WORLD TRADE ORGANIZATION

ICC Digital Standards Initiative

Standards Toolkit
for Cross-border Paperless Trade

ACCELERATING TRADE DIGITALISATION THROUGH THE USE OF STANDARDS

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Acknowledgements

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Foreword

Valued at US$ 28 trillion, global trade is the backbone of the world economy. However, trading across borders is a notoriously complex process and highly dependent on paper documents, in spite of decades long efforts to digitalise. A cross-border transaction involves multiple actors and on average requires the exchange of 36 documents and 240 copies. Currently, fewer than one percent of trade documents are fully digitised.

The recent pandemic has no doubt accelerated digitalisation. However, the lack of adoption of data standards and on how trade data are exchanged, combined with an actual absence of standards, significantly hinder the seamless data flow from one end of the supply chain to the other. This has diminished efficiency gains along supply chains and has weighed heavily on companies, in particular small businesses.

Despite calls for more standardisation, the real issue is the lack of alignment and awareness of existing standards. Although many organisations have been actively working on developing trade standards, adoption remains limited in large part due to the complexity and fragmentation of the standards landscape.

This toolkit provides an overview of existing standards to help drive adoption, identify potential gaps and promote interoperability. Its objective is to equip every supply chain participant, both public and private, with some of the most notable and widely used standards to help push trade digitalisation to the next level. In doing so, the international trade community will unlock the benefits of cross-border paperless trade by moving to a future of secure, trusted and seamless connectivity between parties in supply chains.

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Why a Standards Toolkit is Needed

Organisations involved in developing standards devote much time and effort in creating rules, guidelines and best practices to simplify and harmonize how trade and supply chain data are produced and exchanged machine-to-machine. Some users may not be aware of all the existing standards on trade digitalisation. This Standards Toolkit provides a starting point to guide users in their digitalisation journey.

The objective is to drive adoption of existing standards and to facilitate trusted, real-time supply chain collaboration and real-time standard data exchange, while reducing costs and complexity.

To reduce friction and to enable scale in digital exchanges, there is a need to standardise the digital language and medium of exchange when using standardised trade-related documents and data formats. In this toolkit, 'data standard' refers to standards that define the core elements of an electronic record representing that specific trade document, whereas 'data format/exchange standard' refers to standards that help to facilitate the data exchange between different systems owned by different actors in the supply chain.

The aim is to help the international trade community realise the benefits of paperless trade flows, by facilitating and embracing the seamless data connectivity between supply chain parties. Everyone everywhere benefits from full visibility in the global supply chain.

Using this Standards Toolkit

There is a need to move digitisation beyond digital documents (e.g. PDF) whose content still needs to be processed manually at the receiving end. The opportunity exists to enable more effective, automated information sharing and reuse within the supply chain by enabling all parties to speak the same language by leveraging the same set of the standard data description and standard data exchange structure which can then be interpreted in the same way, regardless of the tools chosen to create the machine-readable format.

For instance, governments around the world have been introducing e-invoicing mandates to streamline tax payments, moving away from manual processes. The commercial invoice standard includes common business terms and business rules that enable trade partners to understand all the data content in the same way, and the ways in which structured invoices between a seller and buyer in an electronic format can be automatically exchanged without manual intervention.

It is important to note that this toolkit does not provide an exhaustive list of all standards available but does list some of the most notable and widely used standards as a starting point to facilitate interoperability among the most supply chain actors. The aim is to continually improve and expand, or update the coverage to ensure the toolkit remains relevant to all intended users.

While Sections 1 and 2 of the toolkit are transversal in nature, Sections 3-5 are intended to be starting toolkits for various types of supply chain actors. Section 6 on Interoperable Digitisation Frameworks shows the possible pathways to enable interoperability across sectors and borders.

SECTION 1
FOUNDATIONAL STANDARDS

For all supply chain actors, leveraging the same foundational standards enables more efficient sharing, reporting and reusability of high quality, reliable data while reducing the amount of translation required when those data are transmitted from system to system.

To facilitate basic data sharing, reporting, due diligence and compliance requirements, Table 1.1 lists some foundational standards that are widely recognised.

Table 1.1 Foundational standards available for adoption

TYPE	APPLICABLE STANDARD	PURPOSE
Country Code	ISO 3166-1	Internationally recognised codes that represent a country name.
Code for Trade and Transport Locations	UN/LOCODE latest release	A list of all locations, such as an administrative or economic area, as defined by the competent national authority in each country, related to international trade and transport, identified by the five-character code system.
Currency Code	ISO 4217	Internationally recognised codes for the representation of currencies that enable clarity and reduce errors.
Financial Messaging	ISO 20022	A methodology for defining financial data content using a global and open business standard for information exchange that are interoperable between standards, creating a "standard for standards". More cost-effective communications to support specific financial business processes with a particular view of facilitating interoperability with other existing protocols.
Date and Time	ISO 8601	A clearly defined way of presenting dates and times that is understandable to both people and machines.
Unit of Measure	United Nations (UN) Unit of Measure (UOM)	Codes for units of measurement used in international trade with names, factors of conversion, symbols and sectors of application.
Freight Containers	ISO 6346	An international standard covering the coding, identification and marking of intermodal (shipping) containers used within containerised intermodal freight transport.
Language Code	ISO 639	Internationally recognised codes for the representation of names of languages. May be adopted for any application requiring the expression of language in coded form, especially in computerised systems.

Table 1.2 lists some master references that have informed the basis of many currently available data standards and those in the works. Any supply chain actor that wants to integrate with the rest of the ecosystem would benefit from leveraging the same reference libraries.

Table 1.2 Master references for the cross-border supply chain

REFERENCE	WHAT IT DOES	WHY IT'S IMPORTANT
UN/Core Component Library (CCL)	The United Nations Core Component Library (UN/CCL) is a library of business semantics in a data model which is harmonised, audited and published by UN/CEFACT.	Ensure consistency and interoperability. The Semantic base definitions are compatible with all other UN/CEFACT deliverables and mappable with many other organisations' data models such as WCO, IATA, GS1, etc.
UN/CEFACT Buy-Ship-Pay Reference Data Model (BSP-RDM)	The Buy-Ship-Pay Reference Data Model describes the requirements for a generic reference data model supporting the trade and transport-related processes involved in the cross-border supply chain and covering, at a high-level, the involved business areas, the main parties and the information involved. It provides the framework for any cross-border transport-related business and government domains to specify their own specific information exchange requirements[1] while complying with the overall processes and data structures.	It can be applied by any country, region or industry community to provide the definitions of contextualised transport-related data exchange documents which can be integrated into software solutions for traders, carriers, freight forwarders, agents, banks, customs and other governmental authorities etc.
UNCITRAL Model Law on Electronic Transferable Records (2017)	The Model Law on Electronic Transferable Records (MLETR) aims to enable the legal use of electronic transferable records both domestically and across borders. The MLETR applies to electronic transferable records that are functionally equivalent to transferable documents or instruments. Transferable documents or instruments are paper-based documents or instruments (such as bills of lading, bills of exchange, promissory notes and warehouse receipts) that entitle the holder to claim the performance of the obligation indicated therein and that allow the transfer of the claim to that performance by transferring possession of the document or instrument.	The MLETR builds on the principles of non-discrimination against the use of electronic means, functional equivalence and technology neutrality underpinning all UNCITRAL texts on electronic commerce. It may therefore accommodate the use of all technologies and of all models, such as registries, tokens and distributed ledgers.
ISO 15000 series Electronic business eXtensible Markup Language (ebXML)	Electronic Business using eXtensible Markup Language, commonly known as e-business XML, or ebXML, is a family of XML based standards sponsored by OASIS and UN/CEFACT. XML defines a set of rules for encoding documents in a format that is both human-readable and machine-readable, enabling two disparate systems to exchange information.	It can provide an open infrastructure that enables the global use of electronic business information in an interoperable, secure, and consistent manner by all types of organisations (e.g., commercial enterprises, government agencies, not-for-profit organisations).

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1   Popular standards currently in use are UN/EDIFACT (EDIFACT) and ANSI X12.

SECTION 2
IDENTIFIER STANDARDS

Identifiers are the 'name' and/or 'ID' of 'elements' such as products, packages, persons, entities, carriers, containers, trade documents and any other physical/digital items in supply chain and related data exchanges. Identifiers are a key building block for integrating data within organisations, between business partners and across sectors and industries. From physical procedures to digital data interchanges and workflows, an identifier is the 'bridge' between a physical 'thing' and its data, a virtual entity or a digital twin in an information and digital environment—the latter is also referred to as an information system, the internet, the internet of things, the industrial internet and parts of the meta-universe. All supply chain actors would benefit from a consistent reference to established identifier standards which provide systematic identification of subjects (legal entities and natural persons with rights and obligations) and objects (entities without rights and obligations).

Anyone can create their own identifier and identification for their closed applications and systems. However, using globally accepted and standardised identifiers and code schemes can unlock great advantages for trade partners as they participate in the global economy and international trade. This would facilitate the creation and sharing of unique 'end-to-end' identification of subjects and objects, resulting in richer, high-quality data in the international supply chain. It would also increase the ability to track-and-trace, be it locations of particular objects or status/tracking events such as receiving, packing, shipping and transporting, which occur to the traceable object during its lifecycle across different supply chain actors' processes.

Table 2.1 Identifier Standards for Subjects and Objects

TYPE	APPLICABLE STANDARD	PURPOSE
Identifier Standards for Subjects		
Legal Entity Identifier (LEI)	LEI ISO 17442	The LEI connects to key reference information that enables clear and unique identification of legal entities. LEI issuers—also referred to as Local Operating Units (LOUs)—provide registration, renewal and other services, and act as the primary interface for businesses to obtain[2] an LEI. The LEI data are available for any user free of charge on www.gleif.org.
Decentralised Identifier (DID)	W3C DID[3]	A type of identifier that enables verifiable, decentralised digital identity. A DID refers to any subject (e.g., a person, organisation, thing, data model, abstract entity, etc.) as determined by the controller of the DID. In contrast to typical, federated identifiers, DIDs have been designed so that they may be decoupled from centralised registries, identity providers and certificate authorities.
Physical Locations or Parties	Global Location Number (GLN)	An identifier of an organisation's physical or logical addresses (Ship From, Ship To, etc.) and internal locations.
Business Identifier Code (BIC)	ISO 9362	The BIC is used for addressing messages, routing business transactions and identifying business parties within the financial services industry. SWIFT in its role of ISO registration authority issues BICs[4]. The BIC is used in financial transactions, client and counterparty databases, compliance documents and many others, although not all BICs are connected to the SWIFT network used by banks and other institutions for financial messaging.
Trader Identification Number (TIN)	TIN	A globally unique identification number that can be used for retrieving underlying information relating to an economic operator involved in cross-border supply chain, to enable customs administrations to perform the appropriate actions, particularly in the context of mutual recognition arrangements/ agreements of authorised economic operators.
Identifier Standards for Objects		
Product Code	Harmonised Commodity Description and Coding System (HS code)	A multi-purpose international product nomenclature developed by the WCO, used in customs and trade procedures.
	Global Product Classification (GPC)	A GS1 standard that helps global trade partners to classify products by grouping them into categories based on their essential properties as well as their relationships to other products in GS1 related systems.

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2   There are both an initial registration fee and an annual maintenance fee.

3   A fully digitised LEI service (vLEI) capable of enabling automated identity verification between counterparties operating across all industry sectors globally is being developed leveraging DID methods.

4   The open source BIC-to-LEI relationship file is freely available from both SWIFT and GLEIF websites.

TYPE	APPLICABLE STANDARD	PURPOSE
Products or Individual Trade Item Instance(s)	United Nations Standard Products and Services Code (UNSPSC)	A global classification system of products and services in all industry sectors, managed by GS1 US for the UN Development Programme (UNDP)[5]. Enables procurement teams to conduct spend intelligence, improve strategic sourcing and monitor spending limits.
	Global Trade Item Number (GTIN), GTIN plus a Batch/Lot (LGTIN) and Serialised Global Trade Item Number (SGTIN)	Identifies products at any packaging level (e.g., consumer unit, inner pack, case, pallet). Individual instance(s) can be uniquely identified by combining the GTIN with batch/lot number, serial number.
Logistic Units	Serial Shipping Container Code (SSCC)	Enables the unique identification of any combination of trade items packaged together for storage and/or transport purposes, such as unit loads on pallets or roll cages, and parcels.
Shipments	Global Shipment Identification Number (GSIN)	A global unique number assigned by a seller and shipper of goods to identify a shipment comprising one or more logistic units that are intended to be delivered together.
Consignments	Global Identification Number of Consignment (GINC)	Comprising one or more logistic units (potentially belonging to different shipments) intended to be transported together for part of their journey.
	Unique Consignment Reference (UCR)	A reference number for customs use and may be required to be reported to customs at any point during a customs procedure.
Documents	Global Document Type Identifier (GDTI)	Identifies the type of the document (physical or electronic) such as order, invoice, receipt and other trade documents, etc. and if needed also the individual document instances via the optional serial number.
Unique Identification	ISO/IEC 15459	This series of standards specifies the generation of unique identifiers for transport units, individual products, individual returnable transport items and groupings of items. It makes provision for a registration authority that recognises issuing agencies (e.g., GS1, FIATA, UPU) managing identification systems. Primarily used for automatic identification and data capture applications (barcodes and RFID).
Electronic Signatures	ISO 14533 series	Ensure the interoperability of implementations with respect to long-term signatures that allow validation of the digital signature a long time after its generation.

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5   See Quick Start Guide on How UNSPSC Differs from GPC.

SECTION 3
CORPORATIONS AND MICRO-, SMALL- AND MEDIUM-SIZED ENTERPRISES

Corporations and micro-, small- and medium-sized enterprises (MSMEs) are the driving force behind the international supply chain, acting as manufacturers, importers, exporters, suppliers, distributors and buyers of products.

From a digitalisation perspective, corporations and MSMEs are motivated by the potential to increase value creation, reduce costs, access better financing terms, improve cashflow, and increase velocity and efficiency of business operations while increasing transparency and reducing the complexity involved in connecting with multiple digital islands in their interaction with other actors in the supply chain. To achieve this, corporations and MSMEs need to first move from paper to digital by digitising the flow of key information exchanged among themselves and with other trade partners to facilitate the commercial transaction, transport and related services and payment of the goods[6]. The following tables list the most commonly referenced standards to digitise the flow of frequently used documents at each stage of the Buy-Ship-Pay model.

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6   The document categorisation used in this Standards Toolkit largely correspond to the Buy-Ship-Pay reference models developed by UN/CEFACT.

Table 3.1 Standards for Commercial Transaction Documents ('Buy' Process)

TYPE	DATA STANDARD	DATA FORMAT/ EXCHANGE STANDARD	ANY APPLICABLE RULES, REGULATIONS, GUIDELINES
Catalogue	UN/CEFACT Cross Industry Catalogue	UN/CEFACT XML, UN/EDIFACT OASIS Universal Business Language (UBL) latest version	ICC Incoterms latest version
Request for Quotation (RFQ) and Quotation	UN/CEFACT Cross Industry Quotation	UN/CEFACT XML, UN/EDIFACT OASIS Universal Business Language (UBL) latest version	ICC Incoterms latest version
Purchase Order (PO)	UN/CEFACT Cross Industry Ordering Process	UN/CEFACT XML, UN/EDIFACT OASIS UBL latest version ISO 20022	For companies involved in supply chain finance (SCF) programme (if any, such as pre-shipment finance), specific rules may apply as part of the programme.
Commercial Invoice	UN/CEFACT Cross Industry Invoice (CII) Peppol BIS Billing 3.0[7]	UN/CEFACT XML, UN/EDIFACT OASIS UBL latest version ISO 20022	UN/CEFACT Executive Guide on e-Invoicing ICC Uniform Rules for Forfaiting (URF 800) where needed to obtain receivables financing
Packing List	UN/CEFACT Cross Industry Export Packing List	UN/CEFACT XML, UN/EDIFACT OASIS UBL latest version	
Despatch Advice	UN/CEFACT Cross Industry Delivery	UN/CEFACT XML, UN/EDIFACT OASIS UBL latest version	

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7   compliant with the European Standard (EN 16931).

Table 3.2 Standards for Transport, Forwarding and Cargo Handling Documents ('Ship' Process)

TYPE	DATA STANDARD	DATA FORMAT/ EXCHANGE STANDARD	ANY APPLICABLE RULES, REGULATIONS, GUIDELINES
Shipping/ Forwarding Instruction	UN/CEFACT Multimodal Shipping Instruction DCSA Shipping Instruction for multimodal container shipping	UN/CEFACT XML, UN/ EDIFACT OASIS UBL latest version JSON, API	
Bill of Lading	DCSA electronic bills of lading (eBLs) for multimodal container shipping BIMCO electronic bills of lading (eBLs) for dry and wet bulk (COMING SOON) Electronic FIATA Multimodal Transport Bills of Lading (eFBL)	JSON, API JSON, API & PDF with QR code	ICC Uniform Customs and Practice for Documentary Credits Supplement for Electronic Presentation (eUCP) latest version ICC Uniform Rules for Collections Supplement for Electronic Presentation (eURC) latest version
Air Waybill	IATA e-AWB	EDI messages (FWB/ XFWB, FSU/XFSU), IATA Cargo XML, EPIC Basic API, IATA ONE Record specifications (JSON, API)	IATA Resolution 672 on E-air Waybill, also known as "Multilateral e-AWB Agreement" ICC eUCP latest version ICC eURC latest version
CIM Consignment Note (Rail Transport Document)	CIM/SMGS Consignment Note	EDI, working towards XML/EDIFACT converter	ICC eUCP latest version ICC eURC latest version
CMR Consignment Note (Road Transport Document)	UN/CEFACT eCMR	XML	ICC eUCP latest version ICC eURC latest version
Verified Gross Mass (VGM) Report for Containerised Shipments[8]	Depends on shipping line	UN/EDIFACT Verified gross mass message (VERMAS)	SOLAS (International Convention for the Safety of Life at Sea)

Table 3.3 Standards for Payment Documents ('Pay' Process)

TYPE	DATA STANDARD	DATA FORMAT/ EXCHANGE STANDARD	ANY APPLICABLE RULES, REGULATIONS, GUIDELINES
Documentary Credit Application[9]	Depends on bank	SWIFT MT messages (Category 7) SWIFT MT 798: the 'Trade Envelope' and/or SWIFT FileAct messaging service	ICC eUCP latest version International Standard Banking Practice ISBP 745
Remittance Advice	UN/CEFACT Cross Industry Remittance Advice	UN/CEFACT XML, UN/ EDIFACT OASIS UBL latest version	
Payment Confirmation		SWIFT wire confirmation (MT103), SWIFTRef API, SWIFT gpi for Corporates, pre-authorisation API ISO 20022	
Purchase Order Financing[10] Request, Status, Cancellation	UN/CEFACT Purchase Order Financing	UN/CEFACT XML	
Bills of Exchange	ITFA electronic Payment Undertaking (ePU)	ITFA's dDOC specification	ICC Uniform Rules for Forfaiting (URF 800) where needed by financier to provide financing
Promissory Notes	ITFA electronic Payment Undertaking (ePU)	ITFA's dDOC specification	ICC Uniform Rules for Forfaiting (URF 800) where needed by financier to provide financing

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8   Under SOLAS Convention, the shipper for safety reasons has to provide the ocean carrier with the verified gross mass (VGM) of the container i.e., the total weight of the cargo (cargo weight, loading material/pallets/skids, dunnage, securing material and tare weight of the container).

9   Documentary credit (also known as a letter of credit) is one of the common payment methods used in international trade, designed to protect both the seller (exporter) and the buyer (importer) in a contract of sale. There are other settlement methods such as advance payment, documentary collections and open account.

10 Purchase order financing covers the working-capital needs for the seller, including procurement of raw materials, labour, packing costs, and other pre-shipment expenses in order to allow the seller to fulfil delivery to its buyer(s).

SECTION 4
CARRIERS, FREIGHT FORWARDERS AND LOGISTICS OPERATORS

Carriers, freight forwarders and logistics operators are important intermediaries between the sell-side and the buy-side, facilitating the physical flow of goods to move from origin to destination. From a digitalisation perspective, they are motivated not only by the prospect of improving operational efficiencies but also by the ability to add greater value and differentiation to their offer by enabling a closer, real-time connection with customers and providing an improved customer experience.

Table 4.1 Standards for Transport, Forwarding and Cargo Handling Documents ('Ship' Process)[11]

TYPE	DATA STANDARD	DATA FORMAT/ EXCHANGE STANDARD	ANY APPLICABLE RULES, REGULATIONS, GUIDELINES
Shipping/ Forwarding Instruction	UN/CEFACT Multimodal Shipping Instruction DCSA Shipping Instruction for multimodal container shipping	UN/CEFACT XML, UN/ EDIFACT OASIS UBL latest version JSON, API	
Bill of Lading	DCSA electronic bills of lading (eBLs) for multimodal container shipping BIMCO electronic bills of lading (eBLs) for dry & wet bulk (COMING SOON) Electronic FIATA Multimodal Transport Bills of Lading (eFBL)	JSON, API JSON, API & PDF with QR code	ICC eUCP latest version ICC eURC latest version
Air Waybill	IATA e-AWB	EDI messages (FWB/ XFWB, FSU/XFSU), IATA Cargo XML, EPIC Basic API, IATA ONE Record specifications (JSON, API)	IATA Resolution 672 on E-air Waybill, also known as "Multilateral e-AWB Agreement" ICC eUCP latest version ICC eURC latest version
CIM Consignment Note (Rail Transport Document)	CIM/SMGS Consignment Note	EDI, working towards XML/EDIFACT converter	ICC eUCP latest version ICC eURC latest version
CMR Consignment Note (Road Transport Document)	UN/CEFACT eCMR	XML	ICC eUCP latest version ICC eURC latest version
Verified Gross Mass (VGM) Report for Containerised Shipments[12]	Depends on shipping line	UN/EDIFACT Verified gross mass message (VERMAS)	SOLAS (International Convention for the Safety of Life at Sea)

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11 Similar to Table 3.2.

12 Under SOLAS Convention, the shipper for safety reasons has to provide the ocean carrier with the verified gross mass (VGM) of the container i.e., the total weight of the cargo (cargo weight, loading material/pallets/skids, dunnage, securing material and tare weight of the container).

Table 4.2 Standards for Port/Airport Clearance Documents ('Ship' Process)

TYPE	DATA STANDARD	DATA FORMAT/ EXCHANGE STANDARD	ANY APPLICABLE RULES, REGULATIONS, GUIDELINES
IMO FAL forms: 1. General Declaration 2. Cargo Declaration 3. Ship's Stores Declaration 4. Crew's Effects Declaration 5. Crew List 6. Passenger List 7. Dangerous Goods Manifest 8. Security Report 9. Waste Delivery in Port	IMO Compendium[13]	UN/CEFACT IMO eFAL WCO – IMO Message Implementation Guide ISO 28005 on Electronic port clearance (EPC) digitalOCEANS Port Clearance API specifications (v1.0)	IMO Convention on the Facilitation of International Maritime Traffic (the FAL Convention).
Port Call	DCSA Just-in-time (JIT) port call standards[14]	DCSA Just-in-time (JIT) port call API	IMO Just In Time Arrival Guide

Table 4.3   Standards for Real Time Shipment Tracking Data ('Ship' Process)

TYPE	DATA STANDARD	DATA FORMAT/ EXCHANGE STANDARD
Customer-facing Track and Trace Events in Containerized Shipping	DCSA Interface Standard for Track and Trace	API

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13   The IMO Compendium is a tool for software developers that design the systems needed to support transmission, receipt and response via electronic data exchange of information required for the arrival, stay and departure of the ship, persons and cargo to a port. By harmonising the data elements required during a port call and by standardising electronic messages, the IMO Compendium facilitates the exchange of information, ship to shore, and the interoperability of single windows, reducing the administrative burden for ships linked to formalities in ports.

14   Standards that will allow carriers, ports and terminals to automatically exchange event data in a uniform way.

Besides the identifier standards mentioned in Section 2, the transport and logistic sector benefits from a few additional identifier standards[15] as listed below.

Table 4.4 Identifier Standards for Transport and Logistics

TYPE	APPLICABLE STANDARD	PURPOSE
Identifier Standards for Objects		
Ship Identification Number	IMO ship identification number scheme	The IMO number is a permanent number assigned to each ship for identification purposes, to enhance maritime safety, security and environmental protection, and to facilitate the prevention of maritime fraud. Inserted in the ship's certificate, it would remain unchanged upon transfer of the ship to other flag(s).
Transport Assets or Equipment	Global Individual Asset Identifier (GIAI)	Companies can apply a GIAI on any asset to uniquely identify and manage that asset. This could be a computer, desk, vehicle, piece of transport equipment, or spare part, etc.
Reusable Transport Items, Transport Equipment, and Tools	Global Returnable Asset Identifier (GRAI)	Suitable for the management of reusable transport items, transport equipment and tools, and can identify these returnable assets by type and if needed also individually for tracking and sorting purposes.
Unique Item Identifier (UII)	ISO/IEC 15459-1 and ISO/IEC 15459-5	Identifiers of individual transport units and returnable transport items based on ISO/IEC 15459 Unique Identification system.

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15   Further resources available at GS1 Identification Keys in Transport & Logistics Guideline and GS1 Identification Keys in Transport & Logistics - Interactive User Guide.

SECTION 5
CUSTOMS AUTHORITIES AND OTHER CROSS-BORDER REGULATORY AGENCIES

Customs authorities and other cross-border regulatory agencies (CBRAs) have a regulatory view of the supply chain and require submission of data primarily for the purpose of regulatory reporting and compliance at points of export, import and transit.

From a digitalisation perspective, they are motivated by the prospect of simplified and streamlined processes by gaining access to accurate, relevant and high-quality electronic data, especially supporting documents which would enable automated risk management, control, verification, better fiscal evaluation and speedier goods clearance.

The World Customs Organization (WCO) developed the WCO Data Model[16], a compilation of clearly structured, harmonised, standardised and reusable sets of data definitions and electronic messages designed to meet operational and legal requirements of CBRAs, including customs authorities, which are responsible for border management. The WCO Data Model acts as master reference for regulatory data exchanges, which can comprise: business to government (B2G), government to government (G2G) (in the context of the single window environment) and international G2G data exchanges. The

WCO Data Model is a multipurpose regulatory data management framework. Specific uses of its subsets are represented with 'information packages'.

For official control purposes, customs authorities and CBRAs typically need to reference commercial documents from both the 'buy' and 'ship' process (purchase order, invoice, packing list, transport documents, etc.) as well as official control documents, which also form an integral part of the 'ship' process. In addition, in the context of an interconnected supply chain process, linking the reference to those commercial documents with regulatory data requirements could enable re-using of data available from previous transactions, enhancing data quality and reducing the need for repetitive inputs.

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16   See http://wcoomd.org/DataModel and https://datamodel.wcoomd.org

Table 5.1 Standards for Official Control Documents

TYPE	DATA STANDARD	DATA FORMAT/ EXCHANGE STANDARD	ANY APPLICABLE RULES, REGULATIONS, GUIDELINES
Advance Electronic Information (AEI)	AEI Derived Information Package (DIP)	XML	
Pre-Loading Advance Cargo Information (PLACI)[17]	PLACI regime		WCO's SAFE Framework of Standards Joint WCO-ICAO Guiding Principles for Pre-Loading Advance Cargo Information (PLACI)
Transit Declaration, **Export Declaration,** **Import Declaration, Cargo Report Export, Cargo Report Import**	WCO Data Model and information packages	XML UN/EDIFACT Government Cross-Border Regulatory messages (GOVCBR)	WCO Revised Kyoto Convention - General Annex Guidelines - Chapter 3: Clearance and other Customs formalities WTO Trade Facilitation Agreement (TFA) The International Convention on the Harmonised System (HS Convention) WTO Customs Valuation Agreement WCO Single Window Compendium
Postal Consignment Note, Postal Customs Clearance	CN22/CN23 customs declaration WCO DM – UPU Derived Information Package (DIP)	UPU–WCO standard EDI messaging (CUSITM/ CUSRSP) and inter-postal standard messaging (ITMATT)	WCO Revised Kyoto Convention, Specific Annex J, Chapter 2 (Postal Traffic)
Consignment Security Declaration (CSD)	UN/CEFACT Air Consignment Security Declaration	UN/CEFACT XML, UN/ EDIFACT	

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17   PLACI is the term used to describe a specific dataset (7+1) drawn from consignment data and provided to regulators by freight forwarders, air carriers, DOs, integrators, regulated agents or other entities as soon as possible in a pre-load time frame to facilitate an initial assessment of the potential security risk represented by the consignment.

TYPE	DATA STANDARD	DATA FORMAT/ EXCHANGE STANDARD	ANY APPLICABLE RULES, REGULATIONS, GUIDELINES
Dangerous Goods Declaration (DGD)	UN/CEFACT Air Dangerous Goods Declaration	UN/CEFACT XML, UN/ EDIFACT	
Electronic Sanitary and Phytosanitary (SPS) Certification (SPS e-cert)	UN/CEFACT e-CERT IPPC ePhyto Solution	XML	International Standard for Phytosanitary Measures (ISPM) 12 – Guidelines for Phytosanitary Certificates
CITES[18] Permit or Certificate	eCITES WCO DM eCITES Derived Information Package (DIP)	XML UNCTAD's Automated System for Customs Data (ASYCUDA) eCITES module	eCITES Implementation Framework CITES ePermitting Toolkit
ATA Carnet	ICC eATA Carnet Project WCO DM eATA Carnet Derived Information Package (DIP)	ATA Carnet NICS API ATA Carnet Customs Portal API	WCO ATA Convention and the Convention on Temporary Admission (the Istanbul Convention) ICC WCF international guarantee chain
TIR (Transport International Routier) Carnet	eTIR specifications WCO DM eTIR Derived Information Package (DIP)	XML	Annex 11 of the TIR Convention
Proof of Origin Documentation	WCO DM – CoO Derived Information Package (DIP)	PDF OASIS UBL latest version	WCO Guidelines on Certification of Origin Rules of Origin in The Kyoto Convention WTO Agreement on Rules of Origin ICC International Certificate of Origin Guidelines WTO Rules of Origin Facilitator[19] to navigate origin provisions in trade agreements

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18   An international agreement to protect endangered plants and animals and prevent trade of threatened species.

19   World's first comprehensive global online resource on tariffs, trade agreements and rules of origin.

SECTION 6
INTEROPERABLE DIGITALISATION FRAMEWORKS

To enable interoperability with the various business partners and intermediaries that they need to interact with daily, supply chain actors can leverage digitalisation frameworks that support the exchange of electronic trade documents. The table below details available frameworks that were built with interoperability in mind.

Table 6.1 Interoperable Digitalisation Frameworks

FRAMEWORK	WHAT IT IS	WHAT IT DOES	HOW TO USE
Digital Negotiable Instruments (DNI) Initiative	A technological framework to leverage distributed ledger technology (DLT) in a manner that remains predominantly interoperable with existing practices, systems and channels.	The electronic payment undertaking (ePU) dDOC specifications outline how to leverage technology to produce, manage and share digital documents.	ITFA-DNI Manual
Distributed Ledger Payment Commitment (DLPC)	A digital asset and global standard for a payment commitment that can be used on any blockchain network and can operate across networks.	The Technical Best Practices set forth specifications for the standardised conversion of the promise to pay embedded in a negotiable instrument used for trade finance, into a digital asset. The Business Best Practices provide parties using a DLPC with a set of rules governing their activity.	Business Best Practices Technical Best Practices
OpenAttestation	An open-sourced framework to endorse and verify documents using blockchain.	Provides a Document Endorsement and Verification Framework to ensure verifiable document and transferable records issued are cryptographically trustworthy and can be verified independently.	Getting Started Open Attestation Developer Hub
Peppol	Peppol is a set of artifacts and specifications enabling cross-border eProcurement. The use of Peppol is governed by a multilateral agreement structure which is owned and maintained by OpenPeppol.	Enables trade partners to exchange standards-based electronic documents over the Peppol network (based on a 4-corner model). These documents include e-Orders, e-Advance Shipping Notes, eInvoices, eCatalogues, Message Level Responses, etc.	Introduction about adoption in some key countries
TradeTrust	A set of globally accepted standards and frameworks that support the trusted interoperability of electronic trade documents in terms of authenticity, provenance and legally valid title transfer.	Removes the need for expensive data exchange infrastructure to be built between different digital ecosystems, enables the creation of verifiable documents, transferable documents, and performance of a title transfer.	TradeTrust Developer Hub

Appendix A
LIST OF STANDARD DEVELOPMENT ORGANISATIONS

ABBREVIATION	FULL NAME	WEBSITE
BIMCO	Baltic and International Maritime Council	www.bimco.org
DCSA	Digital Container Shipping Association	www.dcsa.org
FIATA	International Federation of Freight Forwarders Associations	www.fiata.org
GLEIF	Global Legal Entity Identifier Foundation	www.gleif.org
GS1	Global Standard One	www.gs1.org
IATA	International Air Transport Association	www.iata.org
ICC	International Chamber of Commerce	www.iccwbo.org
IMO	International Maritime Organization	www.imo.org
ISO	International Organization for Standardization	www.iso.org
ITFA	International Trade and Forfaiting Association	www.itfa.org
OASIS	Organization for the Advancement of Structured Information Standards	www.oasis-open.org
SWIFT	Society for Worldwide Interbank Financial Telecommunication	www.swift.com
UN/CEFACT	UN Centre for Trade Facilitation and Electronic Business	www.unece.org/trade/uncefact
W3C	World Wide Web Consortium	www.w3.org
WCO	World Customs Organization	www.wcoomd.org
WTO	World Trade Organization	www.wto.org

Appendix B

LIST OF TECHNICAL TERMS

ABBREVIATION	DESCRIPTION	USEFUL RESOURCES[20]
API	An application programming interface (API) is a set of defined rules that explain how computers or applications communicate with one another. APIs sit between an application and the web server, acting as an intermediary layer that processes data transfer between systems. API enables companies to open up their applications' data and functionality to external third-party developers, business partners and internal departments within their companies. This allows services and products to communicate with each other and leverage each other's data and functionality through a documented interface.	What is an API? (3-min video)
GOVCBR	A multi-functional UN/EDIFACT message that can be used for import, export and transit purposes and for response messages, which can be used by all relevant CBRAs such as customs authorities (single window parties).	
JSON	JavaScript Object Notation (JSON) is an open data interchange format that is both human and machine-readable. It is a standard for transferring data between a server and an application.	Compare JSON and XML (3-min video)
UN/EDIFACT	The United Nations Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT) comprise a set of internationally agreed standards, directories and guidelines for the electronic interchange of structured data, between independent computerised information systems.	Introducing UN/EDIFACT
XML	Extensible Markup Language (XML) is a flexible language for creating common information formats and sharing both the format and content of data over the Internet and elsewhere. XML is a formatting language recommended by the W3C.	What is XML? (2-min video)

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20   The resources are for reference only and ICC does not endorse the vendors that created these videos.

ABOUT THE INTERNATIONAL CHAMBER OF COMMERCE

The International Chamber of Commerce (ICC) is the institutional representative of more than 45 million companies in over 100 countries. ICC's core mission is to make business work for everyone, every day, everywhere. Through a unique mix of advocacy, solutions and standard setting, we promote international trade, responsible business conduct and a global approach to regulation, in addition to providing market-leading dispute resolution services. Our members include many of the world's leading companies, SMEs, business associations and local chambers of commerce.

ABOUT THE WORLD TRADE ORGANIZATION

The World Trade Organization (WTO) is the international body dealing with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible, with a level playing field for all its members.

Standards Toolkit for Cross-border Paperless Trade