UNTTC | Transport and trade connectivity in the age of pandemics

Data mapping between selected business documents used in multimodal data and document exchange and regulatory information systems, such as Single Window and Customs systems

PROJECT REPORT

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Disclaimer: this report has been prepared by Ms. Vania Zlateva, UNECE consultant. The views in this document are those of the author and do not necessarily express the position of the UNECE.

During this consultancy project, the Consultant analyzed the data requirements in a sample transport document aligned to the UN/CEFACT Multimodal Transport Reference Data Model (MMT RDM), the European Union Customs Data Model (EUCDM) and the WCO Data Model. The objective was to produce data mapping between these instruments, with a view to propose practical solution for using in regulatory information systems (such as regulatory Single Window, Customs systems) the information in the package of standards for the digitalization of multimodal transport data and document exchange. The knowledge collected in this project will be used in both practical pilot projects for the implementation of the UN/CEFACT standards and the future work on data pipelines. It also makes contribution to the harmonization and standardization of data exchange in international transport, trade and logistics to encourage electronic data exchange in building back better after the Covid-19 pandemic.

The Consultant:

1. reviewed the data requirements in the package of standards for the key documents accompanying goods and dangerous goods declarations (available at https://unttc.org/stream/electronic-trade-and-transport-documents-and-data). In close cooperation with other UN/CEFACT experts (Sue Probert, Dmytro Iakymenkov) and other experts (Kazym Samadov, Azerbaijan, and Galyna Roizina, Ukraine) concrete document(s) forom the package were selected for the data mapping.
2. prepared data mapping between the data in the package of documents and the European Union Customs Data Model (EUCDM) for the purpose of facilitating and objectifying the acceptance of data from the multimodal transport stream into the regulatory (Customs) process of information collection (all mapped to the UN/CEFACT reference data models, notably, the Multimodal Transport Reference Data Model, MMT RDM). The same was done for Azerbaijan and Ukraine.
3. a master excel sheet was created in Excel with relevant data elements in the transport document and the EUCDM, the Customs data set in Azerbaijan and the WCO Data Model.
4. based on the above work a data set was developed for the interoperability between the transport document and EU CDM.
5. Draft a list of recommendations on how the above standards and tools can be used in the transition economies to feed data from the information flows in multimodal transport data and document exchange into the regulatory information collection process (regulatory Single Window / electronic Customs systems), including for proof of concept and practical implementation.

The products of this contract focused on the use of UN/CEFACT instruments to help the digitalization of multimodal transport data and document exchange in the drive to reduce risks from face-to-face contacts in the supply chain due to the COVID-19 pandemic, while improving the efficiency of trade and transport transactions. They will provide a key link between work on the digitalization of data and document exchange and the regulatory control process.

1. APPROACH

Main principles and steps:

- The technical structure of the UN/CEFACT Multimodal Transport Reference Data Model (MMT RDM) is used as the baseline - the matching between the lowest level of the data elements.

- When differences are related to:

- the business content – no mapping is proposed
- format, and/or technical characteristics – a mapping is proposed.

- With regards to the format, agreements will need to be reached whether differences are to be reconciled via transformation through the IT system itself or *ex ante*, through consensus of the parties.

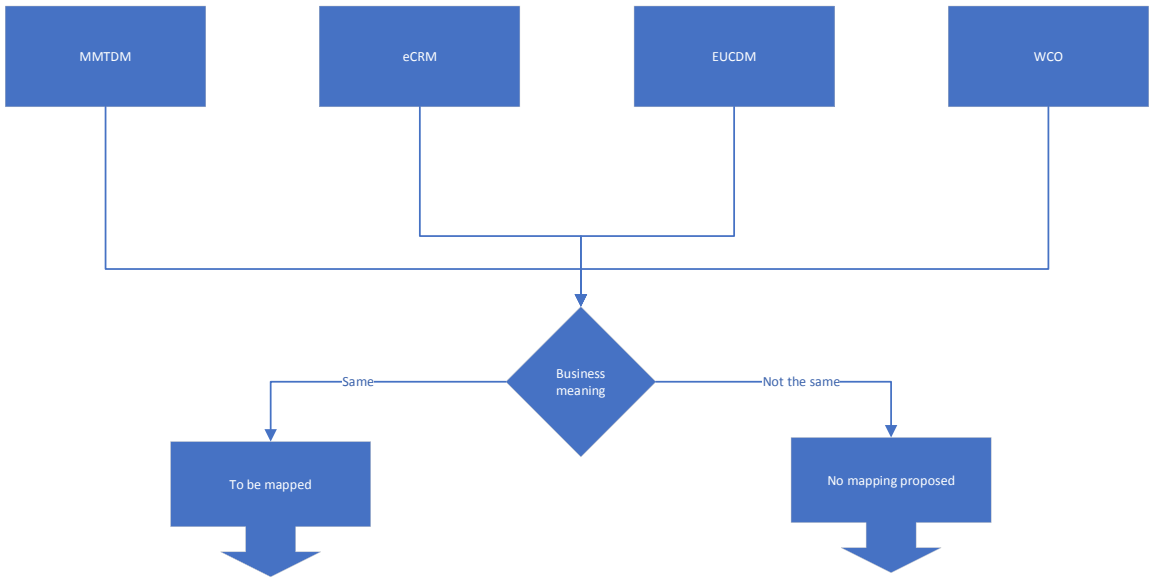
2. eCRM MAPPING

The table attached in Annex A was prepared based on:

1) MMT RDM
2) eCMR (proposal based on paper CMR form)
3) EUCDM (version 6.2, as published on EUCDM 6.2 (softdev.eu.com))
4) WCO (version 3.11.0, as per the publication WCO Data Model App (wcoomd.org))

The mapping has been carried out by comparing data elements from eCMR and MMTDM and the set of data of *Entry summary declaration – Road mode of transport*, column F50, Annex B of UCC and, respectively, WCO Consignment view.

Figure 1: Data mapping process flow



Source: the author

3. NOTES

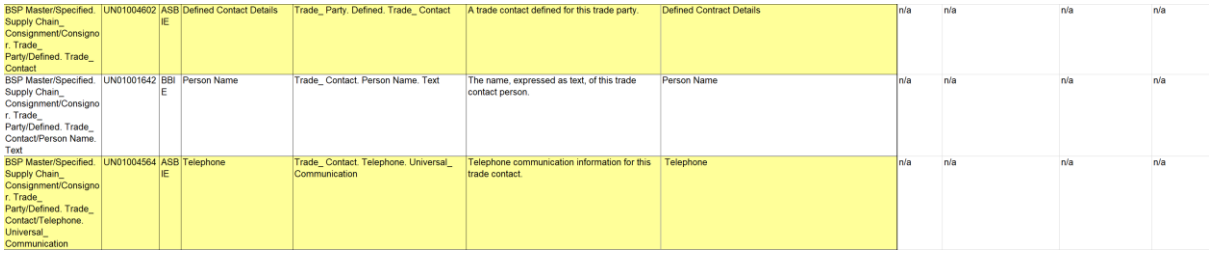
- For data elements (DE) from the electronic road consignment note (eCMR) for which a proper mapping was not found, the proposal is to create new ones with the same format as similar DEs, i.e.:
    - Box 18 Carriers reservations and observations

- Box 21 Established in

- The proposal is not to use the data group (DG) *BSP Master/Exchanged_ Document* but *BSP Master/Exchanged_Declaration* as the mapping is from the perspective of the document as such (to be used for automatical check versus Entry summary declaration or to fill in the declaration DEs (as a re-use of the available data)

- For some of the DEs and DGs (see **Error! Reference source not found.** below) mapping is not provided, as those DEs/DGs are not applicable for the particular customs procedure

Figure 2: DEs and DGs that are not applicable for the particular customs procedure (not mapped)

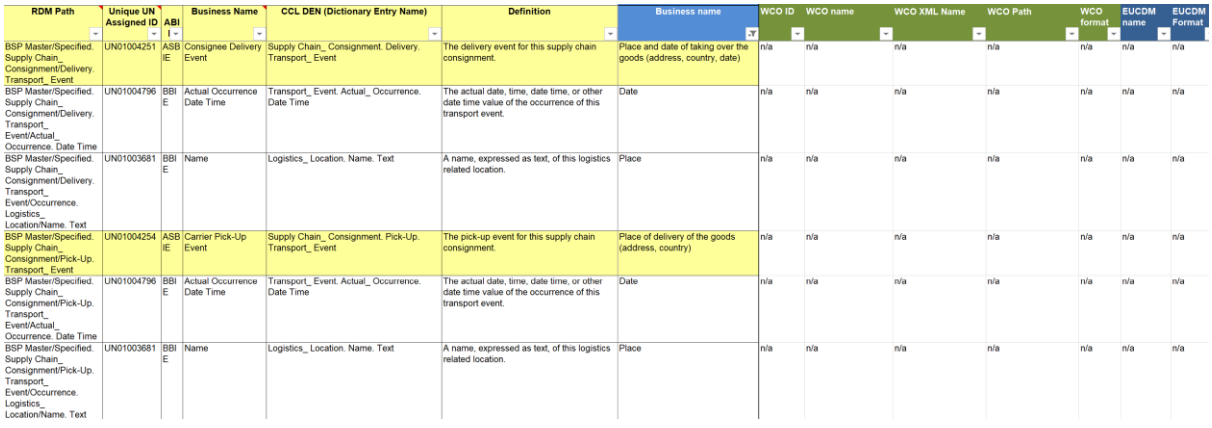


BSP Master/Specified. Supply Chain_ Consignment/Consignor. Trade_ Party/Defined. Trade_ Contact	UN01004602	ASBIE	Defined Contact Details	Trade_ Party. Defined. Trade_ Contact	A trade contact defined for this trade party.	Defined Contract Details	n/a	n/a	n/a	n/a
BSP Master/Specified. Supply Chain_ Consignment/Consignor. Trade_ Party/Defined. Trade_ Contact/Person Name. Text	UN01001642	BBIE	Person Name	Trade_ Contact. Person Name. Text	The name, expressed as text, of this trade contact person.	Person Name	n/a	n/a	n/a	n/a
BSP Master/Specified. Supply Chain_ Consignment/Consignor. Trade_ Party/Defined. Trade_ Contact/Telephone. Universal_ Communication	UN01004564	ASBIE	Telephone	Trade_ Contact. Telephone. Universal_ Communication	Telephone communication information for this trade contact.	Telephone	n/a	n/a	n/a	n/a

Source: the author

- DEs, related to take-over and delivery places and dates and dates are not mapped (**Error! Reference source not found.**), as there is no unambiguous mapping. If the mapping will be to loading or acceptance and unloading or delivery, it depends on who submits the information and on which level.

Figure 3: Des for which mapping is ambigueous



RDM Path	Unique UN Assigned ID	ABI	Business Name	CCL DEN (Dictionary Entry Name)	Definition	Business name	WCO ID	WCO name	WCO XML Name	WCO Path	WCO format	EUCDM name	EUCDM Format
BSP Master/Specified. Supply Chain_ Consignment/Delivery. Transport_ Event	UN01004251	ASBIE	Consignee Delivery Event	Supply Chain_ Consignment. Delivery. Transport_ Event	The delivery event for this supply chain consignment.	Place and date of taking over the goods (address, country, date)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSP Master/Specified. Supply Chain_ Consignment/Delivery. Transport_ Event/Actual_ Occurrence. Date Time	UN01004796	BBIE	Actual Occurrence Date Time	Transport_ Event. Actual_ Occurrence. Date Time	The actual date, time, date time, or other date time value of the occurrence of this transport event.	Date	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSP Master/Specified. Supply Chain_ Consignment/Delivery. Transport_ Event/Occurrence. Logistics_ Location/Name. Text	UN01003681	BBIE	Name	Logistics_ Location. Name. Text	A name, expressed as text, of this logistics related location.	Place	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSP Master/Specified. Supply Chain_ Consignment/Pick-Up. Transport_ Event	UN01004254	ASBIE	Carrier Pick-Up Event	Supply Chain_ Consignment. Pick-Up. Transport_ Event	The pick-up event for this supply chain consignment.	Place of delivery of the goods (address, country)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSP Master/Specified. Supply Chain_ Consignment/Pick-Up. Transport_ Event/Actual_ Occurrence. Date Time	UN01004796	BBIE	Actual Occurrence Date Time	Transport_ Event. Actual_ Occurrence. Date Time	The actual date, time, date time, or other date time value of the occurrence of this transport event.	Date	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSP Master/Specified. Supply Chain_ Consignment/Pick-Up. Transport_ Event/Occurrence. Logistics_ Location/Name. Text	UN01003681	BBIE	Name	Logistics_ Location. Name. Text	A name, expressed as text, of this logistics related location.	Place	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: the author

Annex A Summary Table

eCMR_AZ_EUCDM_WCO1.xlsx

Annex B Glossary

Transformation

The conversion of a data element to comply with the target data model. Such occurrence is applied in instances where there is a difference between the data element from the two data model. For example, when the measurement unit of Net Weight in one data model is grams, while according to the other it should be in kilograms, the number to transformed by dividing to 1000 in order for the measurement unit to comply with the second one.

A second scenario can be identified when *n* data elements part of one data model should become different than *n* data elements of another data model, where *n* is the number of data elements. For example "Commodity Code", which consist of 3 data elements (Harmonized system subheading code, Combined Nomenclature code and TARIC code in), part of EUCDM should become one data element 'ClassCode' (CHED certificates) in the Partner PG's system (TRACES NT) and vice-versa.

Transfer

When the data element should be passed without transformation, as there are no differences between the data element from two data models.

The EUCDM - Background

The initial goal of the EU Customs Data Model (EUCDM) was to facilitate the Real Time Message exchange between the Member States within the use of the Customs trans-European systems such as NCTS, AES, ICS and for Member States' national customs clearance systems. Furthermore, the overall objective has been extended as to provide a technical instrument that models the data requirements laid down in EU Customs legislation to present a single and genuine source of information for the technical developments of the different IT systems that are used for data processing by customs authorities in the EU. An important decision was made in 2013 to model the UCC Annex B data elements as a subset of the globally standardised WCO Data Model.

The EU Customs Data Model (EUCDM) is supported by full descriptions of the business processes at the legislation level, using the BPMN notation to accommodate the Business and the IT understanding of the workflow and sequence of the activities performed by the customs authorities.

The EUCDM data elements are defined in Annex B of the UCC-DA and IA. The EU Data Architecture domain provides the full description of the EUCDM and the interconnection with the EU Process Model thereby achieving improved data consistency and transparency. The EUCDM mapping to the WCO Data model has contributed to the alignment of EUCDM data to international standards and trade.

The EUCDM allows Member States to reuse and customise it for their national purposes in full abidance of EU Customs provisions.

WCO DATA MODEL - Background

The WCO Data Model is an initiative of the World Customs Organisation to simplify and standardise data requirements of cross-border regulatory agencies including customs.

This is based on standardised business processes described in the Revised Kyoto Convention .

The WCO Data Model is made up of a library of components comprising a data set, business process models and information models based on the Unified Modelling Language - UML. The data set is developed based on requirements defined in international conventions and common requirements based on legislation in member administrations therefore representing the governmental view of data requirements.

Based on this library of components, information packages have been developed for use by cross-border regulatory agencies in order to support data exchange in the context of Customs automation and Single Window.

The WCO Information Packages include Base Information Packages (BIP) for Declaration, Response, Intergovernmental, LPCO, which stands for Licences, Permits, Certificates and Others, and also Derived Information Packages (DIP). The latter refers to a subset of information packages based on Regional, National, Sectoral or Corporate needs.

The elements of the LPCO information package are essential for Single Windows, or at least those that aim to provide a 'one-stop-shop' for import/export cargo clearance. In conclusion, the WCO Data Model provides a very rich Customs data set as a result of years of data analysis work done by the WCO Members.

The WCO Data Model initial version - Version 1.0 was the G7 data set which covered minimum data requirements to cover import/export/transit Customs procedures from a global perspective (1996 onwards). Version 2.0 was the first WCO version which elaborated the Customs scope and data model content including business process definitions, code sets and a library of classes (2001 onwards).

In Version 3.0, the scope of the WCO Data Model was widened to cover the government side of an International Trade Single Window i.e. to cover cross-border management procedures of Customs and Other Government Agencies (2012 onwards). After the production of Version 3.0 of the WCO Data Model, the focus shifted to support the adoption of the instruction by WCO Members. Annual updates to Version 3.0, namely Version 3.1, 3.2 and so on (current 2019 version is 3.11.0) were produced. These updates incorporate the feedback received from WCO Members' administrations.

UN/CEFACT - Background

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. Thus, providing a unified framework, consolidating the constituent data models of these two domains by aligning the overlaps between the concepts used in their different contexts.

UN/CEFACT has been developing Reference Data Models (RDMs) covering the data entities required to cover the Buy/Ship/Pay business processes across the International Supply Chains (SCRDM) including Multi-Modal Transport (MMT RDM). The two RDMs (SCRDM and MMT RDM) share the same subset of components from the UN Core Component Library (UN CCL), which are interlinked but used differently due to the 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 based on the Master Data Structure included in each of the RDMs.

The Buy/Ship/Pay Business Requirements Specification (BRS) is the high-level document which describes the business requirements for the holistic Buy/Ship/Pay Reference Data Model (BSP RDM), combining the concepts of the Multi-Modal Transport Reference Data Model (MMT RDM) and the Supply Chain Reference Data Model (SCRDM). Thus, leading to the development, publishing and improving the maintenance of a Business Standard, which can be applied by country and across any regional administrations and industries.

The BSP-RDM therefore provides a single framework to accommodate the requirements of:

- Cross-border supply chain trade related transactions, including government domain needs for their own specific information exchanges (international sales contracts);
- 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 (international transport contracts).

The BSP RDM project follows the UN/CEFACT Open Development Process (ODP) practice of all UN/CEFACT projects, adopting a holistic approach to develop a reference data model based on the solid and widely used practice by other standards (e.g. GS1) UN/CEFACT Core Component Library (CCL). This brings 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.