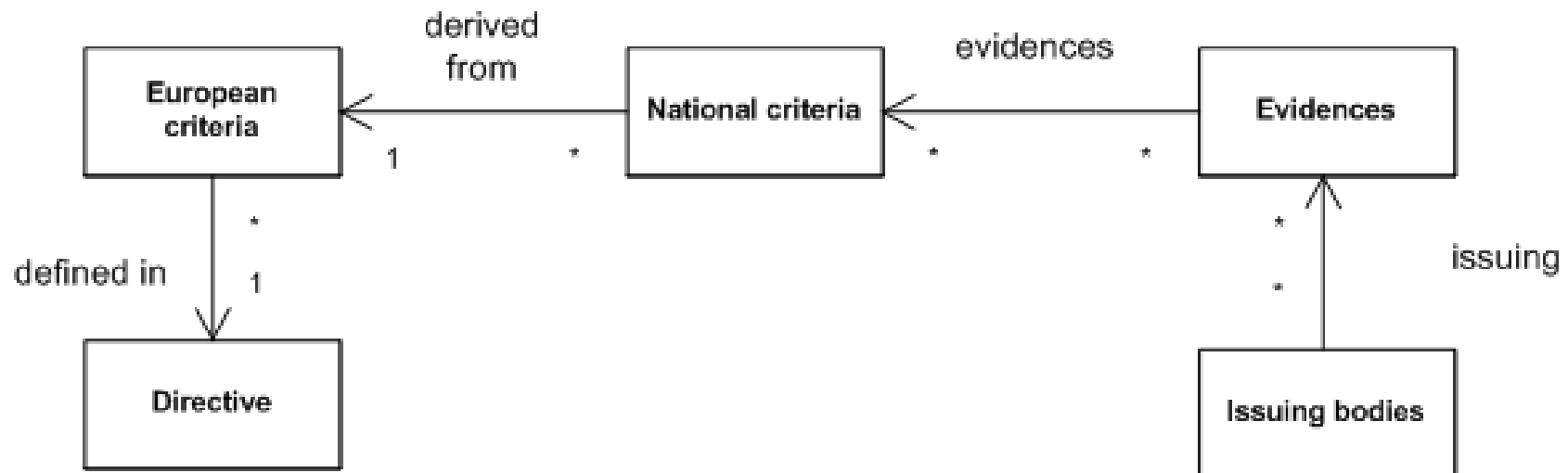
■ Stage 1: pre-VCD mapping tool

- Superset: Basic semantic interoperability model consisting of European criteria and evidences available in a Member State
- Subset: Formal representation of relevant criteria of a particular call for tender

pre-VCD mapping tool



Taxonomy for pre-VCD mapping

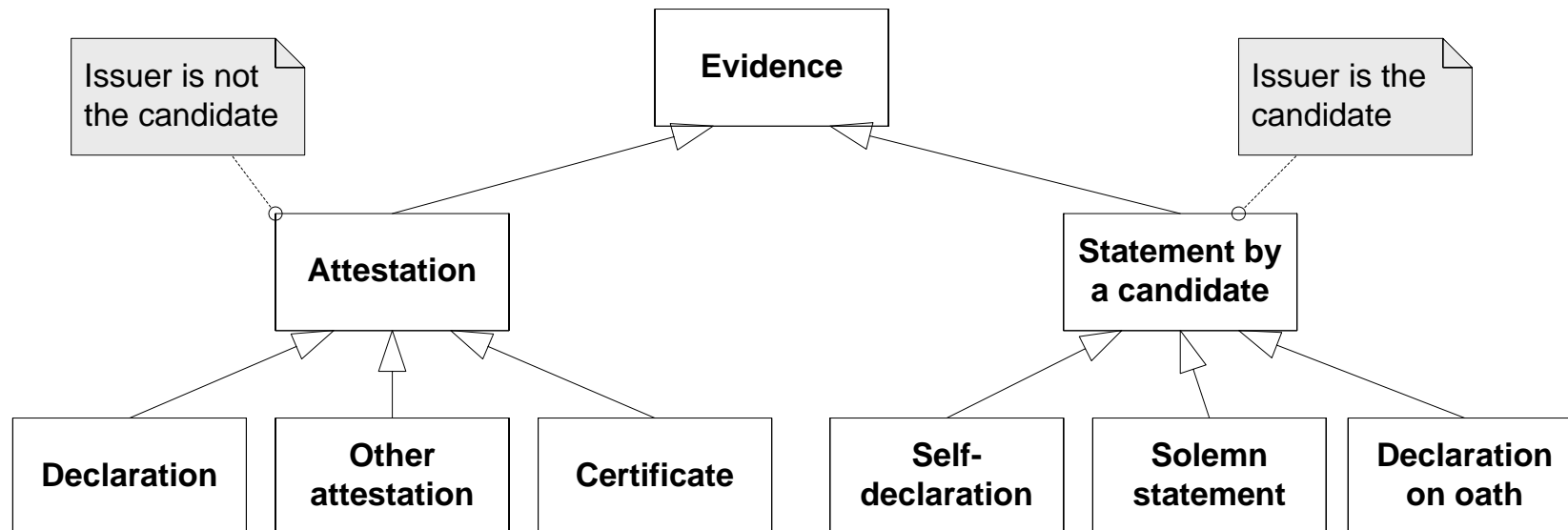


Criteria of qualitative selection and exclusion

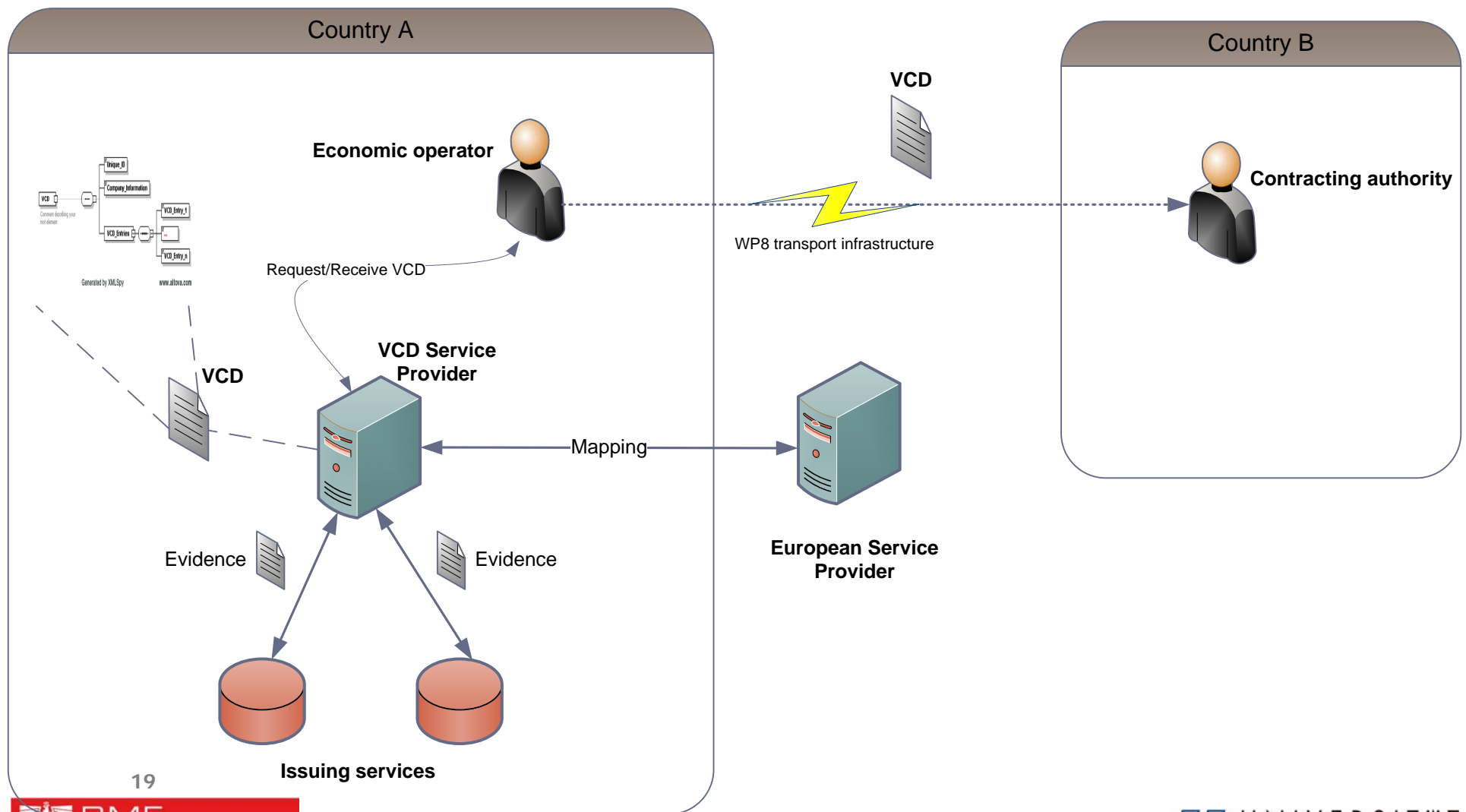
■ European Criteria: The personal situation of a candidate (Article 45)

- **Sub criteria:** Personal situation *with regard to absence of conviction* (sec. 45 §1 and §2 (c, d, g))
 - **Atomic criteria:** has been convicted by final judgment of the *participation in a criminal organisation*
 - **Atomic criteria:** has been convicted by final judgment of *corruption*
 - **Atomic criteria:** has been convicted by final judgment of *fraud*
 - **Atomic criteria:** has been convicted by final judgment of *money laundering*
 - ...
- **Sub criteria:** Personal situation *with regard to non-bankruptcy and financial status* (sec. 45 §2 (a-b))
- **Sub criteria:** Personal situation *with regard compliance with fiscal and social obligations* (sec. 45 § 2 (e-f))

Taxonomy for a VCD evidence



VCD package overview



VCD simple package - 1

Outcome	Approach	Benefit	Efforts
VCD simple package	Define the structure of a VCD package	provides evidence for the suitability of a tenderer	defining and agreeing upon a common VCD package structure Translation of evidences may be still necessary, No automated support for checking the content of the evidences

VCD simple package: Features and types of data



■ Stage 2: VCD simple package (push model)

- Identity and Access management system
- VCD system
 - Initialization of VCD request
 - Arrangement of VCD instance
 - Collection of Evidence
 - **Compilation of VCD instance**
- VCD transportation system
- VCD viewing system

Types of data
Structural VCD package data (e.g. the creation date of the VCD)
Tender specific data (e.g. the TED ID to which the VCD package is related to)
Economic operator data (e.g. name of economic operator)
Structural data of evidence (e.g. document name)
Context-specific data (not included)
Validation value (not included)
Evidences (e.g. criminal record)
Translations (e.g. certified translation of a criminal record)

Structural data of evidence

■ Structural (meta-)data of evidence

- Type of document
- Name of document
- Issuing entity
- Source reference
- Validity period
- Frequency of use
- Flexibility of submission
- Semantic characteristics
- Technical characteristics
- Validation requirements

■ Can be for pre-VCD mapping tool and VCD packages

Introduction to stage 3



■ Stage 3: VCD advanced package (push model)

- merging VCDs of different economic operators (for bidding consortia)
- adding context specific data into VCD
- Re-compilation of a VCD
- validity monitoring

VCD advanced package – Re- compilation service

Outcome	Approach	Benefit	Efforts
VCD re- compilation service	Create a VCD package by reusing evidences from existing VCD packages	Selective re-usage of VCD evidences, Reduction of cost	service implementations for reuse- and re-compile functionalities and interfaces

VCD advanced package – validity monitoring

Outcome	Approach	Benefit	Efforts
VCD validity monitoring	services to detect the necessity for updates on evidences	validity of VCD can be inspected	Additional efforts with regard to service implementations

VCD advanced package – package merging



Outcome	Approach	Benefit	Efforts
VCD package merging	merge VCD data from several entities	compile all the necessary information for a group of economic operators (as one candidate, e.g. a consortium, contractor-subcontractor-relationships)	Definition of possible legal constructions for syndicates

VCD advanced package – context specific data



Outcome	Approach	Benefit	Efforts
context specific data	services which can handle context specific data	<p>Transparency on contents of evidences</p> <p>full document translation will be replaced with “selective translation” of keywords and major contents (context specific data).</p>	<p>Definition of a method to develop context specific data (e.g. reverse engineering)</p> <p>data analysis and design of a context specific data schemas and agreement on it</p> <p>Role assignment.</p>

Introduction to stage 4



■ Stage 4: VCD networked package (pull model)

- Mandate contracting authority to retrieve attestations on demand
- Storing attestations and referencing to it
- Retrieving attestations on demand
- Conflict resolution
- Strong support for implementing Article 52

VCD networked package - 1

Outcome	Approach	Benefit	Efforts
<p>“On-demand” retrieval of attestations</p>	<p>Contracting authority can request attestations on demand. VCD does not contain attestations</p>	<p>Contracting authority can have selective access to specific attestations</p> <p>Contracting authority potentially can request updates on specific attestations more easily</p>	<p>Higher requirements on data confidentiality, data availability, non-repudiation and data integrity, data security and data protection</p> <p>Standardization and agreement on well working context specific data</p> <p>Mechanisms to identify economic operators, national VCD service providers and contracting authorities</p> <p>Requires higher collaboration and technical amendments between key stakeholders</p> <p>Interfaces, protocols and temporary storage to obtain “on demand” VCD network packages</p>

VCD networked package - 2

Outcome	Approach	Benefit	Efforts
Opportunity to establish an official list of approved economic operators in accordance with Article 52 (1) of Directive 2004/18/EC.	VCD contains validation values derived from context specific data which are approved by the national VCD service provider	VCD service provider can maintain a list of approved economic operators. VCD can be easier used in cross-border procedures High support for economic operators Multiple re-usage of evidences	Clarification of legal issues such as liability Changes in national procurement law may be required and have to be implemented according to the Article 52 (1) of Directive 2004/18/EC National and local political commitments needed Implementation of validation points within National Service Provider

Remark to Concept

- Stages of maturity are not meant to be exclusively implemented but
- they are build upon each other
- pre-VCD mapping tool is a precondition for other stages and has to be used in order to make a VCD work

- A Member State may implement stage 2 with some features of stage 3 and stage 4
- Requirements specification only provides implementation guideline
 - requirements are defined open and independently of any technology so that you are able to fulfill certain requirements already if you have a solution in place.

Summary

- Level of support
- Level of completeness
- Criteria for qualification and selection and non-exclusion
- Pre-VCD mapping tool
- VCD simple package
- Types of data contained in a VCD
- VCD advanced package
- VCD networked package

End

Thank you for your attention!



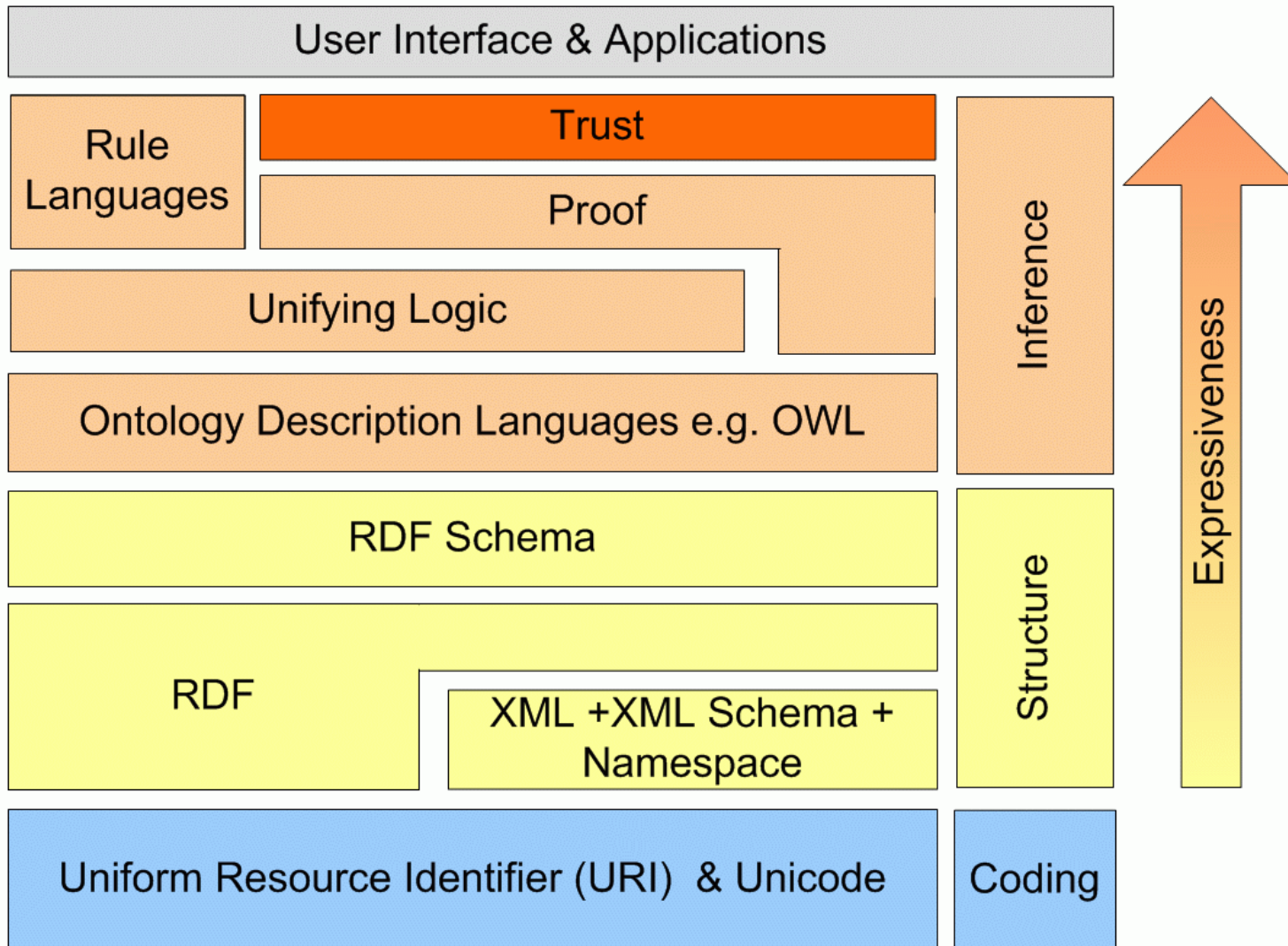
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Semantic Web Layer



URI, XML and XML schema



- Each layer is based and depends on the layer below
- The layers can be developed relatively independently.
- For enabling machines to process data directly, database objects have to be mapped into a system of URIs. Resources are associated with a URI so that anyone can link / refer to it and may access an appropriate representation of it.
- XML provides a standard serial syntax for exchanging data. XML documents are usually based on different schemas but they may represent data with similar semantics.

- RDF is a general method for modelling metadata
- RDF provides a standard form for representing semantics of data which can be processed by machines.
- Uses so called triple stores (subject-predicate-object expressions).
- Resources in RDF are connected to specific URIs that allow to derive information about the resource and its meaning.
- RDF is an application of XML thus it provides an XML-based syntax

- OWL facilitates greater expressivity and machine interpretability of content than that supported by XML and RDF by providing additional vocabulary (e.g. relationships between entities) along with a formal semantics.
- Supports decision procedures
- OWL allows to refer to terms in other ontologies and it uses the linking provided by RDF to enable the distribution of ontologies among different systems

■ Logical reasoning

- Is needed to ensure the consistency and correctness of data sets.
- Is used to infer conclusions that are not explicitly stated but are consistent with and required by a known set of data.

■ **Proofs** are needed in order to trace the steps of logical reasoning

■ **Trust** aims at the provision of authentication mechanisms and the evidence of the trustworthiness of data, services, and agents.

Benefits with regard to interoperability



- Enable mapping: Creating certain rules and axioms that define how terms map to other terms.
- Enable alignment: Refers to the commitment in order to determine correspondences between concepts. Alignment is used to find classes of data that are semantically equivalent, but indeed not necessarily logically identical (e.g. Extracts of judicial records or equivalent documents).
- Enable translation: Refers to syntactic rewriting and semantic rewriting to support the translation between two different representations of data.
- Enable merging: Describes the creations of a common model that is used instead of existing models. Merging different national models into a unified one is an approach for semantic integration which is particularly used when national models overlap significantly over a common

39

Next steps I

■ Maintenance of Requirements in spreadsheet

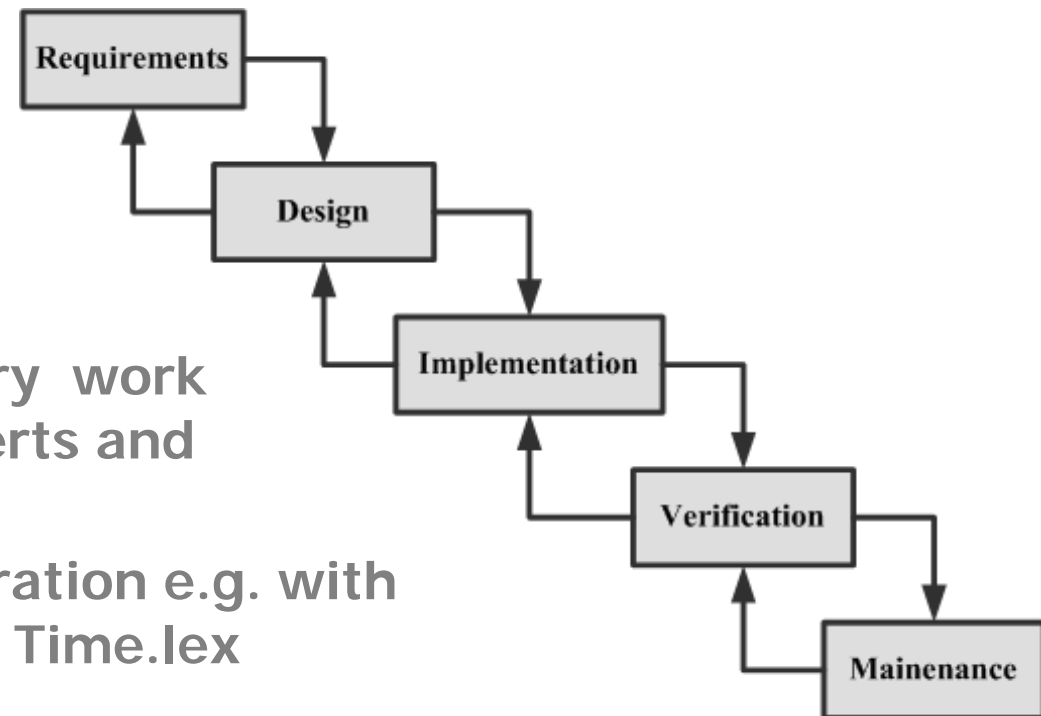
No.	Name	Description	Priority			Relevance for stage in VCD model				Measurement indicators	References and further comments
			Must	Should-	Nice	1	2	3	4		

- Maintain, adapt and perform change management
- Ensure that requirements are complete, explicitly defined, clearly described, numbered and referenced.
- Further characteristics:
 - determinability (atomic character),
 - verifiability (well defined measurement towards the fulfilment of a requirement),
 - traceability (fulfilment and origin of requirements)

40

Next steps II

- The requirements will be the basis for control of design and implementation activities
- They provide guidance and reference in software engineering (e.g. Waterfall model)
- design phase we will further detail the requirements through explicit models and artefacts
- requires interdisciplinary work between e.g. legal experts and software engineers
- requires strong collaboration e.g. with CEN BII and Siemens & Time.lex



Intended contents of the VCD according to the Directive 2004/18/EC (Articles 45-49)



■ Personal situation of the candidate –

- absence of conviction e.g. Criminal records, judicial records, absence of the participation in a criminal organisations, corruption, fraud, money laundering
- non-bankruptcy and financial status e.g. certificate of registration, certificate or statement about non-bankruptcy
- compliance with fiscal and social obligations e.g. latest extract of account, certificate of clearance, tax clearance certificate

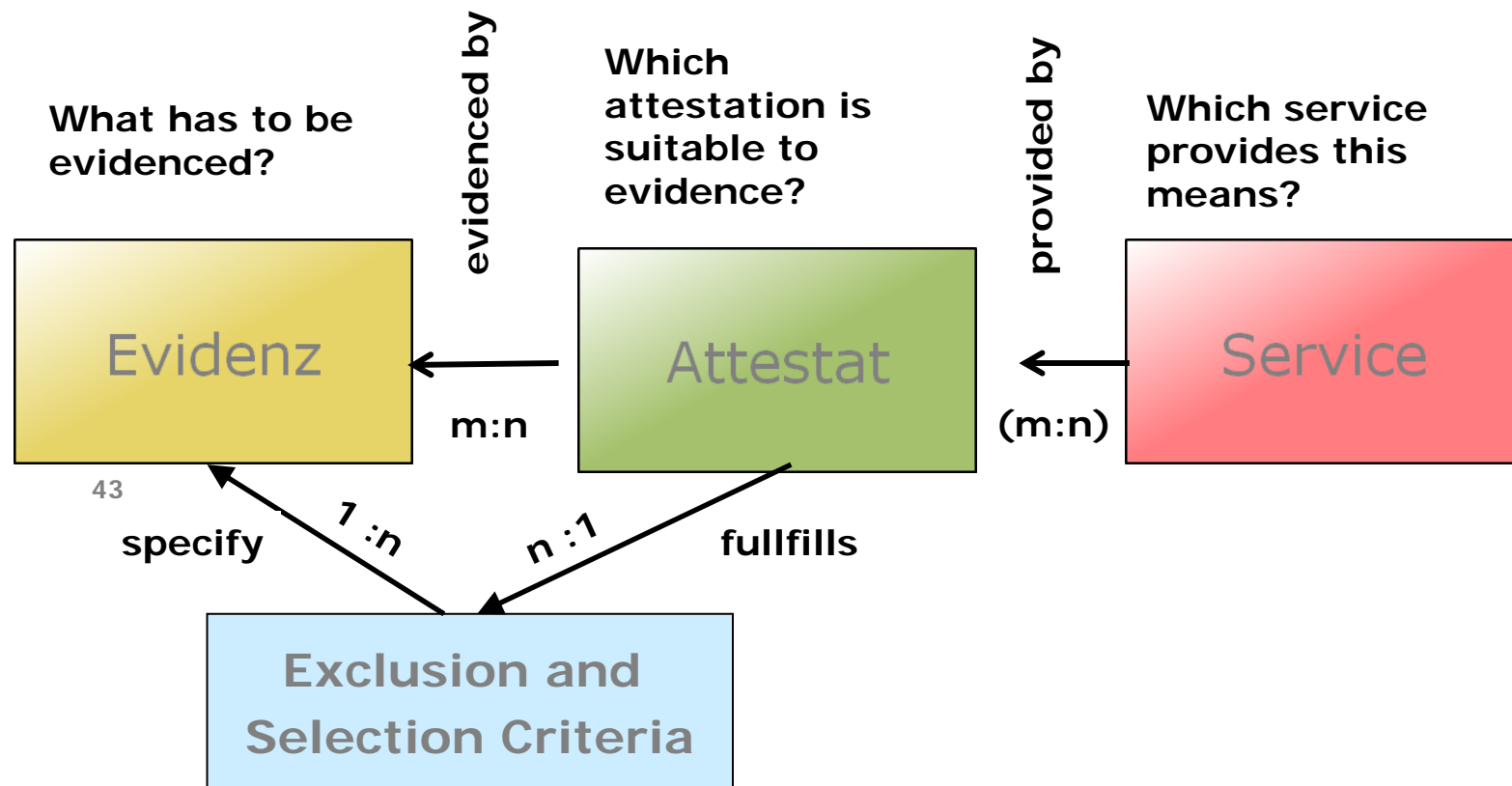
■ Suitability to pursue a professional activity e.g. certificate of registration from the commercial/professional register, declaration of equivalence

■ Economic and financial standing of a tendering company e.g. annual accounts, statement of global turnover, statements from banks to check the creditworthiness

■ Technical and professional ability of candidates e.g. certificates of satisfactory execution of past works, statements about the professional qualification and about technical equipment (contents vary depending on the requirements)

■ Compliance to quality assurance standards and environmental standards e.g. ISO certificates, Quality assurances, Certificates that prove the compliance with environmental guidelines

Common Mapping Strategy



43

Evidence – Criteria – Attestation (Italy)

Evidence with regard to the personal situation of the candidate or tenderer:	Criteria with regard to absence of conviction
<ul style="list-style-type: none"> • absence of conviction <div style="margin-left: 20px;"> <div style="border: 1px solid black; background-color: #e0f0ff; padding: 5px; width: fit-content; margin-bottom: 10px;">Criminal Records</div> <div style="border: 1px solid black; background-color: #e0f0ff; padding: 5px; width: fit-content;">Anti-mafia declaration</div> </div>	<p>has been convicted by final judgment:</p> <ul style="list-style-type: none"> • of the participation in a criminal organization • of corruption • of fraud • which has the force of res judicata

Evidence – Criteria – Attestation (Norway)

Evidence with regard to the personal situation of the candidate or tenderer:	Criteria with regard to absence of conviction
<ul style="list-style-type: none"> • absence of conviction <div style="border: 1px solid black; background-color: #e0f0ff; padding: 5px; margin: 10px 0;">Self Declaration</div> <div style="border: 1px solid black; background-color: #e0f0ff; padding: 5px; margin: 10px 0;">Statement from Governmental institution about non-existence</div>	<p>has been convicted by final judgment:</p> <ul style="list-style-type: none"> • of the participation in a criminal organization • of corruption • of fraud • which has the force of res judicata