UN/CEFACT Evolution/Revolution

Reference Data Models (Semantic Models)

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Hangzhou, 16 October 2018
Agenda

• **Principle of Reference Data Models**
  • Mr. Gerhard Heemskerk, lead editor SCRDM

• **Multi-Modal Transport RDM**
  • Ms. Sue Probert, Chair UN/CEFACT, lead editor MMT

• **Link between Supply Chain and Transport**
  • Mr. Rolf Wessel, project lead SCRDM
Principle of UN/CEFACT Reference Data Models

Principle of RDM

Mr. Gerhard Heemskerk, lead editor SCRDM
A new way to facilitate eBusiness communication

• A semantic model that suits more the data exchange requirements of the future such as for data pipelines as well as for traditional document based data exchanges.

• Reducing dependency on traditional documents by focussing more on process driven data and workflows.
A new way to facilitate the future

traditional infrastructure & super highways

traditional documents & process driven data
What is a UN/CEFACT Reference Data Model?

• An exchange syntax neutral semantic model, a rich collection of business artefacts (subset of library), contextualized for a specific domain

• Based on:
  • UN/CEFACT Core Component Library (CCL)
  • UN/CEFACT BRSs (Business Requirement Specifications)
  • UN/CEFACT principles of UN Layout Key
  • UN Trade Data Element Directory
  • UN/EDIFACT
  • UN/CEFACT principles (harmonization, standardization simplification)
Benefits of UN/CEFACT Reference Data Models

• **Efficient**
  - to implement (restriction of artefacts used, not used principle)
  - to maintain (restriction of same artefact instead of doc specific ones)
  - to find, appropriate artifacts in one subset of the CCL (no redundancy)
  - light weight message xsd’s (only needed re-usable BIEs, qDT’s, uDT’s)

• **Trusted semantic model**
  - international standardized & harmonized
  - links to rich legacy of UN Key Layouts and UN/EDIFACT

• **Enhances interoperability**
  - sharing data e.g. Supply Chain (SCRDM) & Transport (MMT RDM)
  - integrated international code lists (UNECE, UN/EDIFACT, ISO etc.)

• **Future proof**
  - a syntax neutral semantic model
  - support information sharing, such as enabled by data pipelines
What is the evolution?

- Moving from document centric to process driven artefacts
- Still supporting document centric & process driven workflows and data exchange structures
- Introducing a standardized master message structure, syntax-neutral data from which complete documents and/or snippets can be created
Reference Data Model: subset of the library

UN/CEFACT Core Component Library (CCL)

- Process Driven Artefacts (only Reference BIEs used)
- Subset of UN/CEFACT Core Component Library
- Master Message Structure
- Business Data Exchange Structure(s)

Example:
- SCRDM Subset of CCL
- SCRDM CII (Invoice)
No more dependency on traditional documents

**Document Centric**

- CICH_Supply Chain_Trade Agreement Details
- CIDDH_Supply Chain_Trade Agreement Details
- CIJH_Supply Chain_Trade Agreement Details
- CIQH_Supply Chain_Trade Agreement Details
- CIRT_Supply Chain_Trade Agreement Details
- CIS_Supply Chain_Trade Agreement Details

Above artifacts can only be used for specific documents

**Process Driven**

**Process driven artefact**
(Reference BIE)

- Header_Trade Agreement.Details

Same artifact can be used within different processes and message structures

**Data contextualized for a process and/or a message structure**

Master message structure Contextualized for complete documents or snippets
Simplification: Supply Chain 40% less needed, than using document centric approach

CCL Progress

Supply Chain Management & Procurement
Transport & Logistics
Accounting and Audit
Agricultural
Environmental Management
Finance and Payment
Travel and Tourism
Insurance

123 Messages
169 Code lists
1218 Business artefacts
579 Core components

Key:
ABIE - Aggregate Business Information Entities
ACC - Aggregate Core Component
qDT – Qualified DataType

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Ms. Sue Probert, lead editor MMT RDM
(Multi Modal Transport Reference Data Model)
The model behind the UN/CEFACT MMT RDM

The international Supply Chain Reference Model

BUY  SHIP  PAY

Prepare for Export  Export  Transport  Prepare for Import  Import

INvolVes

Commercial Procedures
- Establish Contract
- Order Goods
- Advise On Delivery
- Request Payment
- Packing
- Inspection
- Certification
- Accreditation
- Warehousing

Transport Procedures
- Establish Transport Contract
- Collect, Transport and Deliver Goods
- Provide Waybills, Goods Receipts Status reports etc.

Regulatory Procedures
- Obtain Import/Export Licences etc
- Provide Customs Declarations
- Provide Cargo Declaration
- Apply Trade Security Procedures
- Clear Goods for Export/Import

Financial Procedures
- Provide Credit Rating
- Provide Insurance
- Provide Finance
- Execute Payment
- Issue Statements
The Relationship between International Sales and Transport Service Contracts

- **Actors/Roles**
  - Customer
  - Supplier
  - Final Consignee
  - Exporter
  - Importer
  - Transport Services Buyer
  - Authority
    - Customs
    - OGAs
    - Certification Authority
    - Chamber of Commerce
  - Intermediary
    - Transport Services Provider
    - Carrier
    - Freight Forwarder
    - Bank
    - Customs Agent
    - Insurer

- **Transactions**
  - Identify Potential Sales Partner
  - Establish Agreement (Sales)
  - Order (Sales)
  - Ship
  - Pay (Sales)
  - Sales Quotation
  - Sales Order
  - Transport Service Contract
    - Establish Agreement
    - Order (Transport)
    - Ship (Transport)
    - Pay (Transport)
  - Border Clearance(s)
    - Import/Export Declarations
    - Cargo and Transport Reports
    - Origin and other Certificates
  - Sales Invoice

- Copyright UNECE

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Using a common library and deriving messages

UN/CEFACT Core Component Library (CCL)

Supply Chain (BUY PAY) Semantic model

BUY SHIP PAY Semantic model

BUY SHIP PAY Master (Master message structure)

BUY PAY Master (Master message structure)

e.g. Invoice

e.g. Order

e.g. Quotation

Multi Modal Transport (SHIP) Semantic model

Based on

Based on

Based on

Based on

Based on

Based on

Based on

Based on

Based on

Based on

Based on

Based on

Based on

BILL OF LADING

BOOKING

BAYPLAN

SHIP Master (1)
(Master message structure)

SHIP Master (2)
(Master message structure)

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* No of ABIEs
BUY SHIP PAY master message structure

The ‘Common Master’ message structure

Library CCL

BUY SHIP PAY (BSP)
semantic model

BUY SHIP PAY MASTER
(master message structure)
BUY SHIP PAY Reference Data Model

Based on

COMPLETE LIBRARY
UN/CEFACT CCL

BUY SHIP PAY
Semantic model
Library subset/restrictions
BUY SHIP PAY RDM – Contextualized

Based on UN/CEFACT Forum, Hangzhou 15-19 October 2018

<table>
<thead>
<tr>
<th>SCRDM Semantic model</th>
<th>Library subset/restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Trade Country</td>
<td></td>
</tr>
<tr>
<td>C Trade Currency Exchange</td>
<td></td>
</tr>
<tr>
<td>C Trade Delivery Terms</td>
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<tr>
<td>X Trade Geopolitical Region</td>
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<tr>
<td>C Trade Location</td>
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</tr>
<tr>
<td>X Trade Note</td>
<td></td>
</tr>
<tr>
<td>X Trade Package</td>
<td></td>
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<tr>
<td>C Trade Party</td>
<td></td>
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<tr>
<td>C Trade Payment Discount Terms</td>
<td></td>
</tr>
<tr>
<td>X Trade Payment Instructions</td>
<td></td>
</tr>
<tr>
<td>X Trade Payment Means</td>
<td></td>
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<tr>
<td>C Trade Payment Penalty Terms</td>
<td></td>
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<tr>
<td>C Trade Payment Terms</td>
<td></td>
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<tr>
<td>C Trade Price</td>
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<tr>
<td>C Trade Product Group</td>
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<td>C Trade Product Instance</td>
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<tr>
<td>X Trade Product Warranty</td>
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<td>C Trade Product</td>
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<tr>
<td>C Trade Tax</td>
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<table>
<thead>
<tr>
<th>MMT Semantic model</th>
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<td>X Trade Note</td>
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<td>C Trade Party</td>
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<td>C Trade Product</td>
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<tr>
<td>C Trade Tax</td>
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</table>
### SCRDM & MMT (Trade Price contextualized)

**Based on**

**SEMANTIC MODEL**

**TRADE PRICE**

**SCRDM**
- Semantic model
- Trade Price subset/restriction

**MMT**
- Semantic model
- Trade Price subset/restriction

<table>
<thead>
<tr>
<th>SCRDM</th>
<th>MMT</th>
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<td>Trade Price</td>
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<td>✔ Net Price Indicator</td>
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<td>✔ Type Code</td>
<td>✔ Type Code</td>
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<td>✗ Charge Amount</td>
<td>✔ Charge Amount</td>
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<td>✗ Minimum Charge Amount</td>
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<tr>
<td>✔ Maximum Charge Amount</td>
<td>✗ Maximum Charge Amount</td>
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<tr>
<td>✔ Minimum Quantity</td>
<td>✔ Minimum Quantity</td>
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<tr>
<td>✔ Maximum Quantity</td>
<td>✔ Maximum Quantity</td>
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<td>✔ Unit Amount</td>
<td>✔ Unit Amount</td>
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<tr>
<td>✔ Change Reason Text</td>
<td>✔ Change Reason Text</td>
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<td>✔ Order Unit Conversion Factor</td>
<td>✔ Order Unit Conversion Factor</td>
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<td>✔ Repair Charge Amount</td>
<td>✔ Repair Charge Amount</td>
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<td>✔ Deprecated Validity Period</td>
<td>✔ Deprecated Validity Period</td>
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<td>✔ Applied Allowance/Charge</td>
<td>✔ Applied Allowance/Charge</td>
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<tr>
<td>✔ Validity Period</td>
<td>✔ Validity Period</td>
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<td>✔ Included Tax</td>
<td>✔ Included Tax</td>
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<tr>
<td>✗ Referenced Document</td>
<td>✗ Referenced Document</td>
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<td>✔ Trade Comparison Price</td>
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<tr>
<td>✔ Associated Document</td>
<td>✔ Associated Document</td>
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Contextualized SCRDM messages structure

Supply Chain – BUY PAY - subsetting
SCRDM master message structure

Supply Chain Master Message

Quotation

Document Context

Exchanged Document

Payment

Trade Transaction

Valuation Breakdown Statement

Order

Supply Chain Master Message

Document Context

Exchanged Document

Payment

Trade Transaction

Valuation Breakdown Statement

Invoice

Supply Chain Master Message

Document Context

Exchanged Document

Payment

Trade Transaction

Valuation Breakdown Statement

Remittance Advice

Supply Chain Master Message

Document Context

Exchanged Document

Payment

Trade Transaction

Valuation Breakdown Statement
Contextualized MMT RDM messages structure

Multi Modal Transport – SHIP - subsetting
MMT RDM master message structure

Bill of Lading / IFTMCS

Container BayPlan / BAPLIE

Operational Manifest / IFCSUM

Pipeline Data Exchange Structure (CORE/SELIS)

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The MMT based E-CMR & IMO FAL message

**eCMR**

- **M** eCMR D18A MMT
  - **M** MMT D18A Context SHIP Master
  - **M** Core Component Types
  - **M** eCMR D18A Context CCL
  - **M** CCL18A uDT2-3; edit
  - **M** Main
  - **M** Masters
  - **C** e-CMR Master Message
    - **C** Document Context
    - **A** Transaction ID
    - **A** Business Process
    - **C** Guideline
    - **C** eCMR Header Details
      - **A** eCMR ID
      - **A** Type Code
      - **A** eCMR Issue Date Time
      - **A** Contractual Remarks
      - **C** Additional Particulars Note
      - **C** Issue Location
      - **C** Message Issuer
      - **C** Message Recipient
    - **C** Road Consignment
      - **A** Gross Weight
      - **A** Gross Volume
      - **A** Associated Invoice Amount
      - **A** COD Amount

**IMO FAL**

- **M** MMT IMO FAL Guide
  - **M** MMT D18A Context SHIP Master
  - **M** Core Component Types
  - **M** MMT D18A Context CCL
  - **M** CCL18A uDT2-3; edit
  - **M** Main
    - **M** Masters
    - **C** IMO FAL Guide
      - **C** Logistics Transport Movement
        - **A** ID
        - **A** Stay ID
        - **A** Passenger Quantity
        - **A** Crew Quantity
        - **C** Arrival Event
        - **C** Departure Event
        - **C** Used Transport Means
        - **C** Itinerary Route
        - **C** Call Event
        - **C** Carrier Agent
        - **C** Specified Event
      - **C** Master Consignment
        - **C** Included Consignment Item
          - **A** ID
          - **A** Sequence Number
          - **A** Goods Type Code
          - **A** Gross Weight
          - **A** Gross Volume
          - **A** Package Quantity
          - **A** Package Type Text
          - **C** Cargo Nature Identification
          - **C** Transport Dangerous Goods
          - **C** Used Transport Equipment
## TDED and code lists links

<table>
<thead>
<tr>
<th>Occurrence</th>
<th>Element/Attribute</th>
<th>Short name</th>
<th>TDED</th>
<th>QDT</th>
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<tbody>
<tr>
<td>ABIE</td>
<td>Transport_Cargo. Details</td>
<td>Cargo Identification</td>
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</tr>
<tr>
<td>0 .. 1</td>
<td>BBIE</td>
<td>Type Code</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Definition:</td>
<td>The code, such as UNECE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recommendation 21 single digit codes, specifying the type of transported cargo.</td>
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</tr>
<tr>
<td>0 .. 1</td>
<td>BBIE</td>
<td>Shipping Description</td>
<td>7002</td>
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<tr>
<td></td>
<td>Definition:</td>
<td>The identification, expressed as text, of this transport cargo that is sufficient to identify it for customs, statistical or transport purposes.</td>
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<tr>
<td>0 .. 1</td>
<td>BBIE</td>
<td>Operational Category Code</td>
<td>7085</td>
<td>UN02000077</td>
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<td>Definition:</td>
<td>The code specifying the operational category for this transport cargo, such as obnoxious or military.</td>
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<td>0 .. 1</td>
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<td>7357</td>
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<td>Definition:</td>
<td>The code specifying a statistical classification for this transport cargo.</td>
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<td></td>
</tr>
</tbody>
</table>
Link between Supply Chain and Transport

Mr. Rolf Wessel, project lead editor SCRDM
(Supply Chain Reference Data Model)
Supply Chain & Transport related projects

**BSP**
Publication Buy Ship Pay Reference Data Model Project
Proposed: Cross Industry Track & Trace

**SCRDM**
- Extension of Cross Industry Invoice technical artefacts
- Extension of Cross Industry Cataloguing, Quotation, Ordering, Delivering and Remittance Advice technical artefacts
- Extension of Cross Industry Cross Industry Scheduling
- Cross Industry Invoice-BRS Repository
- Proposed: Revised BRS Despatch & Receive process

**MMT RDM**
- e-CMR
- IMO FAL
- Data Pipeline Carrier
- Smart Containers

**General**
- Procedures for RDM & associated artefacts publication
- Code Management Project
- Proposed: CCBDA profiles Schema Project
Supply Chain & Transport sharing same docs

White Paper
• Concept outline of a Reference Data Model

BRS & CCBDA message structures (Supply Chain & Multi Model Transport)

BRS (Business Requirements Specification)
• Processes in the Supply Chain domain
• Relations to Transport, Finance, Government domains
• The actors and scenarios

CCBDA message structures
• Mapping business requirements to business information entities (Ref BIE)

Guideline
• Executive summary
• Philosophy behind the concept
• Working process and methodology
• Steps for using, updating and creating
Supply Chain & Transport similarity

- **Processes**

<table>
<thead>
<tr>
<th>Supply Chain</th>
<th>Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quoting products &amp; services</td>
<td>Booking Transport</td>
</tr>
<tr>
<td>Ordering products &amp; services</td>
<td>Ordering Transport</td>
</tr>
<tr>
<td>Confirming Order</td>
<td>Confirmation Transport Order</td>
</tr>
<tr>
<td>Instructing Delivery/Handling</td>
<td>Instructing Shipping</td>
</tr>
<tr>
<td>Despatching/Receiving products</td>
<td>Picking up/Unloading goods</td>
</tr>
<tr>
<td>Invoicing goods &amp; services</td>
<td>Invoicing freight</td>
</tr>
<tr>
<td>Synchronizing &amp; status on deliveries</td>
<td>Synchronizing &amp; status on transport</td>
</tr>
</tbody>
</table>

- **Party Roles**

<table>
<thead>
<tr>
<th>Supply Chain</th>
<th>Transport</th>
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</thead>
<tbody>
<tr>
<td>Buyer/Customer</td>
<td>Final Consignee</td>
</tr>
<tr>
<td>Seller/Supplier</td>
<td>Original Consignor</td>
</tr>
<tr>
<td>Buyer/Customer</td>
<td>Transport Service Buyer</td>
</tr>
<tr>
<td>Invoice issuer</td>
<td>Invoice Issuer</td>
</tr>
<tr>
<td>Invoicee</td>
<td>Invoicee</td>
</tr>
<tr>
<td>Sales Agent</td>
<td>Freight Forwarder</td>
</tr>
</tbody>
</table>
Supply Chain & Transport common language

Buy/Ship/Pay RDM

Shared Business Artefacts

- Trade Delivery Terms (inco)
- Trade Party
- Trade Contact
- Trade Address
- Referenced Documents
- Supply Chain Consignment
- Logistics Label
- Delivery Instructions
- Handling Instructions
- Geographical Coordinate
- Logistics Location
- Logistics Package
- Logistics Transport Equipment
- Logistics Transport Means
- Logistics Transport Movement
- Logistics Service Charge
- Logistics Shipping Marks
- Transport Dangerous Goods

Supply Chain RDM

Multi Modal Transport RDM
Supply Chain & Transport optimizing planning

Supply Chain Scheduling

- Demand Forecasting
- Inventory Forecasting
- Supply Instruction
- Supply Notification
- Consumption Reporting

Supply Chain Delivery

- Despatching
- Receiving
- Reporting Status & Events

Transport & Logistics

- Transport Planning
- Transport Movement
- Reporting Status & Events

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Thank you for your attention!

For further information:

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