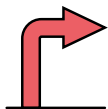# 4
GLOBAL INTEROPERABILITY OF DATA MODELS FOR TRADE DOCUMENTS AND PLATFORMS

In a digital environment, for parties to seamlessly exchange data and documents, all information needs to be clearly defined and unambiguous (World Economic Forum/UNECE, 2017). Reaching agreement on both the semantic content (i.e. data definitions such as whether the 'port of unlading' is the same as the 'port of discharge') and the syntax of data (i.e. data structure or format) is critical to ensure trading partners wanting to exchange information understand it in the same way.

It is also critical to ensure interoperability between platforms. Various platforms being developed, be they private-sector-driven in areas such as trade finance, transportation or national single windows (NSWs), follow their own rules and still often operate in isolation. Connecting the various platforms or developing common cross-sectoral or cross-jurisdictional approaches is needed to enable global flows of electronic data and documents.

Both UN/CEFACT and the WCO have developed semantic libraries ("what means what"). Priority now needs to focus on promoting their use and on developing standardized conceptual data models for all trade documents in a coordinated manner to permit information to be exchanged seamlessly from one end of the supply chain to the other.

A conceptual data model defines what data should be included in a document, independent of its syntax (which may change depending on technology or system). To support interoperability across systems, standardized methods for exchanging data using APIs need to be developed.

Initiatives aimed at developing standardized data models often evolve in silo, thereby undermining standardization efforts. Box 23 provides examples of standardization initiatives for electronic trade documents and processes. Some deal with particular sectors, such as the WCO Data Model, which is focused on information needed by customs authorities and other regulatory agencies for the release and clearance of products.

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Other initiatives are more general and cover the entire supply chain (e.g. UN/CEFACT Buy – Ship – Pay Reference Data Model).[1] Some are spearheaded by large international organizations, others by private companies. Some initiatives also cover trade documents such as invoices. For some trade documents, however, no standard yet exists (e.g. for dry and wet bulk bills of lading); and overall, the rate of adoption of existing standards remains limited.

The lack of alignment of data models and processes limits the cross-border exchange of trade documents and information. For instance, despite government efforts to introduce NSWs to expedite the movement, release and clearance of goods, the exchange of information between NSWs continues to rely on physical documents to fulfil the requirements of trading partners, counterparts and authorities across borders. There is a lack of a common taxonomy and data elements contained in trade documents, and only a few RTAs (e.g. United States–Mexico–Canada Agreement) and regions (e.g. ASEAN, APEC) have worked on interoperability to link NSWs.

To address these interoperability issues, the ICC launched the Digital Standards Initiative (DSI) in 2020 with the support of Enterprise Singapore and the Asian Development Bank and with the participation of the WTO. The DSI seeks to coordinate standardization efforts across sectors to plug gaps, drive adoption of existing standards and ultimately allow the seamless exchange of data from one end of the supply chain to the other.

The DSI also aims to promote alignment of the platform rulebooks developed by the private sector. Membership is open to all organizations, regardless of sector or location, which support the DSI's core mandate. Similarly, some national standardizing bodies are working together towards the development of international standards (e.g. ASEAN–Australia Digital Trade Standards Initiative[2]).

EXAMPLES OF STANDARDIZATION INITIATIVES FOR ELECTRONIC TRADE DOCUMENTS AND PROCESSES

E-invoicing

UN/CEFACT has developed a cross-industry e-invoice data model derived from the UN/CEFACT Supply Chain Reference Data Model. As an invoice is potentially reused for multiple operations (i.e. sale, transport, clearance, fiscality, remittance, insurance), many actors will play the role of receiver (very often in different economies), which makes it important to use an international standard with clear semantic definitions. E-invoicing enhances efficiency, permits cost saving and minimizes the likelihood of document fraud. Other e-invoicing standards exist, such as the Peppol standard (see below). UN/CEFACT has developed many other standards for trade documents, including packing lists, delivery notices, bills of lading and waybills, certificates and inspection reports, dangerous goods and security declarations.

Business to business transaction management

GS1 has developed a semantic methodology to define a complete syntax-neutral dataset that can be shared in a transaction between business partners and then mapped to different syntaxes: (i) European Article Number Communication (EANCOM, a subset of the electronic data interchange for administration, commerce and transport (EDIFACT) ISO 9735 standard); (ii) GS1 XML; and (iii) external global data models, such as the UN/CEFACT Supply Chain Reference Data Model and the European Committee for Standardization (CEN) Core Invoice.

Government procurement

In e-procurement, Peppol provides a set of technical specifications and data models for facilitating the exchange of standards-based e-documents over the Peppol network (e.g. eOrders, eAdvance Shipping Notes, eInvoices, eCatalogues, Message Level Responses). Peppol is governed by a multilateral agreement structure which is owned and maintained by OpenPeppol, a non-profit international association comprising both public-sector and private members. SADEA explicitly refers to PEPPOL standards.

Logistics and transport

The Digital Container Shipping Association (DCSA) recently published an e-bill of lading standard for containerized shipments. Yet, there is still no e-bill of lading standard for bulk shipments within the commodities industry. The Baltic and International Maritime Council (BIMCO) has teamed up with the ICC to establish a globally accepted standard for e-bills of lading for dry and wet bulk shipping. Like the DCSA standard, BIMCO's standard will be fully aligned with the UN/CEFACT Multi-Modal Transport Reference Data Model to ensure seamless and transparent e-bill of lading transactions across borders.

The FIATA International Federation of Freight Forwarders Associations began creating standardized trade

documents more than 65 years ago, including the Forwarders Certificate of Receipt (in 1955), the Forwarders Certificate of Transport (in 1959), the Negotiable Combined Transport Bill of Lading (1970) and the Warehouse Receipt (in 1975). Standards on warehouse e-receipts are forthcoming.

The IATA introduced the ONE Record as a common model to facilitate real-time data exchange between cargo airlines, shippers, forwarders, ground handlers and other actors in the supply chain. This standard for air cargo data sharing aims to create a single record of a shipment.

Customs

The WCO Data Model includes datasets for different customs procedures and information needed by other cross-border regulatory agencies for clearance at borders. The model is consistent with other international standards, such as the United Nations Trade Data Elements Directory (UNTDED).

At the regional level, the ASEAN Single Window is a joint effort of the ASEAN-Business Advisory Council and the United Kingdom Foreign, Commonwealth and Development Office (FCDO). It links National Digital Trade Platforms (NDTPs) to a regional network that standardizes the digital exchange of private sector generated documents for ASEAN member countries and their key trading partners. A research team from International Economics Ltd, IMC Worldwide and the University of Sussex investigated the taxonomy and the different data elements contained in various trade documents, and recommended standards for different aspects relevant to digital trade data, ranging from semantics and syntax to communication and security.

NDTPs can enable harmonization by allowing all trading partners to interact via a single platform, lowering the barriers to entry for firms. They provide efficiency through the automation and simplification of processes, including real-time data exchange and a reduction in associated trade costs. They create transparency through the secure sharing of data directly between supply chain partners. Finally, NDTPs provide security due to the ability to authenticate parties and to digitally record transactions, leading to a reduction in inaccurate information and fraud.

How can trade agreements support the greater use of data models for trade documents and interoperability of platforms?

Despite the wide range of documents involved in trade transactions, trade agreements have so far encouraged the use of standards only for a limited number of trade documents, namely e-invoicing and e-certification for agricultural commodities. Agreements such as DEPA and SADEA encourage governments to work towards interoperability of e-invoicing systems through the adoption of international standards and guidelines on e-invoicing. SADEA also considers interoperability of electronic certification for agricultural products. Possible references to international standards are also being discussed in the context of the WTO Joint Initiative on E-commerce.

Trade agreements could extend this approach to all key trade documents where international guidelines or standards exist and encourage their use. In the absence of such guidelines or standards, trade agreements could encourage governments to accelerate standardization efforts at the global level, such as the ASEAN–Australia Digital Trade Standards Initiative.

Many trade agreements, including the WTO's Trade Facilitation Agreement, support the use of NSWs to expedite the movement, release and clearance of goods. Except a few recent trade agreements, however, none considers the critical issue of interoperability between NSWs.

ENDNOTES

1. The Buy – Ship – Pay Reference Data Model provides common data models used in the transport and logistics domain as well as the supply chain and procurement domain. These common data models are based on the UN Core Component Library, similar to many other standards (e.g. those of GS1). See https://unece.org/fileadmin/DAM/cefact/brs/BuyShipPay_BRS_v1.0.pdf.
2. See https://www.standards.org.au/engagement-events/international/asean-australia-digital-trade.