

SCOBDO

Semantic Conversion Of Business Documents

Mapping of Specifications
The Hague, 8 December 2017

GEFEG



Providing smart and innovative solutions for eCommunity meta data management

Actively involved in national and international eBusiness & eGovernment standardisation



Global reach
(35 countries)

International
customer
base (750+)

Based in
Berlin Germany

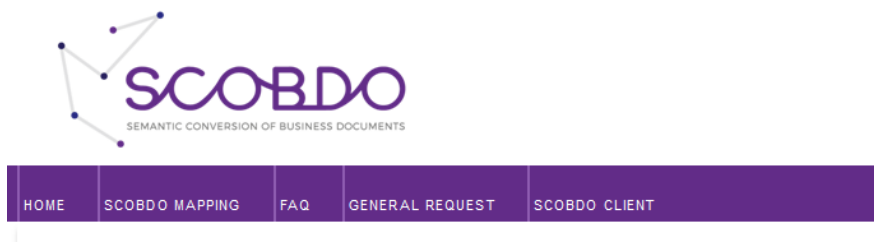
Founded in 1990

Privately owned

GEFEG Portfolio



The Heart of the SCOBDO Portal



Mapping Specifications
publicly available in the
SCOBDO Portal



SCOBDO Mapping

Generate mappings as XSLT files combining any source and target provided here

Source

Type here to filter elements

- EN16931 - UBL 2.1 draft 3
- ZUGFeRD 1.0 Extended DRAFT 1**
- EN16931 - CII D16B Only to RDM
- Simplerinvoicing 1.2 Draft1



Generate XSLT Mapping

Target

Type here to filter elements

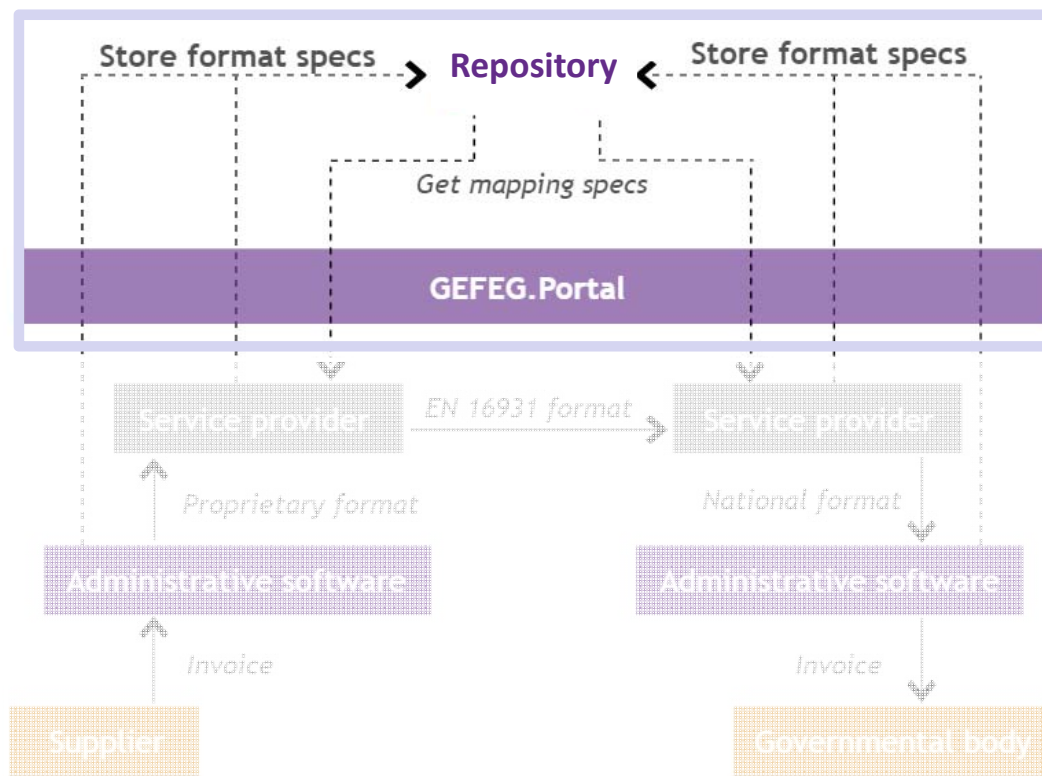
- EN16931 - UBL 2.1 draft 3
- ZUGFeRD 1.0 Extended DRAFT 1
- EN16931 - CII D16B Only to RDM
- Simplerinvoicing 1.2 Draft1**

Data stored in a
repository

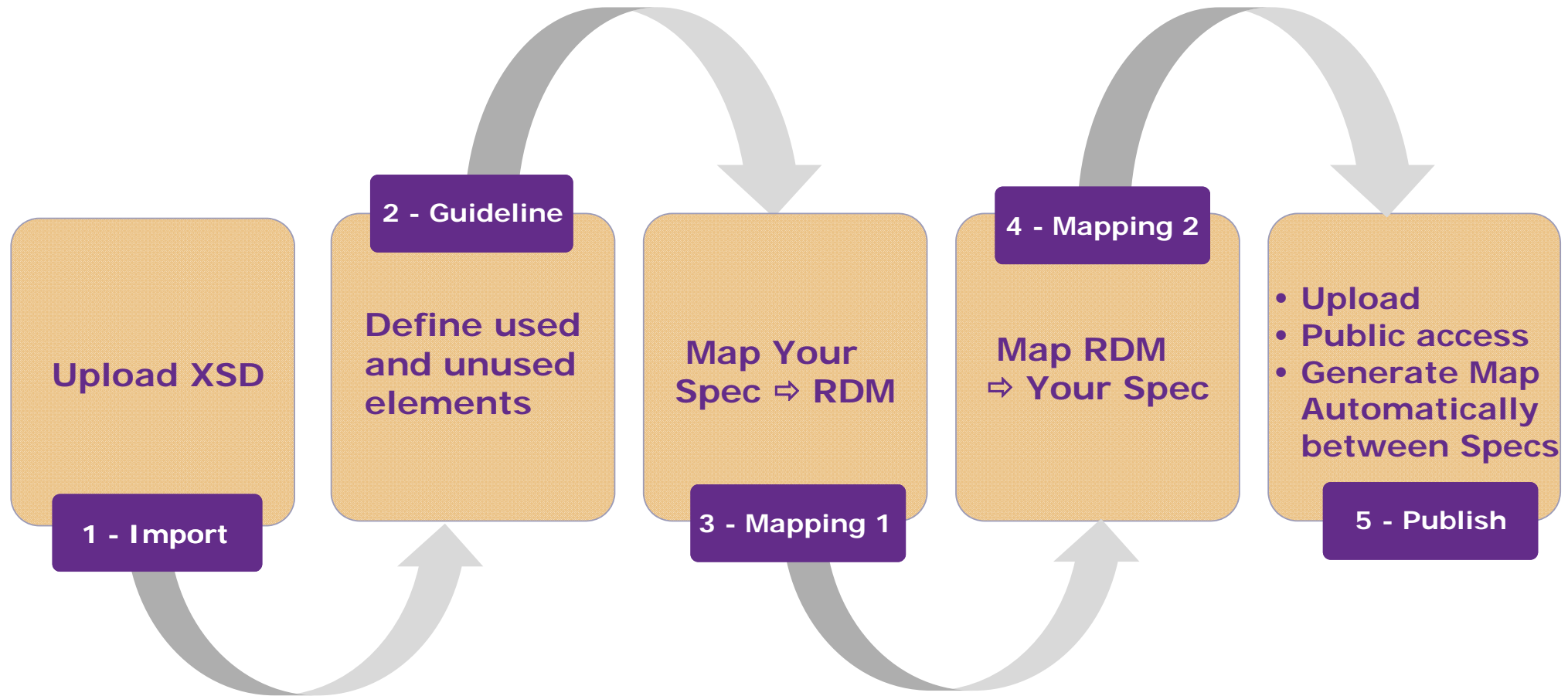
Generated Mapping

XSLT ProductiveMapping_ZUGFeRD 1.0 Extended DRAFT 1_to_Simplerinvoicing 1.2 Draft1.xsl MappingGap_ZUGFeRD 1.0 Extended DRAFT 1_to_Simplerinvoicing 1.2 Draft1.xml

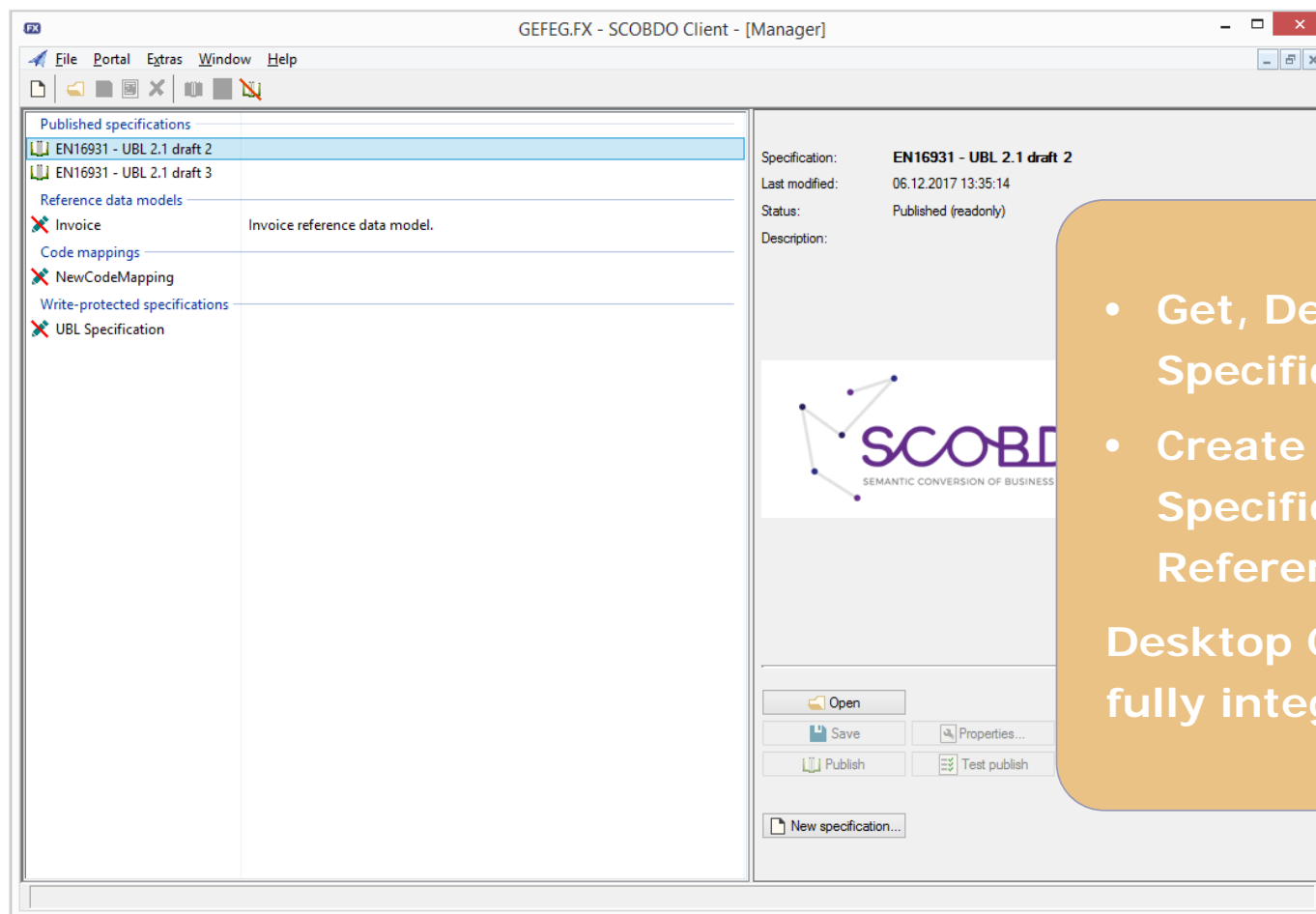
Mapping Specifications in the SCOBDO Concept



How to get there? - 5 Steps to Success

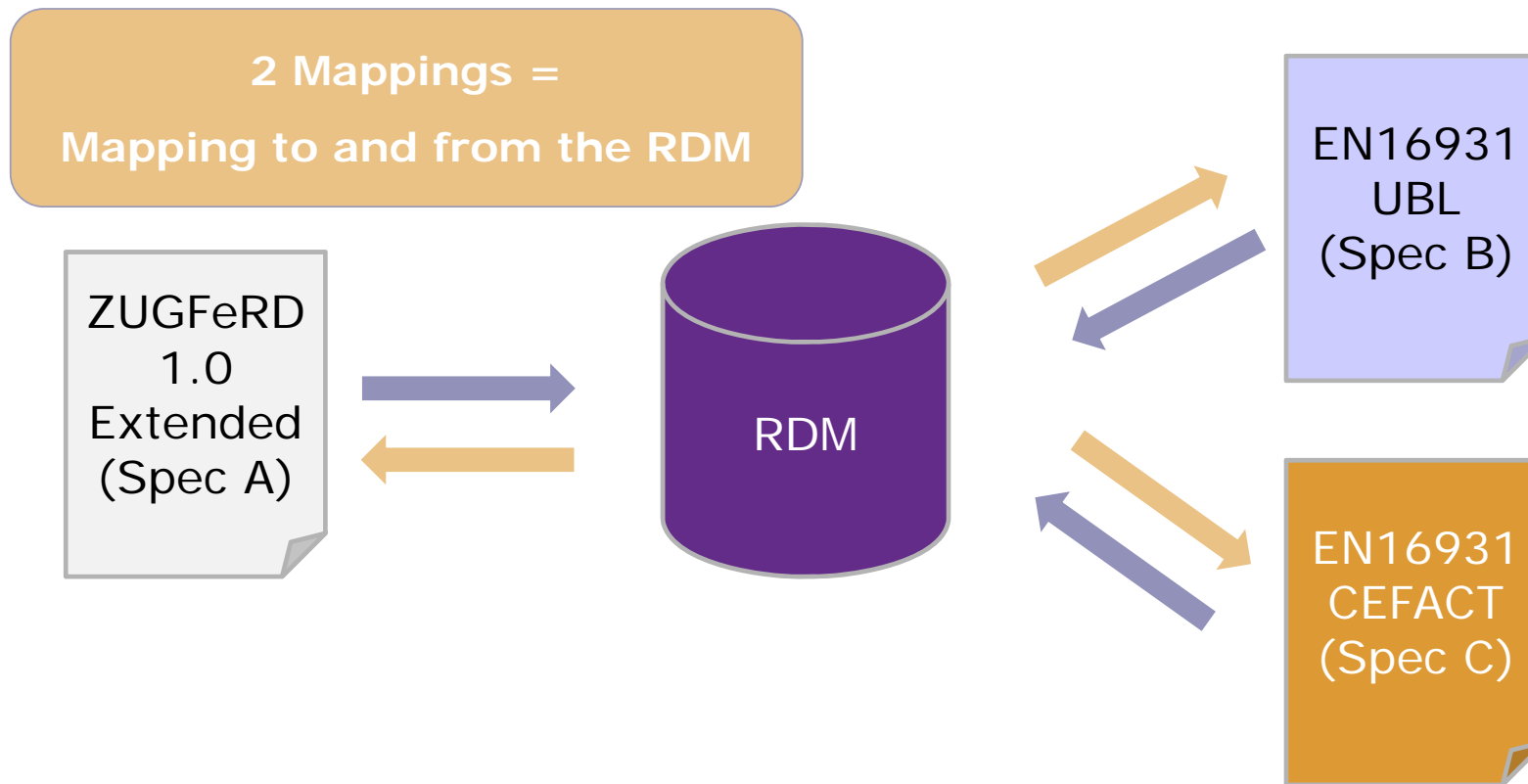


SCOBDO Client

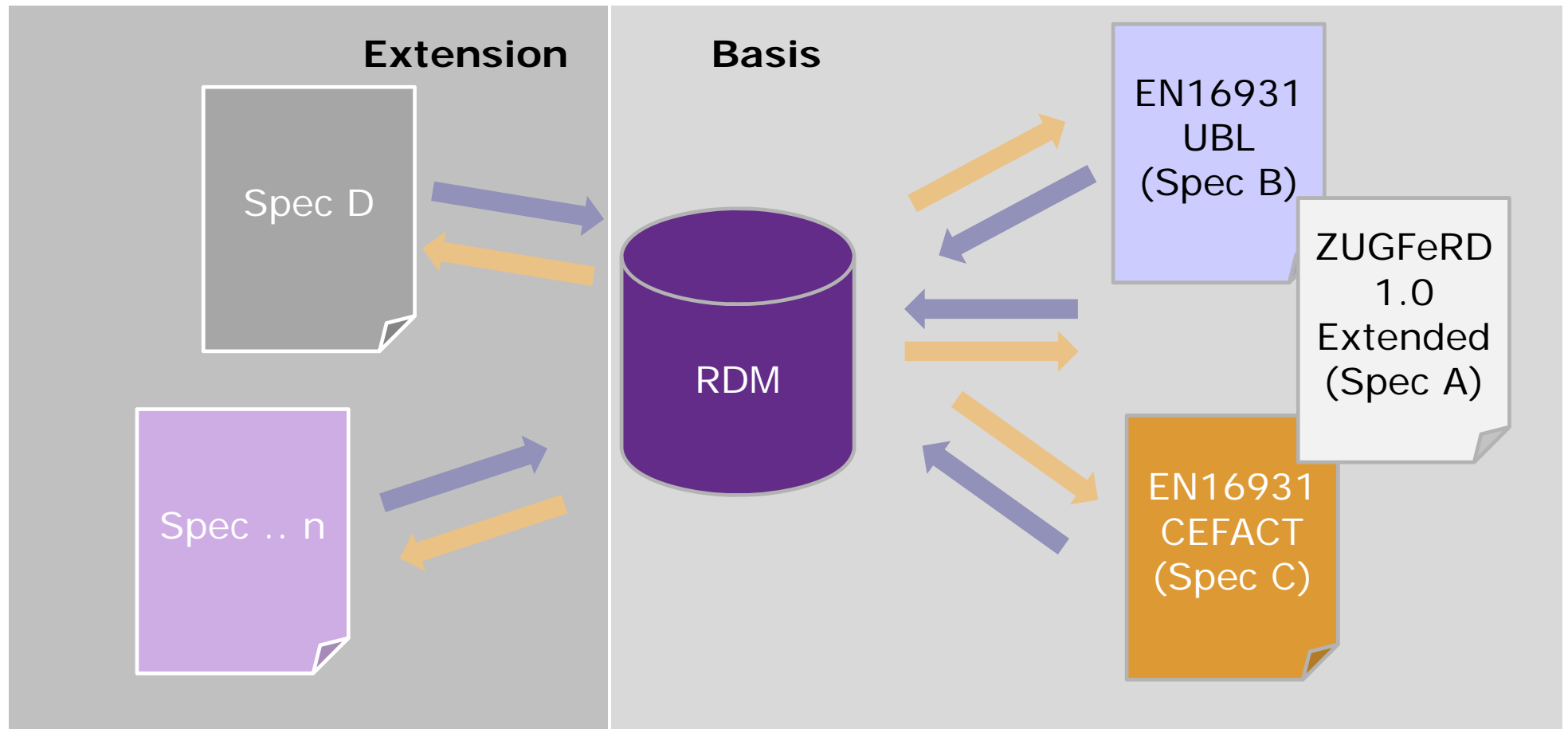


- Get, Develop and Store Specifications on the web
 - Create Mappings between the Specification to and from the Reference Data Model (RDM)
- Desktop Client for Specifiers,
fully integrated with web portal

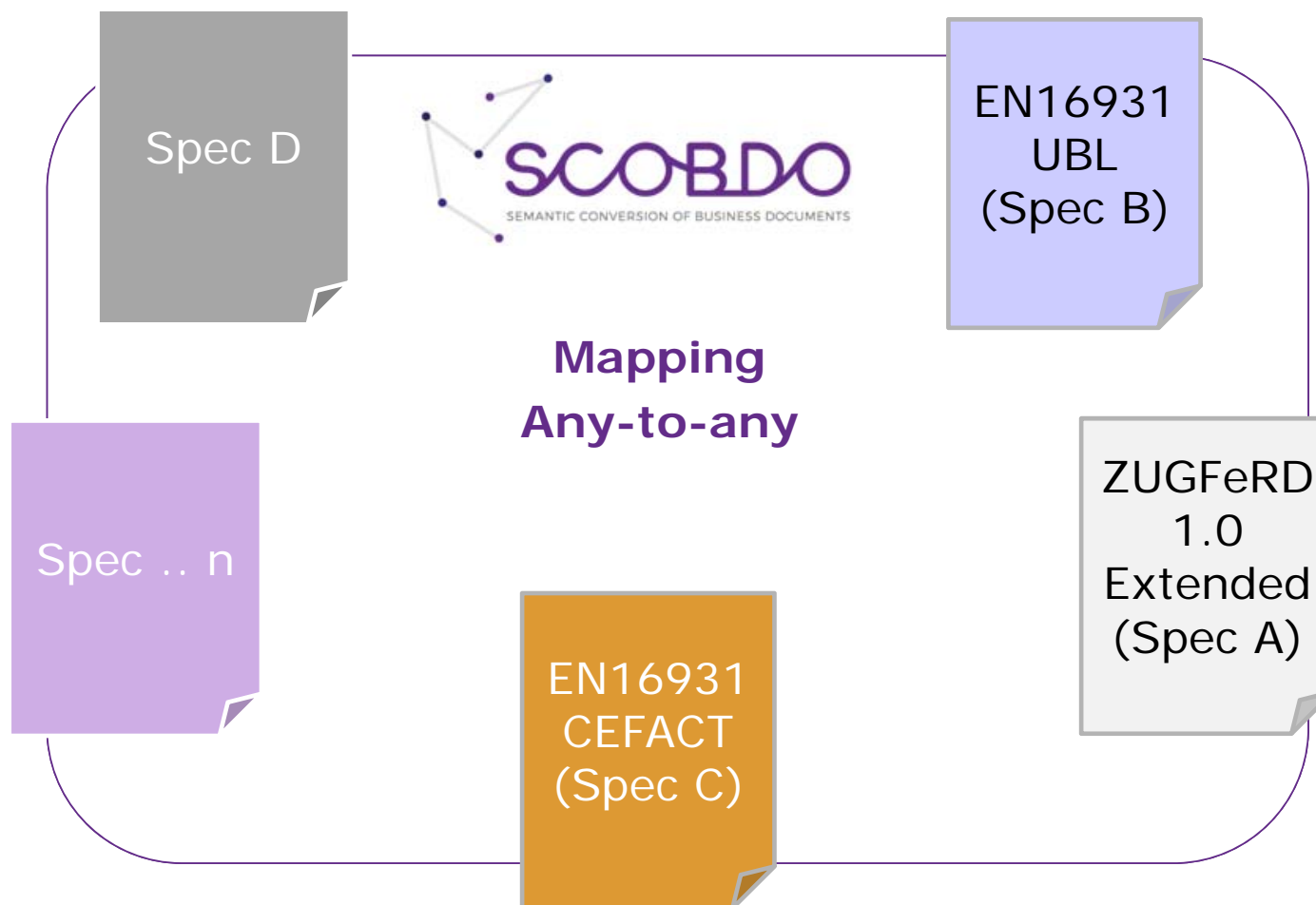
Mapping against a Reference Data Model (RDM)



Developing New Mapping Specifications ...



... for a growing, powerful mapping spec base



How to get a Specification for the Mapping?



SCOBDO Spec Portfolio

**Re-Use and Customize the specifications
available on the Portal**

Upload and use your own specs

**Use Core Invoice User Specifications (CIUS)
provided by national authorities**

Mapping Based on a Re-used and Customized Specification



Create new specification

Please select the specification which is to be copied:

Published specifications	
EN16931 - UBL 2.1 draft 3	06.12.2017 15:34:22
ZUGFeRD 1.0 Extended DRAFT 1	06.12.2017 09:33:31
EN16931 - CII D16B Only to RDM	04.12.2017 15:17:15
Simplerinvoicing 1.2 Draft1	05.12.2017 15:41:20

Re-use



- Specifications that are published on the SCOBDO Portal can be re-used
- Customization of these specs will allow to adapt user requirements
- The customized spec is ready for mapping

GEFEG.FX - SCOBDO Client - [XML schema editor: Specification; Guide\...\CrossIndustryDocument]

File Edit View Reports Portal Extras Window Help

Show all objects English

Elements/CrossIndustryDocument

- [-] E CrossIndustryDocument
 - [-] s xs:sequence
 - [-] E SpecifiedExchangedDocumentContext
 - [-] s xs:sequence
 - [-] E TestIndicator
 - [-] c xs:choice
 - [-] E Indicator
 - [-] E BusinessProcessSpecifiedDocumentContextParameter
 - [-] E GuidelineSpecifiedDocumentContextParameter
 - [-] E HeaderExchangedDocument
 - [-] s xs:sequence
 - [-] E ID
 - [-] E Name
 - [-] E TypeCode
 - [-] E IssueDateTime
 - [-] E CopyIndicator
 - [-] E LanguageID
 - [-] E IncludedNote
 - [-] E EffectiveSpecifiedPeriod
 - [-] E SpecifiedSupplyChainTradeTransaction
 - [-] s xs:sequence
 - [-] E ApplicableSupplyChainTradeAgreement
 - [-] E ApplicableSupplyChainTradeDelivery
 - [-] E ApplicableSupplyChainTradeSettlement
 - [-] s xs:sequence
 - [-] E PaymentReference
 - [-] E InvoiceCurrencyCode
 - [-] E InvoiceeTradeParty
 - [-] E PayeeTradeParty
 - [-] E SpecifiedTradeSettlementPaymentMeans
 - [-] E ApplicableTradeTax
 - [-] E BillingSpecifiedPeriod
 - [-] E SpecifiedTradeAllowanceCharge
 - [-] E SpecifiedLogisticsServiceCharge
 - [-] E SpecifiedTradePaymentTerms
 - [-] E SpecifiedTradeAccountingAccount
 - [-] E SpecifiedTradeSettlementMonetarySummation
 - [-] E ReceivableSpecifiedTradeAccountingAccount
 - [-] E IncludedSupplyChainTradeLineItem

Element Notes Enhanced Children

CrossIndustryDocument

Id

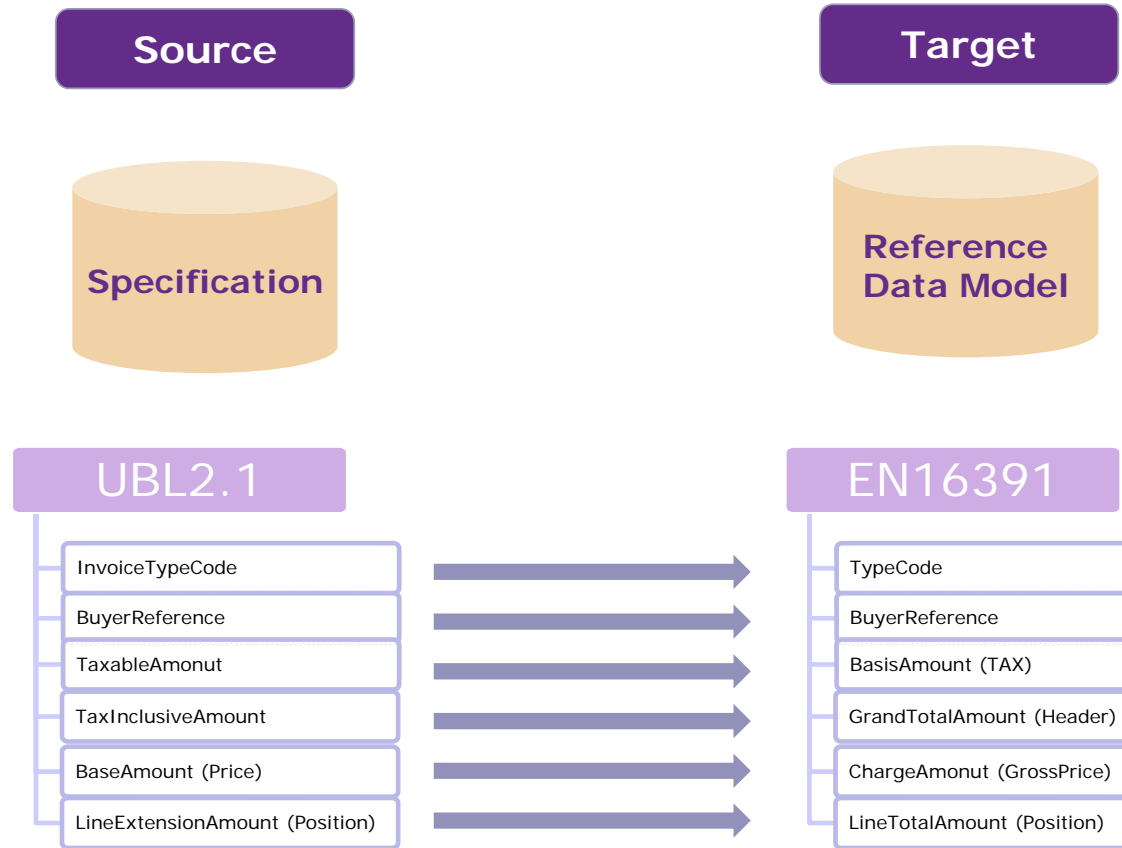
Type rsm2:CrossIndustryDocumentType

SubstitutionGroup

Abstract

1 English Edit

Mapping? Mapping!



What is a Mapping?

- Identification of the data relationship of all elements in two different formats
- Building a connection between two elements with the same semantic meaning

Mapping Reference Data Model to UBL

GEFEG.FX - SCOBDO Client - [Mapping]

Source

```

E /rsm:CrossIndustryInvoice/rsm:ExchangedDocument/ram:TypeCode
E rsm:CrossIndustryInvoice [ 1..1 ]
  s xs:sequence [ 1..1 ]
    E rsm:ExchangedDocumentContext [ 1..1 ]
      E rsm:ExchangedDocument [ 1..1 ]
        s xs:sequence [ 1..1 ]
          E ram:ID [ 1..1 - token ]
          E ram:Name [ 0..1 - string ]
          E ram:TypeCode [ 0..1 - DocumentNameCodeContentType ]
          E ram:IssueDateTime [ 1..1 ]
          E ram:CopyIndicator [ 0..1 ]
          E ram:Purpose [ 0..1 - string ]
          E ram:ControlRequirementIndicator [ 0..1 ]
          E ram:LanguageID [ 0..1 - token ]
          E ram:PurposeCode [ 0..1 - MessageFunctionCodeContentType ]
          E ram:RevisionDateTime [ 0..1 ]
          E ram:VersionID [ 0..1 - token ]
          E ram:GlobalID [ 0..1 - token ]
          
```

Target

```

E /p1:Invoice/cbc:InvoiceTypeCode
E p1:Invoice [ 1..1 ]
  s xs:sequence [ 1..1 ]
    E cbc:CustomizationID [ 1..1 - normalizedString ]
    E cbc:ProfileID [ 0..1 - normalizedString ]
    E cbc:ID [ 1..1 - normalizedString ]
    E cbc:IssueDate [ 1..1 - date ]
    E cbc:DueDate [ 0..1 - date ]
    E cbc:InvoiceTypeCode [ 1..1 - normalizedString ]
    E cbc:Note [ 0..unbounded - string ]
    E cbc:TaxPointDate [ 0..1 - date ]
    E cbc:DocumentCurrencyCode [ 1..1 - normalizedString ]
    E cbc:CurrencyCode [ 0..1 - normalizedString ]
    E cbc:AccountingCost [ 0..1 - string ]
    E cbc:Reference [ 0..1 - string ]
    E cbc:Period [ 0..1 ]
    E cbc:Reference [ 0..1 ]
    E cbc:Reference [ 0..1 ]
    
```

Element | **Notes** | **External code lists** | **Codes** | **Enhanced** | **Children**

Code	Name
c 4	Test report
c 5	Product performance report
c 6	Product specification report
c 7	Process data report
c 8	First sample test report
c 9	Price/sales catalogue

Name (EN) Certificate of analysis
 Desc (EN) Certificate providing the values of an analysis.
 Name (DE) Analysezertifikat
 Desc (DE) Zertifikat, das die Werte einer Analyse enthält.

Mapping list

Seq	Source	Type	Target	Check
1	urn:cen.eu:en16931:2017	☐	cbc:CustomizationID [1..1 - normalizedString]	
2	ID [0..1 - token]	☐	cbc:ProfileID [0..1 - normalizedString]	
3	ID [1..1 - token]	☐	cbc:ID [1..1 - normalizedString]	
4	DateTimeString [1..1 - string]	☐	cbc:IssueDate [1..1 - date]	
5	DateTimeString [1..1 - string]	☐	cbc:DueDate [0..1 - date]	
6	TypeCode [0..1 - DocumentNameCodeContentType]	☐	cbc:InvoiceTypeCode [1..1 - normalizedString]	
7	SubjectCode [0..1 - token]	☐	cbc:Note [0..unbounded - string]	
8	Content [0..unbounded - string]	☐	cbc:Note [0..unbounded - string]	

Mapping list

Going into the details of mapping practice

ZUGFeRD ⇔ EN 16931



**Mapping
Properties
Area**

The screenshot displays the 'Mapping project: Specification - RDM' interface. It features two main panels for schema comparison:

- Source:** /rsm:CrossIndustryDocument/rsm:SpecifiedSupplyChainTradeTransaction/ram:ApplicableSupplyChainTradeAgreement [1..1]
- Target:** /rsm:CrossIndustryInvoice/rsm:SupplyChainTradeTransaction/ram:ApplicableHeaderTradeAgreement [1..1]

The interface shows the hierarchical structure of both schemas, with elements like 'xs:sequence', 'rsm:ExchangedDocumentContext', 'rsm:ExchangedDocument', 'rsm:SupplyChainTradeTransaction', 'ram:IncludedSupplyChainTradeLineItem', and 'ram:ApplicableHeaderTradeAgreement'.

On the right, the **Mapping properties** panel is visible, showing a 'Direct mapping' configuration. Below this, a **Library with Functions for Experts** is provided, listing various XPath functions and their descriptions:

Name	Description
Accessor	
base-uri()	Returns the value of the base-uri property of the current or specified node
base-uri(node)	Returns the value of the base-uri property of the current or specified node
data(item, item...)	Takes a sequence of items and returns the value of the data property of the first item
document-uri(node)	Returns the value of the document-uri property of the current or specified node
is-empty(node)	Returns a Boolean value indicating whether the node is empty
node-name(node)	Returns the node-name of the current or specified node
Error and Trace	
error()	Example: error(fn:QName(http://www.w3.org/2001/XMLSchema-instance, 'error'))
error(error)	Example: error(fn:QName(http://www.w3.org/2001/XMLSchema-instance, 'error'))
error(error, description)	Example: error(fn:QName(http://www.w3.org/2001/XMLSchema-instance, 'error'), 'error description')
error(error, description, error-object)	Example: error(fn:QName(http://www.w3.org/2001/XMLSchema-instance, 'error'), 'error description', \$error-object)
trace(value, label)	Used to debug queries
Numeric	
abs(num)	Returns the absolute value of the argumentExample: abs(3.14)Result: 3.14, Example: abs(-3.14)Result: 3.14
ceiling(num)	Returns the smallest integer that is greater than the number argumentExample: ceiling(3.14)Result: 4
floor(num)	Returns the largest integer that is not greater than the number argumentExample: floor(3.14)Result: 3
number(arg)	Returns the numeric value of the argument. The argument could be a boolean, string, or node
round(num)	Rounds the number argument to the nearest integerExample: round(3.14)Result: 3

Source:
ZUGFeRD 1.0

Target:
EN 16931

**Library with
Functions
for Experts**

Direct Mappings

EN 16931 ↔ ZUGFeRD 1.0



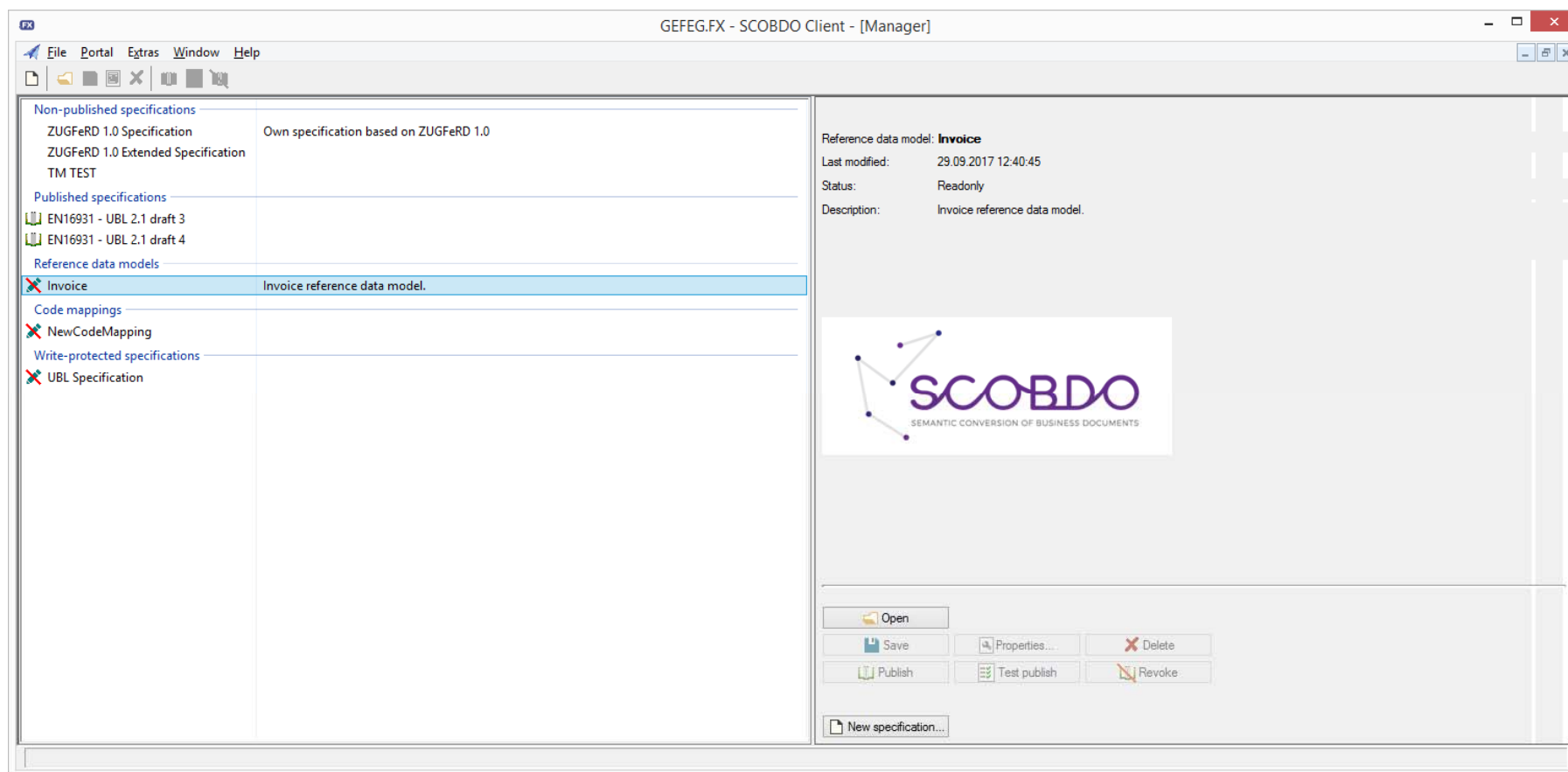
Source:
ZUGFeRD 1.0

Target:
EN 16931

Mapping Properties Area

Library with Functions for Experts

Live Demo of the SCOBDO Client



Features for Technical Experts: Handling Mapping Issues



Direct mappings

Connecting two elements with the same meaning

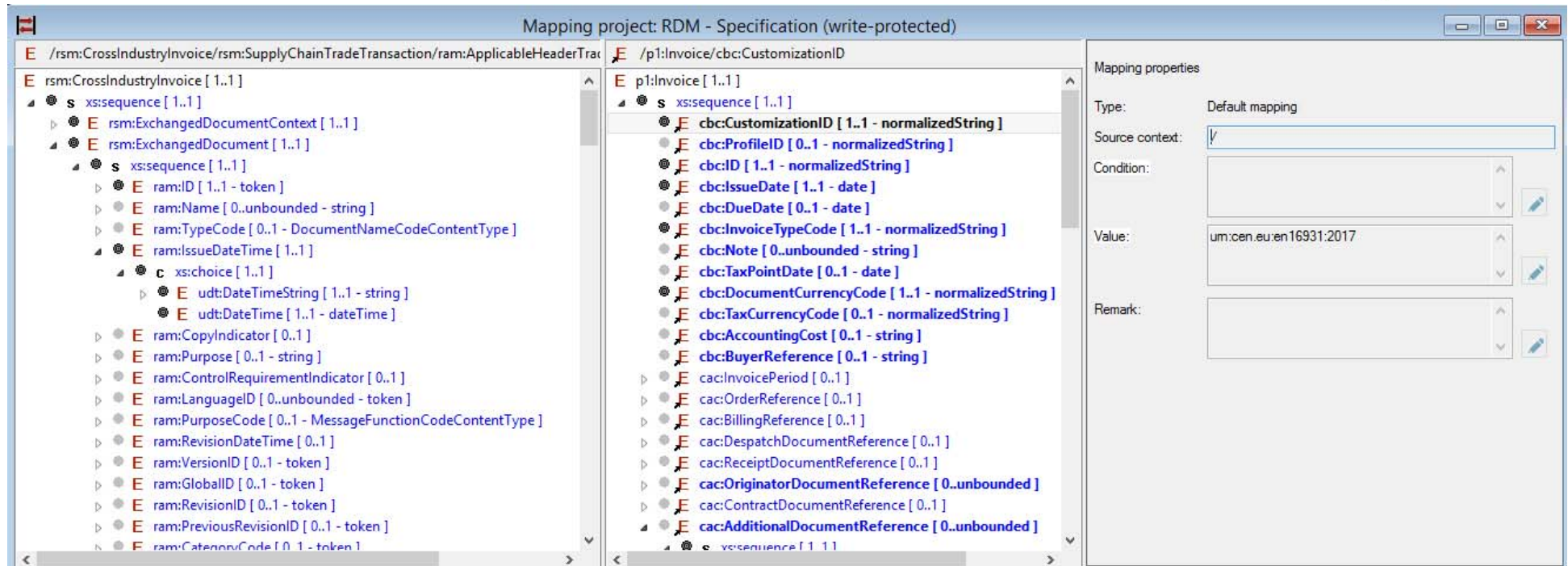
Default mappings

Setting default values in order to deal with different technicality of corresponding elements

Structure mappings

Solving structural mismatches of source and target of corresponding elements

Default Mappings



Mapping project: RDM - Specification (write-protected)

Left Schema: /rsm:CrossIndustryInvoice/rsm:SupplyChainTradeTransaction/ram:ApplicableHeaderTradeAgreement

- rsm:CrossIndustryInvoice [1..1]
 - xs:sequence [1..1]
 - rsm:ExchangedDocumentContext [1..1]
 - rsm:ExchangedDocument [1..1]
 - xs:sequence [1..1]
 - ram:ID [1..1 - token]
 - ram:Name [0..unbounded - string]
 - ram:TypeCode [0..1 - DocumentNameCodeContentType]
 - ram:IssueDateTime [1..1]
 - xs:choice [1..1]
 - udt:DateTimeString [1..1 - string]
 - udt:DateTime [1..1 - dateTime]
 - ram:CopyIndicator [0..1]
 - ram:Purpose [0..1 - string]
 - ram:ControlRequirementIndicator [0..1]
 - ram:LanguageID [0..unbounded - token]
 - ram:PurposeCode [0..1 - MessageFunctionCodeContentType]
 - ram:RevisionDateTime [0..1]
 - ram:VersionID [0..1 - token]
 - ram:GlobalID [0..1 - token]
 - ram:RevisionID [0..1 - token]
 - ram:PreviousRevisionID [0..1 - token]
 - ram:CategoryCode [0..1 - token]

Right Schema: /p1:Invoice/cbc:CustomizationID

- p1:Invoice [1..1]
 - xs:sequence [1..1]
 - cbc:CustomizationID [1..1 - normalizedString]
 - cbc:ProfileID [0..1 - normalizedString]
 - cbc:ID [1..1 - normalizedString]
 - cbc:IssueDate [1..1 - date]
 - cbc:DueDate [0..1 - date]
 - cbc:InvoiceTypeCode [1..1 - normalizedString]
 - cbc:Note [0..unbounded - string]
 - cbc:TaxPointDate [0..1 - date]
 - cbc:DocumentCurrencyCode [1..1 - normalizedString]
 - cbc:TaxCurrencyCode [0..1 - normalizedString]
 - cbc:AccountingCost [0..1 - string]
 - cbc:BuyerReference [0..1 - string]
 - cac:InvoicePeriod [0..1]
 - cac:OrderReference [0..1]
 - cac:BillingReference [0..1]
 - cac:DespatchDocumentReference [0..1]
 - cac:ReceiptDocumentReference [0..1]
 - cac:OriginatorDocumentReference [0..unbounded]
 - cac:ContractDocumentReference [0..1]
 - cac:AdditionalDocumentReference [0..unbounded]

Mapping properties

Type: Default mapping

Source context: p1:Invoice

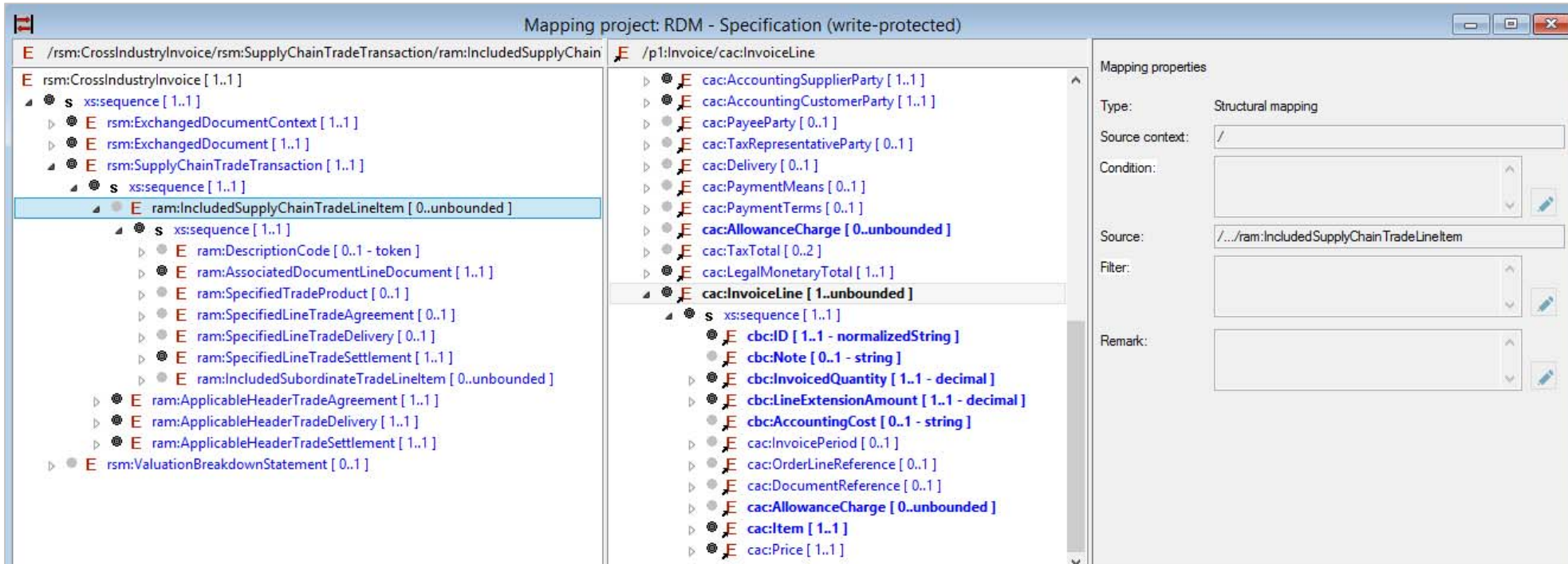
Condition:

Value: urn:cen.eu:en16931:2017

Remark:

- Used to define fixed values and constants, e.g. Customization ID in UBL invoice referring to EN Norm (RDM).

Structure Mappings



The screenshot displays the 'Mapping project: RDM - Specification (write-protected)' window. It shows two XML schemas side-by-side with their structural elements mapped.

Source Schema (Left): `/rsm:CrossIndustryInvoice/rsm:SupplyChainTradeTransaction/ram:IncludedSupplyChain`

- `rsm:CrossIndustryInvoice [1..1]`
 - `xs:sequence [1..1]`
 - `rsm:ExchangedDocumentContext [1..1]`
 - `rsm:ExchangedDocument [1..1]`
 - `rsm:SupplyChainTradeTransaction [1..1]`
 - `xs:sequence [1..1]`
 - `ram:IncludedSupplyChainTradeLineItem [0..unbounded]`** (Selected)

Target Schema (Right): `/p1:Invoice/cac:InvoiceLine`

- `cac:AccountingSupplierParty [1..1]`
- `cac:AccountingCustomerParty [1..1]`
- `cac:PayeeParty [0..1]`
- `cac:TaxRepresentativeParty [0..1]`
- `cac:Delivery [0..1]`
- `cac:PaymentMeans [0..1]`
- `cac:PaymentTerms [0..1]`
- `cac:AllowanceCharge [0..unbounded]`** (Selected)
- `cac:TaxTotal [0..2]`
- `cac:LegalMonetaryTotal [1..1]`
- `cac:InvoiceLine [1..unbounded]`** (Selected)
- `xs:sequence [1..1]`
 - `cbc:ID [1..1 - normalizedString]`
 - `cbc:Note [0..1 - string]`
 - `cbc:InvoicedQuantity [1..1 - decimal]`
 - `cbc:LineExtensionAmount [1..1 - decimal]`
 - `cbc:AccountingCost [0..1 - string]`
 - `cac:InvoicePeriod [0..1]`
 - `cac:OrderLineReference [0..1]`
 - `cac:DocumentReference [0..1]`
 - `cac:AllowanceCharge [0..unbounded]`
 - `cac:Item [1..1]`
 - `cac:Price [1..1]`

Mapping properties (Right Panel):

- Type: Structural mapping
- Source context: /
- Condition: (Empty)
- Source: `/.../ram:IncludedSupplyChainTradeLineItem`
- Filter: (Empty)
- Remark: (Empty)

- Used for repetitions, e.g. LineItems
- Used for 2 level filtering: Condition and Filter, e.g. optional fields
- Variants (Target) available

What will I do with the Mapping Spec Results



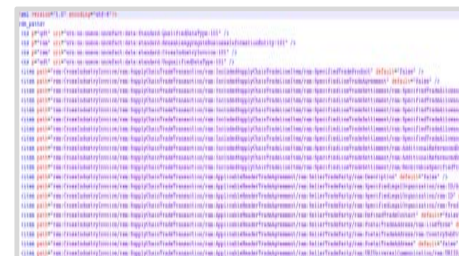
XSLT 2.0

Open the XSLT Outcome of the Mapping, e.g. for comparison of formats



Productive Mapping

Download version of the XSLT file, e.g. for further use in converter software



Mapping GAP

For running a gap analysis of unmapped elements from source to RDM

Example XSLT 2.0 File



```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet exclude-result-prefixes="meta xs xsl qdt ram rsm udt rsm2 src_ram src_udt" xmlns:src_udt="urn:un:unece:uncefact:data:standard:UnqualifiedDataType:15"
xmlns:src_ram="urn:un:unece:uncefact:data:standard:ReusableAggregateBusinessInformationEntity:12" xmlns:rsm2="urn:ferd:CrossIndustryDocument:invoice:1p0"
xmlns:udt="urn:un:unece:uncefact:data:standard:UnqualifiedDataType:101" xmlns:rsm="urn:un:unece:uncefact:data:standard:CrossIndustryInvoice:101"
xmlns:ram="urn:un:unece:uncefact:data:standard:ReusableAggregateBusinessInformationEntity:101" xmlns:qdt="urn:un:unece:uncefact:data:standard:QualifiedDataType:101"
xmlns:p1="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2" xmlns:cbc="urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-2"
xmlns:cac="urn:oasis:names:specification:ubl:schema:xsd:CommonAggregateComponents-2" xmlns:xsl="http://www.w3.org/1999/XSL/Transform" xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:meta="http://www.gefeg.com/xslt/meta" version="2.0">
  <xsl:output indent="yes" encoding="UTF-8" method="xml"/>
  - <xsl:variable name="phase-1-output">
    <xsl:apply-templates mode="phase1" select="/" />
  </xsl:variable>
  - <xsl:template mode="phase1" match="/">
    - <rsm:CrossIndustryInvoice xmlns:rsm2="urn:ferd:CrossIndustryDocument:invoice:1p0" xmlns:udt="urn:un:unece:uncefact:data:standard:UnqualifiedDataType:15"
      xmlns:ram="urn:un:unece:uncefact:data:standard:ReusableAggregateBusinessInformationEntity:12" xmlns:tgt_udt="urn:un:unece:uncefact:data:standard:UnqualifiedDataType:101"
      xmlns:tgt_ram="urn:un:unece:uncefact:data:standard:ReusableAggregateBusinessInformationEntity:101">
      - <rsm:ExchangedDocumentContext>
        - <xsl:attribute name="meta:mandatory">
          <xsl:value-of select="'true'"/>
        </xsl:attribute>
        - <tgt_ram:TestIndicator>
          - <tgt_udt:Indicator>
            - <xsl:attribute name="meta:mandatory">
              <xsl:value-of select="'true'"/>
            </xsl:attribute>
            <xsl:value-of select="rsm2:CrossIndustryDocument/rsm2:SpecifiedExchangedDocumentContext/ram:TestIndicator/udt:Indicator/text()"/>
          </tgt_udt:Indicator>
        </tgt_ram:TestIndicator>
        - <xsl:for-each select="rsm2:CrossIndustryDocument/rsm2:SpecifiedExchangedDocumentContext/ram:BusinessProcessSpecifiedDocumentContextParameter">
          - <tgt_ram:BusinessProcessSpecifiedDocumentContextParameter>
            - <tgt_ram:ID>
              <xsl:value-of select="ram:ID/text()"/>
            </tgt_ram:ID>
          </tgt_ram:BusinessProcessSpecifiedDocumentContextParameter>
        </xsl:for-each>
        - <tgt_ram:GuidelineSpecifiedDocumentContextParameter>
          - <tgt_ram:ID>
            <xsl:value-of select="rsm2:CrossIndustryDocument/rsm2:SpecifiedExchangedDocumentContext/ram:GuidelineSpecifiedDocumentContextParameter/ram:ID/text()"/>
          </tgt_ram:ID>
        </tgt_ram:GuidelineSpecifiedDocumentContextParameter>
      </rsm:ExchangedDocumentContext>
    </rsm:ExchangedDocument>
  </template>
  </xsl:template>
```

Contact



Jenny Hertzfeldt
Senior eBusiness Consultant
+49-30-979914-0
Jenny.Hertzfeldt@gefeg.com

GEFEG mbH
Storkower Strasse 207
10369 Berlin, Germany
www.gefeg.com
info@gefeg.com



**Many thanks for your
attention.
Your questions, please?**

Lots of Functions Available

- XSLT 2.0
- Individual functions like code mappings

XPath functions	
Name	Description
Accessor	
base-uri()	Returns the value of the base-uri property of the curr...
base-uri(node)	Returns the value of the base-uri property of the curr...
data(item,item,...)	Takes a sequence of items and returns a sequence ...
document-uri(node)	Returns the value of the document-uri property for th...
nilled(node)	Returns a Boolean value indicating whether the argu...
node-name(node)	Returns the node-name of the argument node
Error and Trace	
error()	Example: error(fn:QName('http://example.com/test', '...
error(error)	Example: error(fn:QName('http://example.com/test', '...
error(error,description)	Example: error(fn:QName('http://example.com/test', '...
error(error,descriptio...	Example: error(fn:QName('http://example.com/test', '...
trace(value,label)	Used to debug queries
Numeric	
abs(num)	Returns the absolute value of the argumentExample: ...
ceiling(num)	Returns the smallest integer that is greater than the n...
floor(num)	Returns the largest integer that is not greater than the...
number(arg)	Returns the numeric value of the argument. The argu...
round(num)	Rounds the number argument to the nearest integerE...
round-half-to-even()	Example: round-half-to-even(0.5)Result: 0Example: ro...
String	
codepoint-equal(co...	Returns true if the value of comp1 is equal to the val...

Example: Date Conversion

Source: DateTime, 2017-09-18T00:00:00Z

Replace(substring(\$value,1,10), "-","")

Target: FormattedDateTime, 20170918