Business Document Naming and Design Rules Version 1.0

Committee Specification Draft 02

01 June 2016

Specification URIs

This version:

http://docs.oasis-open.org/ubl/Business-Document-NDR/v1.0/csd02/Business-Document-NDR-v1.0-csd02.xml (Authoritative)
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Previous version:

http://docs.oasis-open.org/ubl/Business-Document-NDR/v1.0/csprd01/Business-Document-NDR-v1.0-csprd01.xml (Authoritative)
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http://docs.oasis-open.org/ubl/Business-Document-NDR/v1.0/Business-Document-NDR-v1.0.html
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Abstract:

This specification prescribes a set of naming and design rules used to create XML document model validation artefacts (W3C Schema XSD files and OASIS Context/value association files) associated with abstract information bundles formally described using the Core Component Technical Specification 2.01 [**CCTS**].

Status:

This document was last revised or approved by the OASIS Universal Business Language TC on the above date. The level of approval is also listed above. Check the "Latest version" location noted above for possible later revisions of this document. Any other numbered Versions and other technical work produced by the Technical Committee (TC) are listed at https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=ubl#technical.

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See Appendix A, *(informative) Release notes* for more information regarding this release package.

Citation format:

When referencing this specification the following citation format should be used:

[**Business-Document-NDR-v1.0**] *Business Document Naming and Design Rules Version 1.0.* Edited by Tim McGrath, Andy Schoka and G. Ken Holman. 01 June 2016. OASIS Committee Specification Draft 02. http://docs.oasis-open.org/ubl/Business-Document-NDR/v1.0/csd02/Business-Document-NDR-v1.0-csd02.html. Latest version: http://docs.oasis-open.org/ubl/Business-Document-NDR/v1.0/Business-Document-NDR-v1.0.html.

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1 Introduction

1.1 Basic concepts

1.1.1 Naming and design rules

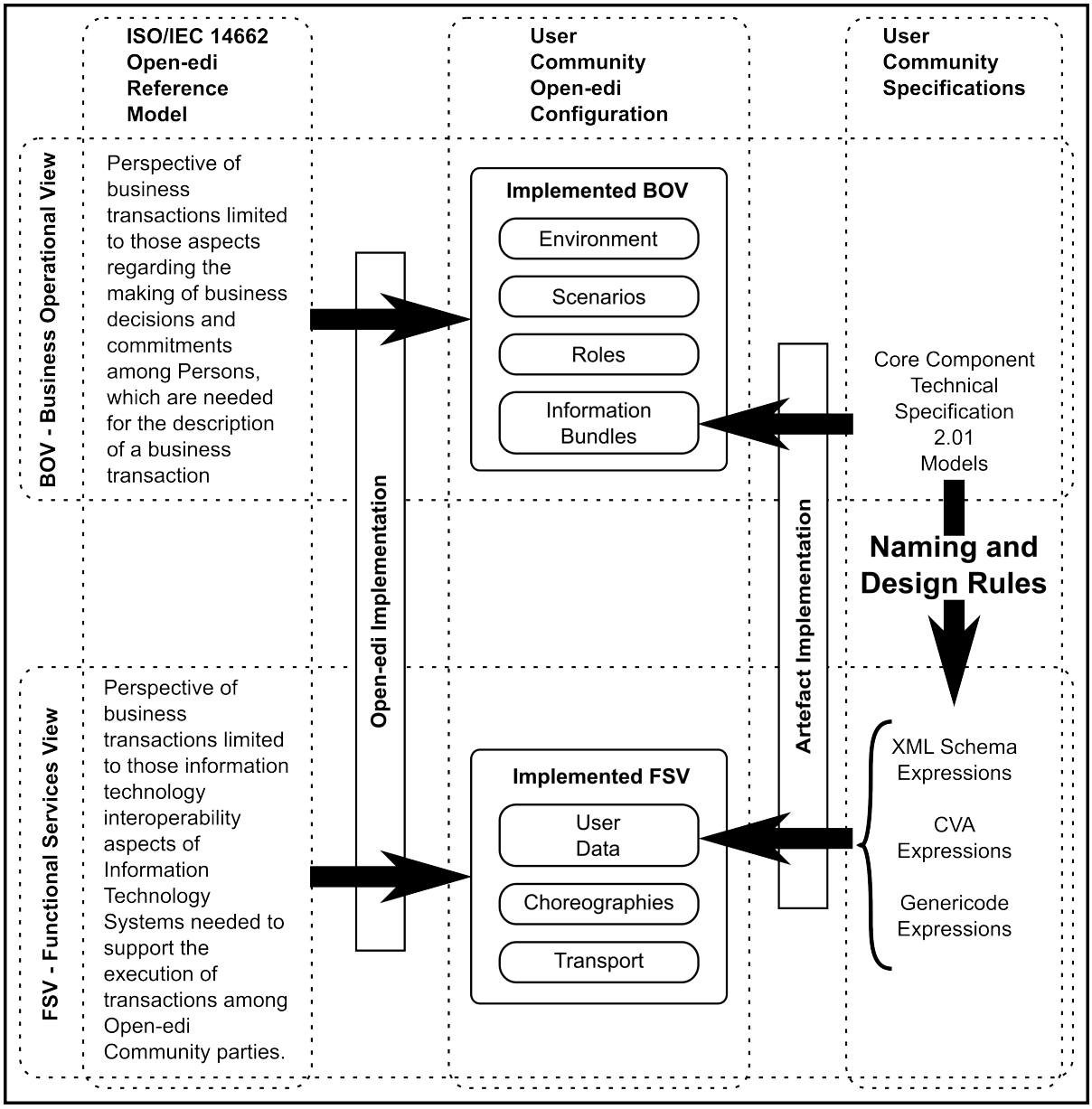
The Open-edi Reference Model [**ISO 14662**] defines an information bundle as the abstract description of the structure and semantics of the information exchanged between parties.

An information bundle can be represented as a logical semantic model. This logical semantic model can be used to produce a physical syntax model that defines the structure and syntax of the Open-edi user data actually exchanged in business transactions.

These naming and design rules formalize a method of representing the semantic components of information bundles using the ebXML Core Components Technical Specification [**CCTS**]. These semantic models can then be used to produce equivalent W3C Schema XSD schema XSD files and OASIS Context/value Association [**CVA**] expressions suitable for defining and validating XML Documents used to convey Open-edi user data.

This is illustrated in Figure 1, “XML Naming and Design Rules in an Open-edi Application”.

Figure 1. XML Naming and Design Rules in an Open-edi Application



The rules presume the reader is already familiar with the following specifications:

- United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) Core Components Technical Specification 2.01 – Part 8 of the ebXML Framework [**CCTS**];
- ISO/IEC 11179 Data Elements [**ISO 11179**];
- W3C Schema XSD schema XSD files for XML document constraint specification;
- OASIS Context/value association using genericode [**CVA**] for code list association; and
- OASIS genericode [**genericode**] for code list representation.

Note

The OASIS Universal Business Language (UBL) can be considered as a reference implementation of these naming and design rules and the examples used in this specification are primarily taken from the UBL 2.1 specifications.

Note

Other validation artefacts (using RelaxNG and ASN.1) are also provided for UBL 2.1. The rules for producing these are outside the scope of this work product.

1.1.2 Modeling concepts

Information bundles (describing information to be exchanged) are modeled as a collection of semantic components.

Each semantic component in an information bundle corresponds to one of the following types of Business Information Entity (BIE) in a CCTS Document Model:

- a single irreducible semantic component (referred to as a Basic Business Information Entity or BBIE);
- a structured aggregation of other semantic components (referred to as an Aggregate Business Information Entity or ABIE); or
- an association between ABIEs (referred to as an Association Business Information Entity or ASBIE).

The CCTS semantic model is not dependent on the syntax of the Open-edi user data actually exchanged.

The Open-edi user data exchanged between parties is a machine-readable instance of an information bundle (CCTS Document Model).

This specification assumes XML is the machine-readable syntax used for exchanging the Open-edi user data.

When using an XML document for exchanging Open-edi user data each BIE corresponds to an XML element.

The relationships between these various concepts are described in Table 1, “Modeling concepts”

Table 1. Modeling concepts

Open-edi Reference Model (ISO 14882)	Semantic Model (ebXML CCTS)	Physical representation (W3C XML)
Information bundle	Semantic model	Document schema
Semantic component	Business Information Entity	XML element
Open-edi user data	Document	XML document
	Document ABIE	XML document element schema definition with only element children, and the XML document element itself
	Library ABIE	XML element schema definition (but not a document element schema definition) with only element children
	ASBIE	XML element (but not a document element) with only element children, defined by a Library ABIE
	BBIE	XML element with only text characters as children, no elements as children

1.1.3 Business Information Entities

Following the conventions of the ebXML Core Component Technical Specification [**CCTS**] a Business Information Entity (BIE) is piece of business data or a group of pieces of business data with a unique business semantic definition.

A BIE is the result of using a core component within a specific business context. As such each BIE must be based on a core component. The definition of core components is outside the scope of this specification.

It is the Business Information Entities that provide the structure for the semantic components of the body of the business document.

The semantic components used to create the Open-edi user data validation artefacts (following these naming and design rules) are to be applied in a specific business context. Therefore it is the contextualized Business Information Entities to which these rules apply and not the core components from which they have been derived.

1.2 Terminology

1.2.1 Key words

The key words *must*, *must not*, *required*, *shall*, *shall not*, *should*, *should not*, *recommended*, *may*, and *optional* in this document are to be interpreted as described in [**RFC 2119**]. Note that for reasons of style, these words are not capitalized in this document.

1.2.2 Terms and Definitions

Business Information Entity (BIE)
: A piece of business data or a group of pieces of business data with a unique Business Semantic definition, see [**CCTS**].

Context/value Association (CVA)
: The association of value constraints imposed on information found in a particular document context, see [**CVA**].

document ABIE
: The apex ABIE of an information bundle.

document element
: The apex element of information in an XML document, see [**XML**].

extension collection
: The set of extension elements found in an XML document, constrained by an extension schema, that supplements the base information that is constrained by the published document model.

extension item
: A single instance of structured supplemental information and its associated metadata distinguishing it from other extension items.

extension point
: The apex element of structured supplemental information described by its metadata.

information bundle
: The formal description of the semantics of the recorded information to be exchanged, as defined in [**ISO 14662**].

naming and design rules
: A set of rules governing the expression of information bundles using [**CCTS**], and the creation of associated XML document model validation artefacts using [**CVA**] and XSD schema.

object class
: A set of ideas, abstractions, or things in the real world that are identified with explicit boundaries and meaning and whose properties and behavior follow the same rules [**ISO 11179**] (definition 3.3.22).

Open-edi user data
: Machine-readable instance of the content of information bundles or components of information bundles (as semantic components), see [**ISO 14662**].

property
: A characteristic common to all members of an object class [**ISO 11179**] (definition 3.3.29).

semantic component
: A unit of information unambiguously defined in the context of the business goal of the business transaction. A semantic component may be atomic or composed of other semantic components, see [**ISO 14662**].

XSD schema
: An XML document model definition conforming to the W3C XML Schema language [**XSD1**][**XSD2**].

The terms Core Component (CC), Basic Core Component (BCC), Aggregate Core Component (ACC), Association Core Component (ASCC), Business Information Entity (BIE), Basic Business Information Entity (BBIE), and Aggregate Business Information Entity (ABIE) are used in this specification with the meanings given in [**CCTS**].

The terms Object Class, Property Term, Representation Term, and Qualifier are used in this specification with the meanings given in [**ISO 11179**].

1.2.3 Symbols and Abbreviations

ABIE
: Aggregate Business Information Entity [**CCTS**]

ASBIE
: Association Business Information Entity [**CCTS**]

BIE
: Business Information Entity [**CCTS**]

BBIE
: Basic Business Information Entity [**CCTS**]

CCTS
: Core Component Technical Specification [**CCTS**]

CVA
: Context/value Association [**CVA**]

NDR
: Naming and Design Rules naming and design rules

TC
: Technical Committee

XSD
: W3C XML Schema Definition XSD schema

1.3 Normative References

[**CCTS**] *UN/CEFACT Core Component Technical Specification - Part 8 of the ebXML Framework)* 15 November 2003Version 2.01*http://www.unece.org/fileadmin/DAM/cefact/codesfor-trade/CCTS/CCTS_V2-01_Final.pdf*

[**CVA**] *OASIS Context/value association using genericode 1.0.* 15 April 2010. Committee Specification 01. http://docs.oasis-open.org/codelist/cs01-ContextValueAssociation-1.0/doc/context-value-association.html.

[**genericode**] *OASIS Code List Representation (Genericode) Version 1.0.* 28 December 2007. Committee Specification 01. http://docs.oasis-open.org/codelist/cs-genericode-1.0/doc/oasis-code-list-representation-genericode.html.

[**ISO 11179**] *ISO/IEC 11179-1:2004 Information technology — Specification and standardization of data elements — Part 1: Framework for the specification and standardization of data elements* *http://standards.iso.org/ittf/PubliclyAvailableStandards/c035343_ISO_IEC_11179-1_2004(E).zip*

[**ISO 14662**] *ISO/IEC 14662:2004 Information technology — Open-edi reference model* *http://standards.iso.org/ittf/PubliclyAvailableStandards/*

[**RFC 2119**] S. Bradner, , *Key words for use in RFCs to Indicate Requirement Levels*, BCP 14, RFC 2119, March 1997, <*http://www.rfc-editor.org/info/rfc2119*>.

[**XML**] *Extensible Markup Language (XML) 1.0 (Fifth Edition)*, T. Bray, J. Paoli, C. M. Sperberg-McQueen, E. Maler, F. Yergeau, Editors, W3C Recommendation, 26 November 2008, *http://www.w3.org/TR/2008/REC-xml-20081126/*. Latest version available at *http://www.w3.org/TR/xml*.

[**XPath 1.0**] *XML Path Language (XPath) Version 1.0*, J. Clark, S. DeRose, Editors, W3C Recommendation, 16 November 1999, *http://www.w3.org/TR/1999/REC-xpath-19991116/*. Latest version available at *http://www.w3.org/TR/xpath*.

[**XSD1**] *XML Schema Part 1: Structures Second Edition*, H. S. Thompson, D. Beech, M. Maloney, N. Mendelsohn, Editors, W3C Recommendation, 28 October 2004, *http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/*. Latest version available at *http://www.w3.org/TR/xmlschema-1*.

[**XSD2**] *XML Schema Part 2: Datatypes Second Edition*, P. V. Biron, A. Malhotra, Editors, W3C Recommendation, 28 October 2004, *http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/*. Latest version available at *http://www.w3.org/TR/xmlschema-2*.

1.4 Non-Normative References

[**UBL-2.1**] *Universal Business Language Version 2.1.* 04 November 2013. OASIS Standard. http://docs.oasis-open.org/ubl/os-UBL-2.1/UBL-2.1.html.

[**UBL-CCTS**] *UBL Conformance to ebXML CCTS ISO/TS 15000-5:2005 Version 1.0* 08 May 2014. Committee Note 01. http://docs.oasis-open.org/ubl/UBL-conformance-to-CCTS/v1.0/.

[**xmldsig**] *XML-Signature Syntax and Processing Version 1.1*, D. E. Eastlake, J. Reagle, D. Solo, F. Hirsch, M. Nyström, T. Roessler, K. Yiu, Editors, W3C Recommendation, 11 April 2013, *http://www.w3.org/TR/2013/REC-xmldsig-core1-20130411/*. Latest version available at *http://www.w3.org/TR/xmldsig-core1*.

2 Context of use and application of these rules

These XML Naming and Design Rules may be used to create a collection of artefacts for defining and validated a set of extensible XML document types.

They describe processes for:

A. expressing the semantic components of information bundles using the ebXML Core Components Technical Specification [**CCTS**], and

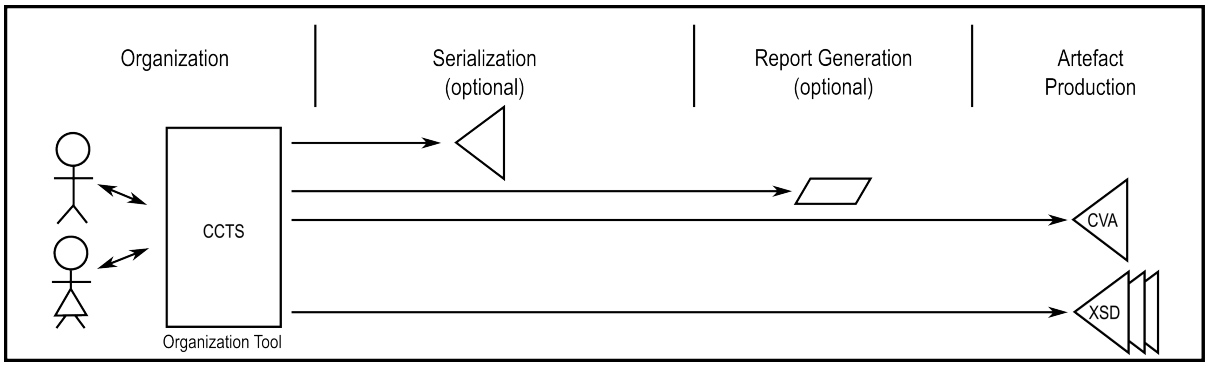
B. producing XML definition and validation artefacts based on those semantic components, specifically:

   I. Document structural constraints of elements and attributes (for example, nesting and cardinality) using W3C Schema XSD schema, and

   II. Data value constraints using OASIS Context/value Association [**CVA**] expressions of values [**genericode**] (for example, coded value domains or code lists) with XML document locations using XPath [**XPath 1.0**].

These processes are depicted in Figure 2, “Generic NDR processes to create XML validation artefacts”.

Figure 2. Generic NDR processes to create XML validation artefacts



Designers (and implementers) may choose to adopt other, optional processes to produce additional artefacts. For example, the serialization of the information bundle (as a CCTS model) into a form suitable for further processing or the production of reports useful in the design and review of the model. See Appendix C, *(informative) Additional production processes* for more details.

3 Information modeling

3.1 Document ABIEs

A Document ABIE structures the apex of the information bundle to be exchanged between parties.

MOD01 Document ABIE
The apex of the information bundle shall be structured as a single top-level ABIE, referred to in this specification as a Document ABIE. **Note** The rationale is that the Document ABIE is always considered a one-member collection in and of itself with no other members in the collection.

3.2 ABIE library

The ABIE library is a collection of common, reusable ABIEs available to be referenced by ASBIEs.

The ABIE library does not include any Document ABIEs.

MOD02 ABIE library contents
A Document ABIE shall not be referenced by any ASBIE. **Note** The rationale is that Document ABIEs are identified in syntax implementations separately from other collections of ABIEs.

MOD03 ABIE library ordering
The ABIE library shall have all ABIEs defined in alphabetical order of the ABIE's dictionary entry name. **Note** The rationale is that the library can be very large and a reader new to the library may be unfamiliar with any arbitrary ordering of the ABIEs. Designers and implementers can navigate a collection of ABIEs more easily when they are in alphabetical order.

3.3 Extensions

Wherever possible semantic components within an information bundle should be expressed using the BIEs found in an existing Document ABIE or the ABIE Library. However there may be implementations where supplementary information is required to be exchanged in the information bundle in a way that does not interfere with existing BIEs.

The extension mechanism in this specification provides for including additional semantic components that may augment a standardized information bundle with customized additional information.

Extensions can contain new BIEs or can reference BIEs from existing ABIEs but used in a different context. Extensions can also include foreign constructs not defined as BIEs.

Extensions may be horizontal in nature in that they are available to use for all information bundles. An example might be the structure of digital signatures.

Extensions may also be vertical in nature, in that they are applicable only to a single information bundle. For example, additional invoice line detail information to augment an invoice for a specific industry.

An extension collection provides a placeholder for the extensions to be used with a set of Open-edi user data. Within each collection there may be a number of extensions, each with metadata properties regarding the extension and each with a single extension point (the apex structure of the supplemental information).

MOD04 Extension availability
Each document shall allow for optional augmentation with a collection of information not conceptually described by existing BIEs.

Note

There are no constraints on the information that may be included in an extension, including re-using BIEs from existing ABIEs.

Note

When using an XML document for exchanging Open-edi user data, extension XSD schema fragments augment the document's XSD schema created for a document ABIE.

4 Dictionary information

4.1 Dictionary information overview

A BIE is described by the values of its dictionary information as specified by the Core Components Technical Specification 2.01 [**CCTS**].

To facilitate the definition of the appropriate name for a BBIE, the CCTS property term is specified as the concatenation of two contributing dictionary information values. The optional property term possessive noun and the mandatory property term primary noun are used. When the possessive noun is used the values are separated by a space character.

To facilitate the definition of the appropriate name for a ASBIE, the CCTS property term is specified as the concatenation of two contributing dictionary information values. The optional associated object class qualifier and the mandatory associated object class are used. When the associated object class qualifier is used the qualifier value is suffixed with an underscore character and the values are separated by a space character.

4.2 Dictionary information values

Certain rules govern the creation and expression of dictionary information values for all BIEs defined in the semantic model of an information bundle.

COM01 Dictionary information values
The text describing dictionary information values shall be a string value of Unicode characters without embedded hierarchical structure. The value itself may be structured in its syntax within the string. **Note** The rationale is that the dictionary information values may be constrained in its expression, such as is true in an XML attribute.

COM02 Dictionary information value prohibited characters and character sequences
The following characters shall not be contained in any dictionary information value: • the characters "<", ">", "&" • white-space characters other than the " " (space) character • the character sequence "--" **Note** The rationale is that prohibiting these characters and sequences will allow the dictionary information values to be processed more simply in different XML contexts without special handling. **Note** The constraint on white-space characters prohibits values from being structured as paragraphs.

4.3 Abbreviations

It may be convenient to abbreviate complex terms or to use commonly-accepted abbreviations in dictionary information values.

COM03 Controlled list of abbreviations in BIE names
Abbreviations for terms used in BIE names shall be taken from a controlled list of abbreviations agreed for use within the semantic model. **Examples** "Identifier" is abbreviated as "ID". "Universally Unique Identifier" is abbreviated as "UUID". **Note** The rationale is that some common or complex terms have commonly-accepted abbreviations suitable for shortening the length of BIE names.

COM04 Controlled list of abbreviations in dictionary entry name information values
Abbreviations for terms used in dictionary entry name information values shall be taken from a controlled list of commonly-agreed abbreviations. **Examples** "XML Path Language" is abbreviated as "XPath". "Card Verification Value" is abbreviated as "CV2". **Note** The rationale is that some common terms have widely-accepted abbreviations in general use or in particular use within the information domain. Inconsistent use of abbreviations may lead to semantic ambiguity.

COM05 List of equivalent terms in BIE names
Equivalent terms used in BIE names shall be taken from a list of commonly-agreed equivalent terms. **Example** The property term primary noun "URI" is considered equivalent to the representation term "Identifier". **Note** The rationale is that some common terms wholly include the concepts presented in other terms and so should be considered equivalent in order to prevent duplication.

4.4 Dictionary information for BIEs

4.4.1 Component type for BIEs

COM06 Component Type for a BIE
Each BIE component shall be typed as being one of either an ABIE, BBIE or ASBIE.

4.4.2 Dictionary information for ABIEs

COM07 Minimum set of dictionary information values describing an ABIE

Each ABIE shall have the following set of dictionary information values:
• Component Type (mandatory)
  • shall be the value "ABIE"
• Definition (mandatory)
  • this value shall describe the ABIE using complete natural language sentences in a single paragraph
• Alternative Business Terms (optional)
  • this value shall list any other commonly used terms that are synonyms for the ABIE
• Object Class Qualifier (optional)
  • this value shall qualify the object class for a specific context
• Object Class (mandatory)
  • this value shall identify the object of interest within an information bundle; it is the class to which the ABIE's BIEs belong
• Name (mandatory)
  • this value shall be the concatenation of Object Class Qualifier and the Object Class without any spaces, abbreviating the values as required
Example (using an XPath expression)
Given the following:
$OCQ = Object Class Qualifier
$OC = Object Class
C:ABBREV(arg) = custom function to return the abbreviation of an argument, or the argument itself if no abbreviation, and all spaces removed
`concat( C:ABBREV($OCQ),`
`C:ABBREV($OC)`
`)`
• Dictionary Entry Name (mandatory)

COM07 Minimum set of dictionary information values describing an ABIE

- this value shall be the concatenation of the Object Class Qualifier, followed by an underscore and space when defined, followed by the Object Class, followed by a period and space, followed by the word "Details"

Example (using an XPath expression)

Given the following:

$OCQ = Object Class Qualifier
$OC = Object Class

```
concat( if( $OCQ )
          then concat($OCQ,'_ ') else '',
        $OC,
        '. Details'
      )
```

Example ABIE

Fixed value:

Component Type="ABIE"

Entered values:

Definition="A class to define common information related to an address."
Object Class="Address"

Derived values:

Name="Address"
Dictionary Entry Name="Address. Details"

4.4.3 Dictionary information for BBIEs

COM08 Minimum set of dictionary information values describing a BBIE

Each BBIE shall have the following set of dictionary information values:

- Component Type (mandatory)
  - shall be the value "BBIE"
- Cardinality (mandatory)
  - shall be one of:
    - "1" (required and not repeatable),
    - "0..1" (optional and not repeatable),
    - "0..n" (optional and repeatable) or
    - "1..n" (required and repeatable)
- Definition (mandatory)

COM08 Minimum set of dictionary information values describing a BBIE

- this value shall describe the BBIE using complete natural language sentences in a single paragraph

- Alternative Business Terms (optional)
  - this value shall list any other commonly used terms that are synonyms for the ABIE
- Object Class Qualifier (optional)
  - this value shall qualify the object class for a specific context
- Object Class (mandatory)
  - this value shall identify the object class of the ABIE to which the BBIE belongs
- Property Term Qualifier (optional)
  - this value shall qualify the property term for a specific context
- Property Term Possessive Noun (optional)
  - this value shall identify a distinguishing nature of the characteristic of the object class
- Property Term Primary Noun (mandatory)
  - this value shall identify the principle nature of the characteristic of the object class
- Property Term (mandatory)
  - this value shall identify a characteristic of the object class as the concatenation of Property Term Possessive Noun followed by a space should it exist, followed by the Property Term Primary Noun

Example (using an XPath expression)

Given the following:

$PTPsN = Property Term Possessive Noun
$PTPrN = Property Term Primary Noun

```
concat( $PTPSN,
        if( $PTPSN )
          then ' ' else '',
        $PTPRN
      )
```

- Representation Term (mandatory)
  - this value shall identify the form of the value domain and shall be selected from the set of primary and secondary representation terms specified in CCTS Table 8.3 Permissible Representation Terms (ordered by primary term with secondary terms in parentheses):
    - Amount

COM08 Minimum set of dictionary information values describing a BBIE

- Binary Object (Graphic, Picture, Sound, Video)
- Code
- Date Time (Date, Time)
- Identifier
- Indicator
- Measure
- Numeric (Value, Rate, Percent)
- Quantity
- Text (Name)

- Name (mandatory)
  - this value shall be the concatenation of Property Term Qualifier, Property Term Possessive Noun and, when the Property Term Primary Noun is not "Text" or it is "Text" and both the Property Term Qualifier and the Property Term Possessive Noun are not defined, then the Property Term Primary Noun (abbreviating it as required) and, when the Representation Term is not "Text" and the Property Term Primary Noun is not equivalent to the Representation Term, then also the Representation Term component (abbreviating it as required), all without intervening spaces

Example (using an XPath expression)

Given the following:

$PTQ = Property Term Qualifier
$PTPsN = Property Term Possessive Noun
$PTPrN = Property Term Primary Noun
$RT = Representation Term
C:ABBREV(arg) = custom function to return the abbreviation of an argument, or the argument itself if no abbreviation, and all spaces removed, or the argument itself if no abbreviation, and all spaces removed
C:EQUIVALENT(noun,term) = custom function to return TRUE/FALSE if the primary noun and representation term are to be considered equivalent

```
concat( C:ABBREV($PTQ),
        C:ABBREV($PTPSN),
        if( $PTPRN!='Text' OR
            ( not($PTQ) AND not($PTPSN) ) )
          then C:ABBREV($PTPRN) else '',
        if( $RT!='Text' AND not(C:EQUIVALENT($PTPRN,$RT)))
          then C:ABBREV($RT) else ''
      )
```

- Dictionary Entry Name (mandatory)
  - this value shall be the concatenation of the Object Class Qualifier, followed by an underscore and space when defined, followed by the Object Class, followed by a period and space, followed by the Property Term Qualifier, followed by an

COM08 Minimum set of dictionary information values describing a BBIE

underscore and space when defined, followed by the Property Term, and then, when either the Property Term Qualifier is defined or the Property Term is not equal to the Representation Term, followed by a period and space and the Representation Term

Example (using an XPath expression)

Given the following:

$OCQ = Object Class Qualifier
$OC = Object Class
$PTQ = Property Term Qualifier
$PT = Property Term
$RT = Representation Term

```
concat( $OCQ,
        if( $OCQ )
          then '_ ' else '',
        $OC,
        '. ',
        $PTQ,
        if( $PTQ )
          then '_ ' else '',
        $PT,
        if( $PTQ OR ( $PT != $RT ) )
          then concat( '. ',$RT) else ''
      )
```

- Data Type Qualifier (optional)
  - this value shall distinguish particular restrictions on a data type from the use of a data type with other (or no) restrictions
- Data Type (mandatory)
  - this value shall be the concatenation of the Data Type Qualifier followed by an underscore and space when it exists, the Representation Term, followed by a period and space, followed by the word "Type"

Example (using an XPath expression)

Given the following:

$DTQ = Data Type Qualifier
$RT = Representation Term

```
concat( $DTQ,
        if( $DTQ )
          then '_ ' else '',
        $RT,
        '. Type'
      )
```


COM08 Minimum set of dictionary information values describing a BBIE

Example BBIE

Fixed value:

Component Type="BBIE"

Entered values:

Cardinality="0..1"
Definition="An additional street name used to further clarify the address."
Object Class="Address"
Property Term Qualifier="Additional"
Property Term Possessive Noun="Street"
Property Term Primary Noun="Name"
Representation Term="Name"

Derived values:

Name="AdditionalStreetName"
Dictionary Entry Name="Address. Additional_ Street Name. Name"
Property Term="Street Name"
Data Type="Name. Type"

4.4.4 Dictionary information for ASBIEs

COM09 Minimum set of dictionary information values describing an ASBIE

Each ASBIE shall have the following set of dictionary information values:

- Component Type (mandatory)
  - shall be the value "ASBIE"
- Cardinality (mandatory)
  - shall be one of:
    - "1" (required and not repeatable),
    - "0..1" (optional and not repeatable),
    - "0..n" (optional and repeatable) or
    - "1..n" (required and repeatable)
- Definition (mandatory)
  - this value shall describe the BBIE using complete natural language sentences in a single paragraph
- Alternative Business Terms (optional)
  - this value shall list any other commonly used terms that are synonyms for the ABIE
- Object Class Qualifier (optional)
  - this value shall qualify the object class for a specific context

COM09 Minimum set of dictionary information values describing an ASBIE

- Object Class (mandatory)
  - this value shall identify the object class of the ABIE to which the BBIE belongs
- Associated Object Class Qualifier (optional)
  - this value shall qualify the object class of the associated ABIE for a specific context
- Associated Object Class (mandatory)
  - this value shall identify the object class of the ABIE the ASBIE associates to
  - the ABIE must exist in the model with the same qualification (or lack thereof) as the ASBIE's associated object class qualifier
- Property Term Qualifier (optional)
  - this value shall qualify the property term for a specific context
- Property Term (mandatory)
  - this value shall be the concatenation of the Associated Object Class Qualifier, an underscore and a space when defined, and the Associated Object Class

Example (using an XPath expression)

Given the following:

$AOCQ = Associated Object Class Qualifier
$AOC = Associated Object Class

```
concat( $AOCQ,
        if( $AOCQ )
          then '_ ' else '',
        $AOC
      )
```

- Representation Term (mandatory)
  - this value shall be the same as the Property Term
- Name (mandatory)
  - this value shall be the concatenation of Property Term Qualifier and the Property Term without any spaces or underscore, abbreviating the values as required

Example (using an XPath expression)

Given the following:

$PTQ = Property Term Qualifier
$PT = Property Term
C:ABBREV(arg) = custom function to return the abbreviation of an argument, or the argument itself if no abbreviation, and all spaces removed, or the argument itself if no abbreviation, and all spaces removed

COM09 Minimum set of dictionary information values describing an ASBIE

```
concat( C:ABBREV($PTQ),
        C:ABBREV($PT)
      )
```

- Dictionary Entry Name (mandatory)
  - this value shall be the concatenation of the Object Class Qualifier, followed by an underscore and space when defined, followed by the Object Class, followed by a period and space, followed by the Property Term Qualifier, followed by and underscore and space when defined, followed by the Property Term, and then when the Property Term Qualifier is defined, followed by a period and space and the Representation Term

Example (using an XPath expression)

Given the following:

$OCQ = Object Class Qualifier
$OC = Object Class
$PTQ = Property Term Qualifier
$PT = Property Term
$RT = Representation Term

```
concat( $OCQ,
        if( $OCQ )
          then '_ ' else '',
        $OC,
        '. ',
        $PTQ,
        if( $PTQ )
          then '_ ' else '',
        $PT,
        if( $PTQ )
          then concat('. ',$RT) else ''
      )
```

Example ASBIE

Fixed value:

Component Type="ASBIE"

Entered values:

Cardinality="0..1"
Definition="The buyer of the item."
Object Class="Forecast"
Associated Object Class="Customer Party"
Property Term Qualifier="Buyer"

Derived values:

Name="BuyerCustomerParty"
Dictionary Entry Name="Forecast. Buyer_ Customer Party. Customer Party"
Property Term="CustomerParty"

COM09 Minimum set of dictionary information values describing an ASBIE
Representation Term="CustomerParty"

4.4.5 Dictionary entry names

COM10 Dictionary entry name uniqueness
All dictionary entry names in a semantic model shall be unique. **Note** The rationale is that a BIE describes a unique semantic component of business data within a specific business context.

COM11 CCTS dictionary information item name value prohibited characters
All information items contributing to a component's dictionary entry name shall be void of all sensitive dictionary entry name markup characters. The following characters must not be used in any dictionary information values that contribute to the dictionary entry name: • the characters "." (period) and "_" (underscore) • leading, trailing or multiple sequential " " (space) characters **Note** The rationale is that prohibiting these characters in name values prevents ambiguity when assembled into the dictionary entry name using these characters to provide structure.

COM12 Use of leading upper case letter in dictionary entry name values
All words that are not abbreviated in name values contributing to the dictionary entry name shall have a leading upper-case letter and all other letters in lower-case.

4.5 Structure of an ABIE

COM13 ABIE contents cannot be empty
Every ABIE shall contain at least one BIE.

COM14 ABIE children ordering
Every ABIE shall have all of its BBIE children listed before its ASBIE children.

5 XML validation artefacts

5.1 XML validation artefacts overview

These NDR provide for expressing the semantic model of an information bundle as XML artefacts that provide for definition and validation of the structure and content of XML Documents.

There are two types of validation artefacts required for XML Documents:

1. W3C Schemas are used to define and validate *the structure* of elements and data content, and
2. OASIS CVA expressions and OASIS genericode files are used to define and validate *the values* of data content.

These rules do not require these artefacts to be located in any particular directory structure.

5.2 Namespaces

An important aspect of identifying and distinguishing the names used for information in XML documents is by using namespaces. Like-named constructs are distinguished by having different namespaces.

Note

Namespace abbreviations (also used here as namespace prefixes) in these examples are not mandatory and have been selected solely for convenience and consistency. Implementations of these NDR and the documents governed by these NDR are welcome to use any namespace abbreviation or namespace prefix for any of the namespaces defined or referenced.

NAM01 Namespaces for information found in information bundles
BIEs expressed in XML documents shall use the following set of namespaces: • one namespace for each Document ABIE **Note** These namespaces are not abbreviated in these examples as they are not imported or included. • one namespace for all BBIE components **Note** This namespace is abbreviated in these examples as "cbc" for "common basic components". • one namespace for all Library ABIE components **Note** This namespace is abbreviated in these examples as "cac" for "common aggregate components". • one namespace for the extension collection and extension metadata elements

NAM01 Namespaces for information found in information bundles

> **Note**
>
> This namespace is abbreviated in these examples as "ext".

Each extension has a number of namespaces distinct from the document, library and other extensions.

NAM02 Namespaces for an extension

BIEs expressed in extensions shall use the following set of namespaces:

- one namespace for the apex ABIE of the extension

  > **Note**
  >
  > This namespace is abbreviated in these examples as "myext1".

- one namespace for all BBIE extension components that are not existing library components

  > **Note**
  >
  > This namespace is abbreviated in these examples as "mycbc1".

- one namespace for all ABIE extension components that are not existing Library ABIE components

  > **Note**
  >
  > This namespace is abbreviated in these examples as "mycac1".

> **Note**
>
> The structure of an extension parallels that of a Document ABIE with the distinct apex namespace, BBIE namespace and Library ABIE namespace. Where possible the extension should reuse existing library components that have their own namespaces. This parallel approach makes it easier to consider incorporating extension elements in future versions of the library simply by changing the namespace.

> **Note**
>
> In these abbreviations "my" is used as in the first-person possessive pronoun, and "1" implies one of multiple extension namespaces

In addition to the namespaces for the elements in XML documents, the dictionary information regarding BBIE data types is also distinguished using namespaces.

NAM03 Namespaces for BBIE data types

The expression of data type information supporting BBIE definitions shall use the following set of namespaces:

- one namespace for all qualified data types

NAM03 Namespaces for BBIE data types

> **Note**
>
> This namespace is abbreviated in these examples as "qdt".

- one namespace for all unqualified data types

> **Note**
>
> This namespace is abbreviated in these examples as "udt".

- one namespace for CCTS Core Component Type definitions

> **Note**
>
> This namespace is abbreviated in these examples as "ccts-cct".

> **Note**
>
> These namespaces are used only for dictionary information definition and not for BIEs themselves. As such they never appear in the XML document and are therefore never declared in an XML artefact governed by these NDR.

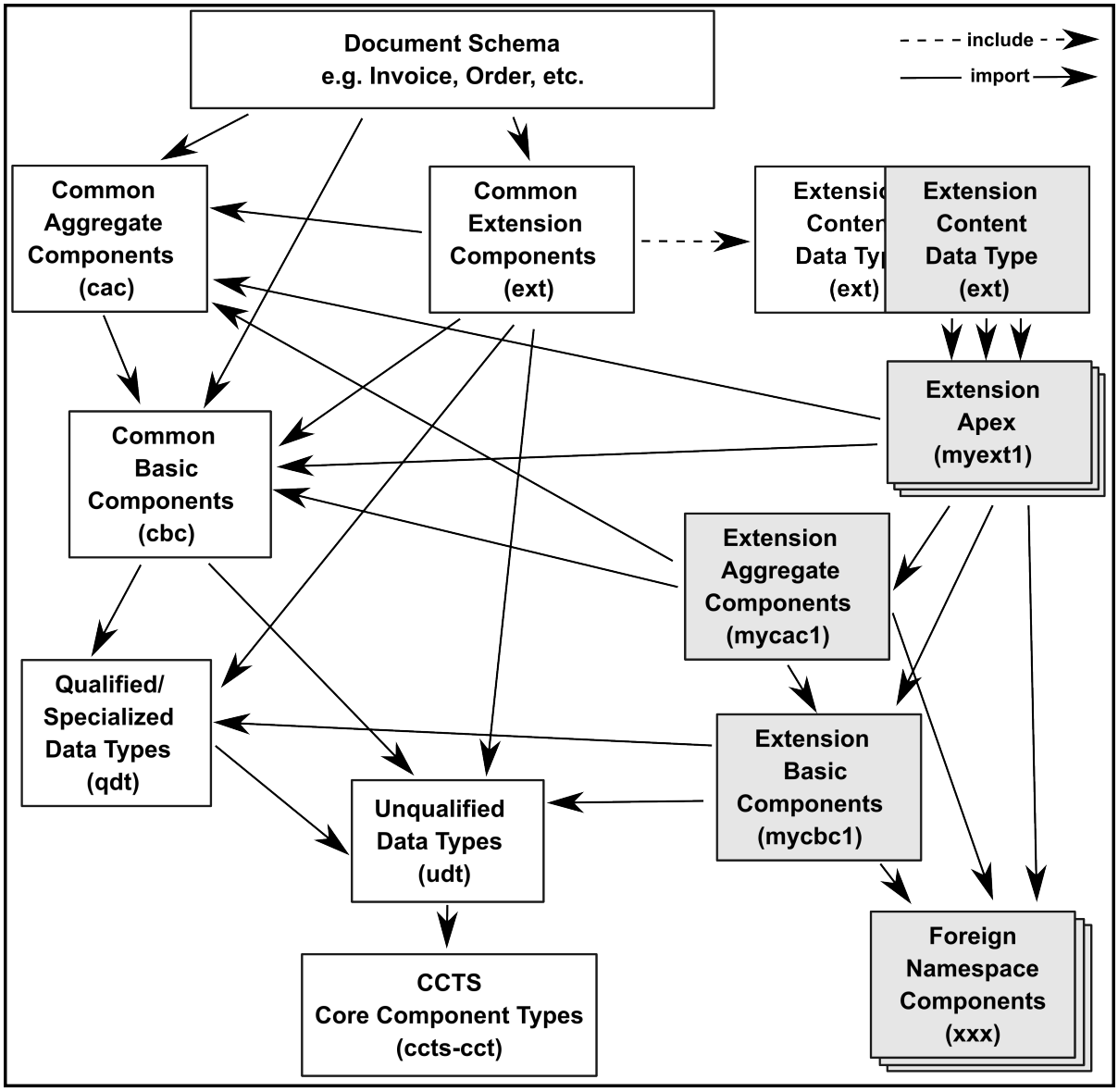
An implementation of these NDR may choose to have additional namespaces for the expression of type information.

5.3 XSD import/include tree

The relationships between the XSD schema fragments that are described in this section are shown in Figure 3, “Possible import/include hierarchy of XSD schema expressions”.

For reference purposes each box is a schema fragment and the parenthesized name tokens identify the namespace associated with the schema fragment.

Figure 3. Possible import/include hierarchy of XSD schema expressions



In this diagram the unshaded boxes represent fragments of the common schema. Once created there is no need for implementers of the schema to modify these fragments. To ensure they are not inadvertently modified, these may be marked as read-only files in the file system.

The shaded boxes represent fragments that extend the common schema. The Extension Content Data Type defines which schemas are in play for the extension point of an extension item in the extension collection. This fragment is distinguished from other fragments in that it is initially created by the designers of the schema and subsequently may be replaced by implementers.

5.4 Schema fragment annotations

There are no constraints regarding what annotation information may be added to the W3C Schema expressions in XSD files.

Good practice suggests augmenting the schema fragments with dictionary information and governance information using W3C Schema declaration annotations and XML comments. This information may be useful to the human reader or to tools exploiting the schema information in providing functionality to

operators, but it does not impact on the interpretation of constraints imposed on XML documents being validated with the XSD documents.

W3C Schema annotations are typically defined for and with each of the many declarations in the XSD file. Good practice suggests providing a version of the published XSD files without annotations so as not to burden runtime processing. A runtime schema processor has no use of informational annotations and may incur unnecessary processing time ingesting and accommodating the information.

Separate from the concept of W3C Schema annotations are simple XML comments that annotate schema. Such comments are ignored by schema processors and do not burden their processing. The information in these comments may be useful to implementers and, in some cases, may be required for intellectual property reasons imposed by the designers. Good practice suggests that such information includes module identification, module revision metadata and copyright declarations. The information in these comments may be useful to implementers and may by required by licensing conditions on the use of the files.

The W3C Schema version annotation (the "version" attribute of the xsd:schema element) may be used to record the release version of the collection of schema fragments.

5.5 Schema fragments and declarations

5.5.1 Schema fragments for Document ABIEs

FRG01 Document ABIE schema fragments
There shall be one schema fragment created for each Document ABIE.

FRG02 Document ABIE element declaration
Each Document ABIE schema fragment shall include a single element declaration, that being for the Document ABIE.

FRG03 Document ABIE type declaration
Each Document ABIE schema fragment shall include a single type declaration, that being for the content of the Document ABIE.

5.5.2 Schema fragment for Library ABIEs

FRG04 Library ABIE schema fragment
There shall be one common schema fragment created to contain all ASBIEs (that is, from every Document ABIE and every Library ABIE) and all Library ABIEs. **Example** In UBL 2.1 the `UBL-CommonAggregateComponents-2.1.xsd` fragment serves this purpose.

FRG05 Library ABIE element declarations
The common Library ABIE schema fragment shall include an element declaration for every ASBIE in the model (that is, from every Document ABIE and every Library ABIE) and for every Library ABIE.

FRG06 Library ABIE type declarations
The common Library ABIE schema fragment shall include a type declaration for every Library ABIE, each being for the content of each Library ABIE.

There are no constraints on the order of the ABIE declarations in the schema expression.

Note

This lack of an order constraint may seem in conflict with the semantic model library constraint of alphabetical order of ABIE components. Whereas the semantic ABIE components are organized for the benefit of the human reader, the order of the schema component declarations does not affect the schema processor. However, using alphabetical order in the schema fragment may be a convenience for the human reader of the schema expressions.

5.5.3 Schema fragment for BBIEs

FRG07 BBIE schema fragment
There shall be one common schema fragment created to describe all BBIEs in the model (that is, from every Document ABIE and every Library ABIE). **Example** In UBL 2.1 the `UBL-CommonBasicComponents-2.1.xsd` fragment serves this purpose.

FRG08 BBIE element declarations
The common BBIE schema fragment shall include an element declaration for every BBIE in the model (that is, from every Document ABIE and every Library ABIE) describing the content of each BBIE.

FRG09 Library ABIE type declarations
The one BBIE schema fragment shall include a type declaration for every BBIE in the model (that is, from every Document ABIE and every Library ABIE), each being for the content of each BBIE.

There are no constraints on the order of the BBIE declarations in the schema expression.

Note

The order of the schema component declarations does not affect the schema processor. However, using alphabetical order in the schema fragment may be a convenience for the human reader of the schema expressions.

5.5.4 Schema declarations for all BIEs

DCL01 Element declarations
Every BIE element declaration shall be global.

DCL02 Element declaration references
Every BIE element in an ABIE type definition shall be declared by reference.

DCL03 Type declarations
Every BIE type declaration shall be global.

5.5.5 Schema declarations for ABIEs

DCL04 ABIE element declaration
Every ABIE element shall be declared with the ABIE name as the element name and the ABIE name suffixed with "Type" as the type.

Example

```
<xsd:element name="ApplicationResponse"
             type="ApplicationResponseType"/>
```

DCL05 ABIE type declaration
Every ABIE complex type name shall be declared with the name of the ABIE suffixed with "Type" as the name.

Example

```
<xsd:complexType name="ApplicationResponseType">
 (... contents ...}
</xsd:complexType>
```

DCL06 Library ABIE type declaration content order
The members of a Library ABIE shall be ordered as the sequence (in the order the BIEs appear in the semantic model of the ABIE) of all BBIE element references first, followed by all ASBIE references.

Example

```
<xsd:complexType name="CatalogueRequestLineType">
 <xsd:sequence>
  <xsd:element ref="cbc:ID" minOccurs="1" maxOccurs="1"/>
  <xsd:element ref="cbc:ContractSubdivision"
               minOccurs="0" maxOccurs="1"/>
  <xsd:element ref="cbc:Note" minOccurs="0"
               maxOccurs="unbounded"/>
  <xsd:element ref="cac:LineValidityPeriod"
               minOccurs="0" maxOccurs="1"/>
  <xsd:element ref="cac:RequiredItemLocationQuantity"
               minOccurs="0" maxOccurs="unbounded"/>
  <xsd:element ref="cac:Item" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

DCL07 Document ABIE type declaration content order
The members of a Document ABIE shall be ordered first with a reference to the extension collection element, followed by the sequence (in the order the BIEs appear in the semantic model of the ABIE) of all BBIE element references first, followed by all ASBIE references.

DCL07 Document ABIE type declaration content order

Example

```
<xsd:complexType name="ApplicationResponseType">
  <xsd:sequence>
     <xsd:element ref="ext:UBLExtensions"
                     minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cbc:UBLVersionID"
                      minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cbc:CustomizationID"
                      minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cbc:ProfileID"
                      minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cbc:ProfileExecutionID"
                      minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cbc:ID"
                     minOccurs="1" maxOccurs="1"/>
     <xsd:element ref="cbc:UUID"
                     minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cbc:IssueDate"
                     minOccurs="1" maxOccurs="1"/>
     <xsd:element ref="cbc:IssueTime"
                     minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cbc:ResponseDate"
                     minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cbc:ResponseTime"
                     minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cbc:Note"
                     minOccurs="0" maxOccurs="unbounded"/>
     <xsd:element ref="cbc:VersionID"
                     minOccurs="0" maxOccurs="1"/>
     <xsd:element ref="cac:Signature"
                     minOccurs="0" maxOccurs="unbounded"/>
     <xsd:element ref="cac:SenderParty"
                      minOccurs="1" maxOccurs="1"/>
     <xsd:element ref="cac:ReceiverParty"
                     minOccurs="1" maxOccurs="1"/>
     <xsd:element ref="cac:DocumentResponse"
                     minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

Note

The rationale for positioning extension information at the very start of the XML instance is to allow processing applications acting sequentially on the document to consume and cache all non-modeled extension information in preparation for consuming any of the modeled document information. Should extension information follow modeled information, the sequential processing of the modeled information would have passed before recognizing the need to associate extension information. In essence, such a sequential processing application would have to cache the entire document, thus losing the benefit of sequential processing.

DCL08 Document ABIE extension element cardinality

In the content type for every Document ABIE the extension collection element cardinality shall be declared as optional and not repeatable.

Example

```
    <xsd:element ref="ext:UBLExtensions"
                 minOccurs="0" maxOccurs="1"/>
```

5.5.6 Schema declarations for ASBIEs

DCL09 ASBIE schema element declaration

Every ASBIE element shall be declared with the ASBIE name as the element name and the ABIE name of the associated object class suffixed with "Type" as the type.

Example

```
<xsd:element name="Party" type="PartyType"/>
```

Example

```
<xsd:element name="AgentParty" type="PartyType"/>
```

5.5.7 Schema declarations for BBIEs

DCL10 BBIE element declaration

Every BBIE element shall be declared with the BBIE name as the element name and the concatenation of the BBIE name and "Type" as the type.

Example

```
<xsd:element name="SourceCurrencyCode"
             type="SourceCurrencyCodeType"/>
```

DCL11 BBIE unqualified type declaration

Every BBIE element type with an unqualified data type shall be declared as simple content restricted from a base of the corresponding unqualified data type without the addition of any additional attributes.

Example

```
<xsd:complexType name="SourceCurrencyBaseRateType">
   <xsd:simpleContent>
      <xsd:restriction base="udt:RateType"/>
   </xsd:simpleContent>
</xsd:complexType>
```

DCL12 BBIE qualfied type declaration
Every BBIE element type with a qualified data type shall be declared as simple content restricted from a base of the corresponding qualified data type without the addition of any additional attributes.

Example

```
<xsd:complexType name="SourceCurrencyCodeType">
   <xsd:simpleContent>
      <xsd:restriction base="qdt:CurrencyCodeType"/>
   </xsd:simpleContent>
</xsd:complexType>
```

5.5.8 Schema declarations for Qualified Data Types

DCL13 Qualified data type declaration
Every qualified data type shall be declared as simple content restricted from a base of the corresponding unqualified data type without the addition of any additional attributes.

Example

```
<xsd:complexType name="CurrencyCodeType">
   <xsd:simpleContent>
      <xsd:restriction base="udt:CodeType"/>
   </xsd:simpleContent>
</xsd:complexType>
```

5.6 Extension schema fragments and declarations

5.6.1 Extension information

The content type for a Document ABIE contains a single optional extension collection element in order to provide for the inclusion of data in the XML that is in addition to the data of the information bundle for the document. Such data may include content designed by other organizations (e.g. signature information) as well as augmentations of the semantic model.

An extension collection element contains one or more extension elements. Each extension element has a suite of metadata elements used to describe the extension. The extension content may reuse existing ABIEs or BBIEs and may contain XML content not modeled as BIEs.

The extension collection and metadata are XML elements implemented as schema fragments and constructs independent of the semantic model.

5.6.2 Extension collection schema fragments and declarations

EXT01 Extension collection schema fragment
The extension collection schema fragment shall include the declarations of the extension collection element, the extension element, the extension content element, the extension metadata elements and any required type information for metadata elements that are not BIEs in the Document ABIEs and Library ABIEs.

EXT01 Extension collection schema fragment

Example

In UBL 2.1 the `UBL-CommonExtensionComponents-2.1.xsd` fragment serves this purpose.

EXT02 Extension content element declaration

The extension collection schema fragment shall include the declaration of the mandatory extension content element, but not the type information for the extension content element.

Note

The rationale for not including the type information for the extension point element is that the type is subject to change, while the extension collection, the extension item and extension item metadata element and type information is not. This separation allows the extension collection and item schema fragment to be deployed as read-only, while the extension point data type schema fragment can be deployed as writable in order to be defined by users.

EXT03 Extension collection element content

The document's extension collection shall have one or more extension elements as its content.

Example

```
<xsd:complexType name="UBLExtensionsType">
  <xsd:sequence>
    <xsd:element ref="UBLExtension"
          minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

Note

The rationale is that different users of a document may have different extension items added to the content. Also, different extensions may be thematically distinguished (e.g. the digital signature extension is semantically separate from an extension augmenting invoice line content).

EXT04 Extension element content ordering

The extension element shall declare all available metadata elements (if any) in advance of a last mandatory single extension content element being the extension point under which the extension information is added to the document.

Example

```
<xsd:complexType name="UBLExtensionType">
  <xsd:sequence>
    <xsd:element ref="cbc:ID"
                 minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="cbc:Name"
                 minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ExtensionAgencyID"
```


EXT04 Extension element content ordering

```
                minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ExtensionAgencyName"
                minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ExtensionVersionID"
                minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ExtensionAgencyURI"
                minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ExtensionURI"
                minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ExtensionReasonCode"
                minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ExtensionReason"
                minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ExtensionContent"
                minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

Note

There are no constraints on the selection, name, definition or cardinality of the extension metadata elements.

5.6.3 Schema fragment for the extension content data type declaration

EXT05 Extension content data type schema fragment

The extension content element type schema fragment shall include the declaration of the content type for the extension content element and any import statements defining constraints on recognized constructs.

Example

In UBL 2.1 the `UBL-ExtensionContentDataType-2.1.xsd` fragment serves this purpose.

EXT06 Extension content data type declaration

The extension content element type schema fragment shall contain only a single complex type declaration being a sequence of exactly one element in a namespace other than the extension namespace to be processed with lax validation.

Example

```
  <xsd:complexType name="ExtensionContentType">
    <xsd:sequence>
      <xsd:any namespace="##other" processContents="lax"
               minOccurs="1" maxOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
```


EXT06 Extension content data type declaration

Note

The rationale for the lax validation is to allow for the extension point to contain, without error, any element for which there are no constraints in any schema fragment imported or included in the validation step.

EXT07 Extension content data type imports

The extension content element type schema fragment may contain import directives for the expected data content of an extension.

Example

```
<xsd:import namespace="urn:oasis:names:specification:
ubl:schema:xsd:CommonSignatureComponents-2"
  schemaLocation="UBL-CommonSignatureComponents-2.1.xsd"/>
```

Note

The rationale for including import directives is to validate those constructs found in an extension that are expected.

Note

There is no order to the import directives.

5.7 Qualified data types schema fragment and declarations

QDT01 Qualified data types schema fragment

The qualified data types schema fragment shall include the declarations of any qualified data types referenced in the schema fragment for BBIEs.

Example

In UBL 2.1 the `UBL-QualifiedDataTypes-2.1.xsd` fragment serves this purpose.

QDT02 Qualified data type declaration name

Every qualified data type shall be declared using the name of the data type qualifier followed by the unqualified data type name.

QDT03 Qualified data type declaration basis

Every qualified data type shall be based on an unqualified data type, imposing whatever qualifications are required to be expressed using XSD schema semantics.

Note

In UBL 2.1 there are no qualifications expressed using XSD schema semantics.

QDT04 Qualified data type declaration constraint
Every qualified data type declaration shall be such that every possible instance of the declared type is also an instance of the base type. **Note** This constraint prevents additions of anything that is not part of the base type, such as the introduction of any new attributes or sub-elements, or any less-constrained element or attribute values.

5.8 Unqualified data types schema fragment and declarations

UDT01 Unqualified data types schema fragment
The unqualified data types schema fragment shall include the declarations of all unqualified data types referenced in the schema fragment for BBIEs. **Example** In UBL 2.1 the `UBL-UnqualifiedDataTypes-2.1.xsd` fragment serves this purpose.

UDT02 Unqualified data types declaration inclusions
An unqualified data type shall be declared for every one of the permitted Primary Representation Terms and Secondary Representation Terms defined as Permissible Representation Terms in the Core Component Technical Specification [**CCTS**].

UDT03 Unqualified data types declaration exclusions
Unqualified data types shall only be declared for the permitted Primary Representation Terms and Secondary Representation Terms defined as Permissible Representation Terms in the Core Component Technical Specification [**CCTS**].

UDT04 Unqualified data types declaration base
Every unqualified data type shall be either a restriction on one of the approved Core Component Types defined in the Core Component Technical Specification [**CCTS**], or an extension of a base XSD data type. **Note** This constraint may be accomplished by either restricting a declaration imported from the Core Component Types schema or by wholly replacing the corresponding Core Component Types schema declaration. **Note** The rational for having UDT declarations is to impose some XSD syntax semantics on top of the more general decimal and string lexical syntax defined in the CCTS specification of Core Component Types. For example, the CCTS Core Component Type for date and time is a simple string without constraint. Such lax structuring of the field value does not serve users in that no particular format is obligated. The UDT can impose, for example, the xsd:dateTime lexical syntax on all date and time values, overriding the CCTS definition.

UDT04 Unqualified data types declaration base

Note

This rule does allow an optional supplementary component defined in the CCTS Core Component Type not to be available in the associated unqualified data type. For example, if the UDT implements a built-in XSD data type for the component then there is no use of a format supplementary component and associated attribute and so the format attribute declaration can be omitted and, thereby, be unavailable for use for that data type.

Example 1

In this example the unqualified data type uses the base type without change:

```
<xsd:complexType name="NumericType">
  <xsd:simpleContent>
    <xsd:restriction base="ccts-cct:NumericType"/>
  </xsd:simpleContent>
</xsd:complexType>
```

Example 2

In this example the unqualified data type redeclares the base type's optional attribute as mandatory:

```
<xsd:complexType name="MeasureType">
  <xsd:simpleContent>
    <xsd:restriction base="ccts-cct:MeasureType">
      <xsd:attribute name="unitCode"
                     type="xsd:normalizedString"
                     use="required"/>
    </xsd:restriction>
  </xsd:simpleContent>
</xsd:complexType>
```

Example 3

In this example the unqualified data type replaces the base type with no attributes and with an XSD built-in type for content:

```
<xsd:complexType name="DateTimeType">
  <xsd:simpleContent>
    <xsd:extension base="xsd:dateTime"/>
  </xsd:simpleContent>
</xsd:complexType>
```

UDT05 Unqualified data types declaration constraint

Every unqualified data type declaration that is not a formal restriction of one of the Core Component Type declarations defined in the Core Component Technical Specification [**CCTS**] schema fragment shall be such that every possible instance of the declared type is also an instance of one of the Core Component Types as defined in CCTS.

UDT05 Unqualified data types declaration constraint

Note

This constraint prevents additions of anything that is not part of the base Core Component Type, such as the introduction of any new attributes or sub-elements, or any less-constrained element or attribute values.

Example

In this example the unqualified data type for a date is based on the XSD data type for date and all instances of the date data type are also instances of the string-based `DateTimeType` data type in CCTS:

```
<xsd:complexType name="DateType">
  <xsd:simpleContent>
    <xsd:extension base="xsd:date"/>
  </xsd:simpleContent>
</xsd:complexType>
```

5.9 CCTS Core Component Types schema

All primitive data types correspond to the 10 CCTS Primary Representation Terms defined in [**CCTS**] Section 8-3 "Permissible Representation Terms".

CCT01 CCTS Core Component Type schema

The core component type schema of primitive data types for primary representation terms on which the unqualified data types are based shall be an unmodified copy of the schema fragment published by UN/CEFACT with the following embedded title and metadata:

```
CCTS Core Component Type Schema Module

Module of Core Component Type
Agency: UN/CEFACT
VersionID: 1.1
Last change: 14 January 2005
```

Example

In UBL 2.1 the `CCTS_CCT_SchemaModule-2.1.xsd` fragment serves this purpose.

5.10 XML attribute names

ATT01 Leading name part in attribute names

Every attribute's derived name shall be composed with the leading name part entirely in lower-case, even when that name part is an agreed-upon abbreviation.

Example

The data type of the BBIE known as "Binary Object. Uniform Resource. Identifier" is represented with the attribute named "uri"

ATT01 Leading name part in attribute names

Note

Terms used in attribute names of supplementary components of CCTS Table 8-2 "Approved Core Component Type Content and Supplementary Components" are subject to abbreviation.

ATT02 Non-leading abbreviations in attribute names

When an attribute's derived name is composed with an agreed-upon abbreviation in other than the leading name part, the abbreviation shall be used unchanged.

Examples

The data type of the BBIE known as "Amount Currency. Identifier" is represented with the attribute named "currencyID"
The data type of the BBIE known as "Amount Currency. Code List Version. Identifier" is represented with the attribute named "currencyCodeListVersionID"

Note

Terms used in attribute names of supplementary components of CCTS Table 8-2 "Approved Core Component Type Content and Supplementary Components" are subject to abbreviation.

5.11 Data type qualifications

Data types may be qualified to define additional constraints on the possible values of the BBIEs of that data type. These constraints may be subject to change over time and so should be applied in a manner that allows modification of the data type qualifications without impacting the schema.

Code lists and identifier lists are examples of controlled sets of values (e.g. currency codes, country codes, product identifiers, etc.).

For some communities of users (e.g. those with business-oriented XML documents) the management of controlled vocabularies presents particular challenges for document modeling. While communities may standardize document structures, trading partners within the community have their own constraints that may change on an hourly basis yet must work within the community framework.

Externalizing the list in a genericode file expresses the enumeration as a resource available to the application for data entry. However, the choice of genericode file may vary on a per-information item basis due to the item's document context, or perhaps vary again for particular trading partners. Expressing the appropriate mappings in a colloquial fashion inhibits interoperability and the sharing of resources and program code.

A context/value association file specifies the relationship from information items found in different document contexts to one or more external genericode files for each item. With these relationships a directed authoring environment can precisely direct the editing of individual information items. Different context/value association files can then be used to create instances for different purposes that have different constraints on the enumerations used therein.

DTQ01 Data type qualification CVA file

Data type qualifications that are not expressed as qualified data types using XSD schema semantics may be expressed using the OASIS Context Value Association [**CVA**] XML vocabulary.

DTQ01 Data type qualification CVA file

Note

The CVA file provides for users to associate value validation constraint expressions and/or coded domain value enumerations with different CVA contexts. A value validation constraint is expressed using XPath. A coded domain value enumeration is expressed using one or the union of more than one OASIS genericode file.

Note

The CVA expressions typically are not used at runtime. More likely the CVA expressions and their associated genericode files would be processed or compiled into a runtime validation artefact. These rules do not constrain where this runtime artefact would be kept, but good practice suggests a location separate from the XSD schemas.

Example

In UBL 2.1 the CVA expression is the `cva/UBL-DefaultDTQ-2.1.cva` file, the associated runtime artefact is the `val/UBL-DefaultDTQ-2.1.xsl` XSLT stylesheet and the referenced genericode files are located in the `cl/` subdirectory of each of the UBL 2.1 distribution and the UBL 2.0 distribution.

DTQ02 Data type element content qualifications

A CVA context shall be created for every BBIE with a non-empty value in the CCTS dictionary information for the data type qualifier.

Example

Entered dictionary information values:

Name="ChannelCode"
Data Type Qualifier="Channel"
Representation Term="Code"
Data Type="Channel_ Code. Type"

In this example the constraints on the value of the `cbc:ChannelCode` element are described by the union of two constraint expressions identified by "`Channel-2.0`" and "`Channel-2.1`":

```
<Context values="Channel-2.0 Channel-2.1"
         metadata="cctsV2.01-code"
         address="cbc:ChannelCode"/>
```

Example

In this example the constraints on the value of the `cbc:PayableAmount` element child of the `cac:LegalMonetaryTotal` element are described by the single constraint expression identified by "maxValue":

```
<Context values="maxValue"
         address="cac:LegalMonetaryTotal/
                  cbc:PayableAmount"/>
```


DTQ03 Data type attribute content qualifications

A CVA context shall be created for every CCTS supplementary component to be validated.

Example

In this example the constraints on the value of the `currencyID` attribute are described by the union of two constraint expressions identified by "`Currency-2.0`" and "`Currency-2.1`":

```
<Context values="Currency-2.0 Currency-2.1"
         metadata="cctsV2.01-amount"
         address="@currencyID"/>
```

DTQ04 Value test constraints

A CVA value test constraint shall be written as an XPath expression.

Example

In this example the constraint on the value is that its numeric value be less than 10,000:

```
<ValueTest xml:id="maxValue"
           test=". &lt; 10000"/>
```

DTQ05 Value list constraints

A CVA value list constraint shall reference an OASIS genericode [**genericode**] file.

Example

```
<ValueList xml:id="Channel-2.1"
  uri="../cl/gc/default/ChannelCode-2.1.gc"/>
```

Note

Each genericode file defines the metadata associated with the enumeration of values therein. Therefore, the union of multiple genericode files is required when the constraint includes values from different enumerations associated with distinctive metadata.

DTQ06 Value metadata association

The CVA instance metadata sets shall identify the XML attributes used in Open-edi user data that are associated with the supplementary components of the unqualified data types.

Example

In UBL 2.1 the `UBL-DefaultDTQ-2.1.cva` fragment includes such declarations.

6 Conformance

6.1 An information bundle and its associated XML validation artefacts conforming to these naming and design rules does not violate any rule or requirement expressed in normative sections of this specification (clauses 3, 4 and 5).

6.2 ATT01 Leading name part in attribute names (5.10)

6.3 ATT02 Non-leading abbreviations in attribute names (5.10)

6.4 CCT01 CCTS Core Component Type schema (5.9)

6.5 COM01 Dictionary information values (4.2)

6.6 COM02 Dictionary information value prohibited characters and character sequences (4.2)

6.7 COM03 Controlled list of abbreviations in BIE names (4.3)

6.8 COM04 Controlled list of abbreviations in dictionary entry name information values (4.3)

6.9 COM05 List of equivalent terms in BIE names (4.3)

6.10 COM06 Component Type for a BIE (4.4.1)

6.11 COM07 Minimum set of dictionary information values describing an ABIE (4.4.2)

6.12 COM08 Minimum set of dictionary information values describing a BBIE (4.4.3)

6.13 COM09 Minimum set of dictionary information values describing an ASBIE (4.4.4)

6.14 COM10 Dictionary entry name uniqueness (4.4.5)

6.15 COM11 CCTS dictionary information item name value prohibited characters (4.4.5)

6.16 COM12 Use of leading upper case letter in dictionary entry name values (4.4.5)

6.17 COM13 ABIE contents cannot be empty (4.5)

6.18 COM14 ABIE children ordering (4.5)

6.19 DCL01 Element declarations (5.5.4)

6.20 DCL02 Element declaration references (5.5.4)

6.21 DCL03 Type declarations (5.5.4)

6.22 DCL04 ABIE element declaration (5.5.5)

6.23 DCL05 ABIE type declaration (5.5.5)

6.24 DCL06 Library ABIE type declaration content order (5.5.5)

6.25 DCL07 Document ABIE type declaration content order (5.5.5)

6.26 DCL08 Document ABIE extension element cardinality (5.5.5)

6.27 DCL09 ASBIE schema element declaration (5.5.6)

6.28 DCL10 BBIE element declaration (5.5.7)

6.29 DCL11 BBIE unqualified type declaration (5.5.7)

Appendix A (informative) Release notes

A.1 Availability

Online and downloadable versions of this release are available from the locations specified at the top of this document.

A.2 Status of this release

Release of this package marks the continuation of its internal committee review.

THIS RELEASE IS SUBJECT TO CHANGE. IT IS PROVIDED FOR TESTING PURPOSES ONLY AND SHOULD NOT BE USED FOR PRODUCTION SYSTEMS.

A.3 Package structure

This Committee Specification Draft 02 is published as a zip archive in the http://docs.oasis-open.org/ubl/Business-Document-NDR/v1.0/csd02/ directory. Unzipping this archive creates a directory tree containing a number of files and subdirectories. Note that while the two XML files comprise the revisable version of this specification, this revisable XML may not be directly viewable in all currently available web browsers.

The base directory has the following files:

`Business-Document-NDR-v1.0-csd02.xml`
The revisable form of the document.

`Business-Document-NDR-v1.0-csd02-summary.xml`
A distillation of the rules, comprising only the rule title and the section number in which the rule is found. The title is linked to the rule and the section number is linked to the section. This XML document is incorporated in the revisable form of the document by way of an entity reference. During the publishing process this file is first distilled from the revisable form and then subsequently incorporated in the revisable form for publishing.

`Business-Document-NDR-v1.0-csd02.html`
An HTML rendering of the document.

`Business-Document-NDR-v1.0-csd02.pdf`
A PDF rendering of the document.

These are the subdirectories in the package:

`art`
Diagrams and illustrations used in this specification

`db`
DocBook stylesheets for viewing in HTML the XML of this work product

Appendix B (informative) Acknowledgements

The following individuals have participated in the creation of this specification and are gratefully acknowledged:

Oriol Bausa Peris, Individual
Kenneth Bengtsson, Alfa1lab
Peter Borresen, Document Engineering Services Limited
Jon Bosak, Individual
Kees Duvekot, RFS Holland Holding B.V.
Martin Forsberg, Swedish Association of Local Authorities & Regions
G. Ken Holman, Crane Softwrights Ltd.
Ole Madsen, Danish Agency for Digitisation, Ministry of Finance
Tim McGrath, Document Engineering Services Limited
Andrew Schoka, Individual

Appendix C (informative) Additional production processes

C.1 CCTS serialization

An implementation of these naming and design rules may choose to create a serialization of the CCTS information. This can be a useful convenience when processing the CCTS information as a whole. The CCTS collaboration tool is not required to produce a serialization if such is not needed to fulfill its obligation to produce validation artefacts.

There are no formal rules for CCTS serialization.

C.2 Reporting

An implementation of these naming and design rules is not required to produce any supplementary reports. These reports can be useful reference materials for review of the CCTS information maintained for the information bundles.

There are no formal rules for reporting.

