Training Manual on Helping Micro-, Small and Medium-Sized Enterprises to Digitalize their Procedures

Submitted by the secretariat

Summary

This training manual was prepared in the framework of the United Nations Development Account (UNDA) project "Global Initiative towards post-Covid-19 resurgence of the micro-, small- and medium-sized enterprise (MSME) sector" and represents a compilation of literature on electronic data exchange from different institutions. It aims to help MSMEs digitalize their processes, including through the United Nations Centre for Trade Facilitation and Electronic Commerce (UN/CEFACT).

Document ECE/TRADE/C/CEFACT/2022/INF.2 is submitted by the secretariat to the twenty-eighth session of the Plenary for information.
1. Trade facilitation can contribute to the competitiveness of economies and companies by streamlining and simplifying the technical and legal procedures for products entering or leaving a country. Trade facilitation can benefit businesses and consumers alike.

2. MSMEs account for the majority of businesses worldwide and are important contributors to job creation and global economic development. Representing about 90% of businesses and more than 50% of employment globally, formally established MSMEs contribute up to 40% of national income (GDP) in emerging economies. This number is even higher when informal MSMEs are included.

3. The concepts of information availability, advance rulings, and appeal procedures are key concepts in the World Trade Organization (WTO) Trade Facilitation Agreement (TFA). They pose particular challenges and offer particular opportunities for MSMEs.

4. This training manual aims to review the use of digitalization to support MSMEs with respect to trade facilitation, including respective WTO concepts. Drafted by consultant, under the guidance of the United Nations Economic Commission for Europe (ECE) Trade subprogramme’s staff, this training manual represents a compilation of literature on electronic data exchange from different institutions, including the United Nations 2021 Digital and Sustainable Trade Facilitation Regional Report, prepared by the ECE secretariat. This training manual provides the opportunity to join elements developed in these different documents within a single, comprehensive manual.

5. Targeted at government officials, businesspeople, and scholars, this manual scopes challenges and solutions of data exchange related to international trade transactions. Its five chapters elaborate on trade data exchanges, suggest approaches for embracing digitalization and provide an overview of known trade facilitation platforms.

6. The ECE hopes that this manual will provide MSMEs with knowledge and resources to facilitate their digitalization and to maximize the benefits of trade facilitation reforms in their countries.

7. The training manual is presented annexed to this Plenary document in the format in which it is intended to be used.
Helping MSMEs to Digitalize their Trade

Training Manual
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Introduction

This training manual is a compilation of literature created by different institutions on the topic of electronic data exchange. It provides the opportunity to join elements developed in these different documents within a single, comprehensive manual. The aim of this manual is to review the use of digitalization to support micro-, small-, and medium-sized enterprises (MSMEs) trade. The manual touches on most aspects of MSME digitalization but does not intend to replace any of the documents used in the development of this training.

The target audience for the first half of this manual are MSME managers and collaborators interested in developing their international trade market. The target audience for the second half of the manual are public authorities and regulators seeking to implement regulation to boost MSME trade. The entire document is also relevant for members of political and economic institutions as well as service providers interested in promoting MSME trade efficiency.

This manual adopts the most commonly used definition for small and medium sized enterprises (SMEs) as enterprises with up to 249 employees. Firms with up to 10 employees are referred to as micro firms. This report uses the acronym “MSME” as the generic term. A distinction between SMEs and MSMEs will only be made where precise definitions are necessary, that is when statistics are used or when the distinction is explicitly made by the source.

The document scopes challenges and solutions of all data exchanges that are related to international trade transactions for which goods are transferred from a “Seller” that is a MSME to a “Buyer” (business-to-business (B2B) or business-to-consumer (B2C)). The following figure illustrates the different roles and services in international trade.

Figure 1: International Supply Chain Model, Roles and Services

Source: UN/CEFACT (2019), Buy-Ship-Pay Reference Data Model (BSP-RDM)
The different dimensions for MSMEs digitalization are presented in the following order:

1. **Background**
   The first chapter describes the trade context for MSMEs, the major international trade barriers they face, and provides a comprehensive account of electronic data interchange with key definitions.

2. **History of trade data exchanges**
   The second chapter describes the emergence and evolution of electronic data interchange and cites key milestones.

3. **First steps in digitalizing data exchange**
   The third chapter introduces the best approach for MSMEs to start their digitalization initiative with regards to trade.

4. **Public sector support**
   The fourth chapter suggests initiatives and infrastructure that the public sector can implement to support MSMEs in their digitalization journey and to reap the benefits from MSMEs digitalization.

5. **Examples of facilitation platforms**
   The last chapter showcases known platforms that can be of interest to MSMEs. These examples are taken from the UN/CEFACT repository.
Background
Domestic and International Trade Context for MSMEs

MSMEs represent about 90% of all businesses worldwide and provide more than 50% of global employment. Formal MSMEs contribute up to 40% of national income (GDP) in emerging economies. These numbers are even higher when informal MSMEs are included.¹

*The WTO World Trade Report 2016*² is the latest report to feature in-depth statistical analyses of the global situation of MSME trade participation in developed and developing economies. The following are the key insights from that report.

The table below shows the distribution of micro firms (upper panel) and of SMEs (lower panel) by country group across four sectors: manufacturing, trade (wholesale and retail), services and agriculture/other. The distribution shows two major patterns:

1. **SMEs are over-represented in labor-intensive sectors** characterized by a combination of relatively low entry barriers and relatively low fixed costs of production.

2. **Developing countries have larger shares of MSMEs in agriculture/other sectors.** This can be attributed to the higher labor-intensity of agriculture in developing countries (especially in least developed countries (LDCs)) as opposed to developed countries, coupled with the fact that small firms tend to be more labor-intensive than large firms, even within the same sector.

### Table 1: Sectoral Distribution of MSMEs (in %)

<table>
<thead>
<tr>
<th></th>
<th>Manufacturing</th>
<th>Trade</th>
<th>Services</th>
<th>Agriculture/other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Share of micro enterprises</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developed</td>
<td>8.0</td>
<td>35.0</td>
<td>56.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Developing</td>
<td>11.5</td>
<td>44.3</td>
<td>38.9</td>
<td>5.3</td>
</tr>
<tr>
<td>G20 developing</td>
<td>14.0</td>
<td>33.0</td>
<td>40.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Other developing</td>
<td>10.0</td>
<td>46.0</td>
<td>40.0</td>
<td>3.0</td>
</tr>
<tr>
<td>LDCs</td>
<td>15.0</td>
<td>45.0</td>
<td>31.0</td>
<td>9.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11.0</td>
<td>49.0</td>
<td>42.0</td>
<td>5.0</td>
</tr>
</tbody>
</table>

|                      |               |       |          |                   |
| **Share of small and medium-sized enterprises** |       |       |          |                   |
| Developed            | 22.0          | 25.0  | 52.0     | 1.0               |
| Developing           | 19.9          | 30.6  | 41.0     | 8.5               |
| G20 developing       | 21.0          | 31.0  | 44.0     | 3.0               |
| Other developing     | 18.0          | 32.0  | 41.0     | 8.0               |
| LDCs                 | 24.0          | 23.0  | 37.0     | 16.0              |
| **Total**            | 20.0          | 30.0  | 42.0     | 8.0               |

Source: WTO World Trade Report 2016, Levelling the trading field for SMEs


² WTO (2016), World Trade Report 2016, Levelling the trading field for SMEs.
On export, MSMEs account for an average of 34% in developed countries. There is a positive relationship between enterprise size and export participation, with lower rates of participation for micro enterprises (9%) and small enterprises (38%) than for medium-sized (59%) and large enterprises (66%).

Among exporting firms, MSMEs are strongly represented in terms of numbers, but account for a small share of a country’s overall exports. Moreover, they often only export a few products to a narrow range of destinations. To a large extent, the relationship between a firm’s productivity, size and export experience explains the relatively limited participation of MSMEs in international trade. The most productive firms are not only larger in size, but also access foreign markets more easily and grow through exports. Evidence suggests that in all economies, developing or developed, the participation of MSMEs in international trade is low compared to large firms and to their share of employment.

International Trade Barriers Faced by MSMEs

Internationalization is a strategic expansion option for any company that aims to achieve growth outside of its domestic market. Firms engaged in international activities, either through export, contractual modes, or foreign production, can exploit economies of scale, improve labor productivity, and enhance management efficiency with larger production and sales volumes. Internationalization also offers the possibility to diversify revenue sources from domestic and international markets. But MSMEs traditionally face disproportionate barriers to trade, whether in the form of tariffs and non-tariff measures, unnecessary regulatory burdens, customs red tape, financing gaps or information deficits.

Despite the impressive track record of large companies in trade, evidence shows that medium-sized enterprises are becoming more and more important in international trade and have significantly contributed to exports in European countries, the most evident example is in Germany (15.3% of national export volume is performed by SMEs). This means that companies do not have to be large, but rather they need to be large enough to overcome international trade barriers and undertake global operations.

The following barriers to international trade have been identified in the UN/CEFACT White Paper: Integrated Services for MSMEs in International Trade (2020):

Difficulties With Import and Export Regulations and Procedures

Multinational corporations are usually well-established with a worldwide reputation and operate in foreign markets via their branches with local employees assisting to comply with local laws. Due to resources and personnel constraints, MSMEs often lack expertise in international trade procedures, local regulations, customs rules and other compliance matters. As a result, it is common for MSMEs to see shipments being delayed or denied from clearance due to non-compliance. Delays are costly and can lead to loss of contracts, damage to the goods and exposure to litigation.

Evidence also shows that tighter technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures are particularly challenging for smaller firms. Studies show

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3 WTO (2016), World Trade Report 2016, Levelling the trading field for SMEs.
4 UN/CEFACT (2020), White Paper - Integrated Services for MSMEs in International Trade (ISMIT): Opening the Global Economy to MSMEs, Version 1
that when a new restrictive SPS measure is introduced in a foreign market, smaller exporting firms and firms that lose more in terms of volumes of trade are more likely to exit the foreign market than large firms who lose comparatively less, because they are able to comply with more stringent requirements more easily and at lower costs than SMEs.

Lack of Access to Trade Finance
Banks often have very limited information to evaluate the credit worthiness and international trade performance of MSMEs, especially in developing countries. With limited information, banks usually give MSMEs a low credit ranking and consider the establishment of Letters of Credit to finance MSME transactions to be risky and expensive. As an alternative, many MSMEs trade on open accounts, which is a risky strategy, because small companies often have limited access to information on the progress of the trade transaction once the goods have left the country. As a result, they have no means to intervene if problems arise. This can lead to payment delays or even a complete loss of payments.

Lack of Access to Quality Logistics Services
To reach foreign markets, a MSME needs to rely on a competent logistics provider that can offer integrated door-to-door services and can act as an intermediary with customs and other authorities. Due to the small volume of MSME shipments, reputable logistic services are often not accessible to MSMEs or only at a premium price.

Lack of Access to Other Essential Quality Business Services
These include a range of services related to international trade in areas such as insurance, marketing, packaging, warehousing and others. This is particularly important in developing countries where, overall, the service sector is less developed.

Lack of Professional Skills
Due to the low volume of their international trade and lack of channels to communicate with regulators and banks, MSMEs often lack the professional knowledge and experience related to regulations and customs procedures, finance, evaluation and other aspects of business and trade management.

Limited Access to Advanced e-Business Solutions
International trade increasingly relies on advanced e-business solutions such as traceability or digital accounting systems. MSMEs lack access to many of these systems, primarily because of the lack of income, technological skills and the low volume of their international trade and capability to leverage the systems. Instead, they often find themselves relying on manual procedures and the exchange of paper documents. This is especially true for MSMEs in developing countries. These procedures are cumbersome and prone to error, and often lead to non-compliance with export and import regulations as well as repeated submissions of documents, increasing the costs and risks for all parties involved.

The next two chapters of this document focus on the latter challenge for MSMEs, and how digitalization can be developed in the most efficient way to remove such challenge.
Electronic Data Exchange

The information for the international movement of goods is traditionally provided in the form of paper documents and procedures carried out through handling such documents. Technological developments, however, have made alternative information handling and transmission methods feasible. It is evident that, when using automatic data interchange, a much more rigid discipline needs to be exercised regarding data presentation and exchange rules than in the case of paper documents.

Even though the required technology and services are available, this does not suffice to make data interchange an operational reality. There is an equally important requirement to develop and agree on standards, procedures, and other essential elements of data handling methodologies to ensure intelligible communications between different systems used by trade and transport operators.5

Data exchange is possible when the following conditions are in place:

- Two or more parties agree to exchange data electronically
- A common data set (semantics) and communication protocol (syntax)
- Technically be able to recognize electronic data being received from a partner
- Conform, where appropriate, to any applicable regulations

Besides using compatible systems, interchange partners should follow uniform rules in respect of communication procedures which include the types of acceptable messages, identification of parties, reference to previously agreed protocols or agreements on character set, language, transliteration and interchange structure (specification of the various parts of the message, identification of the data elements, codes used).

Therefore, harmonization and data transfer with multiple stakeholders shall require a shared vision, alignment on technical and procedural aspects and collaboration. These could be achieved through international standards development organizations such as the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT).

Definition of Key Concepts for Electronic Data Exchange

Semantics

Semantics refer to the meaning of words and phrases. This takes particular importance in electronic data exchange where it is important to ensure that information is understood in the same way. If the billing process depends on the date of arrival in the warehouse of the goods, then it is very important to define and make sure that all stakeholders have a shared understanding of the term. For instance, the date of arrival could also refer to the date of arrival in the country or date of arrival in the transport hub. This example shows that the semantic meaning behind trade and transport terms is more important than the term itself.

Ontologies

Ontologies describe the relationship of words and phrases to each other. Machine learning and big data allow computers to understand the similarities of terms and do an automated mapping of terms in an electronic message. This approach does have merits especially from an implementation point of view; however, from a standards point of view,

UN/CEFACT believes that the semantic definition is a more essential approach to standardized electronic exchange of information.

Codes

Information which is used regularly in an exchange, and which has a limited number of possible responses should be codified. Using a code instead of natural language ensures that all parties are understanding the same information in the same way. This obviously applies to situations in a multilingual environment. However, this can also apply within a language as a term such as “pallet” can be understood in many different ways (wooden pallet, plastic pallet, stackable pallet, etc.).

Code Lists

Codified information has to be structured with a set length and format (i.e. alpha, numeric, or alphanumeric and a set length of three characters, four characters or a length of up to four characters). The possible codes that can be used should be organized into code lists which provide the name of the code list, the various codes, their full name and, most importantly, their definition. It is this definition which provides the semantic understanding of the code itself. The maintenance of the code list will also need to be defined, explaining how modifications or additions can be made. It is advisable to ensure that code lists are always backwards compatible; this implies that deprecating a code list entry may be complicated. Instead of deprecating a code list entry (deleting it from the list), it may be better to “mark” the entry as “no longer in use” or “replaced by” another entry.

Main sources for this session:

- WTO (2016), World Trade Report 2016, Levelling the trading field for SMEs
- UN/CEFACT (2020), White Paper - Integrated Services for MSMEs in International Trade (ISMIT): Opening the Global Economy to MSMEs, Version 1
- UN/CEFACT (in review), Recommendation N°2, Semantic information and codes in international trade data exchange, Interim Draft
History of Trade Data Exchange
From Physical to Electronic Data Exchange

In the nineteenth and twentieth century, scale was often critical to success in international trade. Firms needed to be big in order to create integrated production systems, build global distribution networks, and cover the relatively high transport, communications and border costs associated with international trade. But as the world economy enters the twenty-first century, a number of important changes are diminishing the advantages of scale in international trade, with the result that smaller, nimbler “micro-multinationals” are also beginning to succeed in a global marketplace dominated by big multinationals.6

Efforts to improve cross-border exchange of trade information date back more than 50 years. The United Nations Layout Key for Trade Documents (UNLK)7 was developed in the 1960s to standardize and structure the representation of information on physical trade documents. It was quickly accompanied by a data dictionary so all parties would consistently understand the same thing. The birth of the UN Trade Data Element Directory8 (UNTDED) was the first essential step towards electronic messages.

The standard provides for the:
- Design: paper size, margins, spacing and pitch of characters, data fields (depth of field, the number of lines and the number of characters in each line);
- Data (identifies 18 data fields and defines the nature of the individual data elements);
- Location (the specific locations of the data fields and coded information on the document); and
- Flexibility to allow specific requirements within a “free disposal” area.

These layout rules allow the creation of Master Documents. Subsequently, all documents derived from these Masters are based on the principle of the same data appearing in the same place on all forms. Information in clear text or coded format can be entered (written, typed or generated from an electronic application) using the appropriate data fields and data elements.

Each identified data element in the Directory has been given:
- A data element name;
- A description of the concept to explain the agreed meaning and to aid in determining the content of the information (data value) to be provided with the data elements;
- A specification of the character representation of the data value, with indication of space (in number of characters) available and location in aligned forms, and of field lengths where such have been established in particular interchange protocols.

Information exchange in business-to-business transactions has been facilitated through Electronic Data Interchange (EDI) since the 1980s. The first prominent EDI specifications, such as UN/EDIFACT, translated the paper-document environment into electronic messages having a defined and limited number of characters. This allowed the direct

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6 WTO (2016), World Trade Report 2016, Levelling the trading field for SMEs
8 UNECE (2005), ECE/TRADE/362, last updated 2005
transfer of structured business data between computers by electronic means, i.e. the paperless transfer of business “documentation”.

This form of EDI remains advantageous for large, highly standardized data transmissions because the formatting syntax creates smaller files with less overhead than newer technologies, so it places less stress on storage and transmission resources.

The most common documents exchanged via this form of EDI are purchase orders, invoices, and advanced shipping notices and customs declarations. But there are many others, such as bills of lading, customs documents, inventory documents, shipping status and payment documents.

UN/EDIFACT was the dominant messaging syntax throughout the 1990s and remains the most widely used single standard for data exchange. Key to its success is that UN/EDIFACT is freely available, centrally maintained by the United Nations and is regularly updated. While official statistics are hard to come by, sectoral estimates, such as those by the maritime industry, indicate that about 8,000 EDIFACT messages are exchanged per day.

UN/EDIFACT messages cover all aspects of the international supply chain. For example, in the transport sector, UN/EDIFACT covers both contractual messages such as forwarding and consolidation (IFCSUM), booking (IFTMBF), consignment advice (IFTMCA), multimodal status report (IFTSTA), and operational messages such as bay plan/stowage plan (BAPLIE), vessel call (CALINF), and container gate-in/gate-out (CODECO). These messages allow traders to book transport, receive updates on the status of their delivery, specify where containers are on a ship, declare when a ship is to call at a port, communicate when a container arrives or leaves a customs-controlled area, just to give some examples.

Beginning in the late 1990s, another EDI syntax, eXtensible Markup Language (XML), became increasingly implemented. XML opened new possibilities because of its flexible message structure, the definition of which is carried within the message itself. These message structures can also be used to generate human readable (paper or on-screen) information. The use of this flexible, but albeit often “heavier” data structure was made possible by new technology for increased data storage and faster transmission.

Over the past two decades an increasing number of exchanges use XML. This EDI syntax provides higher flexibility in the structure, length and format, often making it more attractive. However, there is no single, centrally maintained XML version – there could potentially be as many XML languages as business partners. Other technical disadvantages include larger data files. UN/CEFACT does offer a standardized XML, as do some International Organization of Standards (ISO) committees, the World Customs Organization (WCO), the International Air Transport Association (IATA) and others. The use of electronic invoices merits particular attention. The European Union has decided that all public institutions must accept⁹ and may require electronic invoices, as part of a wider drive to decrease the use of paper.

From 2000s, JavaScript Object Notation (JSON) was specified as an open standard file format, and data interchange format, that uses human-readable text to store and transmit

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⁹ Among those that administrations are required to accept is the UN/CEFACT Cross Industry Invoice.
data objects consisting of attribute–value pairs and array data types (or any other serializable value). It is a common data format on internet applications, with a diverse range of uses, such as serving as a replacement for XML in AJAX systems.

**Data Pipeline Concept**

In the coming years, the challenge will not be any more on efficient interfaces between two (or more) parties, but on having data efficiency on overall supply chains.

The concept of a Data Pipeline is still an innovative method to manage data that originates at its source to be provided once and used multiple times throughout the supply chain, regardless of the mode of transport, party or border agency that needs to access the data.

![Figure 2: Representation of an Ideal Data Pipeline](image)

This reflects the Single Window principle of sharing electronic data. The re-capture of data is reserved exclusively for data elements that have changed or need correcting. The pipeline data exchange structure makes it possible for the data elements to be used by multiple cross-border agencies, avoiding the need to resubmit data for each agency. For certain types of data such as parties (buyer, seller) the use of external trusted data source(s) could be included to provide certainty.

It is therefore of paramount interest when starting any new interface to think that in a certain period of time, the data exchange would be transferred further automatically, to avoid retyping information or creating a risk for errors.

**QUIZ**

1) Which format was the first United Nations Layout Key for trade documents (UNLK) designed for?
2) What was the first benefit of the UN/EDIFACT syntax?
3) Why is this still an advantage today?
4) What is the name of the concept where data is entered only once for a complete value chain?

**Main sources for this session:**

- WTO (2016), World Trade Report 2016, Levelling the trading field for SMEs
- UNECE (2021), UNECE NEXUS Sustainable Mobility and Smart Connectivity
- UN/CEFACT (2018), White Paper Data Pipeline Version 1
First Steps in Digitalizing Data Exchanges
Avoiding Common “Expensive Shortcuts”

Usually, the first reason for a MSME to develop an electronic data exchange is a request from a trading party in exchange of a commercial benefit, e.g. a facilitated process from an administration (e.g. customs) or a requirement for a new contract agreement with a client. At that stage, the decision sits on a single variable: is the MSME ready to perform the IT investment to get the commercial benefit of this single interface. Technically, the choice is limited, as much of the time, the interface specifications requirements are defined by the trading party to be connected.

If this stage is performed positively, additional exchanges with other trading parties become feasible and this preliminary investment can bear more benefits. At that moment, the decision makers of the MSME should strategically decide on their interface policy, to avoid creating “expensive shortcuts”: with the current technology (such as XML), developments of 1-to-1 unstandardized interfaces are fast and not a difficult task to perform for any computer expert. Now, the benefits obtained through the flexibility of the XML syntax (message structure) bring mid- to long-term challenges. In an environment, where each data exchange to other entities’ solutions is unique, many of these XML messages are based on a pure electronic equivalent of a paper document without simplification and without including the semantic context (i.e. the context that gives the data a precise meaning). This lack of context can result in messages that function well in a narrow context between a small number of parties but whose data may not be directly usable, even for the same “content”, other messages even within a same entity. Using our previous example, a “date of arrival” used in a contract may not be the same if it is a maritime shipping document (arrival in port), a customs document (arrival at border) or a commercial document (arrival at warehouse or destination). This results in the need to update these links continuously when any information is changed or modified.

On the opposite, the use of clear semantics and coded information in data exchange will help to ensure that all parties involved have a shared understanding of the data. This in turn saves money and time as mappings between data will be less time consuming. It also helps software providers and implementers to create the proper data sets from the outset, eliminating the need to make bilateral agreements and negotiations to define each term and each business case; it will just be necessary to point externally to the relevant international standard.

A use-case is the Warrant Group (a UK-based freight forwarder; with 4,000 shipping instructions, 15,000 bookings and about 2.2 million status messages exchanged in a single semester in 2017) which after a certain period of unharmonized connections decided to implement the free, neutral, and open-source UN/EDIFACT EDI standards to simplify their processes and thus reduce the number of standalone, customized links with its clients. The resulting efficiency gains allowed the Warrant Group to reallocate a portion of its IT staff from the maintenance of customized-customer data connections to value added-development.

The next sections outline how to develop efficient electronic data exchanges from the beginning.
Identification, Formatting and Standardization of Data

The preliminary question when exchanging information is clearly to establish what will be exchanged. The question is often more complex than initially thought, as we tend to start with a preconceived document bias. Since the current process consists of exchanging physical documents, the reflex is to identify how to exchange the document electronically; while the real process requirement is to exchange specific data or data sets that should be in an understandable format.

The following chapter extracts elements from the UNECE Recommendation N°2, *Semantic information and codes in international trade data exchange*.

Semantic Information and Codes in International Trade Data Exchange

Based on international best-practices, the high-level recommendations to start electronic data exchanges are:

- All public and private sector supply chain actors should prioritize codified data instead of textual inputs, and reference whenever possible freely available code lists like those maintained by UN/CEFACT;
- All public and private sector supply chain actors should carefully consider the semantic meaning of data when establishing electronic data exchange;
- All electronic business digitalization efforts should be harmonized in a wholistic approach of the international supply chain;
- All public and private sector supply chain actors should consider using UN/CEFACT semantic standards either as the base of their electronic exchanges, as a reference in the message structures or as a mapping to facilitate interoperability;
- Should any semantic needs or code lists not be defined within UN/CEFACT, the stakeholders which identified this lack are encouraged to bring these as a project within UN/CEFACT to fully cover any potential semantic needs or code lists useful to international trade.

Paper-Centric View Versus Process-Driven Approach

**Dematerialization** of a paper document, that is taking a paper document and making an electronic equivalent, is a relatively easy process. The information in the document may reference international codes and may even reference an international standard library of data. The result may function well and those involved with that specific document may find immediate benefits in this dematerialization. This process may even consider a group of documents related to a similar purpose (transport, commercial ordering, banking, etc.) and the individual documents may be harmonized within that grouping of documents. This would be a paper-centric view of data exchange.

**Digitalization** implies that the shift to an electronic message is also considering the relevant processes and putting these into context of other related processes. The document is then considered as one part of the process instead of the desired outcome. The digitalization of the document’s process will involve a harmonization across the entire contextual process as described in the *UNECE Recommendation 34 on Data*.
Simplification and Standardization for International Trade.\textsuperscript{10} This recommendation outlines four steps for digitalization:

- **Capture** – prepare an inventory of information requirements/data elements (throughout the process, in multiple documents)
- **Define** – clearly define each data element (name, definition, representation [text, format, code], when it is required, legal basis, etc.)
- **Analyze** – check the resulting information for cases that the same information may be requested with different names or for cases where the information may not be necessary (some information may be inferred by other data or some data may not have any legal or operational reason for being requested)
- **Reconcile** – prepare a consolidated list of data elements and align these to an international standard

**Whole of Supply Chain Approach**

This dematerialization process may also only be applied to one segment of the international supply chain such as transportation, commercial or banking processes. If dematerialization is performed by each segment of the international supply chain separately, there is a large risk that the exchange from one segment to the next may not align and that the terms are being used with different semantic meanings. All of these segments are connected: the logistics process does not exist without the commercial process requesting the movement of goods; the banking process does not exist without the exchange of goods from the commercial and logistics processes; the regulatory process does not exist unless there is an exchange of goods or services. There might be an excellent data model to handle the regulatory processes when the goods arrive at a border, but it may be disconnected from the other processes and oblige operators to recapture information or worse, to redefine information.

UN/CEFACT has taken a holistic approach to the supply chain from the outset. All data entered into the Core Component Library is harmonized within the entire global exchange and the information should be reusable in each segment of the international supply chain.

**Structure of Electronic Data Exchanges**

Information which is exchanged electronically is usually not a flat list of data; it is more often hierarchal by design. For example, on a paper document, there is often a box for the operator’s name and address; when this is electronic, this would often be in a hierarchy as follows:

- **Organization**
  - Identification number
  - Organization name
  - Organization role
  - Contact details
    - Person name
    - Email
    - Telephone number
  - Postal address
    - Street Name

The individual data elements such as “country code” or “identification number” are used multiple times within an electronic data exchange; in the above example, both of these are used multiple times. The semantic definition is the same, but they are interpreted in the context of the hierarchy. For example, the “identification number” under “tax registration” is the “tax registration identification number”. If this information was all at the same level with no hierarchy, it would be necessary to define more data in order to put it within its business context. Such a flat file may be possible within the context of the dematerialization of a single document; however, it would become unmanageable in the digitalization of a process or of an entire supply chain.

Foundational Standards and Master References

The following foundational standards and master references for the cross-border supply chain were identified in the 2022 WTO Standards Toolkit for Cross-border Paperless Trade.

Table 2: Foundational Standards Available for Adoption

<table>
<thead>
<tr>
<th>Type</th>
<th>Applicable standard</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country Code</td>
<td>ISO 3166-1</td>
<td>Internationally recognised codes that represent a country name</td>
</tr>
<tr>
<td>Code for Trade and Transport Locations</td>
<td>UN/LOCODE</td>
<td>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.</td>
</tr>
<tr>
<td>Currency Code</td>
<td>ISO 4217</td>
<td>Internationally recognised codes for the representation of currencies that enable clarity and reduce errors.</td>
</tr>
<tr>
<td>Financial Messaging</td>
<td>ISO 20022</td>
<td>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.</td>
</tr>
<tr>
<td>Date and Time</td>
<td>ISO 8601</td>
<td>A clearly defined way of presenting dates and times that is understandable to both people and machines.</td>
</tr>
<tr>
<td>Unit of Measure</td>
<td>United Nations Unit of Measure (UOM)</td>
<td>Codes for units of measurement used in international trade with names, factors of conversion, symbols and sectors of application.</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Freight Containers</td>
<td>ISO 6346</td>
<td>An international standard covering the coding, identification and marking of intermodal (shipping) containers used within containerised intermodal freight transport.</td>
</tr>
<tr>
<td>Language Code</td>
<td>ISO 639</td>
<td>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.</td>
</tr>
</tbody>
</table>

Source: WTO (2022), Standards Toolkit for Cross-border Paperless Trade

### Table 3: Master References for the Cross-border Supply Chain

<table>
<thead>
<tr>
<th>Reference</th>
<th>What it does</th>
<th>Why it is important</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN/Core Component Library (CCL)</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>UN/CEFACT Buy-Ship-Pay Reference Data Model (BSPRDM)</td>
<td>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 while complying with the overall processes and data structures.</td>
<td>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.</td>
</tr>
<tr>
<td>UNCITRAL Model Law on Electronic Transferable Records (2017)</td>
<td>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</td>
<td>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.</td>
</tr>
</tbody>
</table>
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.

ISO 15000 series
Electronic Business using 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).

Source: WTO (2022), Standards Toolkit for Cross-border Paperless Trade

Available Processed Data

If the objective of the data exchange is still the digitalization of trade documents, there are already standardized approaches, as indicated in the following sub-chapters:

**eInvoicing**

Electronic purchasing is used by trading partners, to electronically exchange and monitor transaction documents between one another and to ensure that the terms of their trading agreements are being met. The supporting electronic documents may include invoices, purchase orders, debit notes, credit notes, payment terms and instructions, and remittance slips.

These data may be exchanged in a variety of formats, including EDI, XML, and “comma-separated values” (CSV) files.

**eCertificates**

A very wide range of information is exchanged electronically in trade, and much of this information is of a commercial nature.

Depending on the type of goods and the law/regulation, certificates from authorized entities are required in international trade to either transport, export or import goods. Such certificates attest that the product listed therein has met certain criteria.

Some examples of prominent certificates required in international trade include:

- Documentary proof of origin (i.e. Certificate of Origin, CoO); this is used to apply a preferential tariff treatment ( Preferential CoO) or to apply regulations (Non-Preferential CoO).
- Conformity certificates that confirm the special nature of a product.
- Inspection/Laboratory Certificates (Health, Veterinary, and Plant Health certificates such as Sanitary/Phytosanitary (SPS) Certificates).
- CITES Certificates11

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11 CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in
Documents to support a claim for entry (or exit) under a tariff quota, for excise purposes or to support a claim for VAT relief.

With some exceptions, the automation and use of electronic certificates remains limited to the application process (between the exporter and the exporting country’s regulatory authority). In most cases, the resulting “electronic document” is emitted in a pdf format for uploading into the importing country’s electronic customs system or, in the worst case, it is printed-out and submitted physically to the importing authorities who then either scan it or re-key the data into their system. In other words, the importing regulatory authority is rarely able to automatically process the data in the received “electronic certificate”.

There is still an important gap to be bridged before the entire process from export up until receipt of the goods by the purchaser can be digitalized. The ideal being for the authenticated, non-repudiated and secure data included in the certificate issued by the exporting country to be directly available to the competent authorities in the importing country (as is the case with the IPPC’s e-Phyto Hub). Direct digital exchanges of data would bring significant benefits by dramatically reducing the opportunity for submitting fraudulent data and/or documents.

The principal obstacles to this “end-to-end” digitalization are complex, but one of the most difficult issues to address is the legal uncertainty surrounding electronic documents. Many countries have passed laws supporting electronic commerce and the use of electronic signatures. However, these laws are applicable and enforceable only within the national jurisdiction in question. Some regional groupings such as the European Union, EAEU (Eurasian Economic Union) and ASEAN have regional agreements on the acceptance of e-documents, but these agreements also do not extend beyond the members of these regional groupings. Thus, in the absence of an international convention recognizing the validity of “foreign” electronic documents, regulatory authorities are left in question with regard to the enforceability of data received electronically from foreign parties, be they government agencies or private sector parties.

In the case of eTIR, eCMR, IPPC phytosanitary certificates and eCITES certificates there are international conventions underlying the use of these procedures, where the parties to the convention can legally agree to accept one another’s electronic documents (in some cases through the use of additional protocols to the original convention). However, this is not the case for many other certificates, including Certificates of Origin.

e-CMR

Rules for transporting goods internationally by road are covered by the United Nations Convention on the Contract for the International Carriage of Goods by Road (CMR), which entered into force in 1961 and has fifty-five Contracting Parties in Europe, the Middle East, North Africa, and Central Asia (including all ECE countries except Canada, Iceland, Israel and the United States of America). A CMR consignment note contains information about the shipped goods and the transporting and receiving parties. In some countries, the CMR note is accepted by regulatory authorities and law courts as evidence of a contract of carriage by road and it is also frequently requested by banks as part of the documentation for letters-of-credit. The development of a new e-CMR standard by the UNECE based on UN/CEFACT standards has been an important step towards the CMR becoming fully electronic, which will make the transport of goods by road less cumbersome for trading

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specimens of wild animals and plants does not threaten their survival.

12 UNECE(2020), General Standards. Retrieved from:
www.unece.org/uncefact/mainstandards.html
parties. The technical standards specify a set of consignment data that can be exchanged between businesses and even between regulatory authorities and businesses, describing each step of the trade and transport process starting from the issuance of the consignment instructions to the contract between parties, up to delivery of the goods.

Choosing the Right Interface

Once the data to be shared is defined (and in the best case standardized) the next step is to identify the best channel to exchange the data.

The most common process is to have a direct interface/interconnection, with all the elements of data confidentiality (hash) and cybersecurity requirements. Again, this requires resources to manage 1-1 interfaces.

Additional schemes exist that are especially interesting for MSMEs wanting to transfer data to multiple stakeholders.

**Figure 3: Three schemes for interfacings trade partners**

The majority of MSMEs are not capable of directly providing standardized information and documents to respond to administrative requirements, such as National Single Windows (NSW) or directly the electronic customs system. A third-party provider can act as a trusted third party between them. MSMEs provide the essential and non-standardized information to the Third-party, which can then transform it to standardized information and documents and submit it to the required platform. Examples of such third-parties are presented in §5.

The type of information exchange with such entity can be:

a) Information collection and submission related to customs clearance
b) Information collection and submission related to foreign exchange settlement
c) Information collection and submission related to Value Added Tax (VAT) refund

The figure below shows the Integrated Service for MSMEs in International Trade (ISMIT) concept and its inter-connectivity with existing trade facilitation platform such as the National Single Window (NSW).
Figure 4: Integrated Service for MSMEs in International Trade (ISMIT) concept

An ISMIT can potentially provide MSMEs with fully integrated electronic support services for the complete cross-border trade transaction. This includes access to logistics service providers, financing services, insurance services as well as regulatory services that can either be through connectivity to a National Single Window or directly to customs for export and import declarations and to other relevant government websites. Information from different stakeholders is collected by the ISMIT platform, which would coordinate the information flow in order to facilitate the trade transaction.

Ensuring the Legality of the Data Exchange

Electronic data exchange is reliant on domestic rules on the legal validity of electronic documents, electronic signatures, where these are applied, and other data-regulation requirements.

It is hardly surprising that electronic data exchange is often seen as a tech-driven process. But this is only partially true; implementation requires, first and foremost, a high-level political consensus, policy frameworks, supporting laws and legislation and an institutional set-up. A good example of this are autonomous vehicles. If the technology continues to evolve, it stands to reason that the leading obstacle to a switch in the medium term to autonomous vehicles will be the lack of common standards, incentives, and rules of the game, not the technology.

In a B2B environment, where the data exchange is only between the contractual parties, the parties can define their own rules in terms of what and how the data are exchanged. A good practice is to have the roles and responsibilities of each party clearly stated in a specific electronic data exchange annex of the contractual agreement with a service level
agreement and the actions defined if the connection is not working: points of contacts, recovery plan and roll-back plan to another solution (e.g. potentially paper and e-mail) if the connection is not working within a certain period of time.

If the data exchange is part of an ecosystem (supply chain, Single Window, Port Community system, etc.) or cross-borders, some requirements to increase the legitimacy may be required. One of the most common is the eSignature (see below).

Challenges with eSignatures
Generally, physical documents used in international trade still include handwritten signatures, be it for legal or operational reasons. Because of its physical characteristics, the traditional paper document is accepted as evidence. It is durable, and changes or additions will normally be clearly visible (or at least this was the case prior to the latest developments in scanners, photocopiers and image manipulation software). The same electronic information is typically different, being recorded in a magnetic medium whose data content can be changed at any time, currently without changes or additions being marked. There are new technologies, such as the “Distributed Ledger Technology (DLT)”, that can create digital originals where all changes are indicated – but this is not yet widely available and probably will not be for the next five or more years as technical issues are resolved and investments in systems development take place.

Moving to electronic signatures for document authentication brings challenges, as electronic signatures require three elements for their use: identification (release of electronic credentials), evidentiary (verification/confirmation of the identity) and attribution (confirmation of the capacity to act of the identified person). Due to these elements, there is a tendency to develop elaborate solutions for the use of electronic signatures that are costly in terms of maintenance and development and so are limited in their deployment.

A number of approaches to addressing the issue of document authentication exist:

- The United Nations 2005 Convention on the Use of Electronic Communications in International Contracts (the “Electronic Communications Convention”), ratified by twelve countries, including three UNECE members: Azerbaijan, Montenegro and the Russian Federation.\(^\text{13}\)
- The Eurasian Economic Union adopted a digital agenda in 2017 which includes, among other activities, an integrated information system, using digital signatures and the development of a “transboundary trust space” to support the cross-border recognition of electronic signatures.
- In the European Union, the 2014 electronic IDentification Authentication and trust Services (eIDAS) regulation\(^\text{14}\) ensures that people and businesses can use their national electronic identification schemes (eIDs) in other European Union countries where eIDs are available by ensuring that they will work across borders and have the same legal status as paper-based processes. The regulation defines the following services:


Electronic signature (eSignature): which is the expression in an electronic format of a person’s agreement to the content of a document or set of data. Qualified eSignatures have the same legal effect as handwritten signatures.

Electronic seal (eSeal): which is similar in function to the traditional business stamp. It can be applied to an electronic document to guarantee the origin and integrity of a document.

Electronic Timestamp (eTimestamp): links an electronic document, such as a purchase order, to a particular time, providing evidence that the document existed at that time.

Electronic Registered Delivery Service (eDelivery): allows the user to have proof of the sending and delivery of a document and protects their company against the risk of loss, theft, damage or unauthorized alterations of the document.

In the United States of America, there are “eSignature Laws” at the Federal level and another for adoption at the State level: (1) The Electronic Signatures in Global and National Commerce Act\textsuperscript{15} which in section 301 addresses international e-commerce; and (2) the 1999 Uniform Electronic Transactions Act;\textsuperscript{16} on the use of electronic records and electronic signatures which was drafted by the National Conference of Commissioners on Uniform State Laws and recommended for enactment in all States (it is currently enacted in all but three States).\textsuperscript{17}

**QUIZ**

1) Which process is more efficient: dematerialization or digitalization?
2) What are the four steps for simplifying and harmonizing data in a digitalization process?
3) How many entries are included in the UN/LOCODE code for trade and transport locations (UN/CEFACT Recommendation N°16)?
4) What type of integration services are available for MSMEs by service providers?

**Main sources for this section:**

- UNECE (2021), UNECE NEXUS Sustainable Mobility and Smart Connectivity
- UN/CEFACT (2005), Trade Data Elements Directory (TDED); UNTED (also published as ISO 7372 :2005)
- UN/CEFACT (2013), Recommendation N°34, Data Simplification and Standardization for International Trade
- UN/CEFACT (2017), Recommendation N°1: United Nations Layout Key for Trade Documents Recommended Practice & Guidelines, (also published as ISO 6422-1 :2010)


\textsuperscript{17} Ibid., Enactment History. Retrieved from: www.uniformlaws.org/committees/community-home?communitykey=2c04b76c-2b7d-4399-977ed5876ba7e034&tab=groupdetails
How the Public Sector Can Support MSMEs Digitalization Initiatives

As presented in the first chapter, MSMEs face several trade barriers to trade internationally:

- Difficulties in dealing with import and export regulations and procedures
- Lack of access to trade finance
- Lack of access to quality logistics services
- Lack of access to other quality business services essential for international trade
- Lack of professional skills
- Limited access to advanced eBusiness solutions

This chapter identifies the framework and specific trade facilitation practices that the public sector can deploy to reduce the export entry-cost for the MSMEs. As presented earlier, both large firms and small firms benefit from trade facilitation initiatives, nevertheless, gains from trade facilitation are likely to be larger for MSMEs. As trade costs fall, more and more firms will start to export.

The most impactful activities to be conducted by the public sector is to improve the import and export regulations and procedures. It is certainly a mid-term action, as changing the environment requires following key procedural and formal steps. But again, it is the one which will certainly bear the most impact, and for which the public sector has most of the leverage.

Legal Framework

A good practice in terms of the legal framework to be developed for any electronic data exchange is having a look at the identified steps from the UN/CEFACT Recommendation 35 “Establishing a Legal Framework for an International Trade Single Window”, which develops the legal aspects in detail, that could be used to foster any electronic data exchange environment, such as:

- **Electronic document**: In electronic commerce laws, it is common to use a clause making electronic records functionally equivalent with paper documents. Shared legal principles and, to the extent possible, legislative provisions should be adopted for business and governmental electronic transactions.

- **Electronic format**: The principle of “non-discrimination” between paper and electronic documents should be applied to judicial rules of evidence so that electronic documents or data messages will not be denied admissibility in such proceedings.

- **Data protection**: to establish adequate security and access protocols through identification, authentication, and authorization mechanisms; including elements of data ownership. The issue of data protection is closely related to that of privacy
(e.g., personal data protection) as well as the protection of proprietary company data and confidential trade data.

- **Authority to access and share data between government agencies:** Governments should establish regulations regarding the use of data, such as retention, confidentiality, redistribution or sharing.

On that subject, the United Nations Commission on International Trade Law (UNCITRAL) has developed several recommendations and model laws that could be useful resources, such as:

- UNCITRAL Model Law on Electronic Signatures (2001)

**Trade Facilitation**

Given the widespread phasing out of tariffs worldwide, administrative costs are becoming a major hurdle. Delays in getting goods from origin to destination hinder exports more than do foreign tariffs. The average tariff applied to imports by Sub-Saharan Africa is 11.2%, whereas the tariff equivalent for delay cost is 25.6%.21

A WTO study22 finds that small exporting firms profit relatively more when trade facilitation improvements relate to:

- information availability,
- advance rulings, and
- appeal procedures

These trade facilitation concepts have specific positions in the World Trade Organization (WTO) Trade Facilitation Agreement (TFA). The TFA negotiations have been concluded at the 2013 Bali Ministerial Conference and the agreement entered into force in February 2017. The TFA contains provisions for expediting the movement, release and clearance of goods, including goods in transit. It also sets out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues.

154 WTO members have so far ratified the TFA23

The articles related to these elements are the following:

- TFA Article 1: Publication and availability of information
- TFA Article 3: Advance rulings
- TFA Article 4: Procedure for Appeal or review

23 As of December 29th, 2021 (https://tfadatabase.org/ratifications)
In terms for support in the best way to implement those concepts, WTO has developed a Trade Facilitation Agreement facility which include summary notes, guidelines and case studies dedicated per article.

On the publication and availability of information, resources to develop a digital solution are presented in the chapter 4.1.1 “Trade Information Portal (TFA Article 1)”.

**Applying International Standards**

International standards play an important role in trade governance, in large part due to the WTO Agreements: Trade Facilitation Agreement (TFA) and Technical Barriers in Trade (TBT Agreement) and similar language in free trade agreements (FTAs) / regional trade agreements (RTAs). The TFA Art. 10.3 – Use of International Standards contains the three following sub-bullets:

- **3.1** Members are encouraged to use relevant international standards or parts thereof as a basis for their import, export, or transit formalities and procedures, except as otherwise provided for in this Agreement.
- **3.2** Members are encouraged to take part, within the limits of their resources, in the preparation and periodic review of relevant international standards by appropriate international organizations.
- **3.3** The Committee shall develop procedures for the sharing by Members of relevant information, and best practices, on the implementation of international standards, as appropriate.

Main observations to be taken from the formulation of the article:

- International standards have a key role in trade facilitation.

- Neither the TFA nor article 10.3 provide a definition of “relevant international standards”, neither do they list the “appropriate international organizations”. It gives the responsibility to the implementer to identify the appropriate standards and organizations. With the vision that the more countries implement international standards (vs. the use of additional, local, unique or partially accepted standards and provisions) as the basis for their trade procedures, the simpler the process for clearance of goods will be globally. Any deviation from an international standard will make the clearance process longer and/or more complex, and as a result will increase the compliance cost and reduce trade facilitation.

- Article 10.3 is a “best endeavour” measure. It only encourages WTO Members to “make an effort” to use and participate in the development of international standards by appropriate international organizations as a basis for their importation, exportation or transit formalities and procedures.

- The country member should join the “appropriate international organizations” to develop and review periodically the standards.

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As outlined in the previous section, UN/CEFACT is a unique standards development organization which ensures that all of the standards that it develops are mutually compatible (based on the same structure with the same semantics) and it is ultimately approved by United Nations Member States. A dedicated training on article 10.3 and the use of international standards is also available and includes a brief comparison of different standards development organizations.  

Public Sector Digital Solutions for MSME Trade Support

In line with the Integrated Service for MSMEs in International Trade (ISMIT) concept presented earlier, governments that aim to develop policies and tools to enable MSMEs to access global markets should adhere to the following principles:

- Optimize the business environment which allows ISMIT platforms to provide services to MSMEs by cooperating with the service providers of cross-border trade, such as customs broker, freight forwarding, logistics service providers, warehouses, export agencies, banks, insurance companies, law firms, etc. Rights and responsibilities should be clarified for ISMIT, MSMEs, and service providers.
- Encourage an environment of free competition between platforms that offer ISMIT services. This should be considered under the national trade development agenda on how to leverage the services provided by ISMIT to enable MSMEs to access quality trade related services at a reduced cost, which would result in increasing the competitiveness of MSMEs in international market.
- ISMIT service provider should support national e-government strategies, for example by proposing an entry point into the National Single Window and other relevant systems of government agencies.
- Ensure that there is an appropriate legally enabling environment that recognizes the exchange of information electronically and electronic signatures including the provision of related infrastructure.

But in terms of electronic solutions to be developed by the public sector two major solutions are fundamental to develop a “facilitiated trade environment”, where MSMEs could start exporting by

- having the full visibility on the required import and export regulations and procedures, from the country trade information portal, and
- having efficient electronic exchanges with all government agencies, with the National Single Window.

Here is a list of key resources to support these key concepts:

### Trade Information Portal (TFA Article 1)

<table>
<thead>
<tr>
<th>Entity</th>
<th>Date</th>
<th>Document (with link)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNCTAD</td>
<td>2014</td>
<td>UNCTAD Trade Facilitation Technical Note No. 11</td>
</tr>
<tr>
<td>World Bank</td>
<td>2012</td>
<td>Developing a Trade Information Portal</td>
</tr>
<tr>
<td>UN/CEFACT</td>
<td>2021</td>
<td>Recommendation No.38 Trade Information Portals</td>
</tr>
</tbody>
</table>

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26 UN/CEFACT (2020), White Paper - Integrated Services for MSMEs in International Trade (ISMIT): Opening the Global Economy to MSMEs, Version 1
National Single Window (TFA Article 10.4)

<table>
<thead>
<tr>
<th>Entity</th>
<th>Date</th>
<th>Document (with link)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African Alliance for e-commerce (AACE)</td>
<td>2017</td>
<td>Guidelines for single window implementation in Africa</td>
</tr>
<tr>
<td>UN/CEFACT</td>
<td>2020</td>
<td>Recommendation No.33 Recommendation and Guidelines on Establishing a Single Window</td>
</tr>
<tr>
<td>UN/CEFACT</td>
<td>2013</td>
<td>Recommendation 34 Data Simplification and Standardization for International Trade</td>
</tr>
<tr>
<td>UN/CEFACT</td>
<td>2013</td>
<td>Recommendation 35 Establishing a Legal Framework for an International Trade Single Window</td>
</tr>
<tr>
<td>UN/CEFACT</td>
<td>2017</td>
<td>Recommendation No. 36 Single Window Interoperability</td>
</tr>
<tr>
<td>UN/CEFACT</td>
<td>2019</td>
<td>Recommendation No. 37 Single Submission Portal</td>
</tr>
<tr>
<td>WCO</td>
<td>2017</td>
<td>Building a single window environment</td>
</tr>
</tbody>
</table>

QUIZ

1) On which trade barrier, does the public sector have the most leverage to improve the environment for MSMEs?
2) What international models exist to develop national laws on electronic signature or on electronic commerce?
3) Which are the three trade facilitation concepts which benefit MSMEs the most when improved?
4) Could members of the public sector join "appropriate international organizations" to develop and review periodically international standards?
5) Can you name two digital solutions that could be developed and managed by the public sector that can contribute to trade facilitation?

Main sources for this session:

- UN/CEFACT (2020), White Paper - Integrated Services for MSMEs in International Trade (ISMIT):
  - Opening the Global Economy to MSMEs, Version 1
- WTO (2016), World Trade Report 2016, Levelling the trading field for SMEs
- https://unctd.un.org/
- https://www.tfafacility.org/agreement-article-resources
- UN/CEFACT Trade Facilitation Recommendations: https://unece.org/trade/uncefact/tf_recommendations
Examples of Facilitation Platforms

This is the last section of the manual. It categorizes and provides examples of integrated services.

Integrated services exist for MSMEs to conduct cross-border trade. One global definition for facilitation platforms useful for MSMEs is Single Submission Portals (SSP)\(^{27}\). Single Submission Portals (SSP) are facilitation platforms launched by traders, especially MSME that are willing to gain efficiency benefits in an international trade context. These are all electronic systems, as the main purpose is to provide trade facilitation measures to economic operators and eventually to Government authorities. An SSP is an access point that allows traders to exchange information, in a standard format and related to a specific activity, with relevant parties including Government agencies.

Some of the different examples of SSPs today include
- Port Community Systems,
- Cargo Community Systems,
- Data Pipelines,
- Customs Clearance Systems, and
- Integrated Services for MSMEs for International Trade (ISMIT).

SSPs cover mainly B2B processes such as contracting for transport, logistics and financial services. SSPs will often also facilitate regulatory processes through B2G information exchange. If an SSP exists in parallel to a national Single Window within an economy and facilitates regulatory processes through B2G information exchange, then the required links should be established by the SSP with the national Single Window.

Multiple SSPs could coexist within a single economy as they are private-sector driven, and presumably motivated by economic interest. Free market competition should be allowed to encourage the development of new, high-performance services and it is possible that only those SSPs which provide the most positive economic benefits to their users will survive.

Services that can be offered by a Single Submission Portal:
- **Clearance by border authorities:** the SSP may enable and facilitate the provision of complete and accurate declaration data to cross-border agencies.
- **Trade finance:** the SSP can facilitate increased trade finance collection security by helping to check and validate trade finance instruments for letters of credit terms.
- **Logistics:** SSPs can offer a wide range of services connecting transport and logistics chains:
  a) Information exchange regarding import and export of cargo between all players in the logistics and transport chain, sharing detailed information like the manifest, bill of lading or electronic consignment note;
  b) Contracting of transport and freight forwarding services;
  c) Status information and control, tracking and tracing of shipments throughout the entire logistics chain;
  d) Terminal pre-notification for the pick-up or delivery of containers; and
  e) Electronic facilitation of consolidation or division of shipments.

\(^{27}\) UN/CEFACT (2019), Recommendation No.37; Single Submission Portal
Single Submission Portals of Interest for MSMEs

The following use cases are taken from the UNECE Repository\textsuperscript{28}, which aims at showcasing how the Recommendation 37 on SSP can be implemented. In the repository, the complete use cases (with 34 questions) are reported directly by the organizations managing the SSP solutions.

This is the end of the training manual. We hope that this material was of help to you, your business, and your country. If you have any questions or remarks, please reach out to us at unece_info@un.org.

What motivated the establishment of the SSP?

Benefits

Domestic / Regional / Global

Geographic scope

B2B B2G

Regulatory

Provider

SSP

- Connectivity, simplification, standardization, automation and increased reliability of information exchange and data reuse
- Ease of transactions resulting in lower transaction costs
- Facilitation of G2B status information
- Improvement of port logistics
- Improvement of port management
- Reduction of errors in the processing of customs data
- Increased reliability of information exchange
- Simplification of procedures
- Increased visibility of port status
- Improved communication
- Enhanced security
- Increased efficiency of operations
- Increased transparency of processes
What motivated the establishment of the SSP?

**Benefits**

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<thead>
<tr>
<th>Geographic Scope</th>
<th>Domestic/Regional/Global</th>
<th>Benefits</th>
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<td>B2B</td>
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<td>B2G</td>
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<tr>
<td>B2C</td>
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</table>

- Improves logistics performance through tracking and tracing of cargos.
- Simplifies procedures for the processing of cargo.
- Security, traceability, and transparency.
- Better productivity.
- Anticipation of formalities, better planning.

**Geographic Scope**

- France, Benin, Togo, DR Congo, Jamaica, Indonesia, Malaysia, Hong Kong.
- Almost all communities have been involved, including importers, exporters, brokers, forwarders, authorities, and more.

**Services offered**

- Authorizations (port authority, customs, GPA).
- E-Permits, e-Payment for all types of cargo.
- Announcements, Movement (In-Out, Unloading, Loading).

**Type of SSP**

- Interchangeable (Stalestics, KPI's)

In the 80's, seeing the emergence of Information Technologies and the growing volume of trading, the logistics professionals of the Port of Le Havre decided to use IT to automate the processing of cargo first among the community of freight forwarders, truckers, and terminals. Then in the 90's, in collaboration with local Customs and Ports authorities, more stakeholders have been involved, reaching now all community to streamline, secure, dematerialize, and accelerate the administrative processing and allow tracking-tracing of cargos, reducing the time to automate procedures and making it easier to do business.

**Domestic/Regional**

- France, Benin, Togo, the DRC, Jamaica, Indonesia, Mauritius, Ivory Coast.

**Global**

- E-Permits, e-Payment (import, export licenses, invoicing…).
- Authorizations (port authority, customs, GPA…).
- Announcements & Reporting (Ship Manifest, B/L, Voyage, Un-Stuffing, …)
- Movement (Gate In/Out, Un-/Loading, …)
- Tracking-Tracing (real-time, customizable alerts, history, business intelligence).
- Improvements of (Sea, Air, Land, Railway, Carriage, Dry bulk, Liquid bulk, …) for all types of cargo.
- Security, traceability, and transparency.
- Better productivity.
- Anticipation of formalities, better planning.
- Involvement of all stakeholders, including importers, exporters, forwarders, brokers, authorities, and more.
- Information and logistics management.

**What motivated the establishment of the SSP?**

- Improved logistics performance through tracking and tracing of cargos.
- Simplified procedures for the processing of cargo.
- Security, traceability, and transparency.
- Better productivity.
- Anticipation of formalities, better planning.
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<tr>
<th>SSP Provider</th>
<th>Type of SSP</th>
<th>What motivated the establishment of the SSP</th>
<th>Benefits of the SSP</th>
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<tbody>
<tr>
<td>GeTS (Global Provider)</td>
<td>Integrated Services for MSMEs in International Trade (ISMIT)</td>
<td>Integration of physical, regulatory, and financial flows in the supply chain through digitalization, data exchange, reuse of data.</td>
<td>Time and cost savings, increased productivity, reduced misclassification of HS codes, enhanced trade information sharing and collaboration.</td>
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</table>

**Services offered**

- Trade declaration & Manifest services (Singapore, Canada, US, Mexico, Panama)
- J8Trade declaration & Manifest services (Singapour, Canada, US), B2C
- Electronic Airway Bill (eAWB)
- HS Classification Service
- Hive (freight forwarder community platform)

**Geographic Scope**

- Global
- Regional/B2B
- Domestic/B2C

**SSP** stands for Single Service Provider.
What motivated the establishment of the SSP?

**Benefits**

- Domestic/Regional/Global Geographic Scope
- B2B, B2C Services offered
- Improved and enhanced trade processes in the maritime trade
- Better working with the same standards
- Makes it easier for new companies to enter the maritime trade
- All the participants are working with the same standards
- All the participants are working with the same standards

**Scope**

- National
- Israel
- Foreign

**Provider**

- IS Transferring reports
- Starting with the notification of ship arrival, discharge of cargo, receipt of customs clearance, shipment of cargo, discharge of cargo, receipt of customs clearance, and release of cargo to the transport company and cargo owners.

In the export process, the ports get a booking message from ship agencies and cargo company, then get a booking message from ship agents and cargo company. In the export process, the ports get a booking message from ship agents and cargo company. In the export process, the ports get a booking message from ship agents and cargo company.

**Geographic Scope**

- National
- Israel
- Foreign

**Type of SSP**

- Island
- Regional
- Global

**Establishment of the SSP**

- Israel Pons Development Company Ltd

**Benefits**

- Improved the maritime trade processes in the maritime trade
- Better working with the same standards
- Makes it easier for new companies to enter the maritime trade
- All the participants are working with the same standards
- Better working with the same standards
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**Provider**

- IS Transferring reports
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What motivated the establishment of the SSP?

**Benefits**

- **Domestic/Regional/Global**
  - Geographic scope
  - B2B
  - B2G

- **Services offered**
  - Portbase
  - Port Community System

**Port community needs**

- to have available an information infrastructure to facilitate port logistics’ information exchange between all stakeholders in and around the Dutch seaports.

**National**

- The Netherlands

**Regional**

- BENELUX

**Global**

- EU

**What motivated the establishment of the SSP?**

- National
  - Port community needs

- Regional
  - Increased reliability of information exchange

- Global
  - Increased reliability of information exchange between all stakeholders

**SISP**

- Provider

**SSP**

- Type of SSP

<table>
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**Benefits**

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**Services offered**

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<tr>
<th>Port Authority of Valencia Port Community System Coordination of the Port Community processes and public-private data sharing.</th>
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<tbody>
<tr>
<td>Simplification, standardization, harmonization of processes.</td>
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<td>Transparency and advanced detection of issues that may block transport and port operation.</td>
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<td>Cost and time savings in conducting transport and port operations.</td>
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<td>Increase in the quality and timely reception of data and last-minute changes (real-time data provision).</td>
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<td>Establishment of a paperless and automated environment (i.e. paperless and automated clearing procedures, automated gate procedures, establishment of e-disbursement of a debar provision, change time delays and reduction of time delays in receiving or timely reception of goods).</td>
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<td>Modernization of the port community.</td>
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<td>Support to SMEs to work in an electronic environment.</td>
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**Port Authority of Valencia Port Community System Coordination of the Port Community processes and public-private data sharing.**

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