UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

UNITED NATIONS CENTRE FOR TRADE FACILITATION
AND ELECTRONIC BUSINESS (UN/CEFACT)

**BUSINESS REQUIREMENTS SPECIFICATION
(BRS)**

BUY – SHIP – PAY Reference Data Model
BSP-RDM

Approved: UN/CEFACT Bureau on 13 August 2019

Version: 1.0

1. Table of Contents and Figures

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Change Log

Date of Change	Version	Paragraph Changed	Summary of Changes
	0.1		Initial Creation
September 2018	0.15		Merging Inputs from MMT and SCRDM models
November 2018	0.2		Improvements for consistency between figures and text descriptions
December 2018	0.5		Including comments of internal document review
January 2019	0.6		Internal document, second round of comments
February 2019	0.7		Internal document, third round of comments
July 2019	1.0		Final Document introducing updates by public review, references updated to include Pipeline Project for WCO UCR analysis, and a clarification as last paragraph on p.13

2. Preamble

The UN/CEFACT BSP-RDM project has the intention to bridge two domains within the International Supply Chain PDA, namely the Transport and Logistics Domain and the Supply Chain and Procurement Domain, providing a unifying framework, consolidating the constituent data models of these two domains by addressing any overlaps between the concepts used in their different contexts.

UN/CEFACT has been working on Reference Data Models (RDMs) for International Supply Chains and Multi-Modal Transport. These two RDMs share a same base of components from the UN Core Component Library (UN CCL), which are interlinked but used differently due to differences in context and semantics between the international sales and transport contracts, information exchanges and business practices.

In the concept of RDM, as outlined by the UN/CEFACT White Paper on RDM approved in April 2017, these are complete and focused subsets specific to the needs of a particular domain. The context messages are then subset data exchange structures definitions of the RDMs.

For maintenance purposes, if the current two RDMs are developed separately, any changes in one will require changes to the other. A higher level RDM could cover Buy Ship and Pay thereby facilitating their use and maintenance.

Therefore, the BSP-RDM current project aims to create an intermediate subset of the UN CCL focusing on the shared aspects across the international supply chain and transport-logistics chains.

The end result is expected to be quite beneficial to all modelers and developers for Collaborative Information Exchanges the existence of an intermediate subset of the UN CCL on which both the International Supply Chain RDM and the Multi-Modal Transport RDM are based.

3. References

- BSP-RDM Project Proposal
- UN/CEFACT Multi-Modal Transport (MMT) Reference Data Model
- UN/CEFACT Supply Chain Reference Data Model (SCRDM)
- International Freight Forwarding BRS
- UN/CEFACT Modelling Methodology (UMM) v2.0
- UN/CEFACT Core Component Technical Specification v2.01 (CCS ISO15000-5)
- UN/CEFACT Core Component Library D18B
- United Nations Trade Data Elements Directory 2005 (UNTDED/ISO 7372)
- TBG1- BRS Cross Industry – Supply Chain - Invoice Process - CEFACT/Forum/2006/… – Revision 1.1
- Data Pipeline Project

4. Objective

The objective of this BRS is to describe the requirements for a generic Reference Data Model (RDM), generalizing the concepts of the Multi-Modal Transport Reference Data Model (MMT-RDM) and the Supply Chain Reference Data Model (SCRDM), leading to the development, publishing and improving the maintenance of a Business Standard, which can be applied by country and regional administrations and industries.

Therefore, the BSP-RDM in combination with the UN/CEFACT International Supply Chain Reference Model (ISCRM) BRS describes a generic reference data model and provides a framework to accommodate the requirements of:

   a) cross-border supply chain trade related transactions, including government domain needs for their own specific information exchanges;

   b) supporting the transport-related processes involved in the cross-border supply chain and covering the involved business areas at a high-level, the main parties and the information involved;

whilst complying to and fostering the adoption of the overall processes and data structures as these have been developed in UN/CEFACT. Hence, the BSP-RDM will provide the definitions of contextualized trade and transport-related data exchange structures mapping paper documents which can be integrated into end-to-end software solutions for Traders, Carriers, Freight Forwarders, Agents, Banks, Customs, Other Governmental Authorities etc.

The BSP-RDM project follows the practice of all referenced projects, adopting a holistic approach to develop a reference data model based on the solid and widely used by other standards (e.g. GS1) UN/CEFACT Core Component Library (CCL), bringing together the data exchange requirements of international multimodal transport processes including related trade, insurance, customs and other regulatory documentary requirements based on the integration of trade facilitation and e-Business best practices.

Derivative information exchange specifications will be able to be developed to support the requirements of conventional UN/CEFACT data exchange structure formats for UN aligned paper documents, UN/EDIFACT or UN/CEFACT XML messages as well as information exchanges to support web-based processes such as those required for Single Windows implementations.

The UN/CEFACT BSP-RDM framework will be used to generate a Business Standard which will include paper and electronic document structures as data exchanges which have been derived from the BSP-RDM. Derivation from this reference data model ensures that each BSP paper or electronic document data structures specification is an individual implementation of a methodology which follows the aligned concepts described in UNECE Recommendation 1, the UN Layout Key (UNLK).

This ensures that trading partners can choose the type of data exchanges technology that best meets their business requirements and technology capabilities and also provides a migration path for the adoption of new technologies.

Further, BSP-RDM will accommodate the additional requirements generated by contemporary integration approaches, which deploy RESTful APIs and JSON-LD data exchanges and specifications, these to be accounted in the follow-up phase of the Requirements Specifications Mappings (RSMs) following the UN/CEFACT CCBDA process, and the generation of the message definitions.

5. Scope

The extent and limits of the business processes described in this document have been developed in such a way that it allows application of the BUY/SHIP/PAY business standard for implementations of national, regional, trade sector or modal specific cross-border scenarios.

Only the high-level process descriptions are referenced in this BRS in order that the detailed process analysis of the subset scenarios can provide the detailed process requirements in further individual Business Requirements Specifications (BRSs).

5.1. Scope Comparison

The International Supply Chain Reference Model (ISCRM)[1] covers the processes following the recognition of need by a customer for a product or service up until the fulfilment of an order by a supplier and the resulting financial settlement. In addition to the business processes associated with cross-border trading it also incorporates the necessary logistical and cross-border regulatory activities which may be required by intermediaries and authorities. This is illustrated in the following Use-Case diagram (Figure 1).
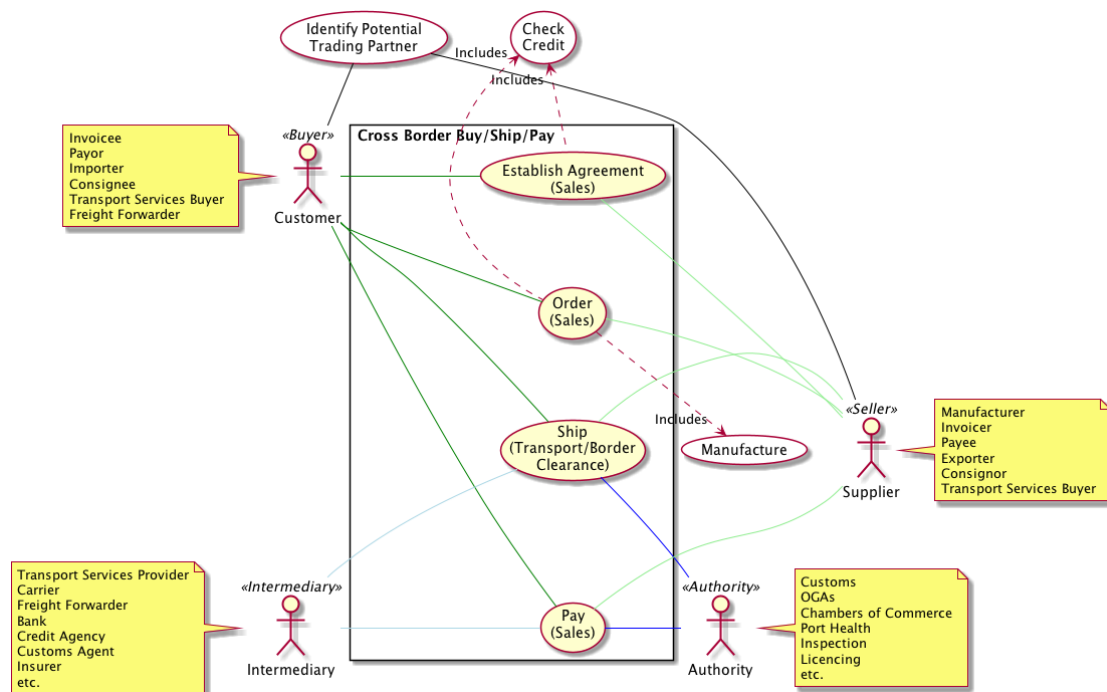

Figure 1: International Supply Chain Model, Roles and Services (Use Cases)

The overall scenario is described in the ISCRM. In summary, the use cases for the cross-border Buy-Ship-Pay business collaborations are the (a) main and (b) supportive top-level processes described in the following:

a) Main:
- *Establish business agreement*: A buyer issues a request for quotation to sellers for a product or service. Sellers respond or send unsolicited quotes to a potential buyer. The buyer negotiates with the selected sellers to agree the terms for a contract agreement.

- *Order:* The buyer recognizes a need for a product or service and places an order under a contract agreement. The seller receives order and responds.

- *Ship:* The seller dispatches the products according to the terms of trade specified. All transport arrangements are made and executed and the requirements laid down by the relevant authorities are met. Invoice (demand for payment) is raised. The buyer receives the product or service.

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[1] http://tfig.unece.org/contents/ISCRM.htm

- **Pay:** A demand for payment is received. The payor makes the payment and the payee receives the payment according to the terms of trade agreed.

b) *Supportive:*
- **Identify potential trading partner:** The buyer looks for potential sellers and the seller looks for potential buyers.

- **Check credit:** A seller initiates query on the credit worthiness of the prospective buyer. An intermediary may respond with credit status. (out of scope in BSP)

- **Manufacture:** When the use case is about a manufactured product, the seller places an order for the manufacturing of that product to a manufacturer, to meet customer's order. The manufacturer confirms the planned delivery date, when the product is available for shipping.

The ISCRM introduces a number of actors and roles as they appear in Figure 1, of which the main are:
- **Buyer:** The party stipulated as the party to whom goods or services are sold. The primary role of the customer as specified in a *sales order contract* is the buyer, while other possible roles include the *final / ultimate consignee, transport services buyer, importer* and *invoicee*.

- **Seller:** The party stipulated as the *supplier* of goods or services. The primary role of the supplier as specified in the *sales order contract* is the *seller* and other possible roles include the *original consignor / shipper, transport services buyer, exporter*, and *invoice issuer*.

- **Intermediary:** Within the international purchase and supply chain, an intermediary can be any party who provides services to support either the *sales order contract* or the *transport service contract*. The possible roles of an intermediary include the *transport service provider* (e.g. *carrier, freight forwarder*), *financial institution* including *banks, credit agencies, insurers, customs agent*, etc.

- **Authority:** An authority provides authorization associated with any conventions or regulations applicable to the trading of goods within the international purchase and supply chain. The possible roles of an authority include *border control authorities* (e.g. *Customs*), *permit/licensing issuing authorities* and *Port Authorities* including *Port Health, Inspection, Chambers of Commerce*, other governmental authorities (*OGA*), etc.

More specific definitions of party roles which are engaged in cross-border transactions, from the above set are:
- **Importer:** The party who makes, or on whose behalf a *customs clearing agent* or other authorized person makes, an import declaration. This may include a person who has possession of the goods or to whom the goods are consigned.

- **Exporter:** The party who makes, or on whose behalf the export declaration is made, and who is the owner of the goods or has similar rights of disposal over them at the time when the declaration is accepted.

- **Transport service buyer:** The party stipulated as the buyer of *transport services* in a *transport service contract*. The transport service buyer role may be performed by either the *consignor* or the *consignee* depending on the terms of delivery specified in the associated sales order contract.

- **Transport service provider:** The party stipulated as the seller of *transport services* in a *transport service contract*. The transport service seller role is an intermediary role as described above.

- **Invoice issuer (invoicer):** The party who issues an *invoice*.

- **Invoicee:** The party to whom an *invoice* is issued.

5.2. Scenario introduction

The scope of this BRS can be expressed as a subset of the scope of the UN/CEFACT ISCRM covering the key processes of the trade and transportation of goods and the cross-border clearances through to invoicing of *goods-supply* and the related *transport services*.
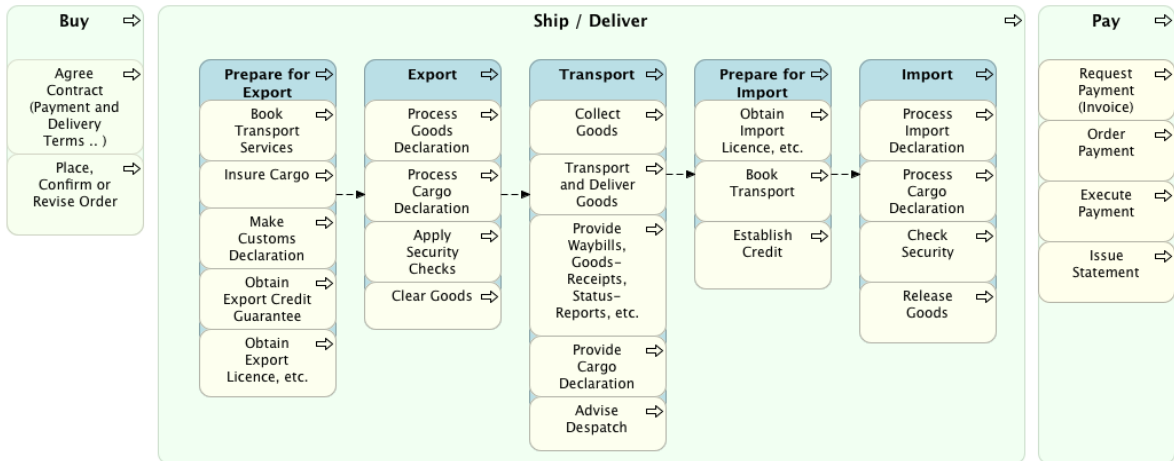

Figure 2: Buy-Ship-Pay model, Business Processes and Transactions

Figure 2, illustrates the business processes and transactions that are included in the Buy-Ship-Pay model[2]. The BUY, SHIP/DELIVER[3] and PAY processes are shown at a high level. Further analysis below that level, involves business process views and their transactions. These definitions are much more detailed, are linked and further addressed to the UN/CEFACT detailed analysis performed in specific projects (e.g. the Pipeline) while the related data are captured in the transaction data model.

6. Business requirements

6.1. "Business requirements" views

As described in Section 5.2 above, the BUY/SHIP/PAY business process scope may be viewed as interrelated business areas representing commercial transport contracts, operational transport and logistics, regulatory and border clearance processes together with the corresponding information used both within each business area and which passes between them.

The following two diagrams (Figure 3 and Figure 4) describe these areas in terms of the key governing contracts – the *sales order contract* and the *transport service contract* – and these diagrams also show the relationships between the key process areas together with an indication of the documentary requirements.

The first diagram (Figure 3) providing the *sales order contract* view, which also applies and includes the *transport services contract* (and thereby, the related use-cases) which is further expanded in the second diagram (Figure 4).

The expanded international transportation scope includes in more detail the processes of *transport booking*, *transport ordering* and *freight invoicing*, mapping the actual transportation and the related paper documents and their data exchange structures.

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[2] http://tfig.unece.org/contents/buy-ship-pay-model.htm
[3] The term "Deliver" is more often used in supply chain, while "Ship" is used more often in transport and logistics processes.
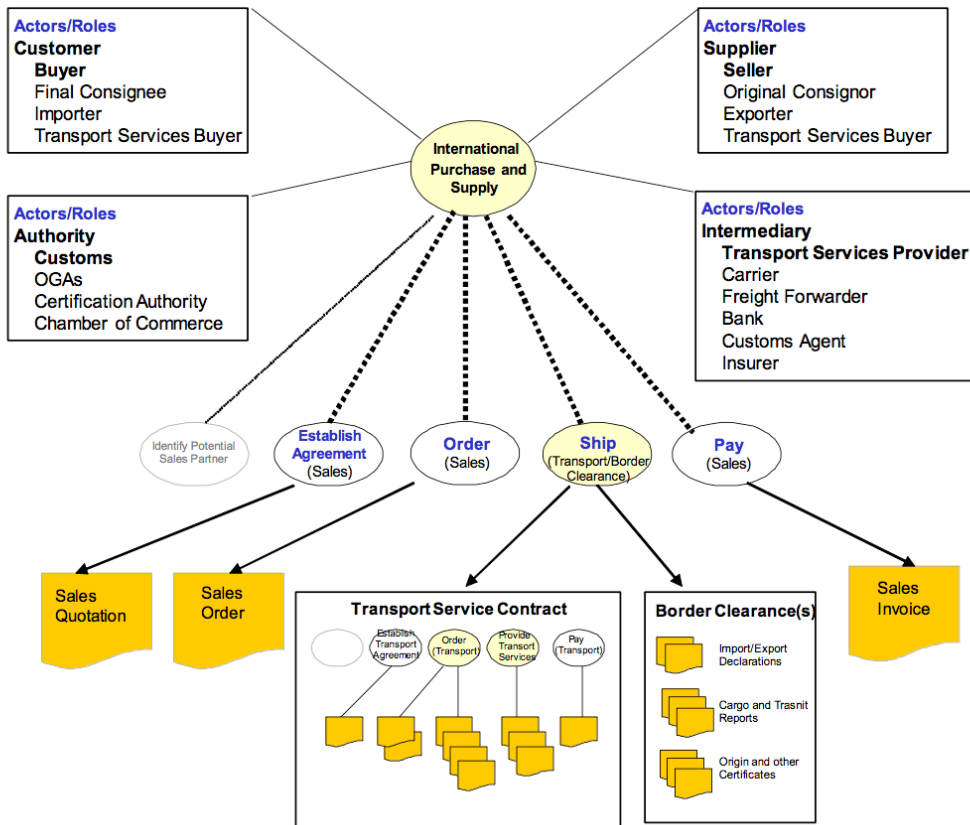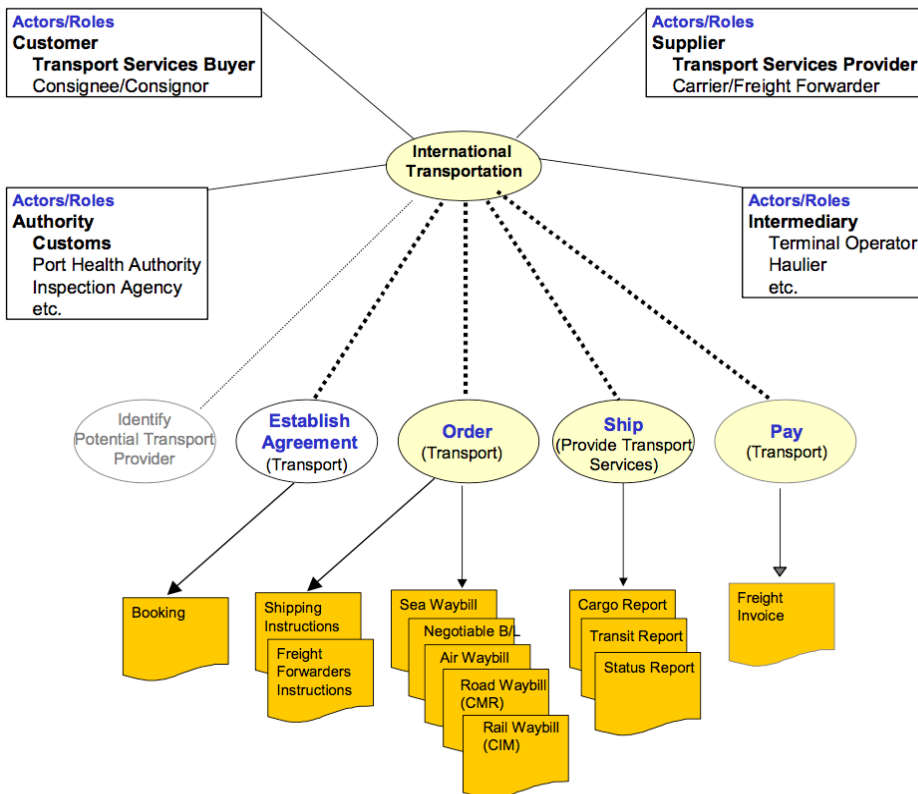
Figure 3: The Sales Order Contract View

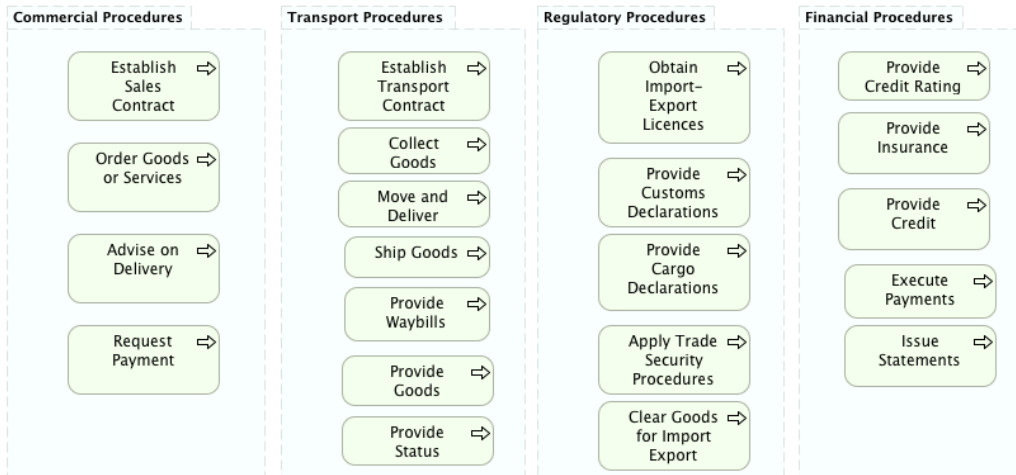*Figure 4: The Transport Services Contract View*

Figure 5: Business Processes within the four Business Areas as defined in ISCRM

The ISCRM maps business processes in four main business areas, namely the; (a) commercial, (b) logistical, (c) regulatory and (d) financial, including procedures as illustrated indicatively in Figure 5.
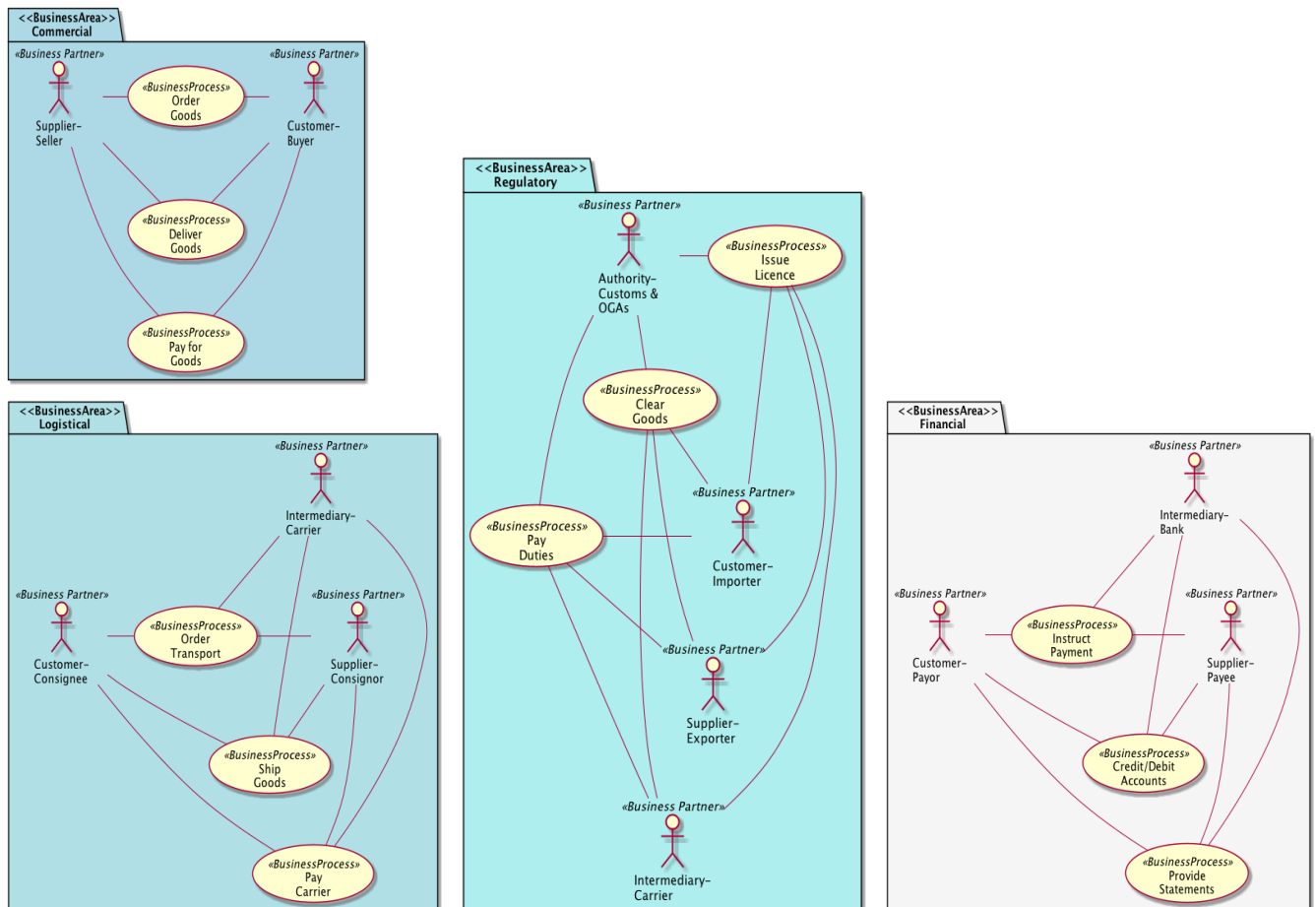

Figure 6: Key Actors/Roles associated with the four main Business Areas

Figure 6 illustrates the key roles and actors related to the different business areas as defined in the ISCRM. The current project scope will include and will be addressing all entities related to the first three (3) ISCRM business areas, i.e. the commercial, the logistical and the regulatory.

Commercial data exchanges / processes

May include:
- Issuing of catalogues,
- Issuing of quotation,
- Confirmation of sales order,
- Delivery scheduling,
- Issuing of despatch advice and packing list,
- Sales invoicing,
- Remittance advice

Logistical (transport) exchanges / processes

May include:
- Booking of cargo space,
- Issuing of shipping instructions,
- Issuing of transport contract document (i.e. Air Waybill),
- Transportation of goods,
- Requesting and issuing of transport status reports,
- Freight invoicing

Regulatory data exchanges / processes

May include reporting to Customs or appropriate other governmental agencies:
- Import/export declarations,
- Cargo and transit reports,
- Cross-border regulatory data pipeline data,
- Certificates of origin,
- Phytosanitary certificates,
- Dangerous goods declarations including Organization of Economic Cooperation and Development (OECD) hazardous waste notifications,
- etc.

Financial processes

May include financial aspects of supply chain transactions such as the:
- Instruct payment,
- Credit/debit accounting,
- Statements and reporting,
- Cargo insurance.

6.2. Participating parties

There are potentially many parties participating in the cross-border international supply chain. These parties can be grouped into four main categories as indicated in the table below:

Table 1: Trade/Transport/Customs Party Roles

Sales order contract	Transport service contract	Definition
Seller	Original consignor/original shipper	The party selling goods or services as stipulated in a *sales order contract*.
Buyer	Final consignee/ultimate consignee	The party to whom goods are sold services as stipulated in a *sales order contract*.
	Transport services buyer (consignor or consignee)	The buyer of transport services as stipulated in a *transport service contract*.
	Transport services provider (carrier or freight forwarder)	The provider i.e. seller of transport services as stipulated in a *transport service contract*.
	Consignor	The party consigning goods as stipulated in a *transport service contract*. *Consignor* is the party who originates a *shipment of goods*, the sender of a *freight shipment*, usually the *seller*.
	Consignee	The party receiving a *consignment of goods* as stipulated in a *transport service contract*. The party to whom goods are shipped and delivered. The receiver of a freight shipment.
	Carrier	The party which provides *transport services*.
	Freight forwarder	The party undertaking the forwarding of goods by provision of transport, logistics, associated formalities services etc.
	Despatch party	The party where goods are collected or taken over by the transport services provider. Operational term is 'pick-up location' (or 'pick-up place').
	Delivery party	The party to which goods should be delivered by the *transport services provider*. Operational term is 'delivery location' (or 'place of positioning').
Ship from	Original despatch party	The party from whom goods will be or have been originally shipped.
Ship to	Final delivery party/ultimate delivery party	The party to whom goods will be or have been ultimately shipped.

6.3. Business entities and business rules

Throughout the international purchase and supply chain various types of information are exchanged. The SCRDM and the MMT-RDM provide a cross-domain framework for the derivation of generic data exchange structures for the exchange of information between the customers, suppliers, intermediaries and authorities no matter which countries or modes of transport may be involved.

All data modelling concepts support full referencing between the business information entities and the UNTDED v2005, which has also been the basis of the WCO Data Model. Hence, both the SCRDM and the MMT-RDM use the same set of generic terms and their definitions for the involved parties and for the business information entities contained within it.

The following diagram (Figure 7) provides the entities and the relationships between the highest-level Business Information Entities (BIEs) of the BSP-RDM, which consolidates the SCRDM and MMT-RDM. The diagram highlights an issue appearing in customs reporting, where data arriving by both the supply chain and the transport related sources are not consolidated, making it difficult to cross-relate descriptions related to the same trade item.
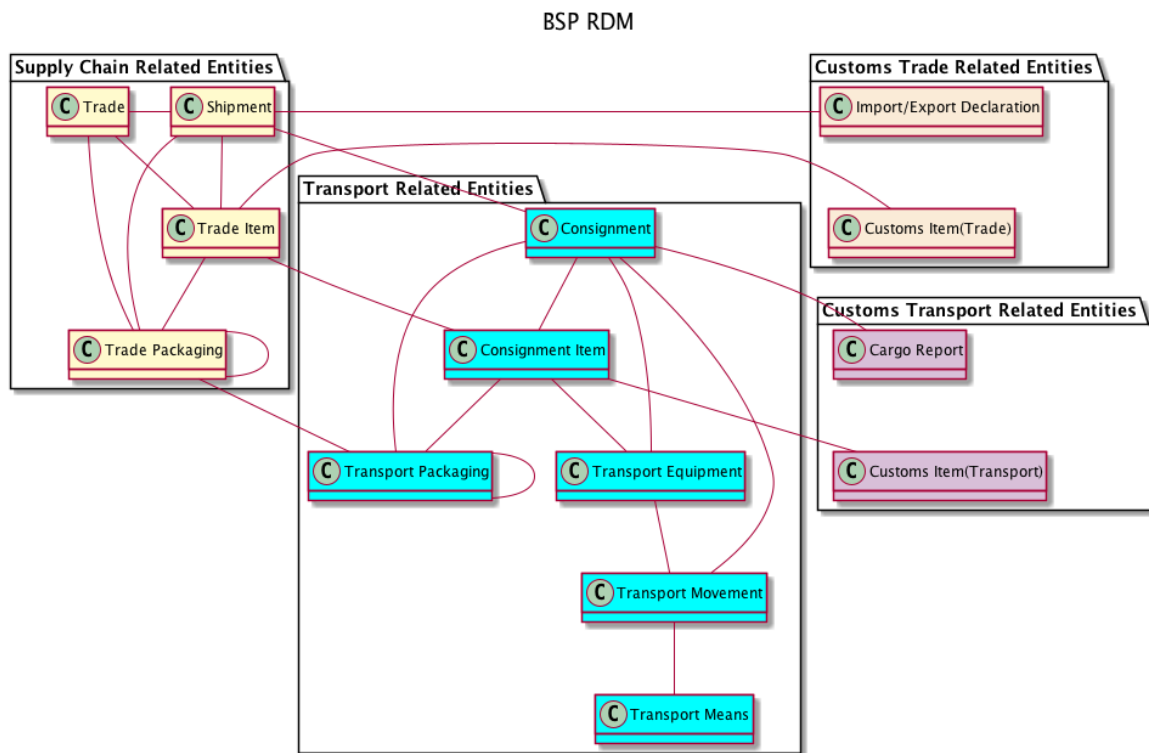

Figure 7: High Level BSP RDM

The following diagram (Figure 8) and the related text descriptions provide more detail on the highest-level BIEs of the BSP-RDM and the relationships between then, given as business rules with constraints and cardinalities.

As regards the WCO Customs UCR concept for Pre-Entry Security Declarations, there needs to be different levels of UCR in order to support the many-to-many Master Transport Contract and House Transport Contract consignment relationships which are at a level of detail not within the context of this analysis. In UN/CEFACT, these have been defined in the BSP Reference Data Model for Pipeline Data Exchange Structures subset in the Pipeline Project as: a) TUCR (Trade Transaction level reference), b) HUCR (House Consignment level reference and c) MUCR (Master consignment level reference).
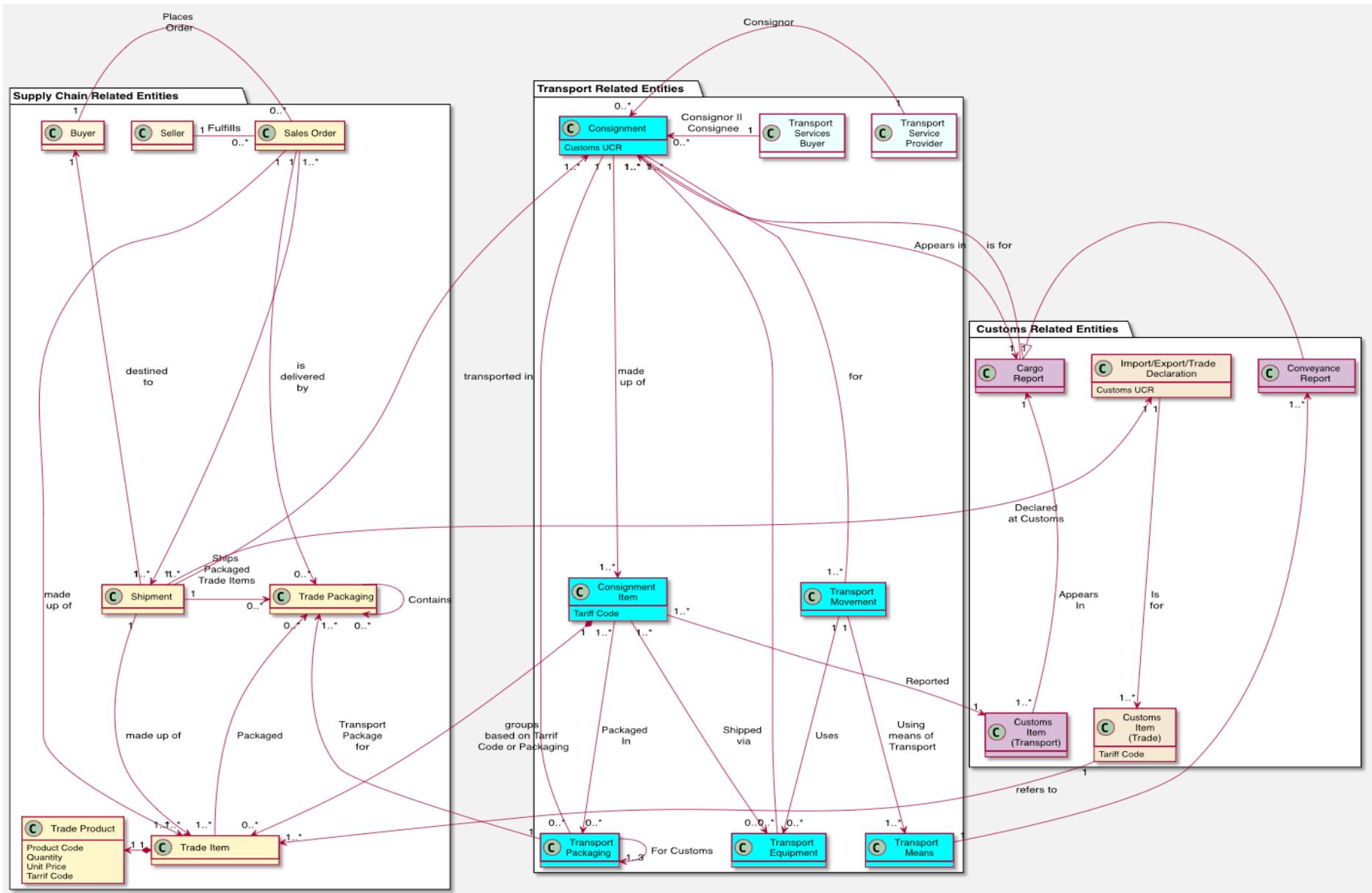
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Figure 8:BSP RDM, showing Entities and Relationships

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In the following a set of definitions for the entities appearing in Figure 8 is provided, based on their physical and process related context, role, relevance and significance:

Sales Order

A *sales order* is a contractual document by means of which a *buyer* initiates a transaction with a *seller* involving the supply of goods or services as specified, according to conditions which are either set out in a formal quotation or otherwise known to the *buyer*. Further, the information typically found in a cross-border order document covers the related commercial *sales order* information to fulfil the business transaction between the *buyer* and the *seller*, including the transport and regulatory information required by all engaged intermediaries and authorities. The following apply:

- A *sales order* can only have one *buyer*.
- A *sales order* can only have one *seller*.
- A *sales order* is made up of one or more *trade items*.

Trade Item

A *trade item* describes the lowest level of "commercial" information in a *sales order* between the *buyer* and the *seller*. Each *trade item* will usually be associated with a particular *product* or *service* and will include details such as *product code*, *quantity* and *unit price*, etc. In the case of cross-border orders each product will also have an associated *customs tariff code*.

- A single *trade item* is related to one *shipment*.
- *Trade items* are aggregated by *tariff code/packaging* into *consignment items*.

Shipment/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 *Unique Consignment Reference* (*UCR*)[4].
- A *shipment* may form part or all of a *consignment* or may be transported in different consignments.

Consignment (Transport Service Order)

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 contract* document.

- A *consignment* can only have one *consignor*.
- A *consignment* can only have one *consignee*.
- A *consignment* can only have one *transport service provider* (*TSP*).
- A *consignment* can only have one *transport service buyer* (also *transport service consumer – TSC*).
  - The *transport service buyer* can be either the *consignor* or the *consignee*.
- A *consignment* may refer to one or more *shipments*
- 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*.
- A *consignment* relates to *transport equipment* used for the implementation of the *transport service* and contain *consignment items*.
- A *consignment* is made up of one or more *customs items* for reporting to *Customs*.
- A *consignment* can have one or more customs UCRs.

Consignment Item

A separately identifiable quantity of products grouped together by customs tariff code or packaging for transport purposes. A *consignment item* is the lowest level of information within a *consignment*. In the case of cross-border consignments each *consignment item* must have only one associated *customs tariff code* in order to satisfy customs requirements.

- A *consignment item* can contain one or more *trade items*.
- A *consignment item* may be contained in *transport equipment* used for the implementation of the *transport service*.
- A *consignment item* can only have one associated *customs tariff code*.

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[4] http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/tools/ucr.aspx

Import/Export Customs Declaration

Documents by which consignments of goods are declared for either export or import customs clearance, conforming to the layout key set out at Appendix I to Annex C.1 concerning outright exportation to the WCO Revised Kyoto Convention[5]. A *customs tariff code* must be provided for each *consignment item* within a *consignment*. The customs tariff code, also known as the *commodity code*, specifies the goods classification under the WCO Harmonised Commodity Description and Coding System[6].

- An *export or import declaration* can contain one or more *customs items*.
- An *export or import declaration* can have only one customs UCR.

Customs Item

A *customs item* is a *consignment item*, a *trade item* or an aggregation of *consignment items* or *trade items* with distinct *customs tariff code* for reporting to Customs.

- A *customs item* can only have one associated *customs tariff code*.
- A *customs item* can refer to one or more *trade items*.
- Each reported *consignment* may contain one or more separately reported *customs items*.

Customs Cargo Report

Documents by which *movements* of goods are reported to Customs at a place of export, import or transit.

- A *customs cargo report* reports on one *transport movement of goods*.
- A *customs cargo report* reports on one or more *consignments*.

Conveyance Report

A *conveyance report* permits the transfer of data from a carrier to a customs administration for the purpose of meeting customs reporting requirements in respect of the *means of transport* on which cargo is carried.

Transport Equipment

A piece of equipment used to hold, protect or secure cargo for logistics purposes.

- A *transport equipment* may relate to one or more *transport movements*.
- A *transport movement* may aggregate more than one *transport equipment*.
- A *transport equipment* corresponds to one *consignment* one *consignment* may aggregate more than one *transport equipment*.

Transport Means

The devices used to convey goods or other objects from place to place during logistics *cargo movements*.

- One *transport means* corresponds to one *transport movement*.
- One *transport means* is the basis of one *conveyance report*.

Transport Movement

The conveyance (physical carriage) of goods or other objects used for transport purposes.

- A *transport movement* is serviced by one *transport means*.
- A *transport movement* corresponds to one or more *consignment*, one *consignment* may include more than one *transport movement*.
- A *transport movement* may carry zero to many pieces of *transport equipment*, *transport equipment* is associated to one *transport movement*.
- A *transport movement* appears to one *cargo report*.

Transport Packaging

A self-contained wrapping or container within which goods can be contained for transport purposes, such as a box or a barrel which can be filled, partially filled or empty.

- A *transport package* relates to one *consignment*, one *consignment* aggregates *transport packages*.
- A *transport package* as a customs requirement may define two additional levels of *sub-packaging*.

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[5]http://www.wcoomd.org/Topics/Facilitation/Instrument and Tools/Conventions/pf_revised_kyoto_conv/Kyoto_New
[6]https://unstats.un.org/unsd/tradekb/Knowledgebase/50018/Harmonized-Commodity-Description-and-Coding-Systems-HS