United Nations

Economic and Social Council

Economic Commission for Europe

Executive Committee

Centre for Trade Facilitation and Electronic Business

Twenty-seventh session
Geneva, 19-20 April 2021
Item 6 (e) of the provisional agenda
Recommendations and standards:
Support to capacity building and technical cooperation

Training Material on the Implementation of Single Window

Submitted by the secretariat

Summary

This training material was prepared in the framework of the UNDA project "Evidence-based trade facilitation measures for economies in transition." It aims to group together and explain the recommendations and standards available through the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT). This material concentrates on the implementation of Single Window mechanisms for import, export and transit regulatory requirements.

Document ECE/TRADE/C/CEFACT/2021/INF.5 is submitted by the secretariat to the twenty-seventh session of the Plenary for noting.
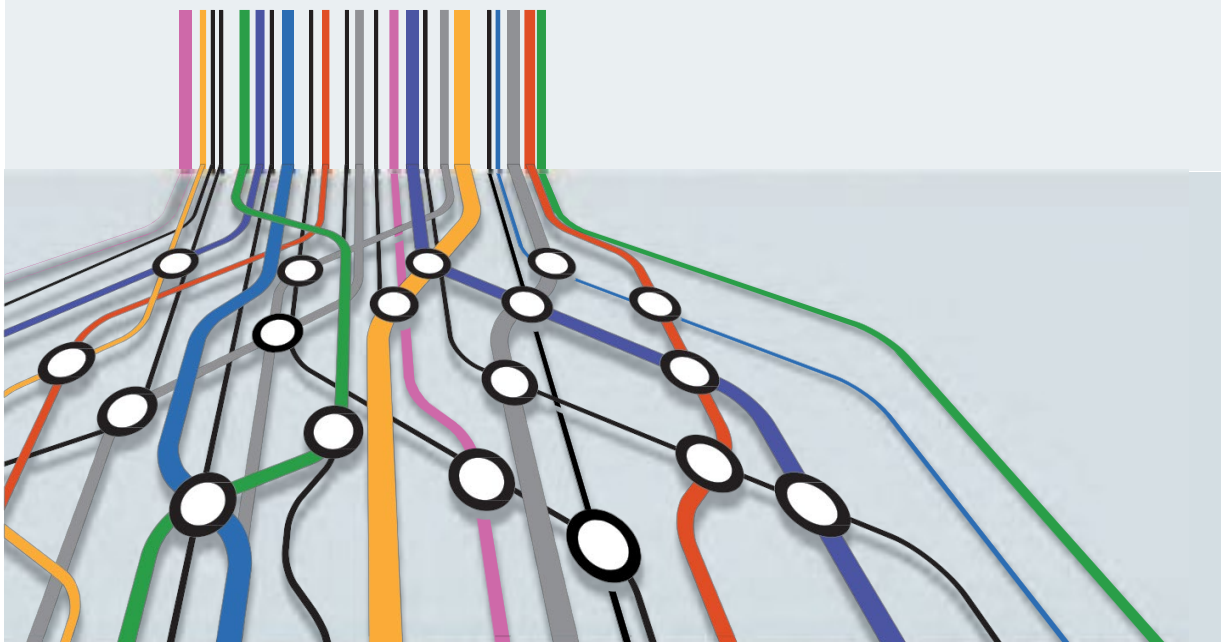
1.   Facilitating trade contributes to the competitiveness of economies and companies by reducing trade costs. It has the potential of boosting global trade.

2.   The international trading community continues to recognize the great potential of implementing a national Single Window as demonstrated in the World Trade Organization's Trade Facilitation Agreement. Accordingly, member States shall endeavor to establish or maintain a Single Window (article 10.4). To date, though, it does remain one of the least implemented measures of this agreement reflecting the level of complexity in its implementation. Single Window implementation is intrinsically linked to the United Nation's 2030 Agenda for Sustainable Development in its target 17.10; this Agenda recognizes trade as "an engine for inclusive economic growth and poverty reduction, [that] contributes to the promotion of sustainable development".

3.   Drafted by the United Nations Economic Commission for Europe (UNECE) Trade Facilitation Section, this training manual aims to group together and explain the recommendations and standards available through the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) as well as relevant material from other organizations. The manual consists of five sections targeting policymakers, project managers and government experts involved in the formulation, the implementation, the governance and the maintenance of Single Window mechanisms.

4.   The UNECE hopes that this training manual will intensify the efforts to implement the Trade Facilitation Agreement and contribute to streamlining border processes. It will therefore bring benefits to governments through increased revenue collection and fraud control, to businesses through increased competitiveness and to consumers through lower prices.

5.   The training material is presented annexed to this Plenary document in the format which it is intended to be used.

Annex

UNITED NATIONS TRADE

Single Window Training Material

Single Window Training Material

Contents

Single Window Training Material

This training material is a consolidation of best practices found in various recommendations and publications both directly on Single Window and on related topics. The intention is to connect the elements developed in these publications, and to provide a review of the practical stages of Single Window implementation. It touches on all aspects of implementation; however, it is not intended to replace any of the documents used to develop this training material.

While several sources have been used, the following are the fundamental United Nations Economic Commission for Europe (UNECE) recommendations, and the chapters in this document that relate to them:

Table 1: UNECE Recommendations related to Single Window and chapters cited in this training. Source: UNECE.

Rec.	Title	Chapter	Chapter title
No.33	Recommendation and Guidelines on Establishing a Single Window	all	
No.34	Data Simplification and Standardization for International Trade	2.6	Data harmonization and use of international standards
No.35	Establishing a Legal Framework for an International Trade Single Window	1.4.2	Legally enabling environment
No.36	Single Window Interoperability	3.2	Governance considerations
		5.2	Single Window interoperability
No.37	Single Submission Portal	5.3	Interoperability with other systems
No.40	Consultation Approaches: Best Practices in Trade and Government Consultation on Trade Facilitation matters	4.4	Consultation on trade facilitation matters

1. Single Window: basic principles

1.1 Introduction

1.1.1 Smart connectivity

A Single Window is the archetype of smart connectivity because Single Window deployments require the utilization and development of the three dimensions of smart connectivity: infrastructure, knowledge management and collaboration. However, the key dimension that differentiates between successful or failed Single Window deployments is collaboration: "*The most important prerequisites for the successful implementation of a Single Window facility are the political will of the Government, the participation of relevant governmental authorities and the full support and participation of the business community*".[1]

Recent decades have seen impressive growth in all types of data exchanges between entities such as Governments, organizations, businesses, people and things (via the internet of things). Technology, and the accompanying digitalization of information, has been the main

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[1] Source: UN/CEFACT Recommendation No. 33: Recommendation and Guidelines on Establishing a Single Window, 2020

driver behind this growth. However, more than just technology is required for connectivity to be "smart". It also requires the simplifying, streamlining, and standardizing of connections along three dimensions[2]:

- Infrastructure: the foundation of the connectivity, which consists of **physical infrastructure (roads, optical networks, electricity, etc.); information and communication technology (ICT); legal frameworks; and innovation policy and processes.**
- Knowledge Management: free, **openly available and harmonized standards, recommendations, guidance, regulations and conventions**[3] that promote, create and facilitate efficient connectivity and seamless data exchanges.
- Collaboration: the bringing together of public service needs, private sector know-how and/or private sector knowledge across sectors to support innovation and financing for knowledge management and **to develop, finance and operate sustainable connections.**

Figure 1: The dimensions of smart connectivity. Source: UNECE
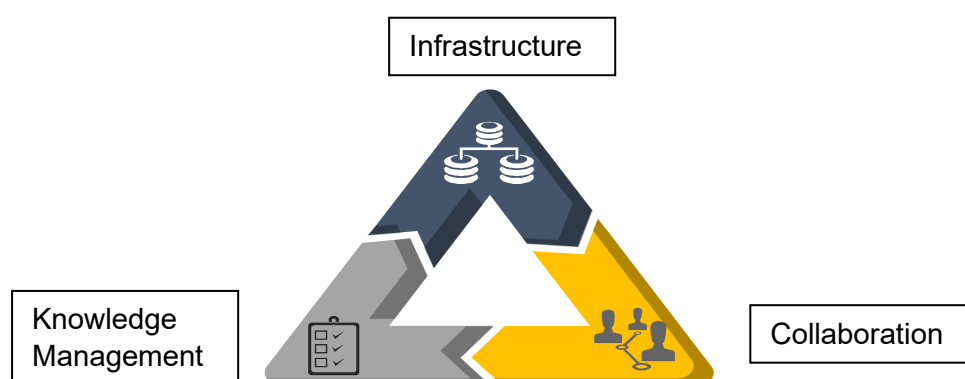
This highest level of smart connectivity is possible when the following conditions are in place along the three dimensions described earlier:

- **Infrastructure**:
  - All systems are connected to a network (for example, a Single Window)
  - The systems either share a common data resource or are interfaced (directly or through a third-party platform).
  - The systems each have an identity that is recognized by the others and is authorized for the electronic transfer of data.
  - The exchanged data is legally recognized whenever it is needed and appropriate.
- **Knowledge Management**

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[2] Source: UNECE Nexus: Sustainable Mobility and Smart Connectivity, (forthcoming)

[3] **Standard**: *"something used as a measure, norm, or model in comparative evaluation" or "a form of language that is widely accepted as the usual form"*; **Recommendation**: *"a suggestion or proposal as to the best course of action, especially one put forward by an authoritative body"*; **Guidance**: *"advice or information aimed at resolving a problem or difficulty, especially as given by someone in authority."*; **Regulation**: *"a rule or directive made and maintained by an authority."*; **Convention**: *"a way in which something is usually done" or "an agreement between states covering particular matters, especially one less formal than a treaty"*. (Definitions are from the Oxford English Dictionary.)

- o The process is optimized, with all steps adding value as a result of thoughtful process analysis and knowledge provided by recommendations and guidance published freely by recognized bodies.
- o Authorities support process improvements through regulations that have been developed in consultation with stakeholders and by participating in relevant international conventions.
- o Electronic systems identify the data automatically and correctly based on agreed syntax, and understand the values correctly based on agreed semantics.

- **Collaboration**
  - o Formalities, procedures and trade documents are aligned and, for neighbouring countries, working days/hours are aligned at border-crossing facilities.
  - o Risk analysis allows physical controls to be limited to the strict minimum based on the use of ICT and on coordination between the relevant regulatory entities (customs, inspection authorities, ministries, etc.).
  - o Changes in regulations, procedures, systems and knowledge management tools support constant improvement through consultations with all relevant stakeholders and appropriate public-private partnerships.
  - o Evolution in technology, processes or information exchanges is discussed in collaborative platforms which ensure that standards are implemented, information is available to all stakeholders and assistance with implementation is provided when needed.

1.1.2 History of the Single Window concept

In the latest version of UN/CEFACT Recommendation No. 33: Recommendation and Guidelines on Establishing a Single Window, "A *Single Window is defined as a facility providing trade facilitation that allows parties involved in trade and transport to lodge standardized information and documents with a single-entry point to fulfil all import, export, and transit-related regulatory requirements. Individual data elements should only be submitted once electronically."*

The concept and the definition have evolved over time. For example, the last sentence of the definition was slightly different in the previous version of the recommendation published in 2005 as it put a conditional element on the use of information technology: *"If information is electronic, then individual data elements should only be submitted once."* [4]

To clarify this evolution, we need to go back to the beginning of the concept. Almost twenty years ago, when the concept was first launched, the implementation of the Single Window started as a mostly manual environment with the cooperation of all border authorities. It did not imply the use of an IT system. The emphasis was on all information being submitted only once at one physical location, sometimes identified as "trade-facilitation centres" or "trade points". Trade stakeholders (e.g. customs, banks, chambers of commerce, freight forwarders, transport and insurance companies) were grouped together under a single physical roof or linked virtually to the trade point to provide all the services required for trade transactions. [5]

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[4] Source: UN/CEFACT Recommendation No. 33: Recommendation and Guidelines on Establishing a Single Window, 2005
[5] Source: UNECE: ten years of single window implementation: Lessons learned for the future, 2011

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Today, most definitions of a Single Window refer to an electronic platform. An important principle for such platforms is that, when information is electronic, individual data elements need only be submitted only once. It is important to underline that the objective is not the electronic platform, but the trade facilitation that it can offer.

1.1.3   Context of the WTO TFA

Single Window is fundamentally a trade facilitation concept and has therefore a specific position in the World Trade Organization (WTO) Trade Facilitation Agreement (TFA)[6]. The TFA negotiations were 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. It further contains provisions for technical assistance and capacity building in this area. So far, 151 WTO Members have ratified the TFA[7] and 77 have notified the implementation of their Single Window as of September 26 2020:

Argentina	Hong Kong, China	North Macedonia
Australia	Hungary	Norway
Austria	Iceland	Oman
Belgium	India	Paraguay
Brazil	Indonesia	Peru
Bulgaria	Ireland	Poland
Canada	Israel	Portugal
Chile	Italy	Romania
China	Japan	Russian Federation (the)
Colombia	Kazakhstan	Saudi Arabia
Costa Rica	Korea (the Republic of)	Senegal
Cote d'Ivoire	Kyrgyz Republic (the)	Singapore
Croatia	Lao People's Democratic Rep.	Slovak Republic (the)
Cyprus	Latvia	Slovenia
Czech Republic	Liechtenstein	Spain
Denmark	Lithuania	Sweden
Dominican Republic (the)	Luxembourg	Switzerland
El Salvador	Macao, China	Chinese Taipei
Estonia	Malawi	Tajikistan
European Union	Malta	Thailand
Finland	Mauritius	Turkey
France	Mexico	United Kingdom
Georgia	Morocco	United States of America (the)
Germany	Netherlands (the)	Uruguay
Greece	New Zealand	Viet Nam
Guatemala	Nicaragua	

The Single Window article of the TFA (10.4)[8] is subdivided into four sub-articles, each defining an important element related to Single Window which reflects the same points developed in the UNECE Recommendation No.33:

   1)   Art. 10.4.1: Each [WTO] Member shall establish a Single Window

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[6] WTO TFA website: https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm
[7] Ratifications counter available at: https://tfadatabase.org/ratifications (as of 14 June 14th, 2020).
[8] WTO TFA available at: https://tfadatabase.org/files/pages/Trade%20Facilitation%20Agreement%20-%20931%20-%20en.pdf (Accessed 18 December 2020).

2) Art. 10.4.2: Single entry point for single submission of all documentation and data
3) Art. 10.4.3: Notification of the parameters of the Single Window
4) Art. 10.4.4: Use of information technology to manage the Single Window information

1.1.4 Context of Single Window implementation internationally

One of the first successful documented deployments of electronic transmission of trade documents between private entities and government departments on a countrywide scale was developed in Singapore in 1989. Within ten years, several other deployments, using electronic data interchange (EDI) techniques, were also implemented: Taiwan, Province of China (1992), Mauritius (1994), Hong Kong (1997), Japan (1998), etc.

The 2019 the United Nations Global Survey on Digital and Sustainable Trade Facilitation[9] provided an overview of Single Window implementation in 128 countries around the globe.

Figure 2: Single Window implementation according to the 2019 UN Global Survey on Digital and Sustainable Trade Facilitation. Source: UNECE.

State of implementation of electronic single window systems

| 32 | 40 | 18 | 38 |

- ■ Fully implemented ■ Partially implemented ■ Pilot stage of implementation ■ Not implemented
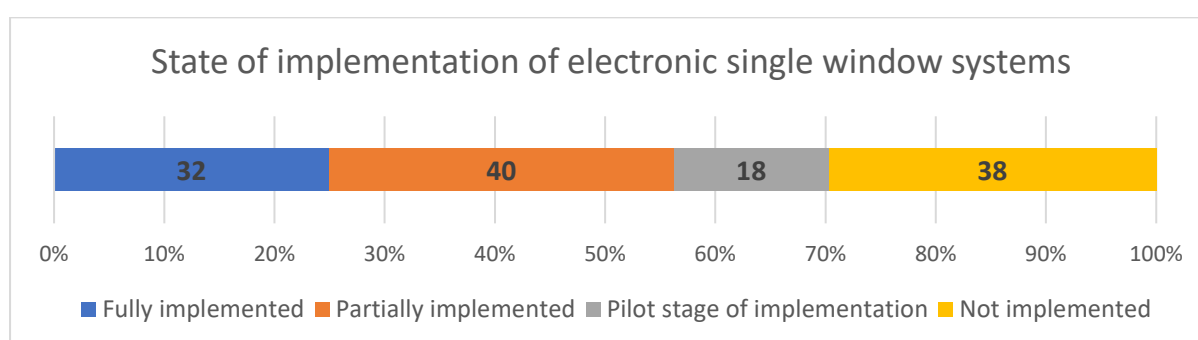
Another source for implementation status is the WTO, as it is mandatory for its members, having ratified the TFA, to inform the secretariat of their implementation status.

Figure 3: Single Window implementation according to the WTO as of 2020. Source: WTO.

TFA Art.10.4: Single window rate of implementation

| 39.6% | 6.7% | 50.0% | 3.7% |

- ■ Implemented
- ■ Implementation requiring additional time
- ■ Implementation requiring additional time and assistance
- ■ No information

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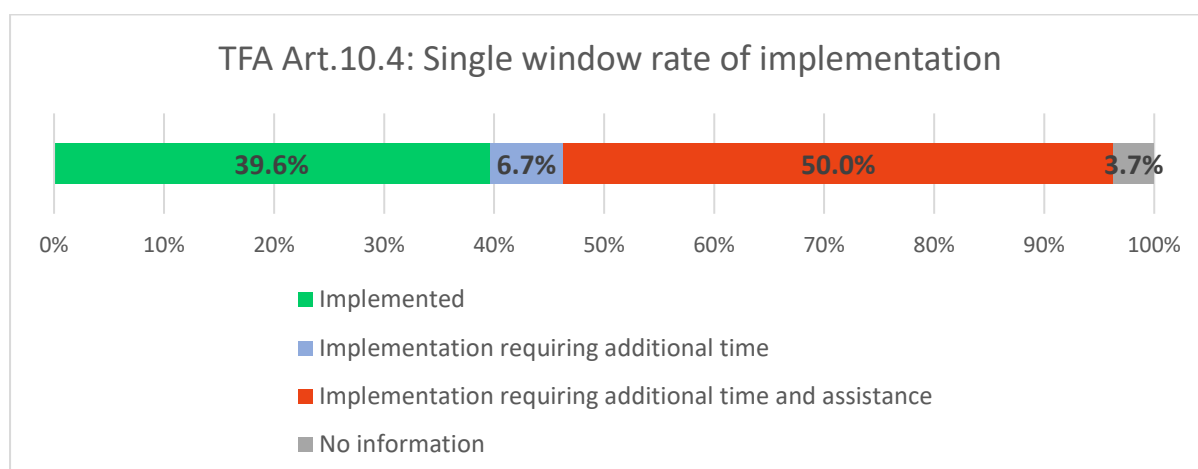
[9] Source: The United Nations Global Survey on Digital and Sustainable Trade Facilitation (2019). Available at: untfsurvey.org

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As we can see from these statistics, less than 40 per cent of countries have completed implementation of a Single Window. While the Single Window concept was developed almost forty years ago, it remains a global trade facilitation opportunity.

1.2 Knowledge Management

Single Window systems have been implemented over four decades, and there is now an opportunity to use this experience to learn best practices and avoid pitfalls. The first lesson is to unambiguously clarify what is considered Single Window and to align the expectations of all the stakeholders.

1.2.1 Single Window Definition

The definition in UN/CEFACT Recommendation No. 33 is as follows:

A Single Window is defined as a facility providing trade facilitation that allows parties involved in trade and transport to lodge standardized information and documents with a single-entry point to fulfil all import, export, and transit-related regulatory requirements. Individual data elements should only be submitted once electronically

It has been proven that the implementation of a Single Window based on this definition is highly beneficial for both Governments and trade.

For Governments it can bring better risk management, improved levels of security and increased revenue yields with enhanced trader compliance.

Trading communities benefit from transparent and predictable interpretation and application of rules and better deployment of human and financial resources, resulting in appreciable gains in productivity and competitiveness.

Any implementation of a Single Window should result in a visible reduction in the time and cost of doing trade.

Here are the five key elements embedded in the definition, which will be reviewed in detail in this session:

1. **Parties:** This implies the parties that are involved in trade and transport (both from the public and private sector).
2. **Standardized information and documents:** Use of internationally recognized standards for Single Window implementation is key for coordination between stakeholders and between countries.
3. **Single entry point:** This is a facility where all data concerning a transaction is submitted electronically; an economic operator should only need to submit their data to one such entry point for their transaction.
4. **Fulfils regulatory requirements:** This implies that a Single Window fulfils a government function and, as such, has received a relevant mandate from the Government to perform these actions.

5. **Single submission** of individual data elements: Individual data elements, which have been submitted once, should not need to be submitted again. This does not mean that all individual data elements must be sent at the same time in a single submission; data can be sent progressively.

1.2.1.1 Definition: key element 1 - parties involved in trade and transport

A Single Window is a cooperation tool; representatives from all relevant parties from the public and the private sectors should partner in the establishment and operation of the system.

On the public sector side, a Single Window is generally managed centrally by a lead agency, enabling the appropriate governmental authorities and agencies to receive or have access to the information relevant for their purpose. Although customs administration is usually the most visible body at the international border, many more governmental agencies share responsibility for regulating and controlling imports, exports and transit of commercial goods. Commercial goods and their means of transport must conform with various acts and regulations for market entry, exit and conveyance. Accordingly, different governmental bodies are tasked with ensuring conformity with State regulations and intervening in trade activities on both the political and operational levels.

Regulatory bodies can include the following:
- Tax authorities
- Border regulatory agencies
- Licensing authorities (non-tariff regulation)
- National statistics authorities
- State authorities carrying out transport control
- State authorities carrying out veterinary control
- State authorities carrying out phytosanitary control
- State authorities carrying out sanitary and quarantine control
- State control (supervision) over compliance of technical regulations
- State control of export, radiation, foreign exchange, etc.
- Government owned port authorities
- Organizations authorized to issue permits, including chambers of commerce, certification bodies, and testing laboratories (centres) performing work in the field of assessment (confirmation) and compliance with technical regulations.

Agencies other than customs are generally referred to as "other governmental agencies" (OGAs). The term "participating governmental agencies" (PGAs) is used in some countries to refer to the agencies currently connected with a Single Window.

Private sector stakeholders of a Single Window may include the following:
- Exporters, importers, exporting companies, central purchasing companies and their representative associations
- Carriers, non-vessel operating common carriers (NVOCC), ship agents, global service and sales agents (GSSAs), express carriers, handling agents, stevedores and their respective representative associations
- Logistics companies, freight forwarders, forwarding agents and their representative associations
- Customs brokers, customs agents, customs carriers, owners of temporary storage warehouses, owners of customs warehouses, owners of free warehouses, owners of duty-free shops and their representative associations

- Certification companies, chambers of commerce and industry
- Banks, second-tier banks (branches), non-banking credit and finance institutions, insurance companies, patent organizations (patent attorneys), postal operators and other organizations
- Single Submission Portal operators

1.2.1.2 Definition: key element 2 - standardized information and documents

The harmonization, simplification and standardization of all data used in international trade is an essential requirement for the smooth, automatic operation of a Single Window, as the objective of a Single Window is to streamline processes and make trading easier, both for private-sector operators and government agencies. It is not simply meant to dematerialize existing paper processes (as dematerialization alone does not optimize processes for greater efficiency).

This may seem trivial, as today we see electronic exchange of information everywhere, performed in many different environments and sectors, using dozens of open or proprietary protocols, messages and file formats. But electronic exchange of information cannot operate efficiently without common standards. Machines need a "common language" to understand each other. In the future, machine learning and artificial intelligence may, in some cases, allow a receiving IT system to understand the exact semantic meaning of messages and their data based on context. However, the technology still needs to be developed to do this cost effectively and the required level of accuracy would be difficult to attain — at least with currently available technology.

One commonly identified barrier to using standards for the electronic exchange of information is the time and money required for their initial set up, including the need to modify existing legacy systems and the need for all parties participating in the exchange to make this investment. Some shortcuts have been employed; however, they have often been found to create efficiency challenges in the long run:

- The development of "translation bridges" (interfaces) between systems has been used to avoid modifying the data semantics in the different legacy systems. This may be a workable practice in a 1-to-1 interface, but it becomes a clear issue in a 1-to-multiple interfaces; the IT support required to manage these independent "bridges" raises the operating cost.
- Initiatives have been employed to develop a new, specific user-group data standard. These initiatives usually happen when there is a lack of knowledge about which standards already exist and how they can be used. Again, the maintenance of such a specific standard can cause inefficiency in the long run.

These barriers can be real from a short-term perspective, but standards do bring important benefits and returns on investments in the short term — especially given that common, standardized libraries of semantics (definitions) that allow for the use of unambiguous, clear and defined standardized terms and codes exist; the largest and most complete library of this kind is the UN/CEFACT Core Components Library (CCL), which also ensures compatibility with other international systems and applications, documents and data models.

1.2.1.3 Definition: key element 3 - single entry point

The Single Window, through a single entry point, enables a trader to submit all trade declarations and all relevant information to the various authorities for processing and approval with a single, unified response, and in a single data format.

In other words, the trader is only required to submit their standardized information and documents to one entry point from which the information is distributed to relevant agencies that have an interest in the transaction.

This can be done in the following ways[10]:

1) Through an integrated system where the data is processed by the single entry point
2) Through an interfaced system (decentralized) where the data is sent through the single-entry point to each agency for processing, or
3) Through a combination of (1) and (2) where some agencies may use the single-entry point to process the data and other agencies may process the data in their own system

At first thought, this key element indicates that there is only one official Single Window in an economy, and all government agencies should — either at the outset or progressively — participate in this framework in order to streamline processes and eliminate redundancies. In this case, no other Single Window should exist within that economy, and it would be called the "National Single Window".

However, the reality of what is emerging in some countries is the establishment of multiple systems, each claiming to be a Single Window. The principle is that a Single Window system is established with the economic operator as its main user. Consequently, more than one Single Window could, in fact, coexist in a same economy, each targeting a different type of economic operator as long as the five key elements of the Recommendation No. 33 definition are respected (notably having a mandate from a government authority and being a single entry point for the user). The economic operator, when acting in any particular role, should not be obliged to communicate with multiple Single Window systems for the same operation. The specific role of each Single Window system should be clear. This is particularly important if multiple official Single Window systems coexist in the same economy.

1.2.1.4   Definition: key element 4 - fulfilling regulatory requirements

To be operational and legitimate, the Single Window system must fulfil a government function and, as such, should have received a relevant mandate from its Government to perform the entrusted actions.

The regulatory functions are mainly the management of business-to-government (B2G) transactions — either as an integrated system, an interface, or both (see definition for key element 3). This definition emphasizes that business-to-business (B2B) platforms cannot pretend to be a Single Window if they do not have a clear mandate to be the sole provider to manage any regulatory submission. Yet such a platform could potentially evolve into a Single Window if it receives the required mandate.

Another requirement to become a Single Window is ensuring a neutral, secured information channel between the trader and the single entry point, as well as between all government agencies, where complete confidentiality of the transferred data and information are ensured.

1.2.1.5   Definition: key element 5 - single submission of individual data elements

The single submission of individual data elements for one transaction can span across time, depending upon the type of merchandise and its method of transport (potentially in multiple deliveries). For example, if a preliminary request for an import permit is submitted (prior to import of goods) and the main parties and merchandise information is submitted as part of

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[10] See also section 1.4.1: Electronic system

that request, then the same information should not be resubmitted when the goods arrive, unless that information has changed.

With single submission, we must still be cautious and consider the changes that can happen due to logistic challenges related to the overall trade context. Therefore, timestamping of submitted information is key to a well-managed Single Window.

In a consignment, a single data element can vary from the beginning to the end of the journey; for example, the time of arrival may change because of delays en route or delays within the port, so it may be necessary to update the original information that was sent.

1.2.2 Single Window advantage and potential services

A Single Window can provide a wide variety of services and facilities depending on its design and coverage. These can include services in the spheres of customs and tax procedures; tariff and non-tariff regulatory compliance (including duty/fee calculations and their e-payment or remittance control); technical regulatory compliance; application of sanitary, veterinary and sanitary-phytosanitary quarantine measures; safety/security; management of quota levels; intellectual property rights; submission of supporting documentation, among others.

The benefits for traders are primarily in the reduction of costs and time, obtained by having processes managed and visible within the Single Window system.

For government agencies, a Single Window can provide the following benefits:

- The exchange of information from declarations and government responses to traders to those exchanges between agencies constitutes one of the main services and is essential to the smooth functioning of a Single Window facility.
- An integrated risk management system can be incorporated into the Single Window. One of the mandates of each government agency engaged in border control is to perform control diligently, while facilitating trade to the maximum extent possible and without blocking cargos or performing long physical inspections. Comprehensive, integrated, transversal risk management between customs authorities and other border-control authorities is therefore becoming a priority; especially as it is aligned with the WTO Trade Facilitation Agreement Art. 7.4.3 on risk management. The TFA states that "*each Member shall concentrate customs control and, to the extent possible other relevant border controls, on high-risk consignments and expedite the release of low-risk consignments.*" If border-control authorities do not have joint-inspection agreements, the use of different risk management systems by different authorities can result in less trade facilitation, as shipments that are flagged as being risky by more than one agency become subject to multiple inspections. The Single Window, by being the interface between the different government agencies, can support an integrated risk management system.
- The Single Window can manage a large volume of trade data and information within its data warehouse system. As a single storage mechanism for regulatory compliance, it provides a 360-degree view of all imports, exports and transit goods. The analysis of trade-flow data and performance, and the preparation of analytical reports and statistical material, can be done quickly and easily since the Single Window is essentially the main source of the data. It can also support political decision-making with comprehensive and accurate visibility of trade in the country.

- As a one-stop payment platform to facilitate payments in electronic form for duties and other charges, the Single Window ensures rapid and accurate payments to government authorities and agencies.

1.2.3 Other concepts sometimes related to the Single Window

First, we need to clarify that there is not as of yet any certification process concerning Single Window implementation. As the same time, it is such an important concept for international trade that stakeholders often claim their system to be a Single Window. The most important work to clarify and develop a complete definition of a Single Window is UNECE Recommendation No. 33, which identifies five key elements that must exist for a system to be named a Single Window, without which the trade facilitation objectives of the Single Window may not be achieved.

National Single Window
The term National Single Window (NSW) indicates that there is only one Single Window and all government agencies are (or will be) connected to that system.

Role-designated Single Window
Due to the complexity of trade, we sometimes face the challenge where government agencies prefer to create their own system without coordinating with other agencies. In this case, more than one Single Window may coexist, but the five key elements of the Single Window definition should still be respected.

This type of Single Window is defined per the users it targets. The economic operator still submits a document once (single entry point) and should not be required to submit anything to another Single Window. Roles designations can take the following forms:

- A Single Window for importers and/or exporters
- A Single Window for maritime carriers
- A Single Window for air carriers
- A Single Window for financial institutions
- etc.

This is different from cases which have been observed where a "regulatory Single Window", "customs Single Window" or "logistics Single Window" coexist. These solutions are centred on the administration and not on the user. These require the economic operator to submit he same information to various systems and therefore do not match with the definition requirements for the single submission of data.

It is a challenge to avoid that several administrations develop their own "Single Window" because a true Single Window requires common strategic objectives and collaboration. Again, it goes back to one of the most important prerequisites for the successful implementation of a Single Window facility: the political will of the Government, the participation of relevant governmental authorities and the full support and participation of the business community. There must be a lead agency in charge with the capacity to define the parameters of the different systems.

Regional Single Window
A Regional Single Window (RSW) is a mechanism that handles trade-related regulatory requirements within a given region. This might be collaborative system of NSWs (a network of

networks), it might simply provide additional levels of functionality (such as shared procedures between economies) or it might completely replace all the NSWs in a given region. In these cases, no other RSW should exist for trade-related regulatory requirements.

Single Submission Portal

A Single Submission Portals (SSP) is focused more on B2B transactions and allows traders to submit all information related to a specific activity to a single electronic platform. This platform then redistributes the information to all authorized participants within that portal.

A Single Submission Portal differs from a Single Window in that it may or may not handle regulatory procedures and it may or may not be the only portal within a market. Some examples of SSPs include port community system, cargo community system, Integrated System for MSMEs in International Trade.

Single Environment

Single environments are developed through a network of government systems that work collaboratively to aggregate data related to a transaction, with the intention of satisfying a regulatory requirement. Usually, the systems establish a certain level of reliability and data protection between themselves to seamlessly share the information. This can be completely transparent to the trader. This collaboration between IT systems is, of course, only the technical side of the much larger trade facilitation process of harmonizing and streamlining procedures, business processes and data elements.

It is slightly different from a Single Window as defined in UNECE Recommendation No. 33, as the facilitation here is taken from the point of view of the agencies and not the economic operators. The result is that there is, most likely, no single entry point (traders need to communicate with each agency independently) and thus the data and documents may not be standardized between these processes.

The challenge is greatest for countries who have already invested in electronic systems for individual government agencies. They must write off the investment before changing systems. In this case, it is sometimes more logical to set up a network of systems that work together and exchange information. This does provide the trader with facilitation, but it is not a Single Window unless it can satisfy all five points of the definition established in UNECE Recommendation No. 33.

Table 2: Determining if a system complies with the UNECE Recommendation 33 definition. Source: UNECE.

	Exclusive on the market for this type of operator	Standardized information and documents	Government mandate for Single Entry Point	Regulatory processes	Single submission point for individual data elements
Single Window	Must be	Must use	Must have	Must include	Must be
Single Submission Portal	Can be	Must use	Can have	Can include	Should be
Single Environment	Can be	Must use	Can have	Must include	May be

Port community system

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A port community system (PCS) usually defines itself as a neutral and open electronic platform that enables the intelligent and secure exchange of information between public and private stakeholders to improve the efficiency of the logistics of its operating location. Most PCSs have been developed by port authorities to improve the competitive position of their port, by ensuring a single submission point for individual data elements.

A PCS can be considered a Single Window system if it satisfies the five key elements of the definition of Recommendation No. 33 in the following ways:
- The PCS has received a clear mandate from the Government to be the sole provider of specific regulatory functions.
- There is only one PCS in the given economy; if there are multiple PCS in the same economy, then the carrier or other economic operator trading within the given economy will need to communicate with multiple systems — therefore it is not a Single Window for all operations within that economy.
- The PCS covers all transactions within the economy related to international trade and not just those in the geographical region of the port.

If the first two conditions are fulfilled, but not the third, the type of economic operator should be identified by the system (for example as a Single Window for maritime carriers), as there is a good chance that other systems are being used for other transport modes (air, rail, and road) and for non-transport-related transactions.

Another term with similar attributes is the **cargo community system**. A cargo community system (CCS) is an information technology platform linked to the freight flows (import/export /transit) of any kind of cargo passing through an identified port, airport, or multimodal site(s) at the local or national level. A CCS is open to all parties involved in cargo freight and logistics, including customs administrations. It handles a database in which information is collected, processed, stored and exchanged, and aims to enhance freight optimization, trade safety and security, cargo tracking and tracing, and to facilitate customs and administrative procedures. These systems might be considered a Single Submission Portal or as contributing to a Single Environment.

Trade Information Portal
Governments have obligations to provide information to the international trading community for all cross-border regulatory procedures (see TFA Article 1: Publication and availability of information). These portals are depositories of the processes and regulations in a specific country; they do not manage transactions and cannot be considered a Single Window.

1.3   Collaboration

Single Window implementations are generally large, transformative and therefore expensive projects, as they require alignment between stakeholders without direct organizational relationships. As identified in the introduction, the key factor in a successful implementation is the existence of a strong political will to implement a Single Window.

The other factors are important in terms of managing project variables such as time and cost, but without a clear political will from the beginning to the end of the project, no budget or amount time will transform a Single Window initiative from ideation to operational gains based on the trade facilitation effect of a Single Window. Establishing the necessary political will is the foundation upon which all the other success factors rest.

1.3.1 Importance of a lead agency and political will

There are no unique rules in identifying the lead agency for the deployment of a Single Window because it depends on the legal, political and organizational context. The lead agency must be a strong organization with the necessary vision, legal authority, political backing, human and financial resources and links to the business community.

Customs is usually the agency to lead a Single Window deployment and implementation because of its pivotal role, the information and documentation it receives, its key position at borders and its ability to mandate use of the system to clear or move traded goods. While it can facilitate the initial deployment, leadership challenges can occur when the Single Window needs to include processes and agencies outside of the management of the lead agency. In a best-case scenario the lead agency would be a National Trade Facilitation Body (NTFB), but unfortunately, these organizations usually lack the budget and authority to manage such a project. A third option could be to develop a dedicated Single Window project management group, with a membership that includes senior representatives of the key agencies directly involved in implementing and utilizing the Single Window. This project management group should have the power to commit funds to the project, make resource allocation decisions and commit their relevant organizations to participating in the project.

It must be stressed that the lead authority will face challenges during the roll-out phase, and it is imperative that it
- provide the highest qualified human resources to join the project team;
- mitigate, or even overcome, resistance to change among some stakeholders;
- communicate on a large scale during the rollout phase; and
- manage the pressure related to critical technical incidents, which will no doubt occur in the Single Window.

1.3.2 Private sector engagement and public-private partnership

A Single Window is an organizational trade facilitation tool and practical model for cooperation between agencies within government and between government and trade. Representatives from all relevant public and private sector agencies should be invited to participate in the development of the system. The ultimate success of the Single Window will depend critically on the involvement, commitment and readiness of these parties to ensure that the system becomes a regular feature of their business process.

Regarding the operational issues of the Single Window, the public sector does not always have the capacity to operate the system in house. Some countries have therefore included in the project the participation of a specially designated Single Window operator. This operator is a specialized organization, usually operating under a leading agency, which is directly involved in the creation, development and maintenance of information systems for the Single Window. Global practice shows that the Single Window operator may be a local private company or a company with partial state participation. In this case, the Single Window model is implemented in the form of a public-private partnership.

Combining the Government's convening power and experience with private sector innovation and funding is a good example of how a public-private partnership could be used in the establishment and operation of a Single Window system.

1.4   Infrastructure

The infrastructure is often the most complex dimension to deal with, as there is never just one option for overcoming a technical challenge, and certain stakeholders have legacy systems which will need to be replaced or transformed. This is where a large portion of the cost can occur, and it can potentially cause hesitation in moving forward.

However, one thing is clear with regard to infrastructure: it is better to move forward in the deployment of the Single Window if there are sufficient elements to reach the objective of a secured trade facilitation mechanism rather than to wait for the best potential solution.

1.4.1   Electronic system

Today, a Single Window is fundamentally an ICT system managing data in electronic format. But, as presented above, Single Window core functionalities can vary depending on the context of deployment.

It can be developed as an interfaced (mailbox type) system, where the role of the Single Window is limited to transferring data between stakeholders. It can be developed as an integrated (intelligent) system, where the data is processed within the Single Window (e.g. incorporating risk management), or it can be a combination of both. In each case the ICT infrastructure is an important element as it must ensure the security, confidentiality and reliability of the transactions.

In today's world, several options exist for ICT deployment. However, mainly due to the perceptions of decisions-makers (and sometimes legislative requirements), most Single Window deployments happen "on premises" where data centres have been built at the lead agency facilities (primary and recovery sites). High infrastructure and operational costs are required to have a specific team managing these facilities.

In parallel, while increased digitization ensures trade facilitation benefits, it also presents new challenges for data security and user privacy. As the number of systems, and the volume of data managed in them, increases exponentially they become a more vulnerable target for hackers. Thus, cybersecurity is becoming a critical element in the success of Single Window deployments and must be analysed and included in budget planning.

1.4.2   Legally enabling environment

It is important to establish the legal basis for the operation of the Single Window in line with national laws and regulations. A thorough review of existing legislation, regulations and decrees should be conducted to ensure compliance with current national (and international) law, to identify any gaps that may exist and methods for addressing them. UNECE Recommendation No. 35: Establishing a Legal Framework for an International Trade Single Window outlines the legal aspects in detail.

The key legal aspects for the legal infrastructure are as follows:
- **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. In parallel, electronic archiving should also be established.
- **Data protection**: Establish adequate security and access protocols through identification, authentication, and authorization mechanisms, including elements of data ownership.

- **Authority to access and share data between government agencies**: Governments should establish regulations regarding the use of data with respect to retention, confidentiality, redistribution and sharing.
- **Liability issues**: like national and international legal recourse and possible indemnities for damages suffered, as well as the possibility of establishing limits for liabilities in some circumstances.
- **Dispute resolution**: Provisions for arbitration or similar approaches to dispute resolution between parties should be put in place for model consortium agreements and end-user agreements for parties that use the Single Window. Similar provisions may be provided for in agreements where a Single Window is operated by a private or semi-private enterprise on behalf of a government agency.
- **Competition**: Elements of competition should be evaluated — especially considering the requirement to have a single system to avoid concerns about antitrust and protectionism (i.e. the Single Window should not become a monopoly).
- **End user agreements**: It is necessary to establish end user agreements with the users of the Single Window (i.e. with traders, freight forwarders, agents, banks, etc.). Such agreements should include terms related to access and security controls, procedures, electronic signatures (if required for the ICT environment), liability issues and so on.

With regard to relationships between the different parties involved in the Single Window, memoranda of understanding (MoUs), service level agreements of various types, and information security agreements are important in facilitating engagement and aligning the expectations of each entity in each project context. These formal agreements ensure that the relationships are clear from the beginning and evolve over time to ensure trustworthiness in transferring data, connecting and collaborating in the single system.

Finally, UNECE Recommendation No. 35 includes references to a variety of international organizations engaged in developing policy considerations for Governments and the private sector, including treaties and conventions, model laws, guidelines and recommendations that may be useful in the establishment of a National Single Window and its cross-border operations.

QUIZ

1) WHAT ARE THE PREREQUISITES FOR THE SUCCESSFUL IMPLEMENTATION OF A SINGLE WINDOW?

2) WHAT ARE THE FIVE KEY ELEMENTS EMBEDDED IN THE UN/CEFACT SINGLE WINDOW DEFINITION (REC No. 33)?

3) WHAT IS THE DIFFERENCE BETWEEN THE CONCEPTS "SINGLE WINDOW" AND "SINGLE WINDOW ENVIRONMENT"?

4) IS THE DEPLOYMENT OF A SINGLE WINDOW AMONG WTO MEMBERS BINDING UNDER ARTICLE 10.4 OF THE WTO TRADE FACILITATION AGREEMENT?

5) CAN YOU LIST AT LEAST FIVE GOVERNMENT AUTHORITIES THAT USUALLY PARTICIPATE IN THE SINGLE WINDOW?

Main sources for this session

- African Alliance for E-Commerce (AACE) (2017). *Practical Implementation Guide of Single Windows for Foreign Trade* (version 2). Available at AACE – Guide de mise en œuvre de Guichets Uniques en Afrique V_Anglaise.indd (swguide.org).
- UNECE (2020). *Recommendation No. 33: Recommendation and Guidelines on Establishing a Single Window*.
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- UNECE (2021). Nexus: Sustainable Mobility and Smart Connectivity.
- UNECE et al. (2011). Ten years of Single Window Implementation: Lessons Learned for the Future. Discussion paper for the *Global Trade Facilitation Conference 2011: Connecting International Trade*.
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2. First steps in implementing a Single Window

In countries where there is currently no Single Window or if there is a new initiative to implement a more inclusive version of a Single Window (adding OGAs from the beginning), it is important to develop the right framework for successful implementation.

Currently, Single Window implementations are usually one of the projects included in a global trade facilitation program — either related to the WTO TFA, to a regional trade facilitation initiative or to a country's development plan.

The following are some of the tools and best practices related to such a program.

2.1 Project management group

Implementing a Single Window is a significant undertaking involving many stakeholders and requiring commitment from many players in both government and business. It is essential, therefore, that a systematic approach be adopted from the outset. Presuming a decision is reached to proceed with a feasibility study, the meeting should establish a project management group made up of senior representatives of the key agencies that will be directly involved in implementing and utilizing the Single Window. The meeting should also establish a task force involving the appropriate technical and managerial representatives from key agencies to carry out the organizational and implementation work required for the project.

Each country has different historical, political, legal, economic and geographic contexts, and each national member of the trade community has its own responsibilities regarding trade processes. All countries have their own regulatory histories and existing systems and it is always a challenge to change and move toward simplified, standardized and harmonized regulatory processes which could facilitate trade. In the vast majority of countries, the benefits of permanent frameworks for consultation and cooperation between all national stakeholders have been recognized for supporting such change. The stakeholders include all public administrations involved in the clearance of imports and exports as well as representatives of relevant private sector interests such as transporters, freight forwarders, exporters and importers. These stakeholders have formed National Trade Facilitation Bodies (NTFBs). Such frameworks are not new — the first version of UNECE Recommendation No. 4 on the establishment of national advisory or consultative bodies for implementing trade facilitation was approved in 1974 (the last was revision[11] was in 2015).

As the implementation of a Single Window is a major requirement of the TFA (article 10.4), within the TFA implementation framework the NTFB can potentially be the project management group, with one sub-committee being designated as the task force.

One of the first exercises usually performed by NTFBs is the development of a national trade facilitation roadmap[12] for the trade facilitation program. It is a short but comprehensive document that lays out the strategic vision for implementing trade facilitation reforms in a given country, and within a given period (usually three to five years). The roadmap includes the set of **activities** to be undertaken to reach predefined **goals** that will be measured with the help of performance indicators.

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[11] See Recommendation No. 4 at http://www.unece.org/uncefact/tfrecs.html
[12] UNECE, *Guide to Drafting a National Trade Facilitation Roadmap*, 2015, (ECE/TRADE/420).
Available at http://www.unece.org/fileadmin/DAM/trade/Publications/ECE-TRADE-420E.pdf.

Single Window Training Material

The implementation or improvement of a Single Window is usually an important **activity** within the roadmap. The roadmap can include a unique project, such as the implementation of the Single Window or a concept paper dedicated to the Single Window initiative can be developed. The benefit of including a concept paper as part of a comprehensive initiative (trade facilitation roadmap) is that the roadmap provides a common vision that ensures the trade stakeholders (including public and private agencies) are all moving in the same direction; it highlights relationships with the other projects and prioritizes the activities to be performed by the whole trade community. International donors can use a roadmap as a reference to provide financial and/or technical assistance to the different projects included in it. If a country has not ratified the TFA, or it has not developed a trade facilitation roadmap, the master document should take the form of a Single Window concept paper, which has the same attributes but is solely focused on the Single Window deployment.

2.2 Single Window concept paper

A Single Window concept paper is developed in the initial research phase. It describes the overall objectives and potential benefits of a Single Window and presents a general overview of what is involved in its implementation. The paper typically focuses on practical issues and should avoid excessive technical jargon and in-depth discussions of technical concepts. It is important to understand that the objective of the concept paper is to facilitate initial discussions on the topic and to obtain approval for a more in-depth study into the need for, approach toward, and feasibility of a Single Window. At this stage, a concept paper is not intended to secure agreement for the implementation of a single window.

To define the objective, it is important to identify the current situation (baseline), its deficiencies, the measurable goals and which activities should be performed.
Goals are indicators which need to be quantifiable; they need to have a unit of measurement. Examples of measurements are the time for clearance of imports, the transport costs for a container or the number of inspections. An example of a goal is "to reduce clearance time by (a number or percentage of hours) relative to (a baseline) by (a given date)".
An **activity** is a specific action or project that will result in the implementation a trade facilitation instrument related to the Single Window. Examples of activities are "introduce an electronic payment system for importers and exporters", or "reduce the number of documents required to be submitted following a business process analysis on the procedures and documents required for clearance".

It is important to understand that the objective of a trade facilitation roadmap/Single Window concept paper is to facilitate initial discussion on the topic and to obtain approval for a more in-depth study into the need for, approach to and feasibility of a Single Window.

The preparation of a Single Window concept paper precedes the development of a feasibility study. The concept paper is an important step in Single Window implementation; the trade facilitation roadmap would not be a prerequisite for this.

2.3 Single Window feasibility study

Following the preparation of a Single Window concept paper, within the framework of an open partnership between government and trade, a meeting of high-level representatives from all relevant trade-related organizations and governmental authorities and agencies is organized to discuss the Single Window concept as defined in the paper. The object of this meeting is to secure agreement on the project concept and to launch a feasibility study that will include a detailed needs analysis and a technological assessment.

The feasibility study should determine the potential scope of the Single Window, the level and type of demand, possible scenarios for implementation, potential for and nature of a pilot implementation, resources required (financial, human, technical, etc.), potential benefits and risks, a time frame, and an implementation and management strategy. It is strongly recommended that this study be based on face-to-face interviews with key players in both government and trade, and that it be complimented by relevant questionnaires to collect information from a wider circle of potential participants and users.

A decision must be made as to whether the feasibility study will be performed in-house, by the project task force itself or contracted out to a third party. The major advantage of hiring external consultants is that the report is more likely to have an independent focus; also, the consultants will be able to make comments and recommendations that might be difficult for individual government agencies to suggest (for political or other reasons). Furthermore, the necessary skills, experience and required time may not be available in-house to undertake the analysis within the time frame required. However, the major disadvantage of undertaking the work through consultants is that the report may be seen as an external one, that is, not connected to the key players in the organization (i.e. there may be little or no buy-in to the report). A hybrid option is to hire consultants to assist the task force in undertaking the feasibility study, but clear lines of authority and responsibility would have to be defined for this option. The actual approach adopted will generally be decided based on available resources, the time frame for the report and also political considerations.

2.4   *Master plan of cooperation between agencies and other stakeholders*

The Single Window concept paper establishes a framework of activities to be implemented over a period of three to five years. For this period, a schedule for the implementation of activities should be developed. This implementation schedule will help to monitor the state of implementation.

For this implementation schedule, activities can be divided into three phases:
1. **Start-up phase:** Depending on each country, this phase should not require more than one year. During this phase, the governance structure needs to be established.
2. **Delivery phase:** The delivery phase is the longest phase of the implementation. It includes the delivery of all activities that need to be realized over a period of one to four years. During the delivery phase, goals and activities should be thoroughly monitored to make sure that the country is on the right track to achieve the identified objectives.
3. **Review phase**: The goal of this phase is to (1) evaluate whether the objectives have been achieved and (2) draft a new concept paper for the next three to five years.

It is possible that all players in government and/or trade may not welcome the implementation of a Single Window. In such cases, the specific concerns of opponents should be identified and addressed as early as possible in the project. Identified obstacles should be considered individually, considering the local situation and requirements. Clearly, cost can be a major obstacle, but this must be balanced against future benefits. However, it is important to be clear about the financial implications of the project so that a decision regarding single-phased or multi-phased implementation can be made. Legal issues also constitute a significant potential problem area.

A decision on the financial model for the Single Window should also be reached as early as possible in the project. This could range from a system totally financed by the Government to an entirely self-sustaining model. Possibilities for public-private partnerships should be explored if this is deemed a preferred approach. Clarity on this point can significantly influence decision makers to support the implementation of the system.

A clear implementation timetable should be established and promoted at the earliest possible stage of a Single Window project, as this will assist in the marketing of the project and will help potential users to plan their related operations and investments accordingly. Marketing should clearly identify the benefits and cost savings as well as specific points relating to the increased efficiency derived from the implementation of the Single Window.

2.5   Implementation possibilities: single phased or multi phased

Though launching a Single Window project with all procedures concerning cross-border trade taken into consideration from the outset is ideal, it is not always possible. Some procedures might have complex international legislation which may require a great deal of negotiation and preparation before they can be integrated into a Single Window. For this reason, the following approaches may be used to involve all actors in a Single Window project.

The **single-phase approach** is ideal, though very complex to coordinate. In this approach, absolutely all agencies and their corresponding procedures at the border would be considered in the data harmonization and documentary streamlining procedures[13]. All individual requirements would be considered on an equal footing, ensuring that all needs are covered adequately in the resulting Single Window. The launch of such a project would transition all requirements at the same time to the Single Window.

The **multi-phased approach** is more realistic but does have a few negative aspects. In this approach, the Single Window project would probably start off with key border operations, involving a small number of government agencies. These procedures and agencies would harmonize with each other and launch the Single Window, obliging a certain number of operations to be performed outside of the Single Window. This would likely allow the project to start quicker; however, the agencies and procedures that are not involved from the outset would likely need to align their procedures and data requirements with the existing framework, which may not consider their unique needs. When using a phased approach, the overall national trade facilitation strategy should be kept in mind throughout the process.

Regardless of whether a pilot (a test of the design and the deployment in a limited but relevant scope, to give an opportunity for adjustments), single-phased or multi-phased implementation has been decided upon, it is essential that a clear project management approach be adopted throughout the project implementation. The project management plan should contain a set of clearly defined, interrelated tasks and event milestones. There are many well-established approaches to project management and several good software programs available to assist in this process.
The project management plan should contain the following:
- A clear statement of the project's scope, goals and objectives
- A statement on key deliverables, responsibility for delivery, time frame and milestones for completion

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[13] as described in UNECE Recommendation No. 34

- Definition of the roles and responsibilities of the various participants, including a clear agreement on who is in charge of the project (the project manager) and the level of authority of this manager
- Specification of the management and monitoring responsibilities of the project manager and the line of authority and communication between the project manager and other groups such as project management group, the task force and the implementation working groups
- A clear strategy for communicating with project stakeholders and potential users on a regular basis throughout the implementation, including an agreement on what information needs to be communicated with what groups and in what manner and frequency
- A clear and agreed project budget, including financial and human resources; it is essential that the necessary funds and personnel be allocated to the project from the outset
- A clear statement of the project risks (such as a cutback in budget, delay in required legal reforms, etc.) and an agreed response plan (to the best extent possible) to manage these risks, including contingency plans for high-level risks
- Agreement on the criteria for measuring the project success
- An agreed project review and feedback mechanism to provide ongoing monitoring of the project process and to deal with any changes in the implementation that may be required

2.6   Data harmonization and use of international standards

Once the objectives (goals and activities) and the structure of the Single Window implementation are defined, there is generally (and critically) enthusiasm and optimism present for reaching the Single Window benefits in a short timeframe. This enthusiasm is often challenged when getting into the details of the different legacy systems and the current data sets used by the different stakeholders.

In many countries, companies are required to submit vast amounts of data and documents to the Government to comply with national and international trade regulations. They must also exchange information with relevant stakeholders. The definitions of the data elements required for these processes are often made with little or no coordination among the various government agencies, or indeed among commercial organizations. As a result, companies involved in trade and transport must comply with a variety of data requirements, documents and special forms requiring the repetitive submission of similar or identical information.

The electronic exchange of information cannot operate efficiently without common standards, and over the years progress has been made in aligning the various standards; this has been largely dependent on the specific industries and regions and the technology in question.
Raising awareness among potential users of standards to their benefits is an ongoing effort.

> Box 1: Data harmonization with UN/EDIFACT
> An example of an organization achieving efficient gains based on data harmonization is the Warrant Group: a UK-based freight forwarder who exchanged 4000 shipping instructions, 15,000 bookings and about 2.2 million status messages in 2017 alone. This organization has implemented the UN/EDIFACT EDI standards (which is free, neutral, and open source) to simplify their processes (and, as a result, have reduced the number of standalone, customized links with its clients).
>
> The resulting efficiency gains have allowed the Warrant Group to reallocate a portion of its IT staff from the maintenance of 1-to-1 customized, customer data connections to value-added development work.

To overcome this complex challenge, the UNECE Recommendation No. 34: Data Simplification and Standardization for International Trade identifies the iterative process of **capturing**, **defining**, **analysing** and **reconciling** government information requirements and then mapping this simplified data to international standards. The objective is to eliminate redundancies and duplication and to ultimately define one standard set of data and messages that traders and transport operators can use to meet all governmental information requirements related to import, export, and transit.

2.6.1 Step 1: Capture

The start of the exercise is the preparation of a "national trade data inventory". This involves capturing individual governmental agency information requirements by identifying and listing the data elements. This can be accomplished in several ways, by reviewing agency forms, automated systems requirements, regulations and administrative processes; by examining the documents used by the business community to conduct trade transactions; and by reviewing the commercial records and business systems used to initiate, reconcile and fulfil the domestic or cross-border sales contract. This information can be organized in a spreadsheet or another software tool.

2.6.2 Step 2: Define

This step includes recording the data element name; definition; representation (format or code); when the information is required (release, declaration, inspection, pre or post control); and the citation (legal base) of the relevant agency to demand, collect, view and retain (archive) the information.

The national trade data inventory can be created in an Excel spreadsheet, ideally with the following elements:

- **Agency element number**: This is a reference number for the data element.
- **Data element name**: This is the name of the data element being defined. The naming of the data element should reflect the common business terminology used by the agency, not a computer-related name.
- **Data element description**: This is a detailed description of the data element.
- **Data type**: The data type can be N (numeric), A (alphabetic) or AN (alphanumeric).
- **Data domain**: If the data element has a discrete list of values or a range of values, provide the list, range or a reference to the list or range. For example, the data element country could be restricted to the values in the ISO country code table.
- **International standard identifier**: The identifier of the international standards data element in being referenced (i.e. UNTDED, UN/EDIFACT, or CCL)[14].
- **Mode of transport**: Indicate the mode of transport (maritime, rail, road, air, inland water, other) for which the element is being used.
- **Process**: Indicate if required for export, import or in-transit processes.
- **Category of use**: Indicate if required for cargo, means of transport, crew, or equipment.
- **Legal permission to collect or view**: This data attribute identifies whether the agency is legally permitted or competent to collect or view this element. If the authority allows collection, enter the word COLLECT, otherwise enter VIEW.
- **Source of legal authority**: Cite the source of legal authority or jurisdiction to collect or view. The authority may be derived from a specific form, a regulation, legislative

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[14] United Nations Trade Data Elements Directory (UNTDED); United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT); Core Components Library (CCL).

mandate, memorandum of understanding (MoU) or other. Quote all legal authorities that apply if there are multiple sources. Do not provide the text of the citation.

- **Expiration date of legal authority**: Provide the date of expiry of the legal permission for the agency to view or collect the data. Specify N/A where the authority does not expire.
- **Data source**: Indicate if the information is provided by trade, transport, government, or derived:
  - TRADE indicates that the data originates from, and is filed by, the trading partners;
  - TRANSPORT indicates that the data originates from, and is filed by, the carrier or means of transport; and
  - GOVERNMENT indicates the data is created by an agency of the government. An example of the latter would be the findings from an investigation.
  - If unsure, enter a letter U here for unknown.
  - DERIVED data is calculated by, or extracted from, a reference file; for example, the rate of duty could be extracted from a harmonized tariff file or derived by the computer system from a combination of one or more other data elements.
- **Trade source**: Indicate the trading partner who is the usual source or provides the data. If the data source attribute is "TRADE" please identify which party in the transaction is responsible for filing the data element. Suggested values are T (trader - importer, exporter, broker, forwarder, etc.). C (carrier) or CARRIER AND TRADER. If unsure, enter a letter U here for unknown
- **Timing**, **when data is required and provided**: Identify the point of the transaction's lifecycle at which the agency expects to have access to the data element. Suggested values are: PRE-ARRIVAL, ARRIVAL, RELEASE, POST RELEASE or DATAWAREHOUSE etc.). If unsure, enter a letter U here for unknown.
- **Agency flow source**: If the DATA SOURCE is "GOVERNMENT", identify the agency that creates this element.
- **Remarks/comments**: Free-form text that can be used to annotate the data element.

2.6.3   Step 3: Analyse

The next step is the analysis of the information requirement for each data element. Establishing the need and use of the information requirement is essential. While information is identified by name, it is the meaning which is more important. The process of analysing the information consists of gathering similar data-element names and having a full understanding of the definition and the information required. The use of process models for the national supply chain is recommended. The models for the export and import of key national goods and services and the main modes of transport should be based on approved modelling techniques such as the UN/CEFACT Modelling Methodology, which is based on the Unified Modelling Language (UML).

Recommendation No. 34 gives an example of an element which provides a complete analysis of the term "port of unlading" (or its synonym "unloading"). The analysis reveals the various uses for the term, and that there are three different coded representations of the element: a four-digit code, a five-digit code, and the United Nations Location Code (UN/LOCODE[15]) listed in Recommendation 16.

Table 3: Comparison of data names and descriptions: close but slightly different. Source: UNECE.

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[15] United Nations Code for Trade and Transport Locations (UN/LOCODE)

Name	Description	Type	Source	Mode
Port of Unloading	Location where goods are removed from the ship	4 digit proprietary code	Carrier	Ship
Port of Unlading	Airport where consignment is taken off the airplane	4 digit proprietary code	Carrier	Air
Domestic Port of Unloading	Domestic port where merchandise is removed mode of transport	4 digit proprietary code UNLOCODE	Carrier Broker Importer	Air, Rail, Ship, Truck
Domestic Port of Unlading	Domestic airport where consignment is taken off the airplane	UNLOCODE	Carrier	Air
Foreign Port of Unloading	Foreign port where merchandise is unloaded from the conveyance	5 digit proprietary code	Carrier Exporter	Air, Rail, Ship, Truck
Foreign Port of Unlading	Foreign airport where consignment is taken off the airplane	5 digit proprietary code UNLOCODE	Carrier	Air, Ship

Each key term will have the same type of replication and specific coded representation; therefore, there is a need to harmonize them during the fourth step "Reconcile".

2.6.4   Step 4: Reconcile

The final step is the consolidation of the defined and analysed trade-data inventory into a rationalized data set through the process of reconciliation. This involves the agreement to use one data element name with a common definition and (or) common coding and reconcile it with the United Nations Trade Data Elements Directory (UNTDED). It could be further mapped to other international standards such as the UN/EDIFACT directories and similar instruments; for example, the UN/CEFACT Core Component Library (CCL). This approach provides a range of options for the development of data models and syntax implementation.

2.6.5   Result of the four-step iterative process

The result is a simplified, standardized national data set that is used to provide information requirements in various syntax formats using a range of technologies. It greatly facilitates the development and/or operability of the Single Window.
In addition, at some point two or more countries could decide to combine their national data sets into a bilateral or multilateral data set for use in providing data exchange in trading agreements.

QUIZ
1) WHAT ARE THE DOCUMENTS TO BE PREPARED AT THE OUTSET OF A SINGLE WINDOW PROJECT?
2) LIST THE MAIN PHASES IN ESTABLISHING A SINGLE WINDOW.
3) WHAT IS THE OBJECTIVE OF A SINGLE WINDOW MASTER PLAN? WHAT ARE THE BENEFITS AND CONCERNS OF IMPLEMENTING A SINGLE WINDOW USING A MULTI-PHASE APPROACH?
4) WHAT IS THE OBJECTIVE OF A DATA HARMONIZATION EXERCISE IN A SINGLE WINDOW PROJECT?
5) WHAT ARE THE FOUR STEPS OF DATA HARMONIZATION?
6) WHAT IS THE OUTCOME OF A DATA HARMONIZATION PROJECT?

Main sources for this session:

- African Alliance for E-Commerce (AACE) (2017). *Practical Implementation Guide of Single Windows for Foreign Trade (version 2). Available at https://www.swguide.org/single_window/AACE_guidelines_Single_Window_en.pdf*
- UNECE (in publication). Nexus: Sustainable Mobility and Smart Connectivity.
- UNECE (2015). *Guide to Drafting a National Trade Facilitation Roadmap*.
- UNECE (2020). *Recommendation No. 33: Recommendation and Guidelines on Establishing a Single Window*.
- UNECE (2013). *Recommendation No. 34: Data Simplification and Standardization for International Trade*.

3. Implementing a Single Window

Once the objectives for the Single Window have been confirmed, the feasibility study performed and there is sufficient political will to ensure collaboration at the highest level, the challenge is to define the framework and structure of the vehicle that will manage the Single Window.

3.1 Economic model for a Single Window

All types of financial models exist for financing, operating and sustaining a Single Window. They range from systems totally financed by the Government to an entirely self-sustaining model including public-private partnerships (PPP).

There are several financial elements to be considered for a Single Window economic model that should be defined:

- **The value created by the project**: The Single Window should enable the country to meet the expressed needs or provide innovations to improve the foreign trade environment. At any rate, added value should be generated for stakeholders and users of foreign trade formalities.
- **The project's funding sources:** These may come from the Government, from donors, the private sector, or PPPs.
- **The project's budget**: This should be carefully estimated to avoid lack of resources for the project implementation and start of operation.
- **The pricing of services to be accessed** (if required): Revenue generated from use of Single Window services should be sufficient to cover all costs related to operation and should guarantee the sustainability of the system.

3.1.1 Identifying value creation

The value creation is through facilitation gains resulting from the Single Window deployment, principally identified in terms of direct cost and indirect cost (such as time reduction).

Direct cost reduction is relatively easy to define. It represents all the administrative costs that can be reduced when document requirements are streamlined. It also includes the reduction in workload when compared to filing redundant information in the different systems.

The indirect cost (time) reduction is more difficult to evaluate but is often the most important element for the trade community, as the time required to export and import goods is a significant barrier to trade. There are two aspects of time that represent a cost for trade. Long lead time — the time between placement of an order and receipt of goods — is an obstacle that increases the cost of trade because it creates uncertainty and influences demand for the final product. The other aspect of time that represents an obstacle to trade is the variability of delivery time. The more variable the delivery time, the more buffer stocks are needed to face demand. Direct estimates of the tariff equivalent of time indicate that each day in transit is equivalent to a 0.8 per cent tariff[16]. Calculated on a 20-day sea-transport route (the average for imports to the United States), this amounts to a tariff rate of 16 per cent. This is much higher than the actual average tariff rate[17]. It needs to be highlighted that certain

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[16] David Hummels, Transportation Costs and International Trade in the Second Era of Globalization. *Journal of Economic Perspectives*. vol. 21, No. 3 (Summer 2007), pp. 131-154.
[17] World Trade Organization, *World Trade Report 2008: Trade in a Globalizing World*. Available at: https://www.wto.org/english/res_e/booksp_e/anrep_e/world_trade_report08_e.pdf.

methodologies have been developed to facilitate the evaluation of the overall trade costs in a country such as the World Bank's Doing Business: Trading across Borders scores (which are a benchmarks for standardized shipments all over the globe)[18] or the Total Trade and Logistics Cost (TTLC) methodology[19] used by the Global Alliance for Trade Facilitation.

The aim of the Single Window is to reduce direct trade costs by having clear processes and procedures, and indirect costs by reducing the lead time and the variability of the trade process.

3.1.2   The project's funding sources

The public financing model
This model is used in cases where funding for the setting up, operation and evolution of the Single Window is fully provided by Government or with donor support. What moves a Government to finance the various stages of the life of a Single Window is the desire to improve the foreign trade environment, notably through the facilitation of trade formalities and good administration of the Single Window. The major risk of the Government financing all stages of the Single Window lifecycle lies in the absence of resources to ensure its effective operation and evolution.
Very often, a donor is involved in the setting up of a Single Window and the Government takes over to ensure its financing and operation. However, donors may intervene later to finance the evolutionary needs of the Single Window.

The public-private partnership (PPP) model
This model mainly relates to a Single Window set up as part of a PPP between the State and the private sector. In general, when PPPs are involved in the set up of a Single Window fees are charged for the services offered by the single window; however, these are often negotiated, or approved rates, aimed at balancing the operation. The advantage of a PPP is that it complements the other types of funding available, because, should the need arise, the Government or donors can be called upon depending on the opportunities or context.
Theoretically, this is the best of both worlds, with the private sector capable of engaging investments and bringing capitalist efficiency to ensure return on investments, including innovation. On the other hand, the Government has a long-term, public-benefits vision and the ability to develop a regulatory framework aligned with this objective.

The concession model
Following a public service concession, the private sector may finance the investment necessary for the setting up of the Single Window as well as its maintenance and operation. In this model, the profitability of operation is a must. Thus, the facility provides paid services. In principle, the concessionaire should be paid directly by the users, based on fees predetermined in the terms of the contract with the concession authority. In reality, administrations have limited competence on this type of contract, and concessionaires often take this opportunity to extend the concession time and the schedule of charges. Thus, profit rationale may lead to high costs for services provided by the Single Window concessionaire. To avoid this, the Government should see to the cost effectiveness of the Single Window by providing subsidies, if needed, and by mobilizing donors to finance the Single Window's investment and evolution program.

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[18] For more information, see the World Bank's Doing Business: Trading across Borders methodology webpage, available at https://www.doingbusiness.org/en/methodology/trading-across-borders.
[19] Global Alliance for Trade Facilitation, annual report, 2019

3.1.3   The project's budget

The budget for the establishment of a Single Window under different scenarios (including estimates for the initial and operating costs, value of the benefits, sustainability, possible mechanisms for revenue collection and sources of project financing) should be clearly separated into two categories:

1. Implementation, including investments
2. Operations

Often minimized, the most important phase of Single Window implementation is the operations. This an ongoing process, and therefore a sustainable model to operate and continuously develop the Single Window should be defined (over many years) to keep the infrastructure and the software updated and upgraded periodically.

To develop a Single Window budget with comparable options and scenarios, the best practice is to define the total cost of ownership (TCO) over a certain period (10 or 20 years). It is extremely difficult to use historical information or to replicate a budget from one country to another. The main reasons are that all contexts are different, most of the infrastructure is different, technology is developing rapidly, and the Single Window scope is never the same.

The key aspects to consider when creating a TCO budget are as follows:
- Infrastructure investment:
    - Data hosting, such as data centre and disaster recovery sites, including uninterrupted power supply and reliable communication capacity
    - Office set up, including support centre set up (centrally or in every trade location)
- System hardware: servers and routers, etc.
- System software: applications, 3rd party software and licences
- Resources:
    - Management, project management
    - Change management team, including business process reengineering, communication team and trainers
    - Helpdesk and data analysts
- Utilities and communication costs

Many variables can impact the budget scenarios, such as capital or operational expenditures. Some examples are (1) whether the data will be hosted on premise or in the cloud; (2) whether it will be private, public or government controlled; and (3) how the applications will be acquired: direct purchase, internal development, or software-as-a-service (SaaS).

In a multi-phase approach, it is also assumed that operational expenditures will ramp up with the development stages of the Single Window rather than requiring a large, up-front investment.

3.1.4   The pricing to access the services

In cases where the sustainability of a Single Window is based on charging fees to access the services, several options can be identified to ensure balanced operation and permanent activities:
- Access licensing
- Transactional fees based on volume or value

- Different services/system modules provided by the Single Window, each having its own pricing
- A combination of the different options

The general economic importance of the Single Window makes the level of charges extremely sensitive. Therefore, it is important to maintain a balance between the value added by a Single Window and the fees paid by users, to avoid any risk of inflation. To correctly assess the different options, an evaluation of current and projected trade volumes should be performed based on actualized economic projections.

3.2 Governance considerations

Among the key factors for the successful implementation of a Single Window is governance, which is a combination of several strategic elements that exist throughout the project implementation. Governance is not a set of a priori principles, but (like any architecture) is a set of practices, borne out of concrete challenges that organizations meet, which (little by little) become benchmarks that lead to the formulation of general principles. Legal, economic, social, and cultural specificities vary from one environment to the other. However, given the existing best practices, the following activities should be considered:

- Setting up an inclusive governance body for the Single Window
- Involving all stakeholders at all stages
- Providing transparent pricing of services
- Regular publication of reliable and relevant performance indicators
- Maintaining sustained relations with government authorities

The supreme governing body or entity in charge of the Single Window should represent the whole foreign trade chain (notably in the case of a PPP model) to avoid interests being oriented toward a single organization. For instance, the interests of a Single Window governed by a community of shipping agents will mostly and primarily serve shipping agents. The relevance of the services provided by the Single Window will depend on the integration and involvement of the partners — both public and private — in foreign trade. The Single Window should be designed as a comprehensive community platform, integrating all processes related to international transactions.

3.3 Technical considerations and data security

As presented in the first session and above, several options for infrastructure and ICT exist to develop similar Single Window services for users.

The Single Window implementers will need to
- review existing technical systems for receiving, storing and exchanging information;
- determine the overall technical requirements, including specific requirements for additional systems development, interfaces, outlets and the possible development of interface systems to existing legacy systems for the proposed scenarios;
- determine if existing systems will be able to handle (likely) increases in the volume and flow of data; and
- examine issues related to the verification and authentication of data.

Similarly, given the harmonization of the data, and the development of a standardized national data set, the Single Window initiative is an ideal opportunity to consider the benefits of

implementing related changes in the ITC infrastructure. Related international standards should be referenced for this purpose.

Increased digitization brings benefits, but it also presents challenges for data security and user privacy. As the quantity of systems and data increases exponentially, they become a more attractive target for hackers. Thus, increased and continuous innovation and investment in this field will be needed.

3.3.1   Smart identification

In an electronic environment, it is vital to ascertain who is sending data to whom. The electronic verification of the identity or credentials of any entity is a challenge from a legal standpoint, especially when that verification crosses borders. Model legislation, guidance documents and recommendations exist on this topic such as the United Nations Commission on International Trade Law (UNCITRAL) Model Law on Electronic Signatures[20] and Model Law on Electronic Transferable Records[21]; the United Nations Convention on the Use of Electronic Communications in International Contracts[22] (which has only 12 signatories); and the Organization for Economic Co-operation and Development (OECD) Recommendation and Guidance on Electronic Authentication[23]. In addition, the UNECE has developed Recommendation 14: Authentication of Trade Documents[24] based on this guidance.

Data lodged by a supply chain participant whose identity remains uncertain could compromise all actions taken based on that data.

That being said, the UNCITRAL model laws and UNECE Recommendation No. 14 underline that the authentication method used should be proportionate to the relationship between the stakeholders and the context of the exchange. It is not necessary to have a high level of reliability within a Single Window when each trader must put in place financial guarantees for international transactions. The identification of each party is clear within the IT system. This is outlined in the Recommendation No. 14 Annex Case Study of the United States of America.

3.3.2   Cybersecurity

A major challenge is that today, most ICT systems have been developed with the objective of facilitation and not with security at the core their architecture. As trade data is strategic and its confidentiality should be ensured, any new development should have a strong data-security component from the beginning, built on a bedrock of secure and protected information systems. Single Window systems can be at great risk without appropriate data-security policies, security related roles and responsibilities, a risk management approach, a security audit framework, and a proper data archiving and retention policy.

For the most part, it is not easy to assess the level of security of any ICT system, but external evaluation and certifications do exist to give confidence in the security mechanisms developed for the Single Window. One widely used data security framework is the ISO/IEC 27001 technical standard on information security management.

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[20] https://www.uncitral.org/pdf/english/texts/electcom/ml-elecsig-e.pdf
[21] https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/mletr_ebook_e.pdf
[22] https://uncitral.un.org/en/texts/ecommerce/conventions/electronic_communications
[23] http://www.oecd.org/internet/ieconomy/38921342.pdf
[24] https://unece.org/fileadmin/DAM/cefact/recommendations/rec14/ECE_TRADE_C_CEFACT_2014_6E_Rec14.pdf

Cybersecurity is driven by risk assessment and by mitigation of known threats. An effective response to a cybersecurity incident is critical, as timely and appropriate action will help to contain the damage, recover the system, and regain public confidence. Single Window systems are vulnerable and should not work in isolation when it comes to dealing with cyberattacks. As part of their security policy, they should also participate in national programs and processes that help prevent and protect against attacks on their ICT assets.

3.4   Marketing & communication

Promotion and marketing of a Single Window is very important and should be carefully planned. The promotion campaign should involve representatives from all the key government and trade stakeholders in the system, as these parties can provide valuable information on the expectations of the user community and help to direct promotion and marketing messages. A clear implementation timetable should be established and promoted at the earliest possible stage of a Single Window project, as this will assist in the marketing of the project and will help potential users to plan their related operations and investments according to this schedule. Marketing should clearly identify the benefits and cost savings as well as specific points relating to the increased efficiency derived from the implementation of the Single Window.

Establishing a proper mechanism for keeping all stakeholders informed of project goals, objectives, targets, progress (and difficulties) creates trust and avoids the type of misunderstanding that can lead to the undoing of an otherwise good project.

3.5   Training

When implementing the Single Window, training is a major factor in getting users familiar with the system and ensuring their buy-in, which is fundamental to success. Training can help reduce resistance to change, as it is a fundamental human reflex to prefer a current, known system (sometimes customized to the specific activity of the user) to a new and unknown ICT deployment developed for a larger group of users.

Training should include comprehensive operating instructions and guidelines, and practical training courses (potentially multilingual). Project governance will bring training and capacity-building to users and stakeholders so they can better understand the challenges, and enable them to determine the best strategies and tools to make the project successful. Adequate preparation and capacity-building are necessary to avoid risks and misunderstandings.

In many places, the Single Window is the first transversal system connecting administrations and organizations that used to work independently. Before the single window deployment, process visibility was difficult, and only extremely well-organized customs brokers had any view into transaction situations.

An important feature of Single Window deployment is the visibility it provides to the trading community into any transaction. The information can be provided through a web platform so that users can track the status of their files and consignments. This means that the Single Window is not only the single entry point for document submissions, it is also the first facility to be contacted when something goes wrong for a stakeholder, because it has the most visibility into information on the trade situation.

The requests can be of any kind or for any reason:

- A lack of understanding of a specific process by the user
- A technical challenge for a submission
- A technical challenge regarding infrastructure (application or connection issues)
- An interface challenge between different entities
- A lack of response from one of the OGA
- etc.

Going back to the notion that a Single Window is fundamentally a trade facilitation concept and not just an IT system, any trade facilitation challenge received from the trade community can be supported by the Single Window operator. Most successful Single Window deployments have capable helpdesk teams to support their trade community, and are greatly appreciated for it.

QUIZ
1) WHAT VALUE IS CREATED BY THE IMPLEMENTATION OF A SINGLE WINDOW?
2) WHAT ARE THE BENEFITS OF THE DIFFERENT MODELS IN FUNDING A SINGLE WINDOW PROJECT?
3) LIST THE KEY THINGS TO CONSIDER WHEN PERFORMING A TOTAL COST OF OWNERSHIP BUDGET FOR A SINGLE WINDOW.
4) WHICH INTERNATIONAL STANDARD CAN HELP IN ASSESSING THE DATA CONFIDENTIALITY OF A SINGLE WINDOW SYSTEM?
5) WHAT TYPE OF INQUIRY COULD BE EXPECTED BY A SINGLE WINDOW HELP DESK?

Main sources for this session:

– African Alliance for E-Commerce (AACE) (2017). *Practical Implementation Guide of Single Windows for Foreign Trade (version 2). Available at https://www.swguide.org/single_window/AACE_guidelines_Single_Window_en.pdf*
– Hummels, David (2007). Transportation Costs and International Trade in the Second Era of Globalization. *Journal of Economic Perspectives.* vol. 21, No. 3 (Summer), pp. 131-154.
– UNECE (2020). *Recommendation No. 33: Recommendation and Guidelines on Establishing a Single Window*.
– WCO (2017). Data: ensuring quality, security & privacy. *Building a Single Window Environment*, Compendium Vol. 1, Part 8.

4. Post-implementation considerations

4.1 Trade visibility

A Single Window is a unique whole-of-government effort that leads to facilitated, more transparent interactions between the Government and the trading community. As traders can submit all required information and documents through the Single Window, quicker and more accurate validation and distribution of this information to all relevant government agencies can be achieved. The Single Window has a large volume of trade data and information within its data warehouse system. As a single storage mechanism for regulatory compliance, it provides a 360-degree view of all imports, exports and transit goods. The analysis of trade-flow data and performance and the preparation of analytical reports and statistical material can be done quickly and easily since the Single Window is essentially the main source of the data.

This, in turn, leads to better coordination and cooperation between the governmental authorities involved in trade-related activities.

4.2 Measuring performance (key performance indicators)

The main justification for the implementation of a Single Window is to facilitate and foster trade and to reduce costs; therefore, early identification of the expected benefits is imperative as these will provide the baseline for the monitoring of outcomes. Positive outcomes will result from finding an accurate balance between the facilitation indicators (improvement of transparency, time and cost reduction, reduction of red tape, improved user satisfaction and service coverage, etc.) and indicators related to controls (fraud reduction, revenue increase, etc.). These indicators are often difficult to measure due to the complexity of efficient data collection along the supply chain. Improvement is generally a consequence of a long process and is only measurable once the Single Window is fully operational and actively used by all stakeholders.

If done according to best practices, with clear goals identified at the outset (as defined in section 2.2), the Single Window implementer will follow what was defined initially. Unfortunately, many countries start the journey of Single Window implementation without clearly identifying SMART key performance indicators (KPIs). This is partly due to the difficulty in isolating the real impact of Single Window implementation, since it targets the same indicators as other trade facilitation reforms and can be obscure by the natural evolution of the economic context.

Empirically, here are some suggested of indicators of interest:

4.2.1 Facilitation indicators
- Time for processing of procedures and documents, segregated as follows:
  - Activity
  - Location, border posts
  - Customs regime
  - Type of goods
  - Type of cargo
  - etc.
- Transit time for goods at borders
- Costs related to procedures and document processing and collection (indirect and direct costs)

- User satisfaction (satisfaction surveys)
- Service coverage, e.g.
    - Number of procedures implemented
    - Number of administrations connected
    - Number of documents processed
    - Number of border posts covered
    - etc.

4.2.2 Control indicators

- Increase in revenue (global, per administration, etc.)
- Number of control procedures implemented
- Coordination of agencies in an integrated risk assessment (application of common profiling/rules compared to pre-existing ones)
- Fraud reduction (comparing cases detected)

4.2.3 Technical indicators

When deploying a new IT system, there are several IT elements that should be monitored to ensure that the infrastructure and the systems deployed are responding to the needs:
- Application downtime
- Communication downtime
- IT Infrastructure cost per user
- IT maintenance cost per user
- IT software cost per user
- Helpdesk tickets per volume of transactions
- Helpdesk ticket resolution rate in less than x hours

4.2.4 Measuring operational results

To better measure the KPIs, it is recommended that service level agreements be created between government agencies and all involved stakeholders. Frequent (weekly, monthly, quarterly) reports are good monitoring tools for the analysis of the performance of a Single Window. Many tools can be combined and used in the measurement of indicators:

- Self-assessments of Single Window performance indicators
- The Logistics Performance Index (LPI) of the World Bank
- The Doing Business Methodology of the World Bank
- The Trade Competitiveness Diagnostic Toolkit of the World Bank
- The peer-review methodology of the African Alliance for Electronic Commerce
- The Time Release Study from the World Customs Organization
- The Single Window Maturity Model from the World Customs Organization
- Business process analyses
- Satisfaction surveys

4.3 Helpdesk

The importance of the helpdesk post-implementation is critical as they receive the day-to-day challenges of the users and collect feedback on areas of difficulty and bottlenecks in the

system. This information can be a valuable tool for improving the Single Window and developing it further.

4.4   Consultation on trade facilitation matters

One identified best practice is to have periodic meetings with the trade community during which the KPIs and any relevant statistics are presented and discussed. Such consultations can be conducted in different ways. That is, they can take the form of oral or written contributions, on-site or virtual meetings (via telephone conferences or the internet), or any combination thereof.

A permanent consultative committee is the most commonly-used form of consultation. National Trade Facilitation Bodies (NTFBs) are uniquely positioned to define how the national trade community can collaborate in reviewing processes, developing solutions, aligning procedures and defining the standards that will be used to exchange information. Key success factors for an NTFB are favourable governments policies for economic development and trade, a robust and dynamic private sector, availability of resources to develop analyses and proposals, and a strong political will to modify the status quo.

There needs to be some level of return on investment for both trade and government. Consultation is an opportunity for both sides, but it is also an investment in time and money. The trade community needs to feel their input and point of view are being considered and integrated into any chosen solution. The Government needs to feel that the trade community's participation is not solely in pursuit of individual interests. If either side feels that it is not receiving adequate return on investment, it will most likely result in discontinuity of time or financial investments in consultation.

4.5   Business analysis

New bottlenecks in the trade process will be identified through the use of KPIs, helpdesk statistics, and though feedback received from periodic consultations with the trade community on trade facilitation matters.
A specific team of business analysts should continue working on Single Window improvements to identify and prioritize new functionalities or improvements that will foster the trade facilitation component of the Single Window. Of course, any improvement should have a business case and be justifiable. The same type of justification is required in the overall definition of the Single Window economic model.

4.6   Potential risks and business continuity

A Single Window may be subject to many risks, including the following:

- **Compliance risk**: A Single Window handles procedures that are governed by changing national and international regulations. Compliance risk occurs when a stakeholder cannot comply due to the inability of the Single Window facility to apply a new regulation. This inability is often due to technical, conceptual and/or organizational constraints.

- **Operational risk**: This is the risk that operational factors, such as technical or infrastructure failures or operational errors, will cause or increase the risk of dysfunction.

- **Force majeure risk** (a type of operational risk): This involves the risk that an event beyond the control of anyone prevents one or many stakeholders from complying with any of their obligations. This may include acts of God (earthquakes, drought, tidal waves and floods) war, hostilities, invasion, acts of foreign enemies, mobilization, requisition, revolution, insurrection, radioactive contamination, and radioactive toxic explosions.

- **Risk of dysfunction**: This is the risk that a government agency within the system is unable to offer all or part of a service in the context of its exchanges with the Single Window.

- **Systemic risk**: In the context a Single Window system, this is when one of the above risks results in significant reduction in the foreign trade operations of the Single Window.

- **Interfacing risk:** This is the risk that an established Single Window is not able to interact with the technology of the user community or it cannot be correctly understood by the user community because of different semantic understandings. The Single Window should have the ability to exchange unambiguous data; this is a requirement to enable data federation between the Single Window and the connected actors (i.e. interoperability between the Single Window and users' systems).

A Single Window should have a good legal foundation representing all relevant jurisdictions; a system that is not legally robust, or in which the legal issues are poorly understood, could endanger its participants. Poor understanding or misinterpretation of procedures can lead to a false sense of security, which can lead, for example, to the underestimation of a player's exposure to risk. The Single Window rules should enable stakeholders to fully understand the impact of the facility on each of the risks to which they are exposed. The network operator and other parties involved (including users) must clearly understand the various risks involved in using the facility and how they will be supported in the face of these risks.

The rules and procedures governing the interactions of a Single Window with the different stakeholders should be effective and their consequences foreseeable. For the management of operational and dysfunction risks, the Single Window should have clearly defined procedures specifying the respective responsibilities of the operator of the Single Window (and other actors) and should provide appropriate incentives for managing and containing these risks.

Operational risk is one of the risks most likely to happen. The development of a business continuity plan and an IT continuity plan are recommended to minimize the damage caused by the realization of this risk. Experience feedback from major crises has shown that organizations who have undertaken preliminary measures to ensure the continuity of their business are the most resilient in the face of disruptive events. In the case of Single Windows, the development of business continuity plan is no longer considered a best practice but an obligation as it mitigates the impact of operational and systemic crises on the overall international trade activity of a country. The different actors must also define a recovery time objective (RTO) (maximum permissible interruption time) and a recovery point objective (RPO)

(maximum data-recording time loss that is acceptable during a failure). The definition of the RTO and the RPO not only make it possible to plan the actions to be taken in the event of a disaster, but also (and above all) to adopt an IT investment strategy that anticipates the technological systems (such as failover mechanisms) required to deal with catastrophic situations.

4.7 Keeping up to date with international developments

From the time a Single Window project starts up to its operability one or two years could have passed. It is important for Single Window implementers to keep up to date with international developments in technology, standards and regulatory changes.

Dealing with technological changes and evolution: It is important to note that technologies related to data management are evolving so fast that ignoring the impact to Single Window could reduce the opportunity to provide better performance. It therefore makes sense that Single Window initiatives assess the level of technology they are using and ensure that it meets the requirements for the problems they seek to solve.

Using international standards effectively: Many standards and best practices are available on trade facilitation and Single Window implementation. It is essential for a Single Window to be aligned with international standards for the exchange of trade data and documents internationally. Many economic regions across the globe are building integrated markets; thus, a Single Window should simplify trade integration initiatives using globally standardized data and practices.

Dealing with regulatory changes: Compliance with international regulations concerning data will be increasingly difficult due to the number of countries with their own specific requirements. In principle, any National Single Window should be responsible for the domestic market in which they are operating, but it is very important for Governments, Single Window operators and stakeholders to consider the issue of the legal compliance of any shared or exchanged data or documents in the international community.

QUIZ
1) CAN YOU LIST FIVE KPIs OF SPECIFIC INTEREST FOR YOUR SINGLE WINDOW DEPLOYMENT?
2) WHAT IS THE ROLE OF AN EFFICIENT SINGLE WINDOW HELPDESK?
3) CAN YOU LIST TWO ACTIVITIES THAT FOSTER TRADE FACILITATION INITIATIVES IN THE POST-IMPLEMENTATION PHASE?
4) WHICH RISK IS THE MOST LIKELY TO HAPPEN?
5) WHICH INTERNATIONAL DEVELOPMENTS SHOULD BE MONITORED BY SINGLE WINDOW IMPLEMENTERS?

Main sources for this session:

- UNECE (2015). *Recommendation No. 4: National Trade Facilitation Bodies*.
- UNECE (2020). *Recommendation No. 33: Recommendation and Guidelines on Establishing a Single Window*.
- UNECE (2015). *Recommendation No. 40: Consultation Approaches: Best Practices in Trade and Government Consultation on Trade Facilitation Matters*.
- UN/CEFACT (2020). *White Paper on the Core Principles of the Operation of Systemically Important Single Windows*.
- WCO (2017). Integrated Risk Assessment. *Building a Single Window Environment Compendium*, vol. 2, Part 8.

## 5. Possible evolution of a National Single Window project

As described in the previous chapters, a Single Window is not finite project. It evolves with its context and with the vision of the trade facilitation champions in charge of it. The more a Single Window is interconnected, the more benefits it brings to the economy. Once the core regulatory elements are digitalized, there are several options for further development.

5.1 Five levels Single Window evolution

The United Nations Network of Experts for Paperless Trade and Transport in Asia and the Pacific (UNNExT) presented the concept of an evolutionary Single Window based on an empiric review of many countries' experiences in developing their Single Window. Several levels of potential developments have been observed beyond the National Single Window nucleus (level 1 and level 2). The following figure presents this concept. It is important to note that this is not a roadmap or guideline; it is a representation of potential developments. For example, in some countries level 2 has happened before level 1, or level 3 has happened before level 2, etc.

Figure 4: Levels of Single Window and related platforms' evolution. Source: UNNExT.

1. **Level 1**: Paperless customs + e-payment of customs duties + full container load electronic lists + risks taken into account
2. **Level 2**: Connection with the IT systems of other public regulatory bodies (aligning paperless customs with additional documents such as e-certification and e-permits)
3. **Level 3**: Electronic document interchange between stakeholders within the port community systems (e.g. sea and air)
4. **Level 4:** Integrated national logistics platform where traders and providers of services related to logistics exchange relevant information
5. **Level 5:** Regional system of electronic data exchange
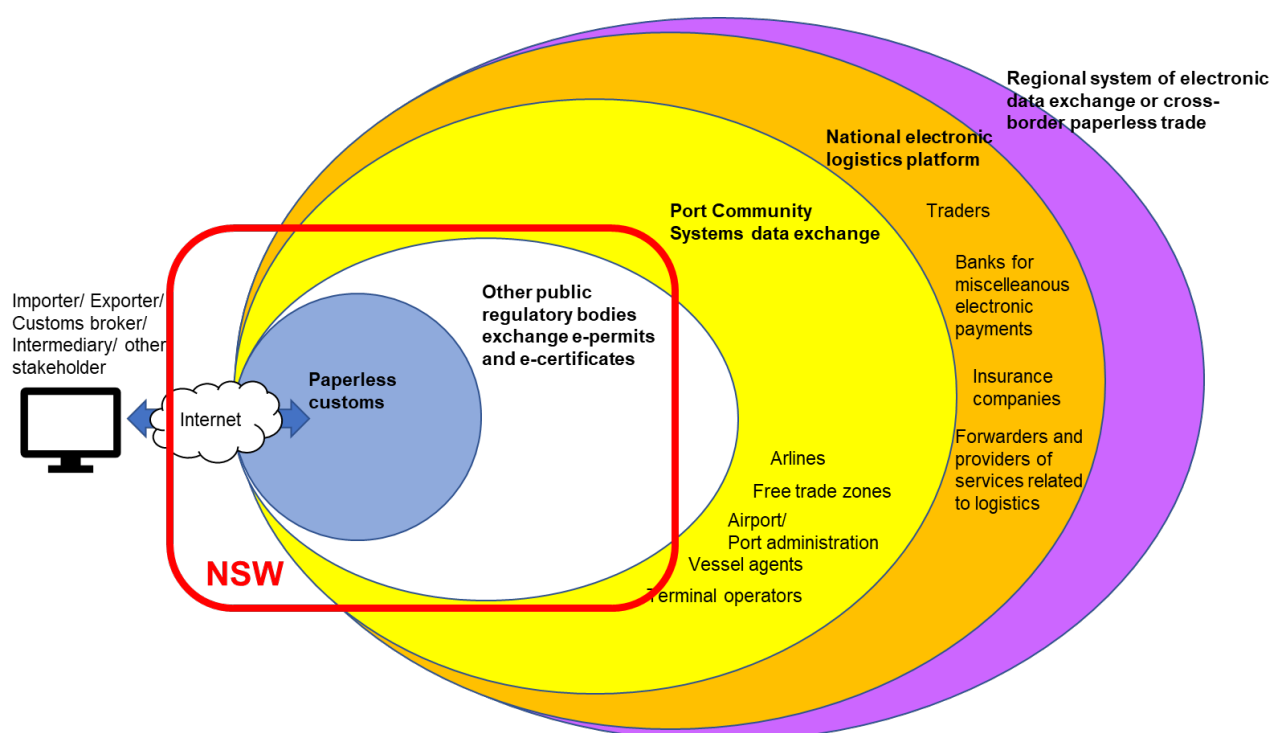
5.1.1   Level 1: Paperless customs

A paperless customs system is the first step in the development of a National Single Window. If a national paperless customs system is not yet available, the development plan should secure funding and implement such a project as the first priority. This system should cover other supporting functionalities such as paper-free customs declaration submission, e-payment for customs duty, automated risk assessment and risk-based inspections, and deployment of the systems at all major seaports, airports and land-border crossings.

5.1.2   Level 2: National Single Window

After linking traders and customs electronically, countries can develop a Single Window e-document exchange system linking several or all government agencies dealing in the regulation of imports and exports. This system allows for the application and issuance of electronic import/export-related permits and certificates and enables their exchange between government agencies.

The challenge is to create a National Single Window with single submission where traders submit their export or import data only once to the Single Window. This challenge is derived mainly from jurisdiction issues, the willingness of many independent government agencies, and from system integration constraints due to existing legacy systems in the administrations.

5.1.3   Level 3 to 4: Additional expansions from the National Single Window nucleus

Possible evolution beyond a National Single Window may include integration with private-sector stakeholders and intermediaries at major airports, seaports, or borders (e.g. port community systems). The challenge in extending the Single Window to this level is to cover the operations and services suitable for all stakeholders within a port community, and if possible, to also extend the Single Window facilities to each and all major ports within the economy. Many economies may have several major ports and each port normally has different sets of stakeholders. Stakeholders and the nature of the required documents and procedures are different between airports, seaports and dry ports. It will therefore require significant time to implement and deploy such an extension for each port.

The (level 4) connection of non-regulatory functions with private-sector participants such as banks, customs brokers, insurance companies, freight forwarders and other logistics service providers has been seen in some places. But, depending on their context, not all countries will benefit in developing their Single Window in this direction.

5.1.4   Level 5: Regional cross-border exchange platform

Electronic, regional, cross-border information exchange is an important instrument for regional integration and increased security, trustworthiness and collaboration between trading countries. A National Single Window — especially with a cross-border e-document exchange platform between two economies or among several economies within a regional grouping — can enable the economic integration process by easing the flow of goods, but with better risk management between and among those economies. The Single Window can enhance the availability and authenticity of information, thereby reducing fraud. It can expedite and simplify information flows between trade and government and can result in greater harmonization and sharing of relevant data across governmental systems. This can bring meaningful gains to all parties involved in cross-border trade. The use of such a facility can result in improved

efficiency and effectiveness of security and official controls and can reduce costs for both Governments and traders due to better use of resources.

Cross-border information exchange can start at any time. The type of data that the Single Window can exchange depends on its development stage. A paperless customs system can only provide customs data for cross-border data exchange while a fully integrated Single Window can also provide transport and commercial transaction data.

5.2 Single Window Interoperability

5.2.1 Why interoperability?

There can be multiple specific needs for interoperability based on the agreements between the economies that are exchanging foreign trade-related information. These should clearly be outlined in agreements or protocols to ensure clarity on the intended usage of the information. Some reasons countries may have for implementing interoperability are outlined below. An aligned series of trade documents offers numerous benefits:

- **Regional integration:** A Single Window can be seen in a broader context as a tool not only to improve national competitiveness but also to promote regional economic growth.
- **Risk analysis**: Receiving information from the export declaration about the arriving merchandise allows government agencies in the importing country to pre-assess any security, safety, fiscal or other risks. The importing country will receive the export-declaration-related information from the exporting country to perform a comparative risk analysis.
- **Advanced security declarations**: Building on this principle of risk analysis, many countries have put in place an advance arrival security declaration system. This is outlined in the World Customs Organization (WCO) SAFE Framework of Standards[25] in its first pillar. Now that these systems have been functioning for a few years, one of the major concerns is with the data quality: information is often requested from a second- or third-hand source, rendering the quality very low and not effective for a proper risk assessment. Single Window interoperability could assist with this through bilateral agreements between countries where the exporting country's platform would capture all the necessary data elements. The exporters could then request that these data elements be sent to the importing country and the exporting country's Single Window platform could transfer the information to the importing country's Single Window on behalf of the exporter.
- **Infrastructure-use planning:** At a minimum, exchanging information about the volume of goods departing one country and arriving in another on an approximate date would allow the importing country to adapt its infrastructure-use planning accordingly to accommodate the expected trade volumes.
- **Combatting illicit activity**: When identifying illicit merchandise or suspected illicit activity at export, the exporting country could forewarn the importing country to ensure that the merchandise is properly inspected upon arrival. This could also be extended to suspicions of fiscal evasion through trading transactions, and to allow countries to plan for the proper inspections relative to such transactions.

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[25] Available at: http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/frameworks-of-standards/safe_package.aspx#:~:text=WCO%20tools%20to%20secure%20and,and%20promote%20trade%20facilitation%20worldwide

5.2.2   Interoperability with other Single Window systems

The primary driver of Single Window interoperability is to facilitate traders in conducting foreign trade while assisting government agencies in taking care of their own tasks. Trade-related information exchange can be used by governments and agencies in different countries and economies to meet the requirements of countries of export and import, and possibly the countries of transit as well. Working towards effective Single Window interoperability (including regional Single Window implementation) for cross-border information exchange relies on traders and authorities having the confidence, readiness and willingness to share relevant trade-related information with authorized parties.

Four areas must be looked at for cross-border interoperability of the Single Window:

1. **Business Needs**: The primary drivers and needs for Single Window interoperability include
   - sufficient volume of trade between economies, and
   - sufficient strength of political will

2. **Semantics**: These are the type of business processes and information to be exchanged and the existing semantic frameworks, including
   - developing/harmonizing the common data set, based on international standards;
   - aligning business processes; and
   - aligning message syntax (ICT systems).

3. **Legislative obligations**: These are regional and bilateral trading obligations. Key elements must be reviewed, such as the legal aspect of interoperability. (International laws on cooperation between states in the field of electronic exchange of regulatory data is not very developed.)

4. **Governance**: The most appropriate model(s) for governance are for the interoperability activity between
   - a centralized model;
   - a gateway or distributed model; or
   - a mixed or hybrid model.

   The governance framework is complex — driven by a wider context involving globalization of trade, internationalization of standards, and regional integration. Each governance approach to Single Window interoperability will need to be adapted to suit the specific environment in which the parties will operate across borders. That being said, there is merit in exploring the idea that certain forms of governance may be more useful at some stages than others.

5.2.3   The Single Window in a regional context

As presented in the session 1*; "a Regional Single Window" would be a mechanism that would handle trade-related regulatory requirements within a given region. This would either create a collaborative system of National Single Windows (a network of networks), provide additional levels of functionality (such as shared procedures between economies) or completely replace the National Single Window. In these cases, no other RSW should exist for trade-related regulatory requirements.*

Some points which need to be considered in the regional context are as follows:

- Every member State of the region should establish a National Single Window
- Each National Single Window within the region should effectively be functioning on a comparable level and all should offer the same level of availability.
- Application of national and regional legislations should be clearly distinguished.
- Potential redundancies associated with the multiplication of information and procedures between member States of the region should be identified.
- Procedures which can be handled by the Regional Single Window should be identified and transferred.
- Border agencies responsible for border crossings and transit should have assurance that sufficient information will be shared with them (to avoid delays at the border).

In cases where there is a higher level of economic integration in the region, the following guidance for Single Window interconnection is proposed:

- The data sets of each National Single Window should be aligned to a **common regional data set** to facilitate the connection and exchange of information (harmonized entry point).
- The exchanges of electronic information (containing relevant, standardized and harmonized data sets) should be sufficiently optimized to perform the export, import and transit operations among National Single Window systems.
- Traders should be able to request services from member States other than those where the goods are physically located.
- New member States within a region should be connected to a common infrastructure on equal terms to have equal access to information.
- Organized information exchange should exist within the functioning framework of the various National Single Window systems to enable risk analysis (financial, security or other).

5.3   Interoperability with other systems

5.3.1   Single Submission Portals

Single Submission Portals (SSPs) are facilitation platforms, launched by traders — especially micro, small and medium-sized enterprises (MSME) — who want to gain efficiency benefits in the international trade context. These are electronic systems by nature which aim to provide trade facilitation 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 examples of SSPs today include the following:
- Port community systems
- Cargo community systems
- Data pipelines
- Customs clearance systems
- Integrated Services for MSMEs for International Trade

Single Submission Portals mainly cover business to business (B2B) processes such as contracting for transport, logistics and financial services. They often also facilitate regulatory processes through business to government (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 are presumably motivated by economic interests. 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.

The following services 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**:**
    - 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
    - Contracting of transport and freight forwarding services
    - Status information and control, tracking and tracing of shipments throughout the entire logistics chain
    - Terminal pre-notification for the pick-up or delivery of containers
    - Electronic facilitation of consolidation or division of shipments

5.3.2   The Integrated Services for MSMEs in International Trade (ISMIT) Framework

An ISMIT platform is a conceptual framework intended to provide services to facilitate cross-border trade for MSMEs. It may take the form of a separate e-commerce platform for services or it may be integrated into a larger B2B or B2C e-commerce platform. The purpose is to eliminate or significantly reduce the barriers to trade faced by MSMEs.

An ISMIT platform combines the competitive small-player advantages of MSMEs (niche products, access to local expertise and low production costs) with the scalability and strength of e-commerce platforms and large enterprises. It can realize economies of scale and can provide expertise on international trade requirements. The platform integrates these things using e-commerce technology and electronic information exchange as an enabler. An ISMIT platform can also connect to other ISMIT platforms to establish an ISMIT network which can provide services to multiple MSMEs from different countries.
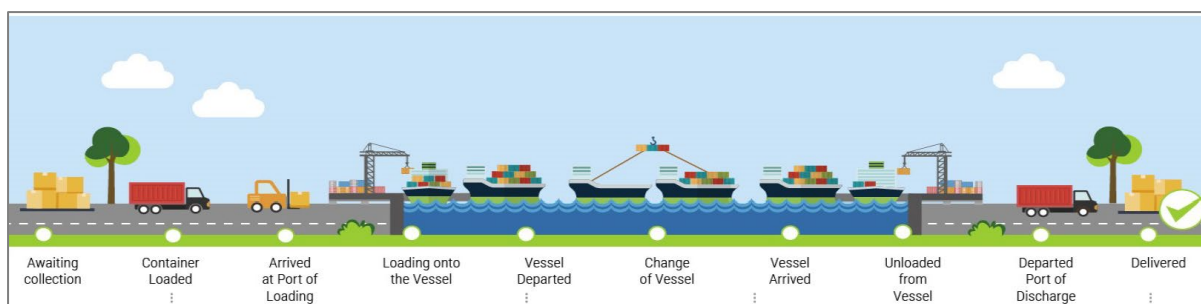
Since the majority of MSMEs are not capable of providing standardized information and documents to a National Single Window, the ISMIT can act as a trusted third party between them. That is, MSMEs provide the essential and non-standardized information to the ISMIT platform, and the ISMIT (as an information exchange platform) can then transform that information into standardized information and documents and submit it to a National Single Window.

5.3.3   Data pipelines

The concept of a data pipeline is an innovative method of managing data which is capture at its source; once initially provided, it is reused throughout the supply chain, regardless of the mode of transport, party or border agency that needs to access the data.

Figure 5: Representation of data pipeline waypoints. Source: UNECE.

| Awaiting collection | Container Loaded | Arrived at Port of Loading | Loading onto the Vessel | Vessel Departed | Change of Vessel | Vessel Arrived | Unloaded from Vessel | Departed Port of Discharge | Delivered |

This reflects the Single Window principle of sharing electronic data. The recapturing 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 used to provide certainty.

QUIZ
1) WHAT ARE THE FIVE LEVELS SINGLE WINDOW EVOLUTION?
2) WHEN IS THE BEST TIME TO DEVELOP CROSS-BORDER INFORMATION EXCHANGE?
3) LIST AT LEAST TWO REASONS TO DEVELOP INTEROPERABILITY BETWEEN SINGLE WINDOWS INTERNATIONALLY?
4) WHAT ARE THE FOUR AREAS TO BE CONSIDERED FOR CROSS-BORDER IINTEROPERABILITY OF SINGLE WINDOWS?
5) WHICH INDEPENDANT SYSTEMS COULD SHARE INTEROPERABLE PROCESSES WITH SINGLE WINDOWS?

Main sources for this session:

– UNECE (2020). *Recommendation No. 33: Recommendation and Guidelines on Establishing a Single Window*.
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– UN/CEFACT (2018). White Paper on Data Pipelines
– UN/CEFACT (2019). Data Pipeline Projecte-business standard. Geneva.
– UNNExt (2013). *Single Window Planning and Implementation Guide*. New York and Geneva. United Nations publication. Available at (Accessed on 20 December 2020).

Single Window Training Material

Training resources:

- African Alliance for E-Commerce (AACE) (2017). *Practical Implementation Guide of Single Windows for Foreign Trade (version 2). Available at* [AACE – Guide de mise en œuvre de Guichets Uniques en Afrique V_Anglaise.indd (swguide.org)](#).

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- UN/CEFACT (2020). *White Paper Integrated Services for MSMEs in International Trade (ISMIT): Opening the Global Economy to MSMEs* (version 1).

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- WCO (2017). Data: ensuring quality, security & privacy. *Building a Single Window Environment Compendium* vol. 1, Part 8.

- WCO. Building Single Window Environment Recourse material website. Available at http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/tools/single-window-guidelines.aspx