



Versions in UBL

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Notes:

Versions in UBL



-
- Introduction - Introduction
 - Module 1 - Versions of the UBL specification
 - Module 2 - Customizations of UBL
 - Module 3 - Trading partner agreements on value constraints
 - Conclusion - Conclusion

Series: Versions in UBL

Reference: Misc

Outcomes:

- Overview of different types of versions of UBL document constraints.

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Introduction

Introduction - Versions in UBL



Expected to have heterogeneous deployments of UBL implementations around the world

- different versions published by the OASIS UBL committee
- different customizations defined in user communities with different requirements
- different value constraints defined in different trading partner relationships for an individual

Cannot expect all users of UBL worldwide to keep in lock-step with one version of UBL

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Notes:

Role of schema validity

Introduction - Versions in UBL



Danish government representative to UBL Committee member:

- "Thousands of Danish Java programmers need to use OIOUBL XML without knowing XML syntax or PSVI concepts ... just load up the data structures and Java programs will work with the information ... no other possible way of doing instance inspection except through off-the-shelf language bindings."

Assumed need for schema validity in order for the data structures to be properly loaded.

Assumed not to be localized only to Danish Java programmers (those are the only ones we've heard from).

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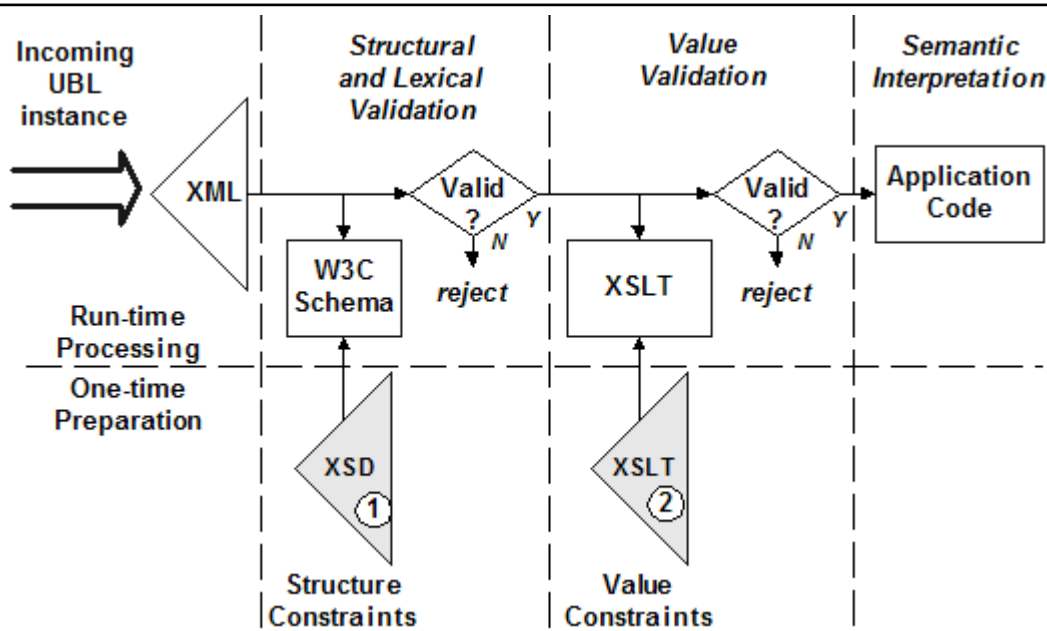
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Notes:



Published receiver processing model for a like-versioned UBL system

Introduction - Versions in UBL



The version of the UBL instance produced by the sender is assumed to be the same as that supported by the receiver.

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Notes:

Module 1 - Versions of the UBL specification



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- Introduction - Versions of the UBL specification
 - Lesson 1 - Major vs. minor vocabulary versions
 - Lesson 2 - UBL common library and new document types
 - Lesson 3 - Minor versioning for backward compatibility
 - Lesson 4 - Processing model for forward compatibility
 - Lesson 5 - Version high water mark
 - Lesson 6 - Schema synthesis
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Versions of the UBL specification

Module 1 - Versions of the UBL specification



Select Naming and Design Rules (NDR):

- [CTD2] Every `ccts:ABIE xsd:complexType` definition content model MUST use the `xsd:sequence` element containing references to the appropriate global element declarations. [Ed. note: i.e. no `xsd:choice` constructs allowed]
- [ELD3] For every class and property identified in the UBL model, a global element bound to the corresponding `xsd:complexType` MUST be declared. [Ed. note: i.e. the Garden of Eden approach to document modeling]
- [GXS14] The `xsd:any` element MUST NOT be used except within the `ExtensionContentType` type definition, and with `xsd:processContents="skip"` for non-UBL namespaces.

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Major vs. minor vocabulary versions

Module 1 - Versions of the UBL specification
Lesson 1 - Major vs. minor vocabulary versions

More NDR:

- [VER5] for UBL minor version changes the namespace name must not change.
- [VER10] UBL Schema and schema module minor version changes MUST not break semantic compatibility with prior versions.

An instance self-declares its version:

- [VER15] Every UBL document schema must declare an optional element named "UBLVersionID" immediately following the optional "UBLExtensions" element.

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Notes:

UBL common library and new document types

Module 1 - Versions of the UBL specification

Lesson 2 - UBL common library and new document types



Schema design inherited from xCBL precursor to UBL:

- one common library of all shared business objects
- 31 different document types define only the document element of each message

Revising all objects involves only revising the common library

Adding new document types to meet user requirements may add new objects to the common library

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Minor versioning for backward compatibility

Module 1 - Versions of the UBL specification

Lesson 3 - Minor versioning for backward compatibility



Only optional constructs can be added to the common library

- e.g. all instances of UBL 2.5 are, automatically, also instances of UBL 2.7

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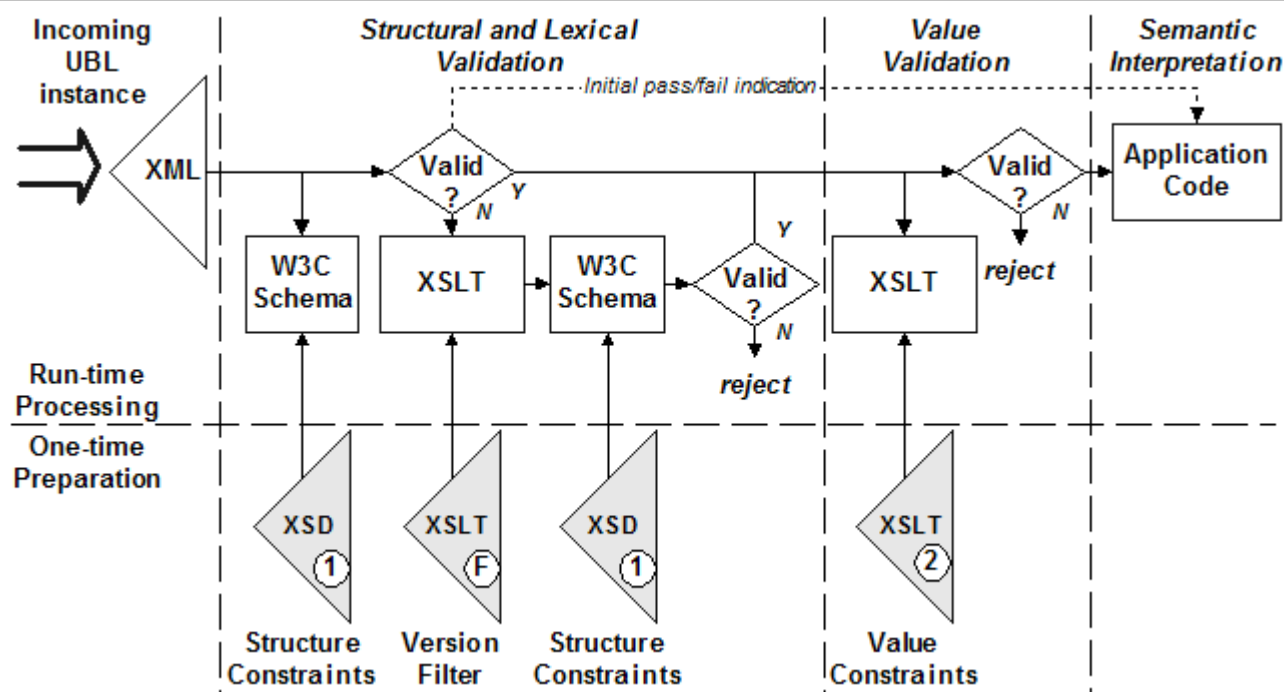
Notes:



Processing model for forward compatibility

Module 1 - Versions of the UBL specification

Lesson 4 - Processing model for forward compatibility



Removes unrecognized constructs from an instance, but only if original does not violate expected constraints.

Contrast this with Published receiver processing model for a like-versioned UBL system (page 5)

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Version high water mark

Module 1 - Versions of the UBL specification

Lesson 5 - Version high water mark

Which should a 2.7 system creating an instance using only 2.3 constructs show?

- `<cbc:UBLVersionID>2.3</cbc:UBLVersionID>`
- `<cbc:UBLVersionID>2.7</cbc:UBLVersionID>`

Logic implies "2.3"

Pragmatism implies "2.7"

Since a 2.3 system won't choke on a 2.7 instance using only 2.3 constructs, pragmatism trumps logic.

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Notes:

Schema synthesis

Module 1 - Versions of the UBL specification

Lesson 6 - Schema synthesis



The information model captures all granularity, order, cardinality and label information for the NDR to change into schema expressions.

The information model orders all BBIE constructs before all ASBIE constructs in an ABIE.

Minor versions are re-expressed as a complete set of schema expressions without using W3C Schema redefinition constructs.

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Notes:

Module 2 - Customizations of UBL



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- Introduction - Customizations of UBL
 - Lesson 1 - UBL Compatibility
 - Lesson 2 - UBL Conformance
 - Lesson 3 - Using XPath files for validating conformance
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Notes:

Customizations of UBL

Module 2 - Customizations of UBL



UBL defines many possible constructs useful in business transactions.

Communities of users may dictate certain optional ones are of no interest at all.

Communities of users may require additional ones not conceived by the committee.

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Notes:

UBL Compatibility

Module 2 - Customizations of UBL

Lesson 1 - UBL Compatibility



Basing interoperability on the ontological/semantic interpretation of business objects based on agreed-upon definition of UBL business objects.

Granularity, cardinality, order and labeling of constituent XML constructs irrelevant to published UBL schemas.

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Notes:

UBL Conformance

Module 2 - Customizations of UBL
Lesson 2 - UBL Conformance



Basing interoperability on the syntactic interchange of the expression of agreed-upon UBL business objects.

Granularity, cardinality, order and labeling of constituent XML constructs must not violate published UBL schemas.

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UBL Conformance (cont.)

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Lesson 2 - UBL Conformance



Customized schemas whose instances are schema-valid with published UBL schemas:

- omit optional UBL constructs
- add customized non-UBL constructs under the standardized `UBLExtensions` element using `<xsd:any>`

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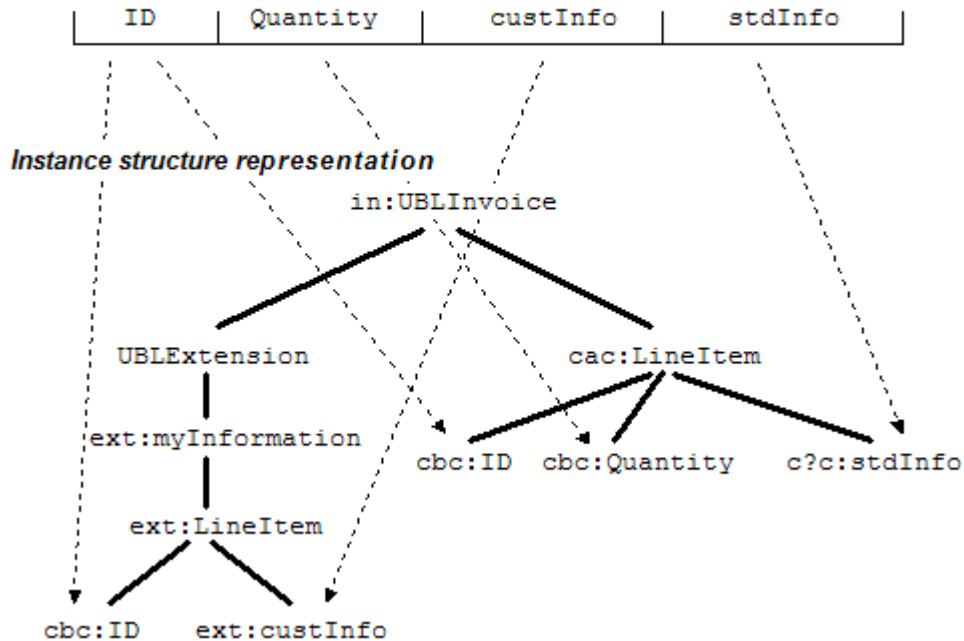
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UBL Conformance (cont.)

Module 2 - Customizations of UBL
Lesson 2 - UBL Conformance

Extended information record



The abstract extended information record is expressed in two pieces without duplicating non-referential constructs.

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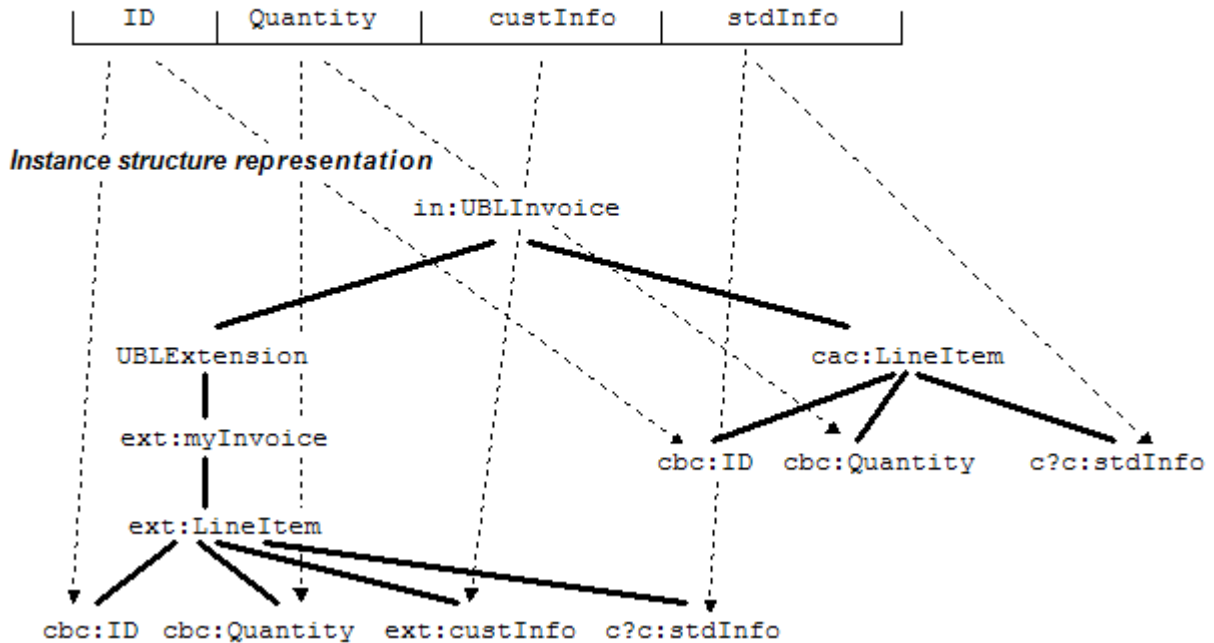


UBL Conformance (cont.)

Module 2 - Customizations of UBL

Lesson 2 - UBL Conformance

Extended information record



The abstract extended information record is expressed in two pieces duplicating non-referential constructs.

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Profiles

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Lesson 2 - UBL Conformance

One community may define different customized versions of the same UBL document for use in different transactions scenarios

e.g. UBL Invoice

- many omissions from OASIS version for use in simplified procurement
- few omissions from OASIS version for use in detailed procurement

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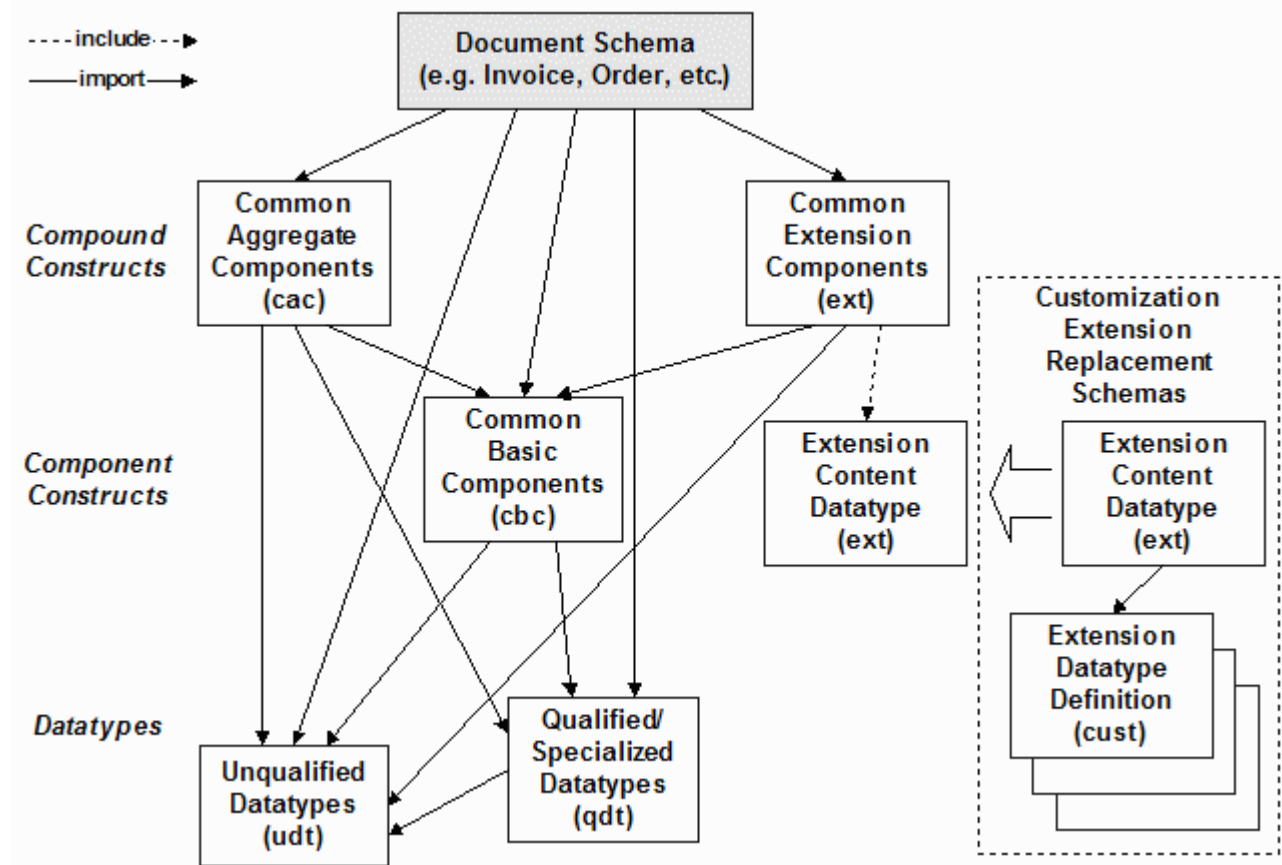
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Conformant schema representation

Module 2 - Customizations of UBL

Lesson 2 - UBL Conformance



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Conformant schema representation (cont.)

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Lesson 2 - UBL Conformance



Surprising backlash of "mistrust" for the subset schema to be reconstituted from scratch.

More anecdotal acceptance of "pruning" the OASIS schema artefacts using XML comment constructs around unwanted schema declarations

- users can "see" the OASIS artefacts are being used

Regardless of the expression approach, how can subset conformance be proven?

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Notes:



Using XPath files for validating conformance

Module 2 - Customizations of UBL

Lesson 3 - Using XPath files for validating conformance

UBL Human Interface Subcommittee created artefacts expressing elements in context

- schema expressions only show parent/child relationships
- non-XML-aware stakeholders cannot picture entire tree with elements in contexts

Validating model conformance requires testing possible elements in context

- some early customizations did not follow NDR and had contextual differences in element constraints

Re-using existing HISC artefacts makes sense rather than inventing new artefacts.

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Using XPath files for validating conformance (cont.)

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Lesson 3 - Using XPath files for validating conformance

```

01 <XPath xmlns="urn:oasis:names:tc:ubl:schema:XPath-1.0"
02     xml:id="urn:oasis:names:tc:ubl:XPath:AttachedDocument-2.0">
03     <Namespace prefix="ad" uri="urn:...:AttachedDocument-2"/>
04     <Namespace prefix="cac" uri="urn:...:CommonAggregateComponents-2"/>
05     <Namespace prefix="cbc" uri="urn:...:CommonBasicComponents-2"/>
06     ...
07     <Element name="AttachedDocument" type="AttachedDocumentType"
08         prefix="ad" minOccurs="1" maxOccurs="1">
09         <Element name="UBLExtensions" type="UBLExtensionsType"
10             prefix="ext" minOccurs="0" maxOccurs="1">
11             <Element name="UBLExtension" type="UBLExtensionType"
12                 prefix="ext" minOccurs="1" maxOccurs="unbounded">
13                 <Element name="ID" type="IDType"
14                     extends="udt:IdentifierType" prefix="cbc"
15                     minOccurs="0" maxOccurs="1" text="">
16                     <Attribute name="schemeAgencyID" use="optional"
17                         type="xsd:normalizedString"/>
18                     <Attribute name="schemeAgencyName" use="optional"
19                         type="xsd:string"/>
20                     ...
21                 </Element>
22                 <Element name="Name" type="NameType"
23                     extends="udt:NameType" prefix="cbc"
24                     minOccurs="0" maxOccurs="1" text="">
25                     <Attribute name="languageID" use="optional"
26                         type="xsd:language"/>
27                 </Element>
28                 <Element name="ExtensionAgencyID"
29                     type="ExtensionAgencyIDType"
30                     extends="udt:IdentifierType" prefix="ext"
31                     minOccurs="0" maxOccurs="1" text="">
32                     <Attribute name="schemeAgencyID" use="optional"
33                         type="xsd:normalizedString"/>
34                     ...
35                 </Element>
36                 ...
37             </Element>
38         </Element>
39         <Element name="UBLVersionID" type="UBLVersionIDType"
40             extends="udt:IdentifierType" prefix="cbc"
41             minOccurs="0" maxOccurs="1" text="">
42             <Attribute name="schemeAgencyID" use="optional"
43                 type="xsd:normalizedString"/>
44             <Attribute name="schemeAgencyName" use="optional"
45                 type="xsd:string"/>
46             ...
47         </Element>
48         ...

```




Using XPath files for validating conformance (cont.)

Module 2 - Customizations of UBL

Lesson 3 - Using XPath files for validating conformance

```

01 1      1..1 /ad:AttachedDocument/
02 2      0..1 /ad:AttachedDocument/ext:UBLExtensions/
03 3      1..n /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
04 4      0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
05                                     cbc:ID
06 4.1 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
07                                     cbc:ID/@schemeAgencyID
08 4.2 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
09                                     cbc:ID/@schemeAgencyName
10 4.3 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
11                                     cbc:ID/@schemeDataURI
12 4.4 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
13                                     cbc:ID/@schemeID
14 4.5 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
15                                     cbc:ID/@schemeName
16 4.6 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
17                                     cbc:ID/@schemeURI
18 4.7 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
19                                     cbc:ID/@schemeVersionID
20 5      0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
21                                     cbc:Name
22 5.1 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
23                                     cbc:Name/@languageID
24 6      0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
25                                     ext:ExtensionAgencyID
26 6.1 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
27                                     ext:ExtensionAgencyID/@schemeAgencyID
28 6.2 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
29                                     ext:ExtensionAgencyID/@schemeAgencyName
30 6.3 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
31                                     ext:ExtensionAgencyID/@schemeDataURI
32 6.4 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
33                                     ext:ExtensionAgencyID/@schemeID
34 6.5 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
35                                     ext:ExtensionAgencyID/@schemeName
36 6.6 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
37                                     ext:ExtensionAgencyID/@schemeURI
38 6.7 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
39                                     ext:ExtensionAgencyID/@schemeVersionID
40 7      0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
41                                     ext:ExtensionAgencyName
42 7.1 0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
43                                     ext:ExtensionAgencyName/@languageID
44 8      0..1 /ad:AttachedDocument/ext:UBLExtensions/ext:UBLExtension/
45                                     ext:ExtensionVersionID

```

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Notes:



Using XPath files for validating conformance (cont.)

Module 2 - Customizations of UBL

Lesson 3 - Using XPath files for validating conformance

```

01 <ad:AttachedDocument
02   xmlns:ad="urn:...:AttachedDocument-2"
03   xmlns:cac="urn:...:CommonAggregateComponents-2"
04   xmlns:cbc="urn:...:CommonBasicComponents-2"
05   ...
06   <ext:UBLExtensions>
07     <ext:UBLExtension>
08       <cbc:ID schemeAgencyID="!4.1!" schemeAgencyName="!4.2!"
09 schemeDataURI="!4.3!" schemeID="!4.4!" schemeName="!4.5!"
10 schemeURI="!4.6!" schemeVersionID="!4.7!">!4!</cbc:ID>
11       <cbc:Name languageID="!5.1!">!5!</cbc:Name>
12       <ext:ExtensionAgencyID schemeAgencyID="!6.1!"
13 schemeAgencyName="!6.2!" schemeDataURI="!6.3!" schemeID="!6.4!"
14 schemeName="!6.5!" schemeURI="!6.6!" schemeVersionID="!6.7!"
15 >!6!</ext:ExtensionAgencyID>
16       <ext:ExtensionAgencyName languageID="!7.1!"
17 >!7!</ext:ExtensionAgencyName>
18       <ext:ExtensionVersionID schemeAgencyID="!8.1!"
19 schemeAgencyName="!8.2!" schemeDataURI="!8.3!" schemeID="!8.4!"
20 schemeName="!8.5!" schemeURI="!8.6!" schemeVersionID="!8.7!"
21 >!8!</ext:ExtensionVersionID>
22       <ext:ExtensionAgencyURI schemeAgencyID="!9.1!"
23 schemeAgencyName="!9.2!" schemeDataURI="!9.3!" schemeID="!9.4!"
24 schemeName="!9.5!" schemeURI="!9.6!" schemeVersionID="!9.7!"
25 >!9!</ext:ExtensionAgencyURI>
26       <ext:ExtensionURI schemeAgencyID="!10.1!"
27 schemeAgencyName="!10.2!" schemeDataURI="!10.3!" schemeID="!10.4!"
28 schemeName="!10.5!" schemeURI="!10.6!" schemeVersionID="!10.7!"
29 >!10!</ext:ExtensionURI>
30       <ext:ExtensionReasonCode languageID="!11.1!" 1
31 listAgencyID="!11.2!" listAgencyName="!11.3!" listID="!11.4!"
32 listName="!11.5!" listSchemeURI="!11.6!" listURI="!11.7!"
33 listVersionID="!11.8!" name="!11.9!">!11!</ext:ExtensionReasonCode>
34       <ext:ExtensionReason languageID="!12.1!"
35 >!12!</ext:ExtensionReason>
36       <ext:ExtensionContent>
37       </ext:ExtensionContent>
38     </ext:UBLExtension>
39   </ext:UBLExtensions>
40   <cbc:UBLVersionID schemeAgencyID="!14.1!"
41 schemeAgencyName="!14.2!" schemeDataURI="!14.3!"
42 schemeID="!14.4!" schemeName="!14.5!" schemeURI="!14.6!"
43 schemeVersionID="!14.7!">!14!</cbc:UBLVersionID>
44   ...

```

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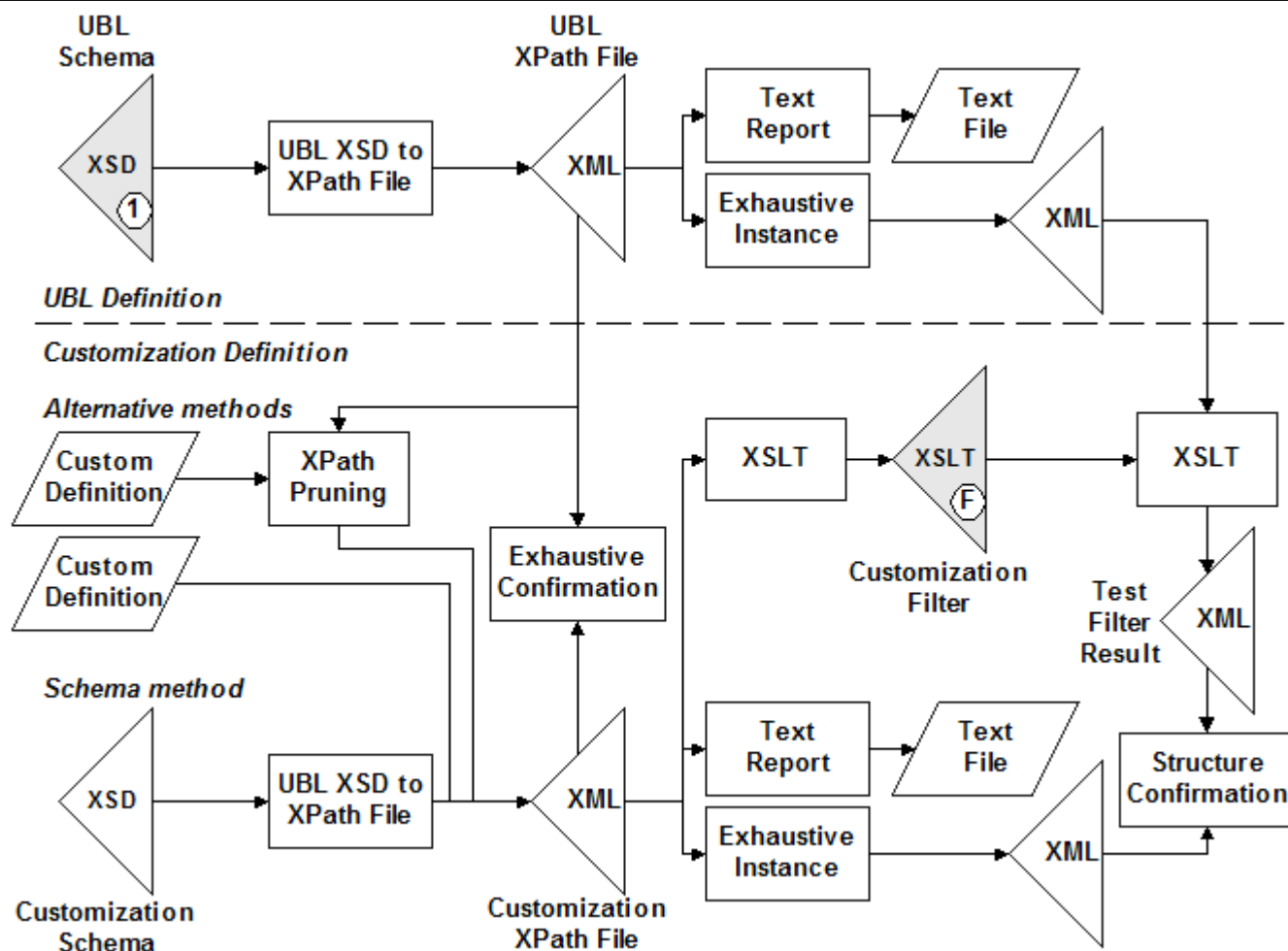
Notes:



Using XPath files for validating conformance (cont.)

Module 2 - Customizations of UBL

Lesson 3 - Using XPath files for validating conformance



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Module 3 - Trading partner agreements on value constraints



- Lesson 1 - Trading partner agreements on value constraints

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Notes:

Trading partner agreements on value constraints

Module 3 - Trading partner agreements on value constraints

Lesson 1 - Trading partner agreements on value constraints



An individual using the original UBL or a community's customization has changing business requirements:

- changing over time for a given trading partner
- different between different trading partners

Value constraints may be different in different contexts for the same information item

Different collections of value constraints represent a different "version" of using UBL.

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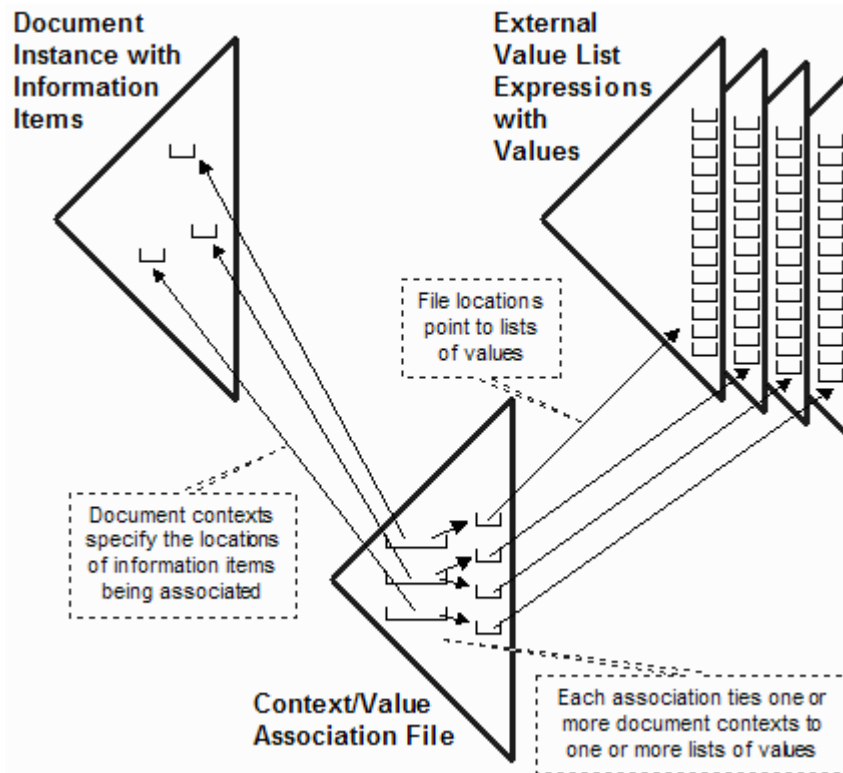
Notes:



Associating values with document contexts

Module 3 - Trading partner agreements on value constraints

Lesson 1 - Trading partner agreements on value constraints



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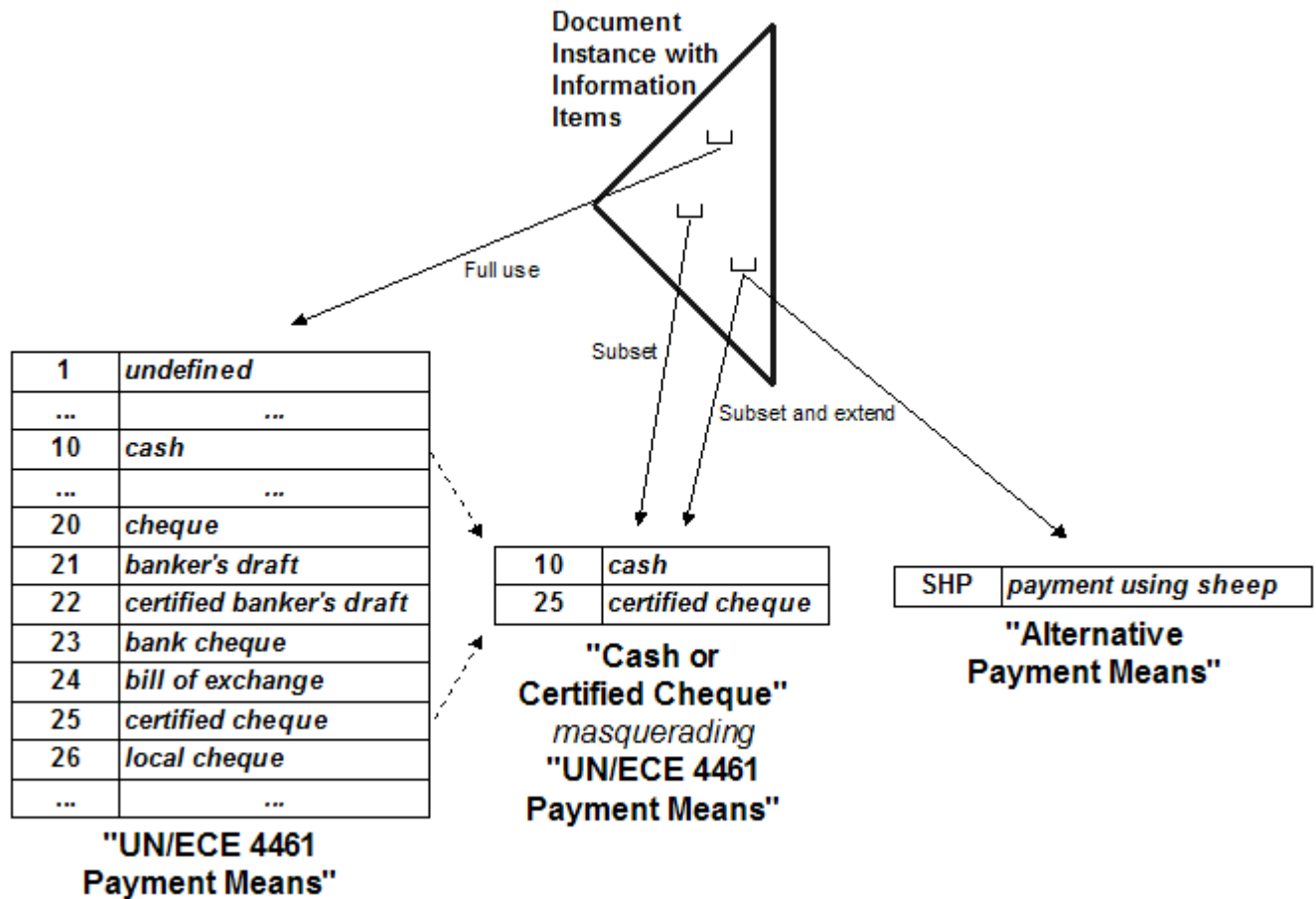
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Contextual uses of code lists

Module 3 - Trading partner agreements on value constraints

Lesson 1 - Trading partner agreements on value constraints



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Value-level meta data

Module 3 - Trading partner agreements on value constraints

Lesson 1 - Trading partner agreements on value constraints

Code	Name	Country	Subdivision	Port, rail, road, air, post, multi-modal, fixed border	IATA	
ADALV	Andorra la Vella	Andorra		3,4,6	ALV	...
...
USCB8	Columbus	United States	MT	2,3	CB8	...
USCBW	Columbus	United States	WI	3	CBW	...
USCLU	Columbus	United States	IN	3,4	CLU	...
USCMH	Columbus	United States	OH	4	CMH	...
USCSG	Columbus	United States	GA	3,4	CSG	...
USCUS	Columbus	United States	NM	3,4,B	CUS	...
USCZX	Columbus	United States	NC	3,6	CZX	...
USOLP	Columbus	United States	MO	3,6	OLP	...
USOLU	Columbus	United States	NE	3,4	OLU	...
USUBS	Columbus	United States	MS	3,4	UBS	...
USUCU	Columbus	United States	KS	2,3	UCU	...
USVCB	Columbus	United States	TX	3	VCB	...
USVDA	Columbus	United States	MI	4	VDA	...
USYBC	Columbus	United States	NJ	2,3,6	YBC	...
...
ZWWKI	Hwange	Zimbabwe		4	WKI	...

"UN/ECE Rec 16 LOCODE"

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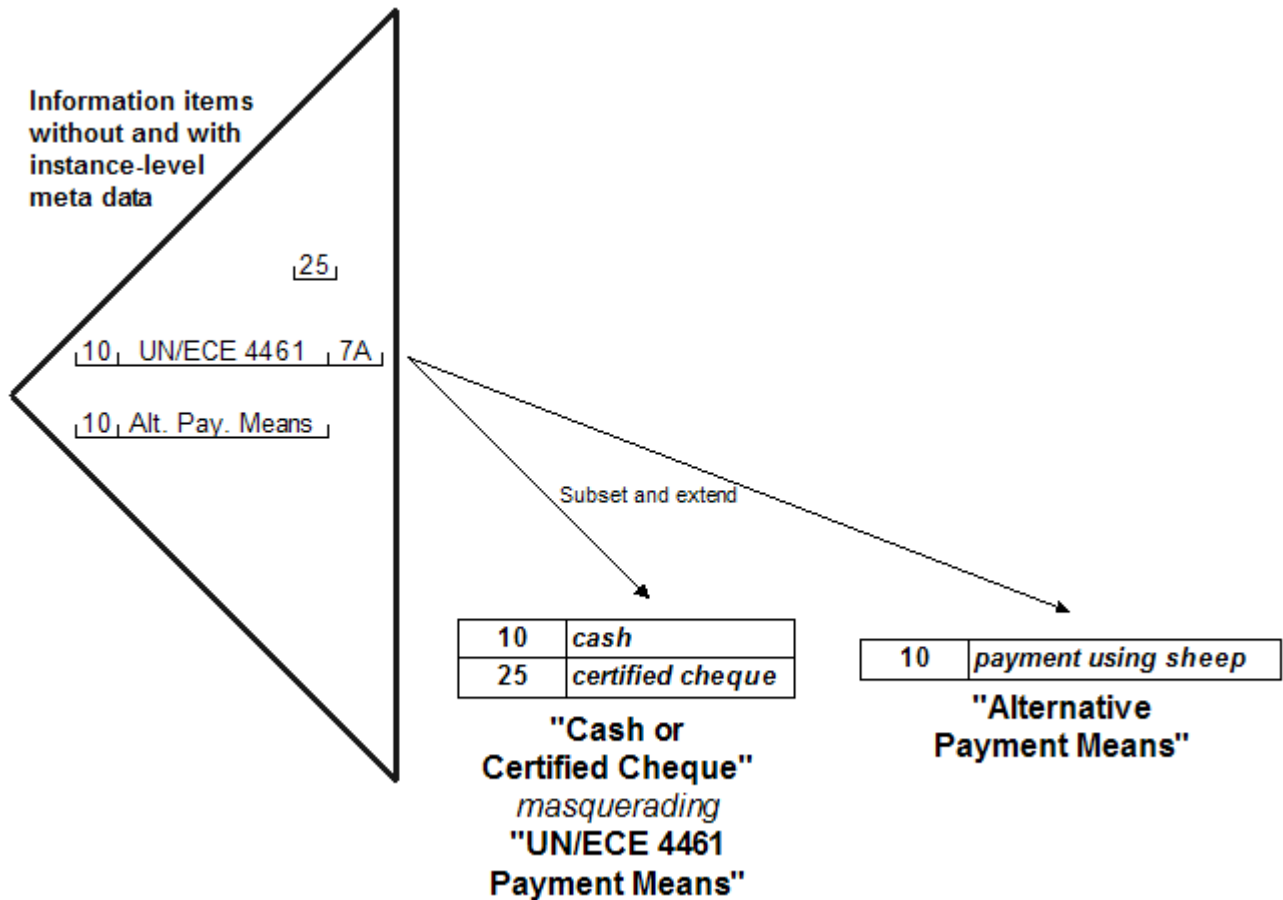
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Instance-level meta data

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Lesson 1 - Trading partner agreements on value constraints



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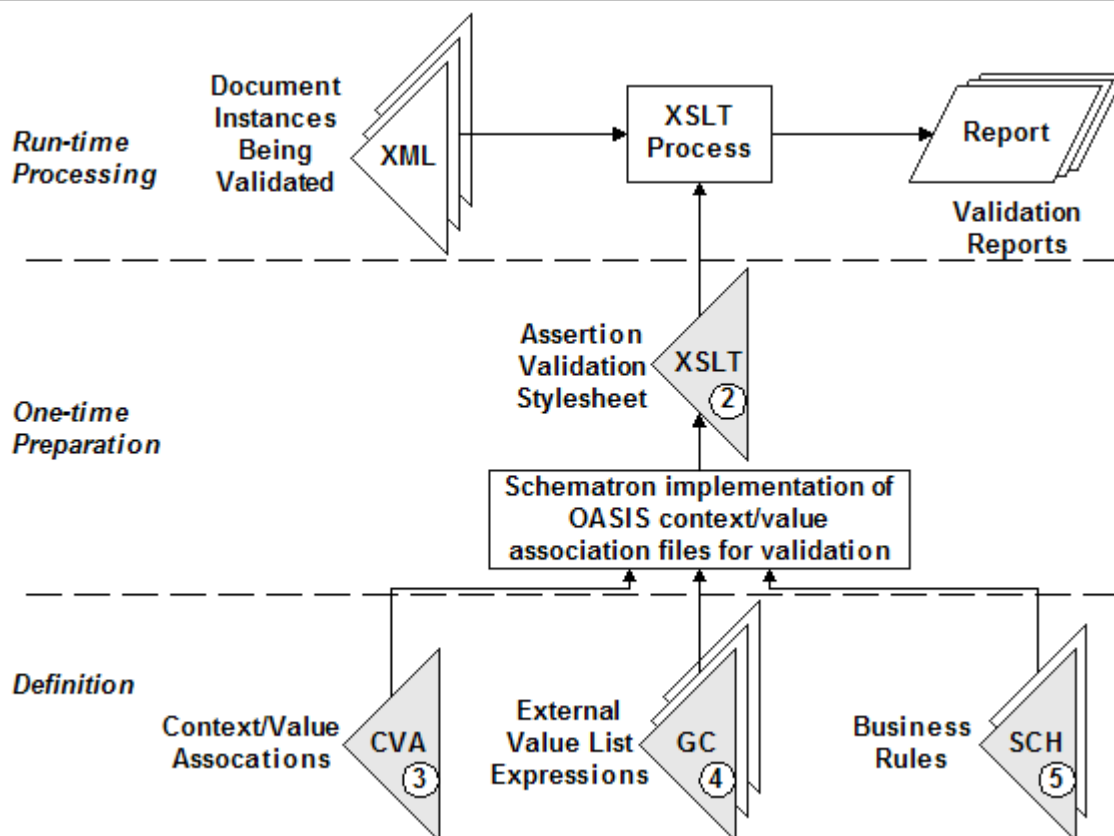
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Validation artefacts

Module 3 - Trading partner agreements on value constraints

Lesson 1 - Trading partner agreements on value constraints



Artefact plugs into Published receiver processing model for a like-versioned UBL system (page 5) or Processing model for forward compatibility (page 11)

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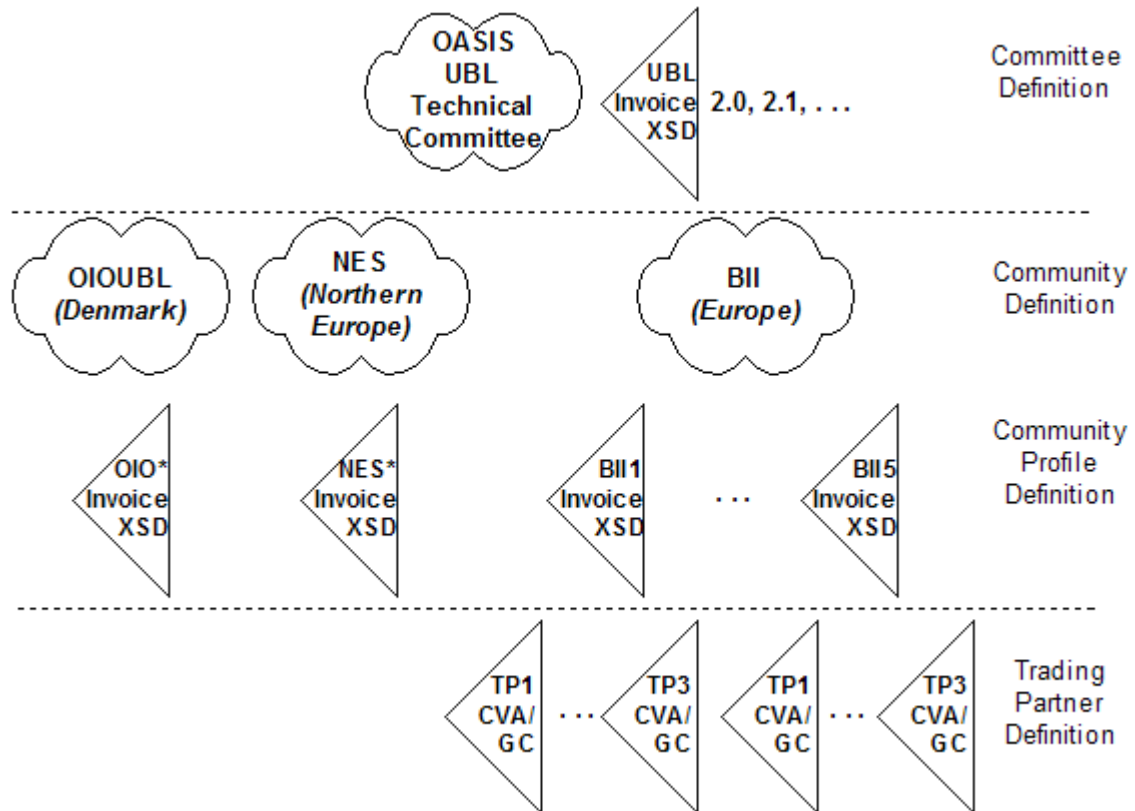
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Conclusion

Conclusion - Versions in UBL

Many versions of UBL used around the world:



Versioning approaches support document-level schema validity across all versions

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Notes:



Versions in UBL

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