

UN/CEFACT 2023 Spring Forum

Monday, 8 May 2023

Introducing CCL, RDM and BRS development
methodologies for UN/CEFACT Business
Standards Projects

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UN/CEFACT Key Outputs



- Business Standards
 - Process Models (BRS)
 - Reference Data Models (RDMs)
 - Semantic Libraries (UNTDED, Core Component Library (UNCCCL) and UN/XML)
- Trade Facilitation Recommendations
- Technical Specifications

UN/CEFACT Open Development Process for Business Standards



Open Development Process
ECE/TRADE/C/CEFACT
/2016/17

Provides a description of the
sequence how projects are carried
out within UN/CEFACT

PDF 

PDF 

PDF 

<https://unece.org/trade/uncefact/policiesprocedures-and-termsreference>

Stage 1: Project Inception

Stage 2: Requirements Gathering

Stage 3: Draft Development

Stage 4: Public Review (Optional)

Stage 5: Project Exit

Stage 6: Publication

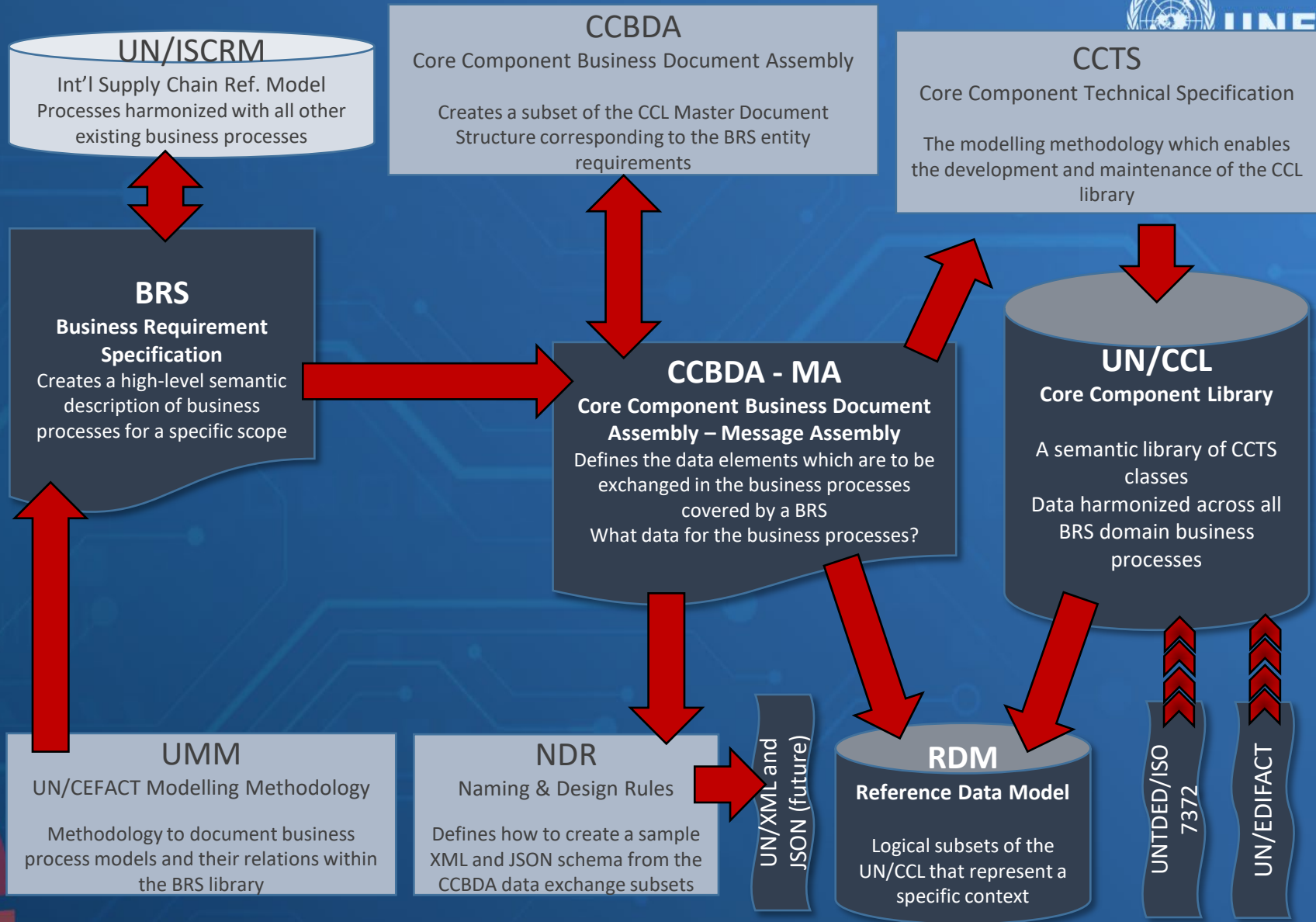
Stage 7: Maintenance (Optional)

UN/CEFACT Business Standards Deliverables



- **1:** Business Requirements Specification (BRS) including
- **2:** Business Information Entity Discovery
- **3:** CCL submission (optional)
- **4:** CCBDA subset of Reference Data Model
- **5:** Technical Artefacts production

Standardising Business Processes & Data



UN/CEFACT Business Standards Deliverables



1: Business Requirements
Specification (BRS) including

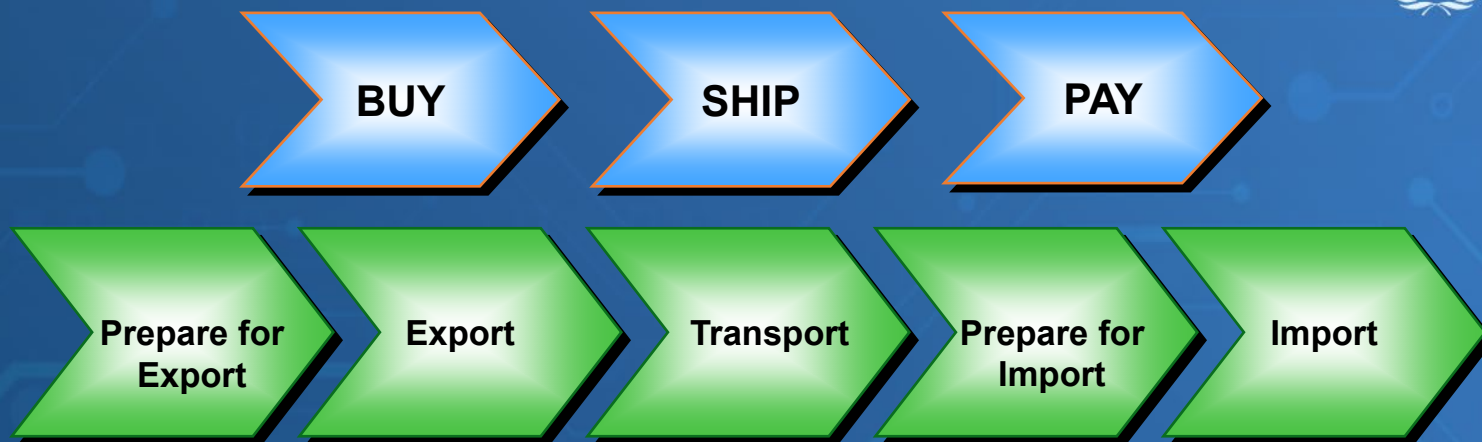
2: Business Information Entity
Discovery

3: CCL submission (optional)

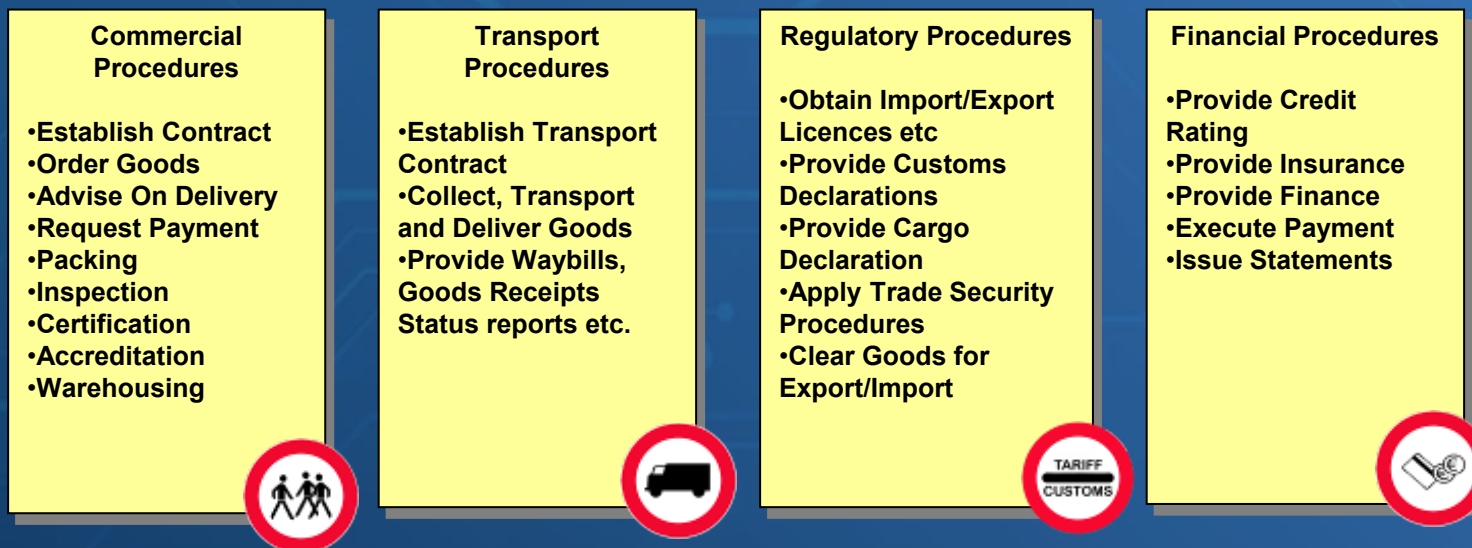
4: CCBDA subset of Reference Data
Model

5: Technical Artefacts production

UN/CEFACT International Supply Chain Process Model



INVOLVES

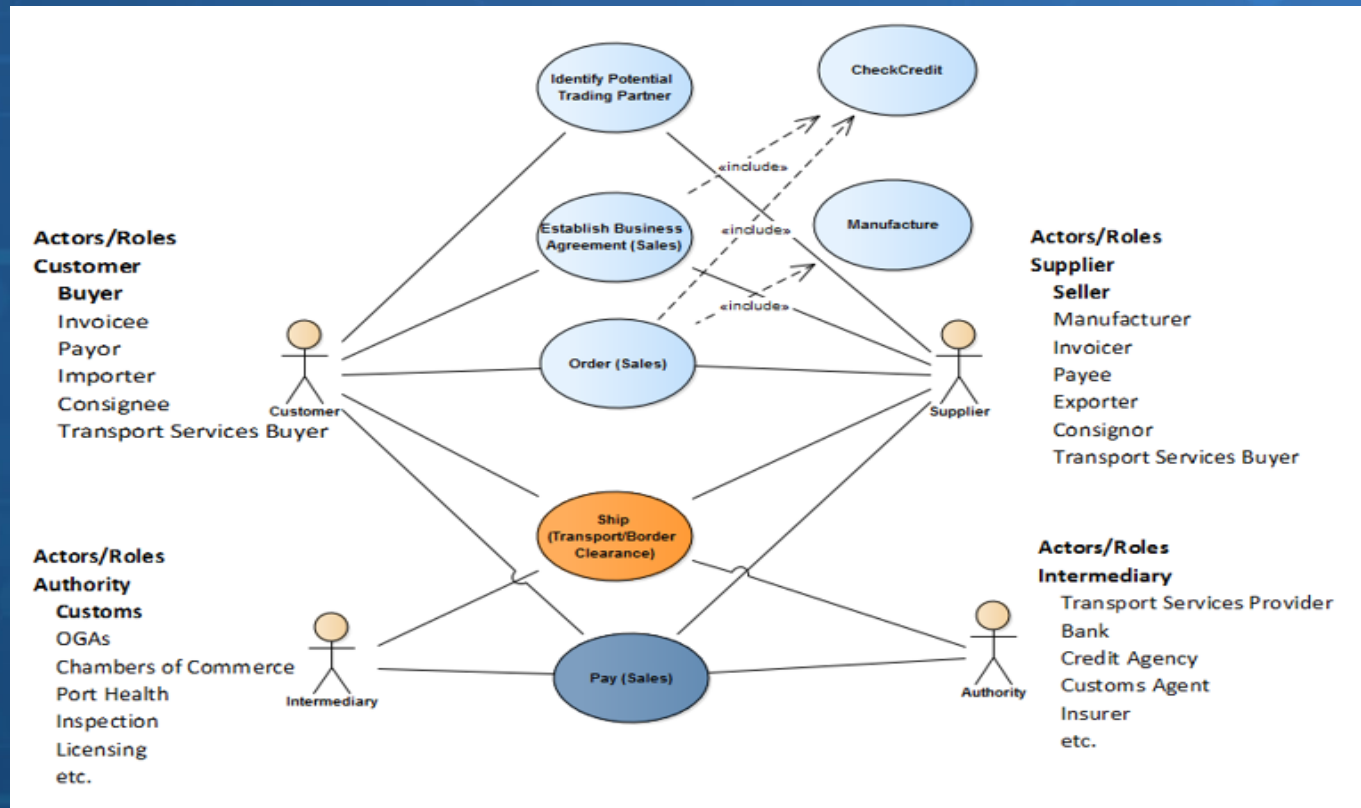


One link in a global supply chain



- Most dematerialization projects are only looking at one sectoral view
 - Almost all sectoral views are just one part of a global supply chain
 - The international supply chain is very complex (multiple actors and multiple relations in data exchanges)
- A holistic view and approach are needed
 - Information will not be related purely to goods or purely to transport or purely to regulatory
 - There are clear links between the information in each part of the global supply chain
- UN/CEFACT deliverables all take this holistic approach
 - Cross Industry
 - MultiModal
 - Cross-border Agencies

The actors



Agreed and Harmonised

- Party and Role Definitions
- Semantic Anchors
- Message Structures
- Contextualised Code Subsets
- Contextualised Business Rules

Shipment (Trade Delivery)

- A shipment is an identifiable collection of one or more Trade Items (available to be) transported together from the Seller (Original Consignor/Shipper) to the Buyer (Final/Ultimate Consignee):
 - A Shipment can only be destined for one Buyer
 - A Shipment can be made up of some or all Trade Items from one or more Sales Orders
 - A Shipment can have only one Customs UCR
 - A shipment may form part or all of a Consignment or may be transported in different Consignments.

Consignment

- A consignment is a separately identifiable collection of Consignment Items (available to be) transported from one Consignor to one Consignee via one or more modes of transport as specified in one single transport service contractual document:
 - A Consignment can only have one Transport Service Buyer
 - A Consignment can only have one Transport Service Provider
 - A Consignment can only have one Consignor
 - A Consignment can only have one Consignee
 - The Transport Service Buyer can be either the Consignor or the Consignee
 - A Consignment is made up of one or more Consignment Items
 - A Consignment can be made up of some or all Trade Items (aggregated into Consignment Items) from one or more Shipments

Overview of BRS Development Process



- A BRS **MUST** start with a clear specification of the scope of the project and where this project fits into a global context of business operations and **MAY** refer to a UMM model of the business domain.
- The Scope **MUST** be specified in terms of the Business Processes that are involved and the Business Entities about which information is to be exchanged by the participants who are involved directly in the Information Exchanges that support the related business process. It **MUST** also indicate stakeholders who have an interest in the processes, or may participate in related processes, and whenever appropriate, what is out of scope of this particular project. The process and information flows that constitute the business process, the business rules that govern the exchanges and the details of the information that is to be exchanged during these processes, **SHOULD** then be elaborated.
- The requirements **MUST** first be specified in business terms and then expressed in formalized terms. The business requirements **MUST** be presented as a numbered list so as to facilitate a check to be made that all requirements have been met in the eventual e-commerce solutions proposed. As the process of completing a BRS progresses, new requirements may be recognized and added to the list.

Overview of BRS Development Process (Cont...)



- The resulting BRS will include text, templates (worksheets) and diagrams, and may refer to a UMM model of the domain. To help with future re-usability, interoperability and to provide a degree of standardization in the developing a BRS, an initial set of preferred terms is provided in Annex 2.
- To minimize the work in creating a new BRS, improve harmonisation and encourage reusability, wherever possible, any relevant existing BRSs artefacts or UMM models SHOULD be used as a basis for producing the new requirements.
- A high level BRS MAY be used to define the context and scope of a domain that is refined by a cascade of more specific BRSs.
- For example, the Business Requirements Specification Cross-Border Supply Chain (UNeDocs) ECE/TRADE/C/CEFACT/2007/8. This BRS sets the scope for the Common Supply Chain BRS which in turn sets the scope for more specific BRSs for: Ordering, invoicing, etc.

Copyright UNECE

UN/CEFACT Business Standards Deliverables



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- 5: Technical Artefacts production

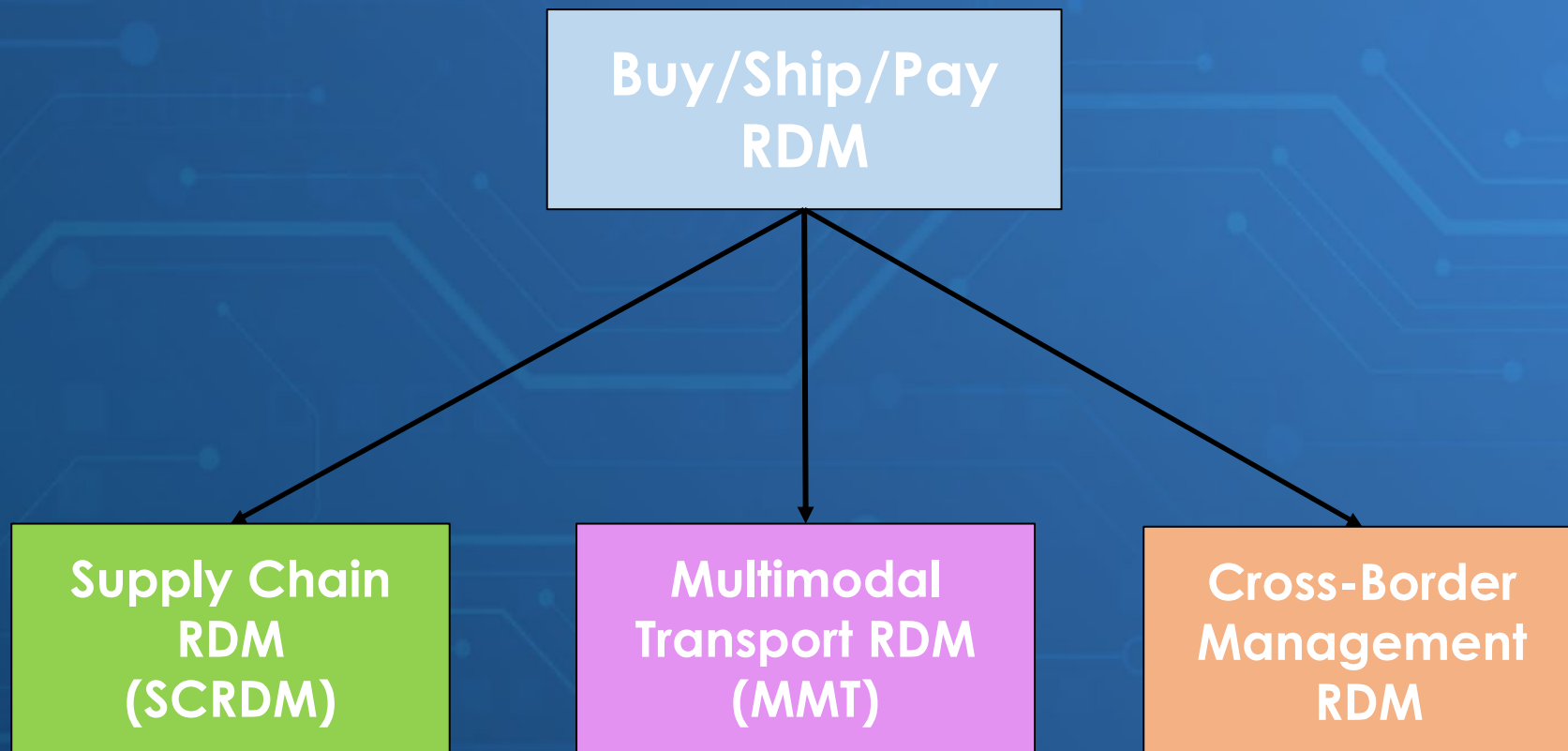
UN/CEFACT evolution/revolution – Reference Data Models



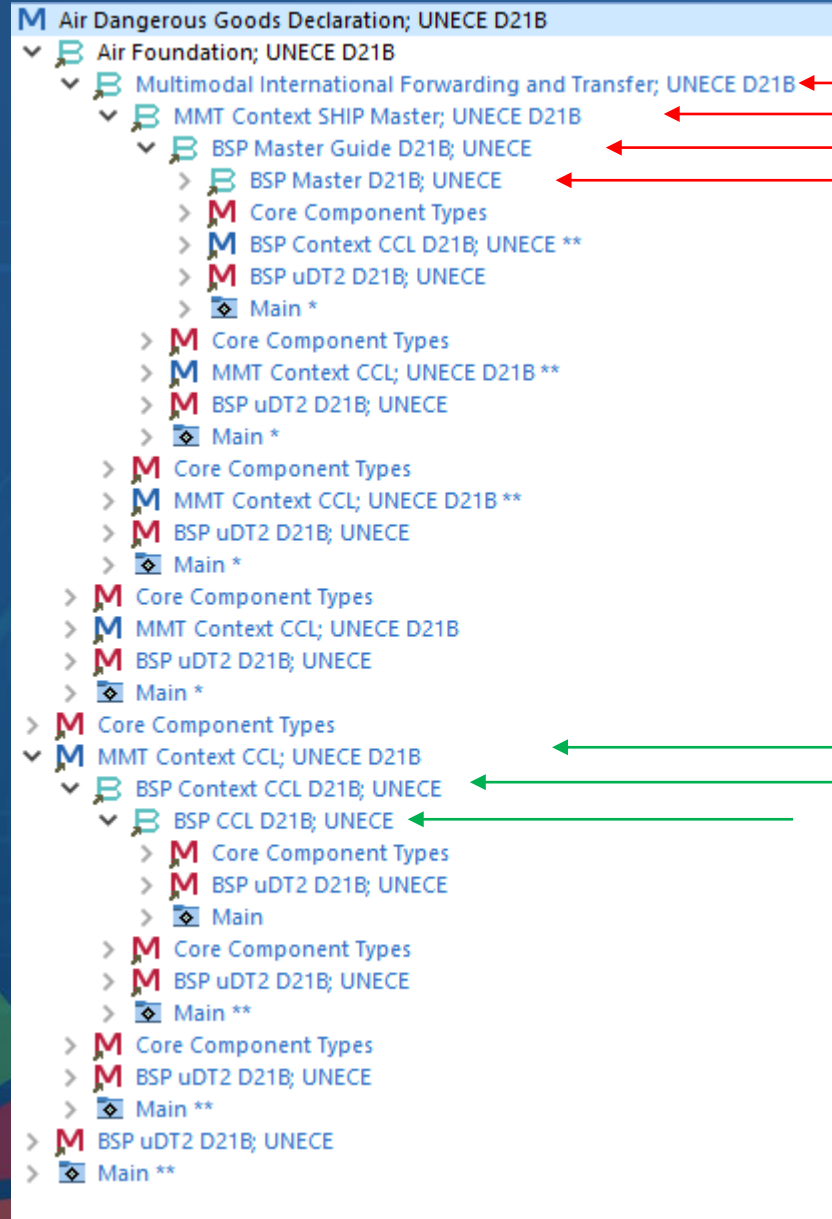
Benefits of UN/CEFACT Semantic Models

- The support for information sharing, such as enabled by data pipelines, with the timely capture of quality data from original data sources ensuring supply chain visibility
- Reduction of administrative burden by efficient reuse of data shared within the BUY SHIP PAY domain model
- Standardized data exchange structures, based on common Master data exchange structure and independent of exchange syntax
- Common basis for implementing in chosen data exchange syntax(es)

UN/CEFACT International Supply Chain Reference Data Model Family



UN/CEFACT RDM Inheritance Levels



← Air DG Level
← Air Mode Level
← Transport Contract Level
← MMT Level
← BSP Level
← RDM Level

CCBDA Subset Inheritance

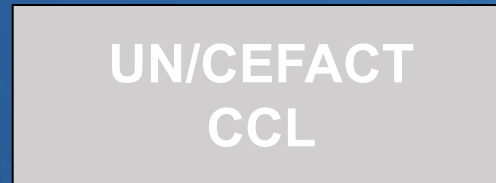
← MMT Level
← BSP Level
← CCL Level

CCL Subset Inheritance

UN/CEFACT International Supply Chain Reference Data Model Family



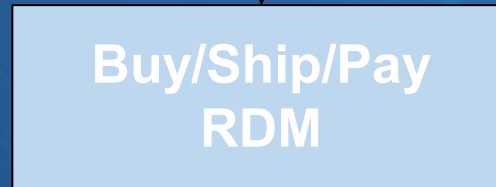
Library level



D22B – includes 1348 ABIEs

Inheritance plus business customisation

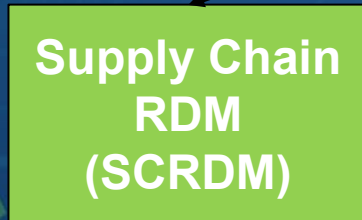
Contextualised RDM
level 1



D22B only uses 381 ABIEs

Contextualised RDMs
level 2

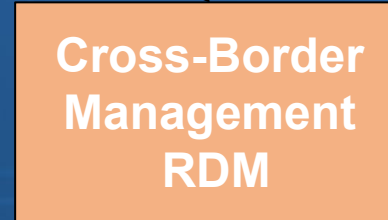
Inheritance plus business customisation



D22B only uses
140 ABIEs



D22B only uses
156 ABIEs



D22B only uses
87 ABIEs



D22B only uses
178 ABIEs

CoreComponent → ABIE contextualisations

Example Person Core Component

80 Attributes

27 Associations incl.

17 reuses as

Business Information Entities



Reuse example
Transport Person for IMO FAL

> ● A Alternate Language Code	C Main/ABIE/AAA Chart Of Accounts Person.Details
> ● A Alternate Language Proficiency Code	C Main/ABIE/AAA Journal Person.Details
> ● A Director Or Officer Indicator	C Main/ABIE/AAA Report Person.Details
> ● A Social Insurance Eligibility Indicator	C Main/ABIE/AAA Wrap Person.Details
> ● A Social Insurance Contract ID	C Main/ABIE/Authoritative Signatory Person.Details
> ● A Medicare Qualified Indicator	C Main/ABIE/Contact Person.Details
> ● A Social Security Number Release Authorization C	C Main/ABIE/Guest Person.Details
> ● A Tax Filing Status Code	C Main/ABIE/Inspection Person.Details
> ● A Affiliate Privacy Response Code	C Main/ABIE/Operator Person.Details
> ● A Third Party Privacy Response Code	C Main/ABIE/Payment Person.Details
> ● A Disablement Registration Date Time	C Main/ABIE/Project Person.Details
> ● A Role Text	C Main/ABIE/Representative Person.Details
> ● A Attends School Indicator	C Main/ABIE/Reserving Person.Details
> ● A College Grade Average	C Main/ABIE/Responsible Person.Details
> ● A School Disciplinary Action Indicator	C Main/ABIE/SPS Person.Details
> ● A Highest Grade Completed Text	C Main/ABIE/TMW Person.Details
> ● A High School Grade Average Text	C Main/ABIE/Transport Person.Details
> ● A College Grade Average Value	
> ● A Category Code	
> ● A Role Code	
> ● A In Transit Indicator	
> ● C Residence Address	
> ● C Nationality Country	
> ● C Telephone	
> ● C Fax	
> ● C URI	
> ● C Information Address	

▼ C Transport Person
> C Based on "Person"
> ● A _T ID
> ● A _T Name
> ● A _T Birth Date Time
> ● A _T Language Code
> ● A _T Role Text
> ● A _T Role Code
> ● A _T Category Code
> ● A _T Gender Code
> ● A _T Given Name
> ● A _T Family Name
> ● A _T Birth Country Code
> ● A _T Birthplace Name
> ● A _T In Transit Indicator
> ● C _T Nationality Country
> ● C _T Certified Accreditation
> ● C _T Attained Qualification
> ● C _T Embarkation Location
> ● C _T Disembarkation Location
> ● C _T Travel Identity Document
> ● C _T Travel Visa Document
> ● C _T Crew Travel Effects
> ● C _T Landline Telephone
> ● C _T Mobile Telephone
> ● C _T Email Address

RDM CCBDA Data Exchange Structure Relationships



- ▼ **C** Buy Ship Pay Master **
 - > ● **C** Exchanged Document Context
 - > ● **C** Exchanged Document
 - > ● **C** Exchanged Declaration
 - > ● **C** Logistics Transport Movement
 - > ● **C** Supply Chain Consignment
 - > ● **C** Logistics Transport Equipment
 - > ● **C** Transport Service
 - > ● **C** Trade Settlement Payment
 - > ● **C** Supply Chain Trade Transaction
 - > ● **C** Valuation Breakdown Statement
 - > ● **C** Financing Request Document
 - > ● **C** Financing Summary

} Exchange Header

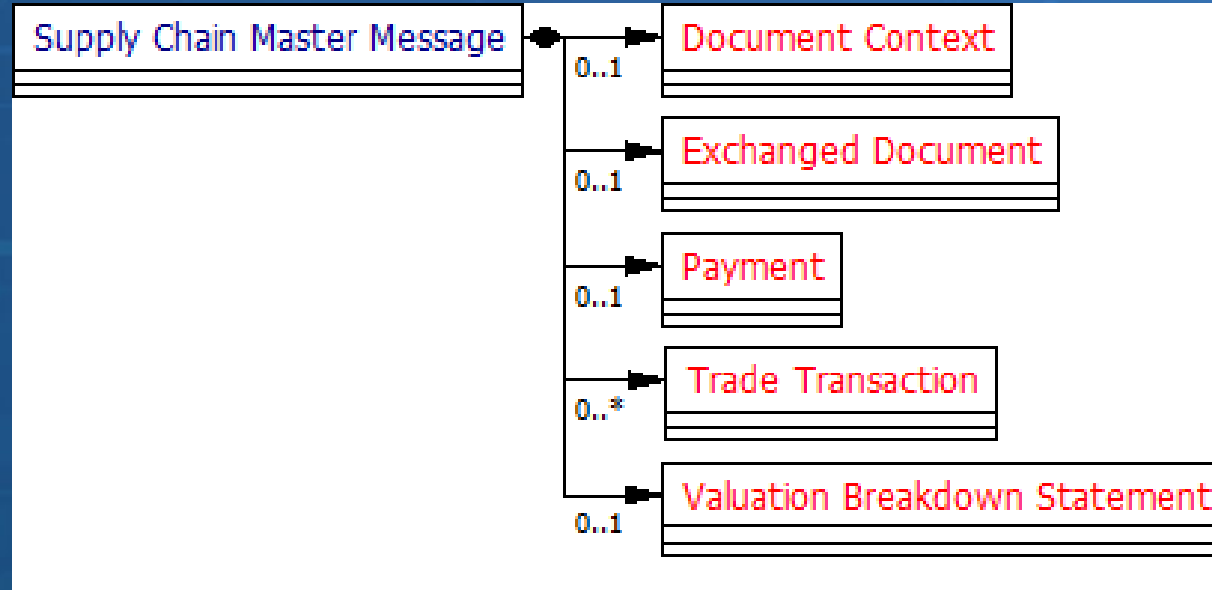
} Regulatory Header

} SHIP

} BUY

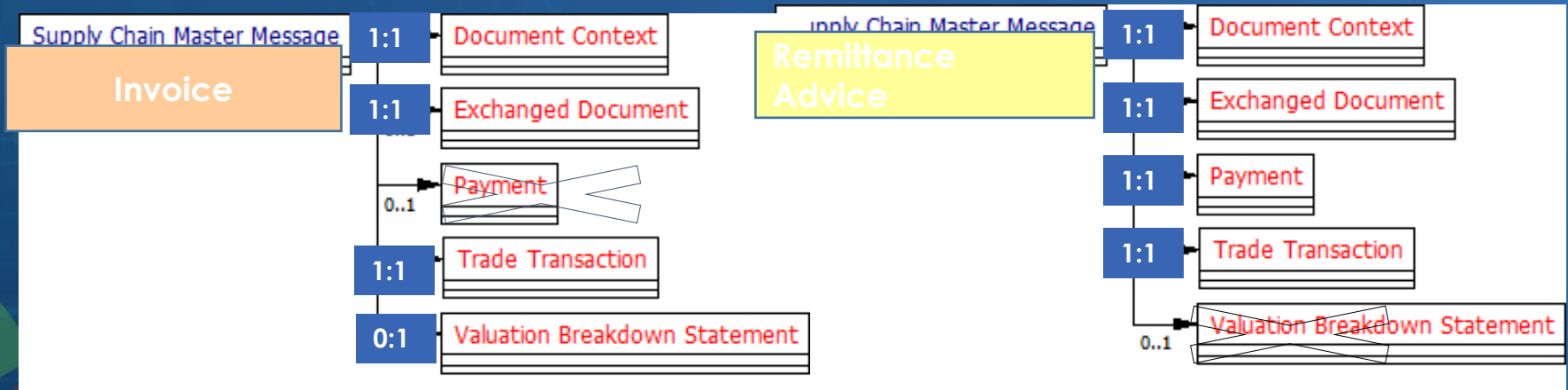
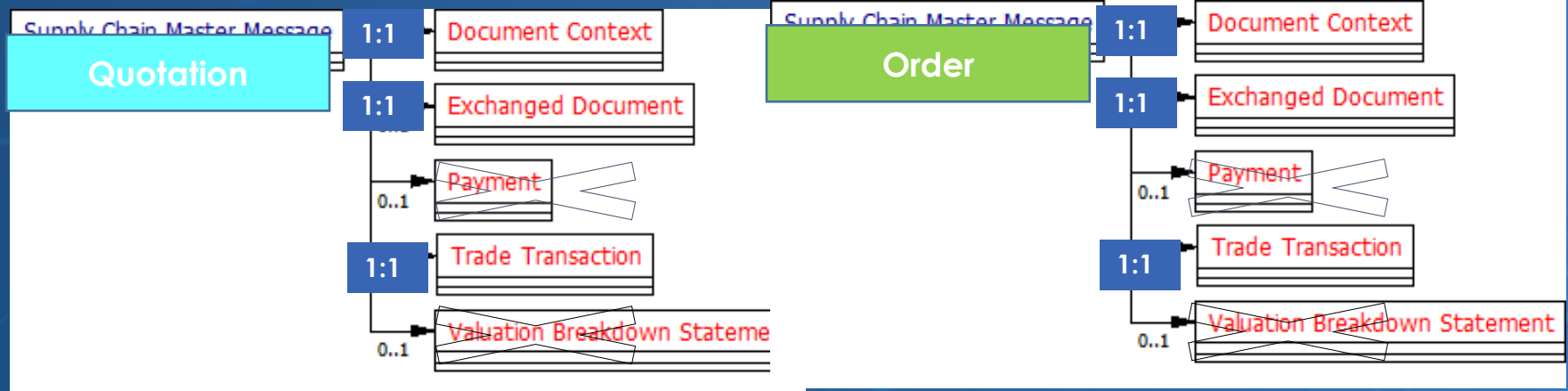
} PAY

Supply Chain (SCRDM) Master Message Structure

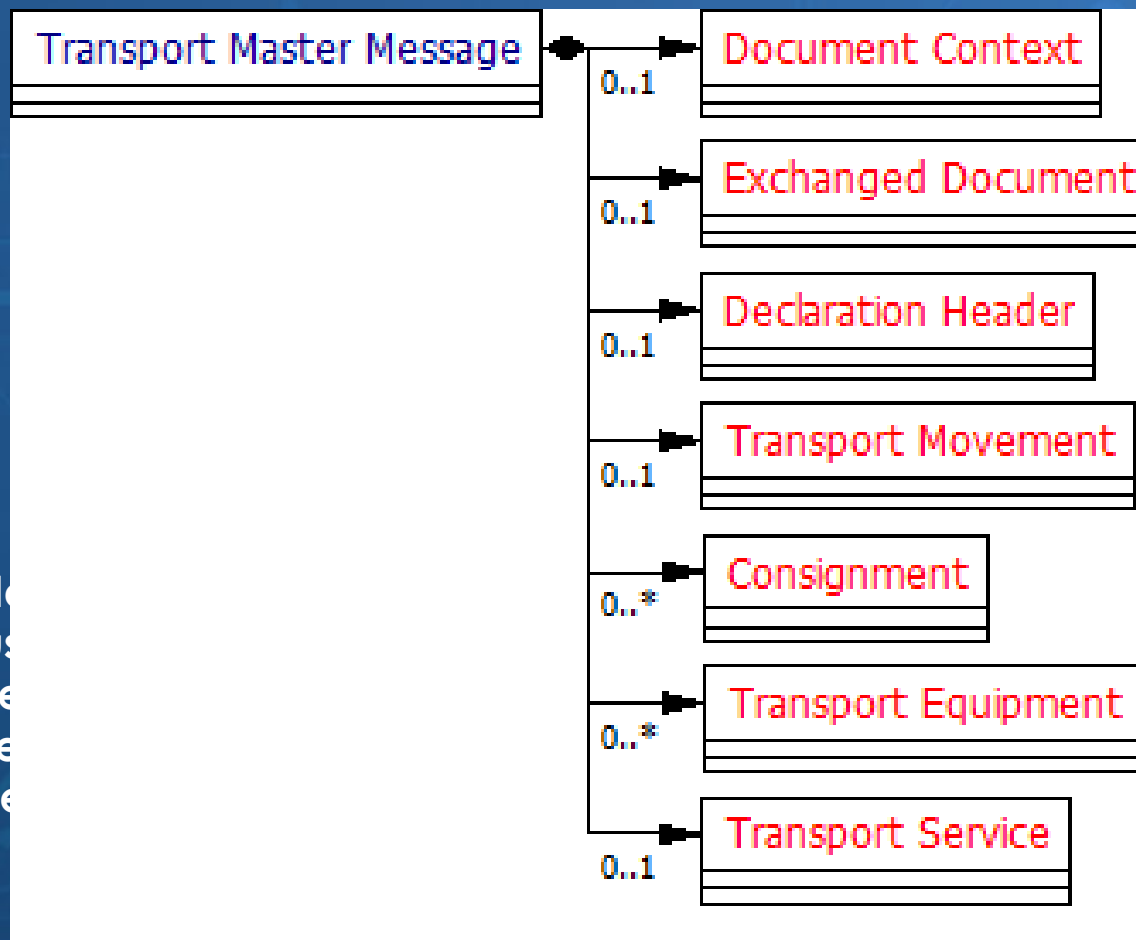


- **Supply Chain Context**
- **Reuses just under 10% of the Reference ABIEs from Core Component Library**
- **Customised set of BSP ABIEs**

Sample Supply Chain CCBDA Subset Data Exchange Structures

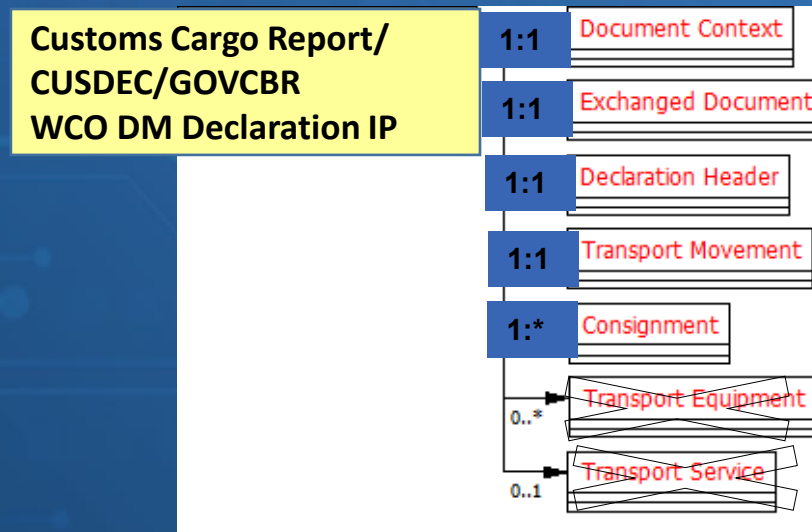
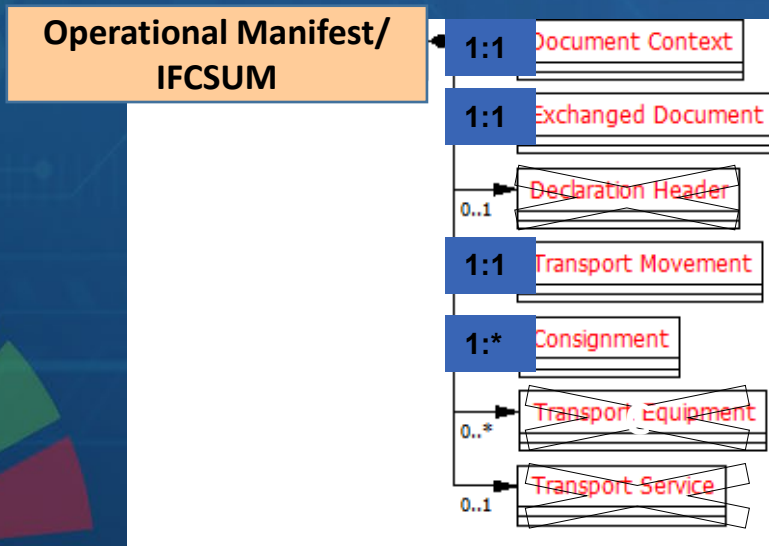
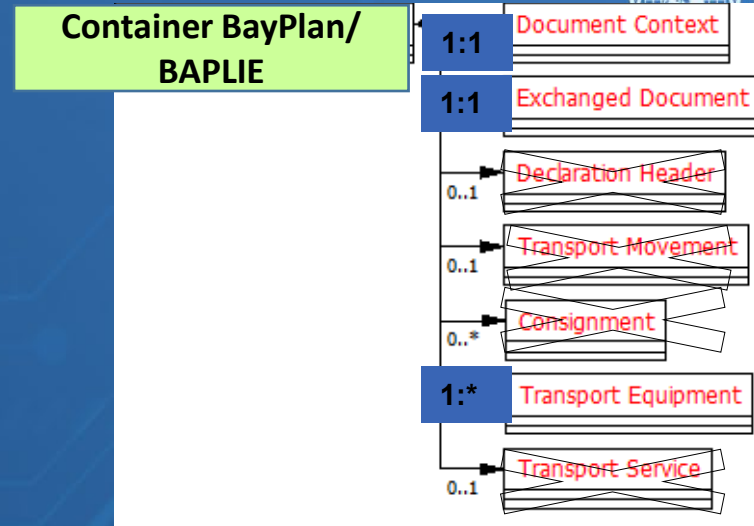
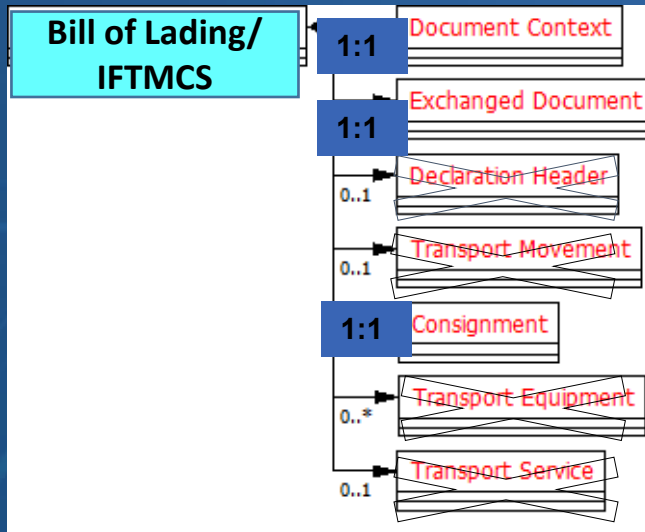


Transport & Logistics (MMTRDM) Master Message Structure

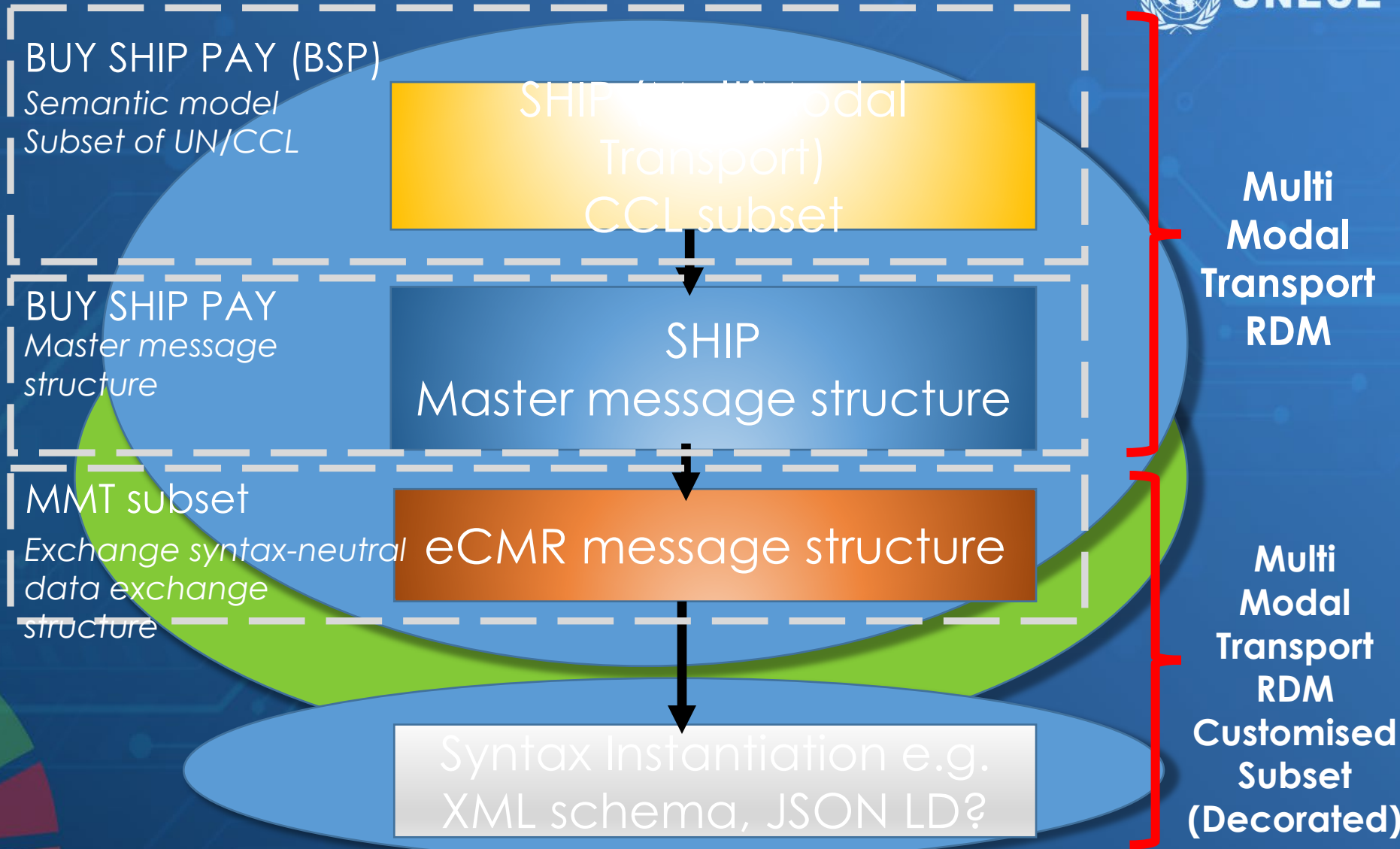


- MultiModal
- Reuses just
- Reference
- Component
- Customise

Sample Transport CCBDA Subset Data Exchange Structures



UN/CEFACT Publication Transport Example: electronic Road Consignment Note (eCMR)



Core Component Dictionary Entry Names and Definitions

Data model: MMT D20A Context CCL - GEFEG.FX - Professional+

Edit View Publishing Extras Window Help

Show used objects only English

MMT D20A Context CCL Main ABIE Logistics Transport Means Name (Logistics_Transport Means. Name. Text)

Logistics Transport Means *

- Type Code
- Type Text *
- ID *
- Name ***
- Gross Weight
- Net Weight
- Length
- Draught Level Measure
- Cargo Gross Weight
- Required Lane Length
- Loaded Cargo Measure
- Sequence Number *
- Driver Accompanied Indicator *
- Conference Code *
- Manoeuvring Speed
- Forward Draught Level Measure
- Aft Draught Level Measure
- Waste Reporting Exemption Indicator *
- Helipad Indicator *
- ISPS Security Level Code *
- Approved Security Plan Onboard Indicato
- Tare Weight Measure
- Manufacturing Date Time

BBIE CCTS Notes Enhanced Children

CCTS type	BBIE
DictionaryEntryName	Logistics_Transport Means. Name. Text
ObjectClassTerm	Transport Means
ObjectClassTermQualifier(s)	Logistics
PropertyTerm	Name
PropertyTermQualifier	
RepresentationTerm	Text
BusinessTerm	
Definition	The name, expressed as text, of this logistics means of transport.

Replace object name with DictionaryEntryName

Business Name

Built-in mappings to UNTDED, UN Layout Key and UN/EDIFACT



TC154
 UID 4237
 TDED repr.
 Locations, Bridges
 AWB: L 24, P 51-52 or 52-53 and P 55-56 or 57-58
 CIMP: (403):a1
 GMR: a1 P = prepaid, C = collect
 Dictionary Entry Name
 Payment Arrangement Code
 Definition
 Code specifying the arrangements for a payment.
 Links to UNCL
 Oper
 Notes for September MA meeting
 TBG15 Notes April 2004
 June 7372MA meeting update
 BN
 BN
 Pub Refs
 Identifier UN01003724
 Ref qDT ID UN02000150
 Usage Rules
 Example
 Version 1.1
 TDED (4237)

UNTDED

UN Layout Keys

UNCL Codes

UNTDID
 EDIFACT

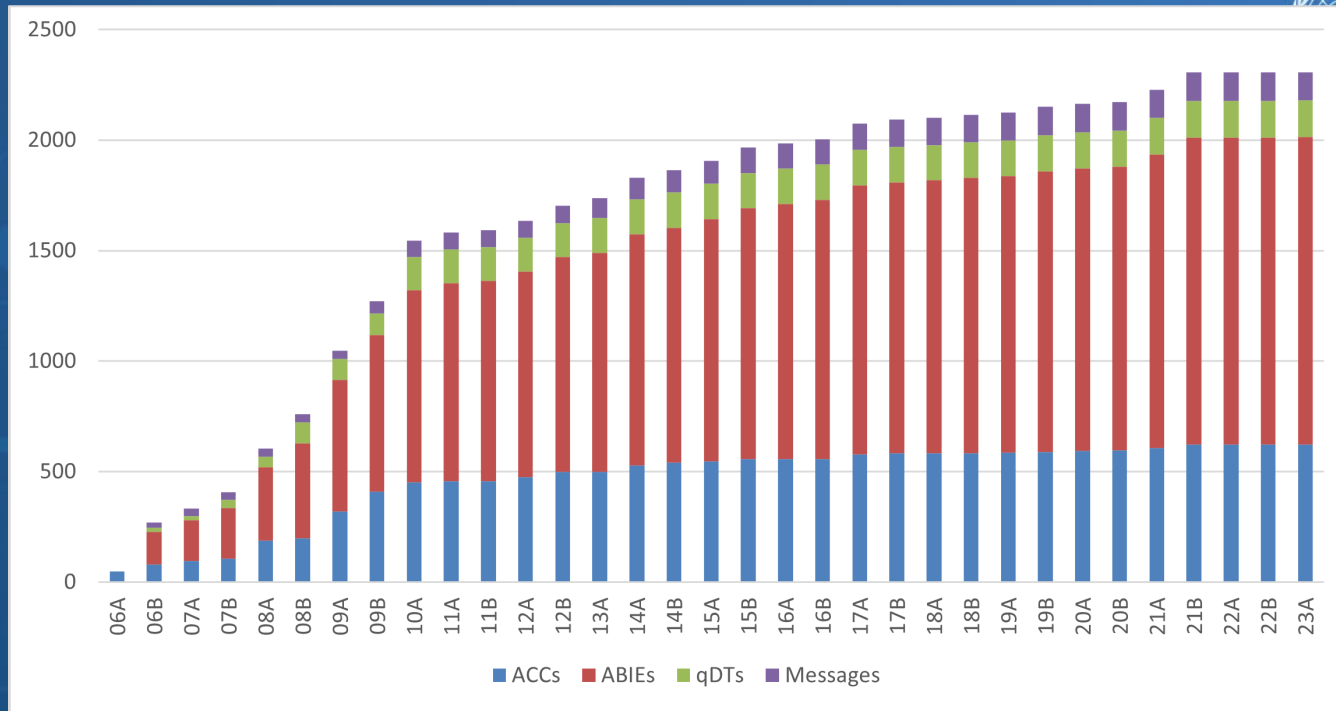
CC
 External code lists
 Codes
 Enhanced
 Children
 Restrict codes

Code	Name
A	Payable elsewhere
B	Third party to pay
C	Collect
P	Prepaid

Name (EN) Collect
 Description (EN) Charges are (to be) collected from the consignee at the destination.



UN/CEFACT Core Component Library



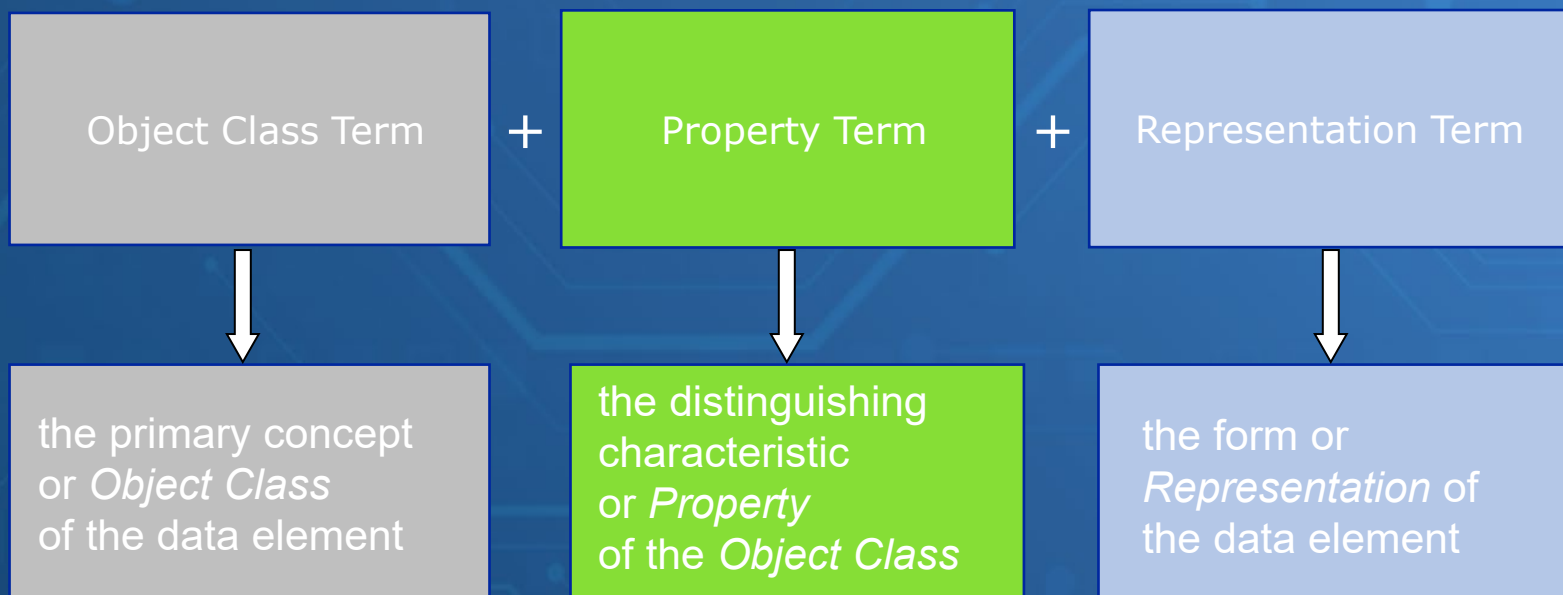
Business Information Entities (BIEs)

Reuses of Object Class Library in different business Contexts
(D23A ~ 1350 BIEs)

Semantic Foundation - Core Component (CCs)

Object Class Library
(D23A ~ 650 CCs)

Tripartite Data Element Naming



Example: Country + Name + Text

CCTS Naming Convention



- The Dictionary Entry Name of any Core Component is unique
- Dictionary Entry Names consist of Object Class Terms, Property Terms, Representation Terms, Qualifiers and Special Terms (like “Details” or “Type”)
- Dictionary Entry Names are ISO11179 compliant
- Terms are separated by a period (.) and a single space
- Qualifiers are separated by an underscore (_) and a space
- Multiple words are separated by spaces (no CamelCase!)

How CCL growth is managed

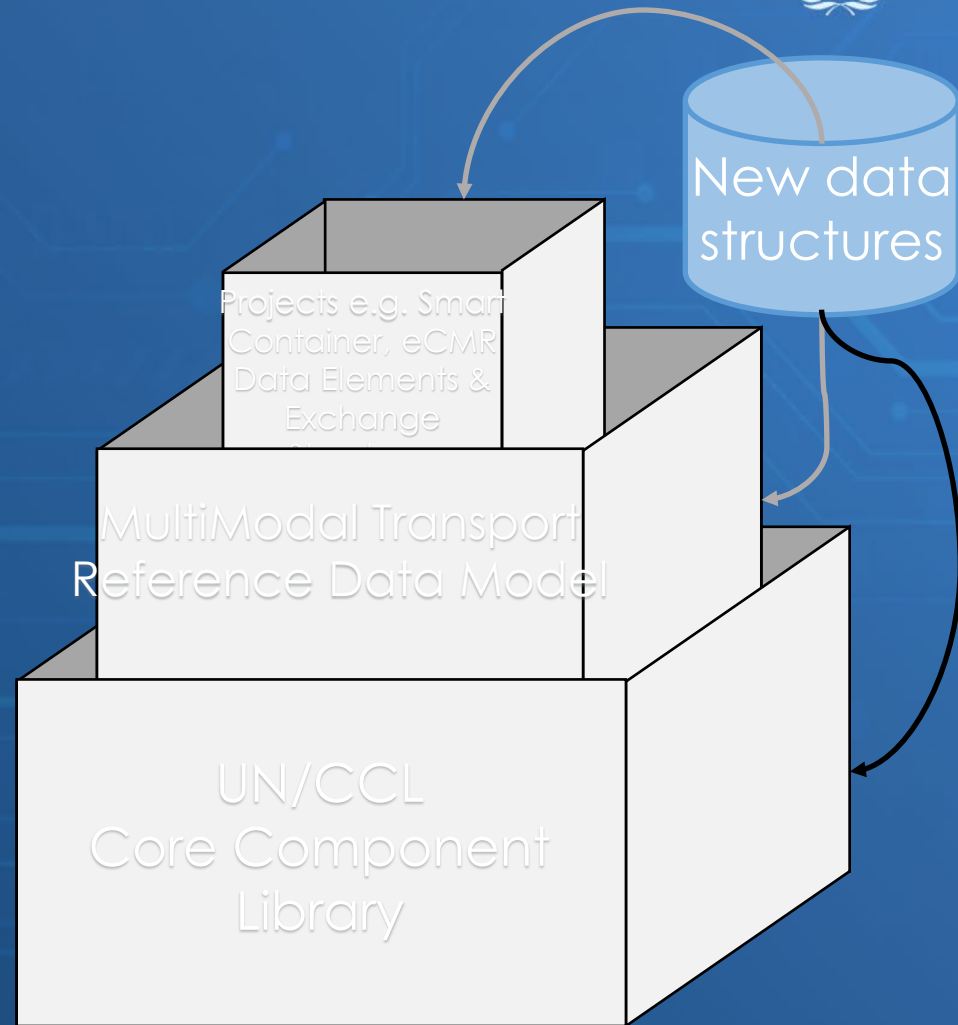


Library Maintenance Team responsible for

- Cross-Domain Harmonisation

Project Teams responsible for

- Contextualised RDM development, CCL submissions and customised data exchange structures



Example CCL Submission



AutoSave Off Covid Submission_20AUG21.xls - Compatibility Mode - Excel sue probert

File Home Insert Page Layout Formulas Data Review View Developer Help

C6 ASCC

	A	C	D	E	I	K	M	P	T	U	BJ	BK	BL	BO	CD
	ADD/CHG	ACC/BCC/ASCC	Dictionary Entry Name (auto generated)	Definition Mandatory	Object Class Term	Property Term	Representation Term	Associated Object Class	Occurrence Min	Occurrence Max	Version	Ref Library Version	Submitter Name	Unique submitter CR ID	Short Name
3		ACC		Aggregate Core Component											
4		BCC		Basic Core Component contained within the ACC											
5		ASCC		Associated (Aggregate) Core Component, associated with the ACC											
6	ADD	ASCC	Consignment Item. Specified. Risk Analysis Result	A results of a risk analysis calculation for this consignment item.	Consignment Item	Specified		Risk Analysis Result	0	unbounded	1.0	D21A	COVID-19 Multimodal	COVID-19CC001	Risk Analysis Result
7	ADD	BCC	Dangerous Goods. Radioactive. Indicator	The indicator of whether or not these dangerous goods are radioactive.	Dangerous Goods	Radioactive	Indicator		0	1	1.0	D21A	COVID-19 Multimodal	COVID-19CC002	Radioactive Indicator
8	ADD	ASCC	Dangerous Goods. Stated. Condition	A stated condition of these dangerous goods.	Dangerous Goods	Stated		Condition	0	unbounded	1.0	D21A	COVID-19 Multimodal	COVID-19CC003	Stated Condition
9	ADD	ASCC	Radioactive Isotope. Specified. Radionuclide	Radionuclide details specified for this radioactive isotope.	Radioactive Isotope	Specified		Radionuclide	0	unbounded	1.0	D21A	COVID-19 Multimodal	COVID-19CC004	Specified Radionuclide
10	ADD	BCC	Material. Radioactive Package Transport Index. Code	A code specifying the radioactive package transport index for this material.	Material	Radioactive Package Transport Index	Code		0	unbounded	1.0	D21A	COVID-19 Multimodal	COVID-19CC005	Radioactive Package Transport Index
11	ADD	BCC	Material. Fissile Criticality Safety Index. Numeric	The number (rounded up to the next tenth) assigned to and placed on the label of a fissile material package, to designate the degree of control of accumulation of packages, overpacks or freight containers containing fissile material during transportation.	Material	Fissile Criticality Safety Index	Numeric		0	1	1.0	D21A	COVID-19 Multimodal	COVID-19CC006	Fissile Criticality Safety Index
12	ADD	ASCC	Material. Applicable. Isotope	A radioactive isotope applicable to this material.	Material	Applicable		Isotope	0	unbounded	1.0	D21A	COVID-19 Multimodal	COVID-19CC007	Applicable Radioactive
13	ADD	ASCC	Package. Stated. Condition	A stated condition of this package.	Package	Stated		Condition	0	unbounded	1.0	D21A	COVID-19 Multimodal	COVID-19CC008	Stated Condition
14	ADD	ACC	Radionuclide. Details	An atom that has excess nuclear energy, making it unstable.	Radionuclide						1.0	D21A	COVID-19 Multimodal	COVID-19CC009	Radionuclide

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including

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Example Business Standard Streamlined Publications 1



Multi-Modal Transport Reference Data Model (MMT-RDM)
<ul style="list-style-type: none">• White Paper on RDM English French Russian• RDM Guidelines RDM• BRS BRS ▼• Executive Guide on RDM English French Russian• Structure Report / Data Elements Structure Report / Data Elements• XSD Schema XSD Schema• UML Diagram UML Diagram• HTML index HTML index
International Forwarding and Transfer
Multimodal Booking
Multimodal Shipping Instruction
Multimodal Waybill
Multimodal Status Report / Request
Road Consignment Note (eCMR)
Maritime Bill of Lading
Inland Waterway Bill
Rail CIM-SMGS (URL)
Rail SMGS
Rail Wagon List
Air Waybill
Air Dangerous Goods Declaration
Air Consignment Security Declaration
Smart Containers
Pipeline Data Exchange Standard (PDES)
IMO FAL Compendium

RDM Artefacts

CCBDA Subset
Business Standards
Based on MMT RDM






Example Business Standard Streamlined Publications 2



Transport and Logistics

Multi-Modal Transport Reference Data Model

International Forwarding and Transfer

- BRS Overall 
- XSD Schema 
- UML Diagram 
- XLS Guideline Structure 
- Spreadsheet 
- HTML
- JSON Schema

RDM Artefacts

Business Standard
CCBDA MMT Subset
Artefacts