UN/CEFACT

Reference Data Models (Semantic Models)

Anticipating and Following Technological Trends in eBusiness Data Exchanges
Content

This presentation will provide you information on:

• UN/CEFACT Reference Data Models (Semantic Models)
• Opportunities for standardisation organisations to utilize the new UN/CEFACT concept
UN/CEFACT Reference Data Model:

• An exchange syntax neutral semantic model

• A subset of the UN/CEFACT Core Component Library (CCL)

• A rich collection of business artefacts contextualized for a domain

• The business artefacts can be contextualized on different semantic model levels (e.g. library/process/message).

• A semantic model based on the principles laid down in UN Key Layouts, UN Trade Data Element Directory and UN/EDIFACT

• Based on UN/CEFACT principles of harmonization, standardization and simplification
The UN/CEFACT evolution

- From document centric to process driven artefacts
  (contextualized business artefacts)
- Supports document centric & process driven workflows
- Standardized syntax-neutral data exchange structures,
  based on a common “Master” data exchange structure
  (from which complete documents and/or snippets of documents can be
  created in e.g. UN/CEFACT XML or UN/EDIFACT)
From document centric to process driven business artefacts

Supply chain document centric artefacts
Needed: 200

Supply Chain process driven artefacts
Needed: 123
Benefits of UN/CEFACT semantic models

- Syntax neutral
- Trusted semantic models
- Future-proof
- Easy to use and implement
- Easy to maintain
- Based on internationally accepted standardized & harmonized business entity library
- Global semantics covering the data requirements of all processes across international supply and transport contracts (BUY-SHIP-PAY domain)
- Integrated international code lists, using commonly used UNECE Recommended code lists, UN/EDIFACT code lists, ISO code lists etc.
Benefits of UN/CEFACT semantic models

• A common basis for implementing
  • from semantics to syntax (XML or EDIFACT)
• Based on a common “Master” for data exchange structure of the semantic model
• Supports information sharing
  • such as enabled by data pipelines
• Efficient reuse of data shared within the BUY-SHIP-PAY domain model
Rationalization results...

• 40% fewer artefacts needed from the UN/CEFACT library (CCL) to build the same number of business messages
• Much more understandable artefacts:
  • business short name aliases provided for each attribute
  • double qualified, document centric artefacts no longer needed
• Much easier to use
  • Simplification by reusing and restricting
• Minimised redundancy
• Much easier to maintain
The BUY-SHIP-PAY model

the international Supply Chain Reference Model

Covered by 2 semantic models sharing the same library:
- Supply Chain (BUY and PAY) and Multimodal Transport (SHIP)

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Building semantic models using a common library

UN/CEFACT Core Component Library (CCL)

Supply Chain (BUY PAY Context)
Semantic model
- e.g. Invoice
- e.g. Order
- e.g. Quotation

BUY SHIP PAY
Semantic model
- Based on

BUY SHIP PAY MASTER
(Master message structure)
- Based on and subset of

BUY PAY Master
(Master message structure)
- Based on

Multimodal Transport (SHIP Context)
Semantic model
- Based on

SHIP Master
(Master message structure)
- Based on

Based on and subset of

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Example: UN/CEFACT Cross Industry Invoice

SEMANTIC MODEL
Supply Chain (BUY PAY)
(subset of CCL)

Supply Chain (BUY PAY)
Master message structure

Invoice message model

Syntax
XML Invoice schema
BUY SHIP PAY master message structure

Library CCL
Based on
BUY SHIP PAY
Semantic model
See next slide
Based on
BUY SHIP PAY MASTER
(Master message structure)
Contextualized library (BUY SHIP PAY semantic model)

Based on

UN/CEFACT CCL

restrictions

BUY SHIP PAY
Semantic model
Library subset/restrictions

- Trade_Order_Contact.Det
- Trade_Delivery_Terms.Details
- Trade_Geopolitical_Region.Details
- Trade_Location.Details
- Trade_Note.Details
- Trade_Package.Details
- Trade_Party.Details
- Trade_Payment_Discount_Terms.Details
- Trade_Payment_Instruction_Details
- Trade_Payment_Means_Details
- Trade_Payment_Penalty_Terms_Details
- Trade_Payment_Terms_Details
- Trade_Price_Details
- Trade_Product_Group_Details
- Trade_Product_Instance_Details
- Trade_Product_Warranty_Details
- Trade_Product_Details
- Trade_Tax_Details
- Trade_Transport_Means_Details
- Trade_Transport_Mode_Details
- Trade_Workflow_Object_Details
- Transaction_Period_Details
- Transport_Service_Location_Details

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Contextualized library (created semantic models)

Based on

Supply Chain Semantic model
Library subset/restrictions
- Trade Country
- Trade Currency Exchange
- Trade Delivery Terms
- Trade Geopolitical Region
- Trade Location
- Trade Note
- Trade Package
- Trade Party
- Trade Payment Discount Terms
- Trade Payment Instructions
- Trade Payment Means
- Trade Payment Penalty Terms
- Trade Payment Terms
- Trade Price
- Trade Product Group
- Trade Product Instance
- Trade Product Warranty
- Trade Product
- Trade Tax

Multimodal Transport Semantic model
Library subset/restrictions
- Trade Country
- Trade Currency Exchange
- Trade Delivery Terms
- Trade Geopolitical Region
- Trade Location
- Trade Note
- Trade Package
- Trade Party
- Trade Payment Discount Terms
- Trade Payment Instructions
- Trade Payment Means
- Trade Payment Penalty Terms
- Trade Payment Terms
- Trade Price
- Trade Product Group
- Trade Product Instance
- Trade Product Warranty
- Trade Product
- Trade Tax

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Contextualized artefacts (of the semantic models)

**Based on**

**Supply Chain Semantic model**
- Trade Price subset/restriction

<table>
<thead>
<tr>
<th>Trade Price</th>
<th>C</th>
<th>Net Price Indicator</th>
<th>X</th>
<th>Type Code</th>
<th>A</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Charge Amount</td>
<td></td>
<td>Basis Quantity</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Minimum Charge Amount</td>
<td></td>
<td>Maximum Charge Amount</td>
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<td>Maximum Quantity</td>
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<td>Unit Amount</td>
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<td>Change Reason Text</td>
<td></td>
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<td></td>
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<td>Order Unit Conversion Factor</td>
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<td>Repackaging Charge Amount</td>
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<td>Repair Charge Amount</td>
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<td>Depreciated Validity Period</td>
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<td></td>
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<td>Applied Allowance/Charge</td>
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<td>Validity Period</td>
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<tr>
<td></td>
<td></td>
<td>Included Tax</td>
<td></td>
<td>Referenced Document</td>
<td></td>
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<td></td>
<td></td>
<td>Delivery Location</td>
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<td>Comparison Price</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Trade Comparison Price</td>
<td></td>
<td>Associated Document</td>
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</table>

**Multimodal Transport Semantic model**
- Trade Price subset/restriction

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<td></td>
<td>Trade Comparison Price</td>
<td></td>
<td>Associated Document</td>
<td></td>
</tr>
</tbody>
</table>

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Contextualized master message structures (of the semantic models)

Using Supply Chain semantic model

Using Multimodal Transport semantic model
Contextualized messages structures

Supply Chain
BUY PAY
master message structure

Supply Chain Master Message
1:1

Quotation
1:1

Document Context

Exchanged Document

Payment

Trade Transaction

Valuation Breakdown Statement

Order
1:1

Document Context

Exchanged Document

Payment

Trade Transaction

Valuation Breakdown Statement

Invoice
1:1

Document Context

Exchanged Document

Payment

Trade Transaction

Valuation Breakdown Statement

Remittance Advice
1:1

Document Context

Exchanged Document

Payment

Trade Transaction

Valuation Breakdown Statement
Contextualized messages structures – Multimodal Transport

Bill of Lading/IFTMCS
- Document Context
- Exchanged Document
- Declaration Header
- Transport Movement
- Consignment
- Transport Equipment
- Transport Service

Container BayPlan/BAPLIE
- Document Context
- Exchanged Document
- Declaration Header
- Transport Movement
- Consignment
- Transport Equipment
- Transport Service

Operational Manifest/IFCSUM
- Document Context
- Exchanged Document
- Declaration Header
- Transport Movement
- Consignment
- Transport Equipment
- Transport Service

Pipeline Data Exchange Structure (CORE/SELIS)
- Document Context
- Exchanged Document
- Declaration Header
- Transport Movement
- Consignment
- Transport Equipment
- Transport Service

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Contextualized artefacts (on message level)

Supply Chain Semantic model
Order Message

- ID
- Partial Delivery Allowed Indicator
- Final Delivery Indicator
- Requested Quantity
- Remaining Requested Quantity
- Agreed Quantity
- Despatched Quantity
- Modification Forecasted Quantity
- Due In Available Quantity
- Due In Forecasted Quantity
- Due In Requested Quantity
- Pick-Up Availability Date Time
- Included Packaging
- Related Consignment
- Ship To Party
- Ultimate Ship To Party
- Ship From Party
- Delivery Instructions
- Planned Despatch Event
- Actual Despatch Event
- Actual Pick-Up Event
- Planned Release Event

Supply Chain Semantic model
Despatch Advice Message

- ID
- Partial Delivery Allowed Indicator
- Final Delivery Indicator
- Requested Quantity
- Remaining Requested Quantity
- Agreed Quantity
- Despatched Quantity
- Modification Forecasted Quantity
- Due In Available Quantity
- Due In Forecasted Quantity
- Due In Requested Quantity
- Pick-Up Availability Date Time
- Included Packaging
- Related Consignment
- Ship To Party
- Ultimate Ship To Party
- Ship From Party
- Delivery Instructions
- Planned Despatch Event
- Actual Despatch Event
- Actual Pick-Up Event
- Planned Release Event
Contextualized schemas (smaller library & data types)

Invoice: document centric version

Invoice: version based on semantic model
Contextualized artefacts (schema example)

Order

Despatch Advice

Same business artefact is more detailed in the despatch advice

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Publishing of UN/CEFACT semantic models

- Semantic models published in PDF
- Semantic models published in MS Excel
- Semantic models published in HTML
- Semantic models publication in machine-to-machine format, in development

➢ Concept of UN/CEFACT semantic models already available in tool(s) (e.g. GEFEG FX)

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<table>
<thead>
<tr>
<th>Occurrence</th>
<th>Element/Attribute</th>
<th>Short name</th>
<th>TDED</th>
<th>QDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 .. 1</td>
<td>ABIE</td>
<td>Cargo Identification</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BBIE</td>
<td>Transport_Cargo. Type. Code</td>
<td>UN02</td>
<td>0096</td>
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<tr>
<td></td>
<td>Definition:</td>
<td>The code, such as UNECE Recommendation 21 single digit codes, specifying the type of transported cargo.</td>
<td></td>
<td></td>
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<tr>
<td>0 .. 1</td>
<td>BBIE</td>
<td>Transport_Cargo. Identification. Text</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>Transport_Cargo. Operational Category. Code</td>
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<td>UN02</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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<tr>
<td>0 .. 1</td>
<td>BBIE</td>
<td>Transport_Cargo. Statistical Classification. Code</td>
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<td>UN02</td>
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<tr>
<td></td>
<td>Definition:</td>
<td>The code specifying a statistical classification for this transport cargo.</td>
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## Excel

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>P</th>
<th>S</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Related to Unique UN Assigned ID</td>
<td>ABIE/BBIE/ASBIE</td>
<td>Dictionary Entry Name</td>
<td>Definition</td>
<td>Short name</td>
<td>TDED</td>
<td>Qualified Data Type UID</td>
<td>Occurrence Min</td>
<td>Occurrence Max</td>
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<td>1</td>
<td>ABIE</td>
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<td>Aggregate Business Information Entity</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>BBIE</td>
<td></td>
<td>Basic Business Information Entity contained within the ABIE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>ASBIE</td>
<td></td>
<td>Associated (Aggregate) Business Information Entity, associated with the ABIE</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>UN01004757</td>
<td>ABIE</td>
<td>Transport_Cargo_Details</td>
<td>Information about goods being transported identifying their nature for customs, statistical or transport purposes</td>
<td></td>
<td>Cargo Identification</td>
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<tr>
<td>1354</td>
<td>UN01004758</td>
<td>BBIE</td>
<td>Transport_Cargo_Type_Code</td>
<td>The code, such as UNECE Recommendation 21 single digit codes, specifying the type of transported cargo</td>
<td></td>
<td>Type Code</td>
<td>UN02000096</td>
<td>0</td>
</tr>
<tr>
<td>1355</td>
<td>UN01004759</td>
<td>BBIE</td>
<td>Transport_Cargo_Identifier_Text</td>
<td>The identification, expressed as text, of this transport cargo that is sufficient to identify it for customs, statistical or transport purposes.</td>
<td></td>
<td>Shipping Description</td>
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<td>0</td>
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<tr>
<td>1356</td>
<td>UN01004760</td>
<td>BBIE</td>
<td>Transport_Cargo_Operational_Category_Code</td>
<td>The code specifying the operational category for this transport cargo, such as obnoxious or military.</td>
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<td>Operational Category Code</td>
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<td>UN02000077</td>
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<tr>
<td>1357</td>
<td>UN01004761</td>
<td>BBIE</td>
<td>Transport_Cargo_Statistical_Classification_Code</td>
<td>The code specifying a statistical classification for this transport cargo.</td>
<td></td>
<td>Statistics Classification Code</td>
<td>7357</td>
<td>UN02000053</td>
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</table>
### SCRM: Subset of CCL D16A.1 (Context CCL)

**Cargo Identification**

<table>
<thead>
<tr>
<th>Qualifier</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABIE</td>
<td>Transport_Cargo_Details</td>
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</tbody>
</table>

#### Shortname

<table>
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<tr>
<th>Shortname</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABIE</td>
<td>Transport_Cargo_Details</td>
</tr>
</tbody>
</table>

#### Attributes

<table>
<thead>
<tr>
<th>Attribute Name</th>
<th>Status</th>
<th>Description/DataType</th>
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</thead>
<tbody>
<tr>
<td>Transport_Cargo_Type</td>
<td>O</td>
<td>Cargo_Category_Code_Type</td>
</tr>
<tr>
<td>Transport_Cargo_Identifier</td>
<td>O</td>
<td>Transport_Identifier_Type</td>
</tr>
<tr>
<td>Transport_Cargo_Communication_Category</td>
<td>O</td>
<td>Cargo_CommunicationCategory_Code_Type</td>
</tr>
</tbody>
</table>

---

**Documentation**

- **Cargo Identification**
- **Type**
- **ABIE**
- **Description**
- **Transport_Cargo_Details**

---

**Publication**

- **Identifier**
- **UN01064757**
Supply Chain profile messages in public review

1. Catalogue
2. Despatch Advice
3. Invoice
4. Order
5. Order Change
6. Order Response
7. Quotation Proposal
8. Quotation Proposal Request
9. Quotation Request
10. Quotation Request Response
11. Remittance Advice
Multimodal Logistics profile messages in advanced development

- eCMR electronic international road consignment note
- Logistics pipeline data exchange structure

Multimodal Logistics profile messages planned for future development

- Multimodal transport contract messages
- Container handling messages
- Bayplan and verified Gross Mass messages
- IMO FAL messages
- Consignment tracking messages
Reusing UN/CEFACT semantic models

- Facilitates profiling for standardisation organisations. eCommunities and individual organisations
  - Create UN/CEFACT conformant semantic models
    - using published UN/CEFACT semantic models
    - subsetting business message by restricting artefacts
  - Create UN/CEFACT conformant XML schemas
    - using published UN/CEFACT schemas
    - Reflecting only the subset of the UN/CEFACT semantic model
  - Creating profile packages
    - Semantic models using different publishing formats
    - UN/CEFACT XML schema

- Concept of UN/CEFACT semantic models already available in tool(s) (e.g. GEFEG FX)
For further information:

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