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GEFEG 

WCO DM XML and Auto-generation Exercise

- **Introduction to WCO DM XML**
- **Exercise to auto-generate conformant WCO DM XML message**
- **Benefits of auto-generation from customisations**

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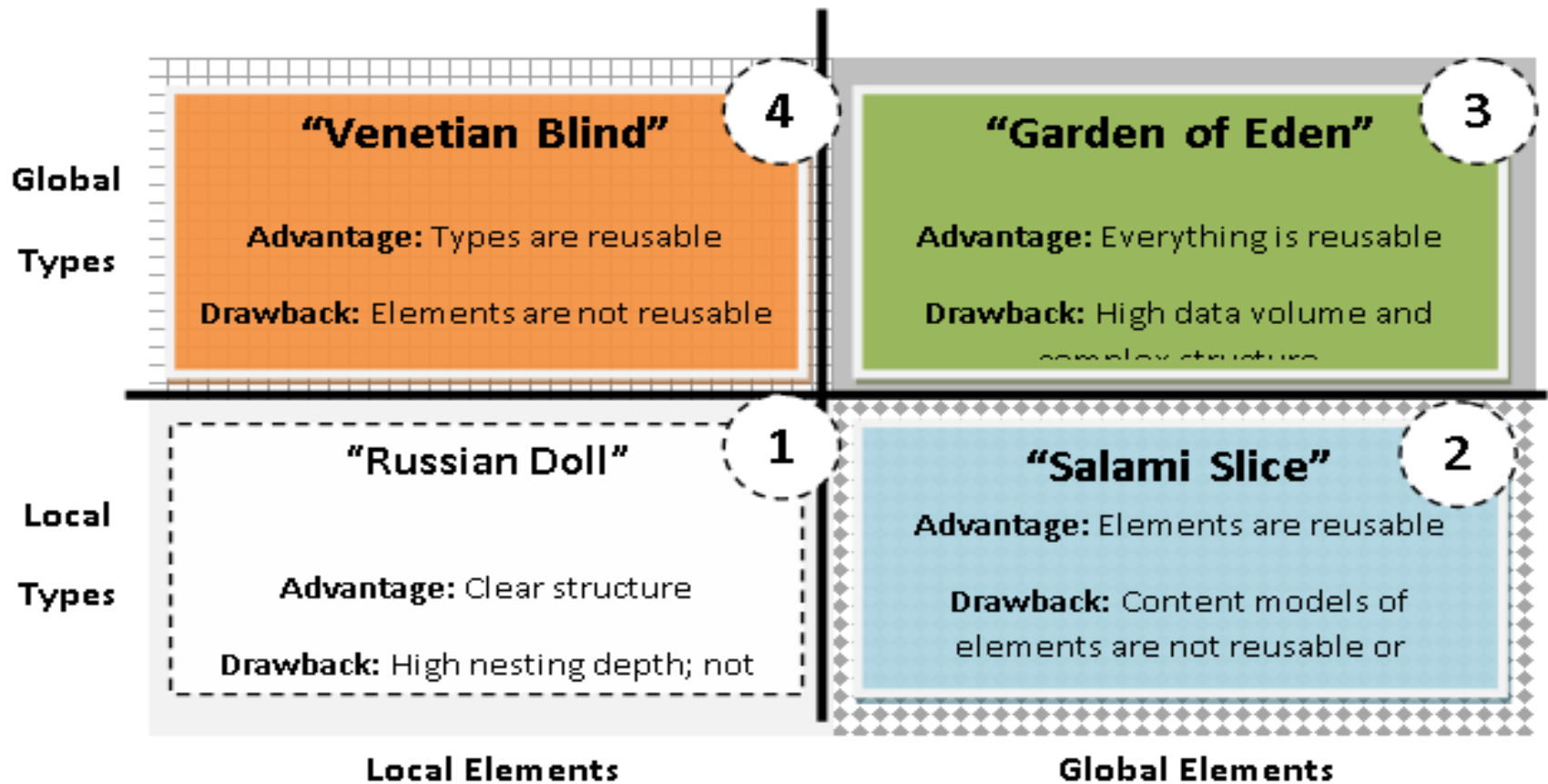
XML Schema Design Aspects

- The design and consequently the usage of any XML schema depends on the relationships between elements and their types
- Each design pattern has pros and contras
- WCO XML Design: almost (simple types are global) Russian Doll
- The Russian Doll design allows for maximum customization, maximum validation and minimum reuse, supports well Web Services development (e.g. Boeing WebService)
- In some cases this has raised XML concerns when the XML design of the published schemas are actually not suited to their required usage of their planned XML exchanged schemas
- In these cases the advice would be for them to generate differently designed XML schemas based on the UML data model message structures published Information Packages



Any adoption of the WCO Data Model may require other formats in addition or as alternatives to the use of the WCO Data Model XML schemas.

XML Schema Design Patterns



From Message Specification to Technical Implementation

Business Expert

Technical Implementer

My business contextualisations will be automatically „transformed“ to support my technical implementation team.

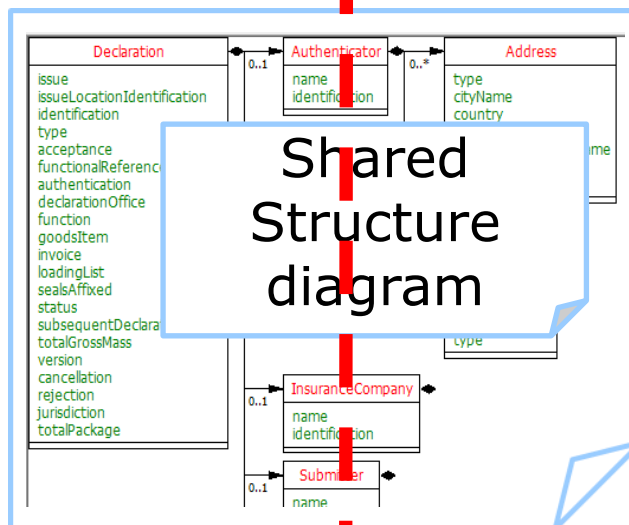
Business Usage Documentation

XML Usage Documentation

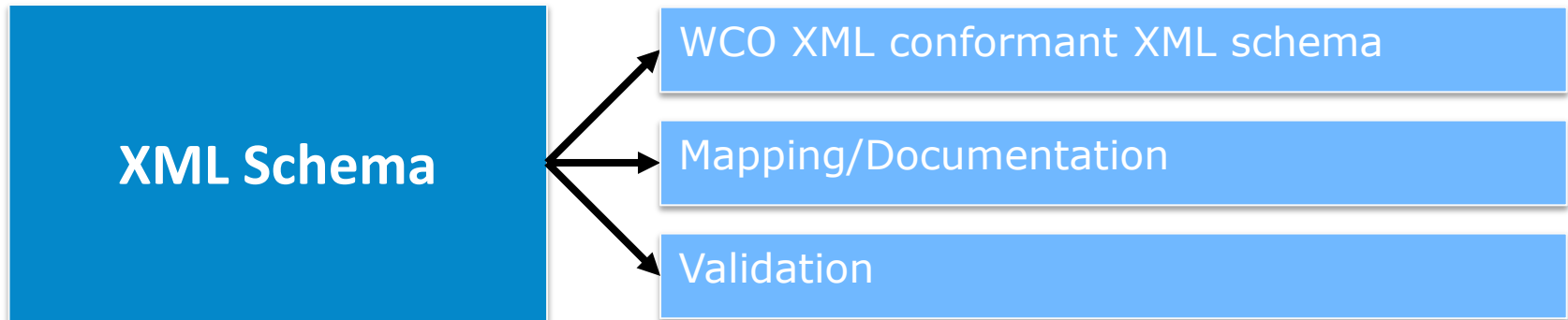
Schematron validation rules

XML Schemas (XSD)

Shared Structure diagram



WCO DM Compliant XML Schema



- Display XML languages, develop and manage XML
- Auto-generation of XML from Data Model structures
- Create business documentation for XML schema implementation
- Validation of business rules (Schematron)
- Complete W3C recommendation implemented

WCO Compliant XML Schemas Specifications

The screenshot displays the GEFEG.FX software interface. On the left, a tree view shows the 'CoO_1p0' schema structure, including 'xs:sequence' and 'Consignment' elements. The main panel shows the 'CoO_1p0' schema details, including a table of technical properties and a 'Technical Properties' section.

The 'Technical Properties' section includes the following table:

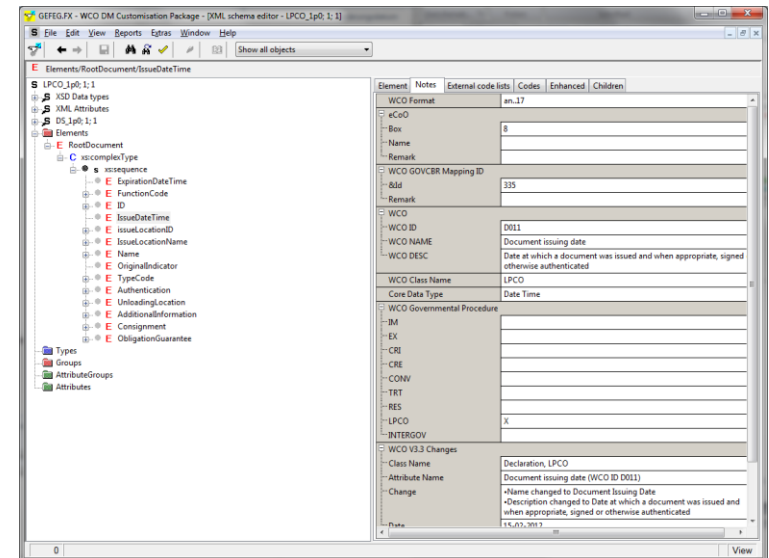
Type	ds:ConsignorIdentificationIDType
Use	
Occurrence	0 .. 1
Fixed / Default	
Length	
FractionDigits / TotalDigits	
Inclusive	
Exclusive	
Pattern	
Whitespace	collapse

Below the table, the text 'CoO_1p0; TEST eCoO; 1test2' and 'Issue date: 09.07.2013 Print date: 0' are visible.

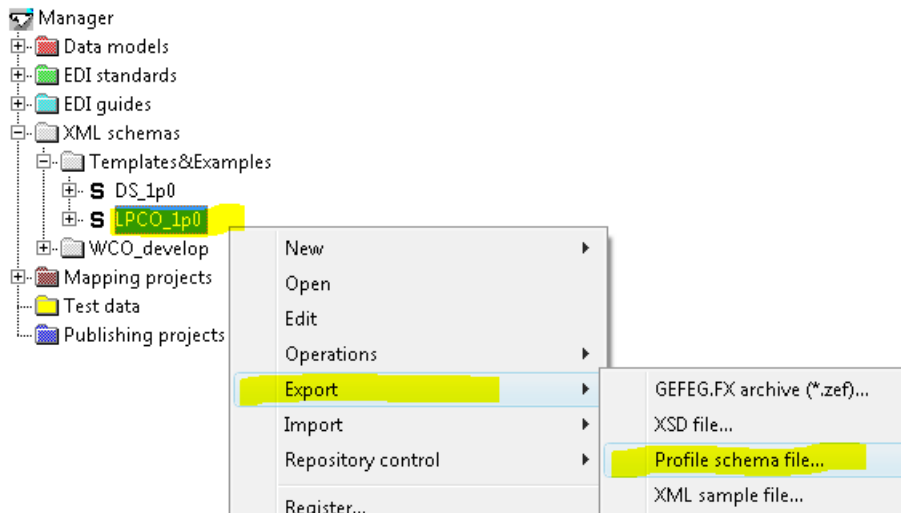
On the right, a file explorer shows a tree view of the 'WCO' directory. A context menu is open over the 'My LPCO Guide; R1; 1' file, showing options like 'New', 'Open', 'Edit', 'Operations', 'Export', 'Repository control', 'Register...', and 'Unregister'. A sub-menu is open for 'Export', showing options like 'GEFEG.FX archive (*.zef)...', 'GEFEG.FX meta file...', 'WCO 3.3 GEFEG.FX XML schema...', and 'WCO GEFEG.FX XML schema...'.

A dialog box titled 'WCO 3.3 GEFEG.FX XML schema' is open, showing a 'Select the data model.' prompt. The 'Data model:' field contains 'My LPCO Guide; R1; 1' and the 'Document class:' field contains 'Main/LPCO'.

- Order of Elements in the schema is following the Order of classes and attributes in the WCO Data Model
- Mixture of Russian Doll and Venetian Blind schema design approach is used
- Element Naming follows „UpperCamelCase“ naming and design concept
- Use of UN/CEFACT Unqualified Data Type to represent the Core Component Technical Specifications (CCTS) Core Data Types of the WCO data elements
- For any WCO Data Model attribute one unique type will be created in the Dataset schema e.g. “DS_1p0 XML-Schema”



Generate XSD Files



```

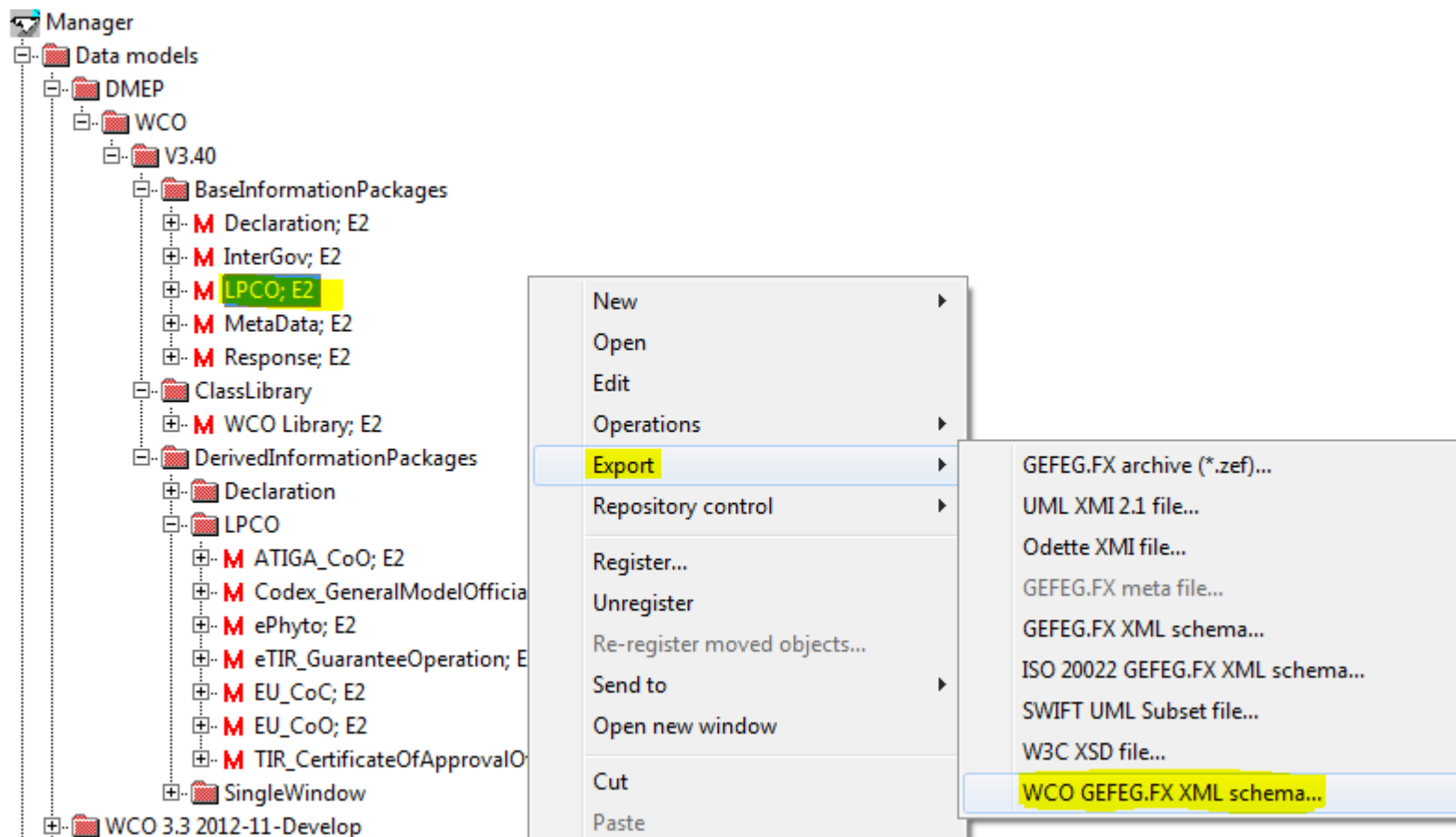
elementFormDefault="qualified">
<xs:import namespace="urn:wco:datamodel:WCO:DS:DS" schemaLocation="CoO_1p0_ur
<xs:element name="CoORootElement">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="Consignment" minOccurs="0" maxOccurs="unbounded">
        <xs:annotation>
          <xs:documentation xml:lang="EN">
            <WCO_ID>28A</WCO_ID>
            <WCO_NAME>Consignment</WCO_NAME>
            <WCO_DESC>Details about the transport between a consignor and a co
          </xs:documentation>
        </xs:annotation>
        <xs:complexType>
          <xs:sequence>
            <xs:element name="Consignor" minOccurs="0" maxOccurs="unbounded">
              <xs:annotation>
                <xs:documentation xml:lang="EN">
                  <WCO_ID>30A</WCO_ID>
                  <WCO_NAME>Consignor</WCO_NAME>
                  <WCO_DESC>Name and address details of the party which, by co
                </xs:documentation>
              </xs:annotation>
              <xs:complexType>
                <xs:sequence>

```

Generate Schematron Files as the W3C Standard for Validation

```
<?xml version="1.0" encoding="UTF-8"?>
<schema xmlns="http://purl.oclc.org/dsdl/schematron"
  queryBinding="gefeg"
  schemaVersion="iso">
  <title>Schema for CoO_1p0; TEST eCo0; 1test2</title>
  <ns uri="coo_ns:1" prefix="p1"/>
  <ns uri="http://www.gefeg.com/xmltextensions" prefix="gefeg"/>
  <ns uri="urn:un:unece:uncefact:codelist:standard:IANA:CharacterSetC"
  <ns uri="urn:un:unece:uncefact:codelist:standard:IANA:MIMEMediaType"
  <ns uri="urn:un:unece:uncefact:codelist:standard:ISO:ISO3AlphaCurre"
  <ns uri="urn:un:unece:uncefact:codelist:standard:UNCEFACT:Character"
  <ns uri="urn:un:unece:uncefact:codelist:standard:UNECE:AgencyIdenti
```

Auto-generate Conformant WCO DM XML Message



Benefits of Auto-generation from Customisations

- Easy to use function for non technical business users
- User subsets and customizations (My Information Packages) can be exported, as well as WCO Base Information Packages (BIPs), Derived Information Packages (DIPs)
- Auto-generation of XSD Schema files based on the WCO data model
- Result is a WCO conformant XML Schema
- Final output can be influenced in regard to contents, design