Standing Committee
for Economic and Commercial Cooperation
of the Organization of Islamic Cooperation (COMCEC)

COMCEC

Single Window Systems in the OIC Member States

COMCEC Coordination Office
February 2017

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List of Acronyms

AACE	African Alliance for e-commerce
ACDD	ASEAN Customs Declaration Document
ADB	Asian Development Bank
AEO	Authorized economic operator
ASEAN	Association of Southeast Asian Nations
ASYCUDA	Automated System for Customs Data
ATIGA	ASEAN Trade in Goods Agreement
B2B	Business to Business
B2G	Business-to-government
BI	Business Intelligence
BL	Bill of Lading
BPA	Business Process Analysis
BPM	Business Process Management
CCN/CSI	common communication network/common systems interface
CDPS	Customs Declaration Processing System
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMR	Convention on the Contract for the International Carriage of Goods by Road
CoO	Certificate of Origin
CVED	Common Veterinary Entry Document
DG TAXUD	Taxation and Customs Union Directorate General
DMZ	Demilitarized Zone
DTI	Direct Trader Input
E2E	End to End
EAEU	Eurasian Economic Union
eBL	Electronic Bill of Lading
ENS	Electronic entry summary declaration
ERP	Enterprise Resource Planning
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ETL	Extract, Transform and Load
EU	European Union
FOREX	Foreign Exchange Market
G2B	Government to Business
G2G	Government to Government
GIZ	Gesellschaft für deutsche Zusammenarbeit
HA	High Availability
HR	Human Resource
HS	Harmonised System
IRM	Integrated Risk Management
ISO	International Organization for Standardization

IT	Information Technology
KPI	Key performance indicator
MASP	Electronic Customs Multi-annual Strategic plan
NTM	Non-tariff measures
OECD	Organization for Economic Co-operation and Development
OIC	Organization of Islamic Cooperation
PCS	Port Community System
PKI	Public Key Infrastructure
PPP	Public–Private Partnership
QA	Quality Assurance
QoS	Quality of Service
RKC	Revised Kyoto Convention
RSS	Rich Site Summary / Really Simple Syndication
SaaS	Software as a Service
SEED	Systematic Electronic Exchange of Data
SLA	Service Level Agreements
SME	Small and medium-sized enterprises
SMS	Short Message Service
SNS	Singapore Network Services
SOA	Service-Oriented Architecture
SPS	Sanitary and Phytosanitary
SW	Single Window
SW	Single Window for Trade
TCO	Total Cost of Ownership
TDB	Singapore Trade Development Board
UML	Unified Modelling Language
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UNECE	United Nation Economic Commission for Europe
UNNExT	UN Network of Experts for Paperless Trade
USAID	United States Agency for International Development
WADL	Web Application Description Language
WCO	World Customs Organization
WCO SAFE	Standards to Secure and Facilitate Global Trade
WTO	World Trade Organization
WTO TFA	Trade Facilitation Agreement
XML	Extensible Mark-up Language

Executive Summary

The subject of this study is Single Window efforts in OIC Member States. In the past years the number of Single Windows worldwide has steadily risen and many OIC Member States have set up or are planning to set up a Single Window for Trade.

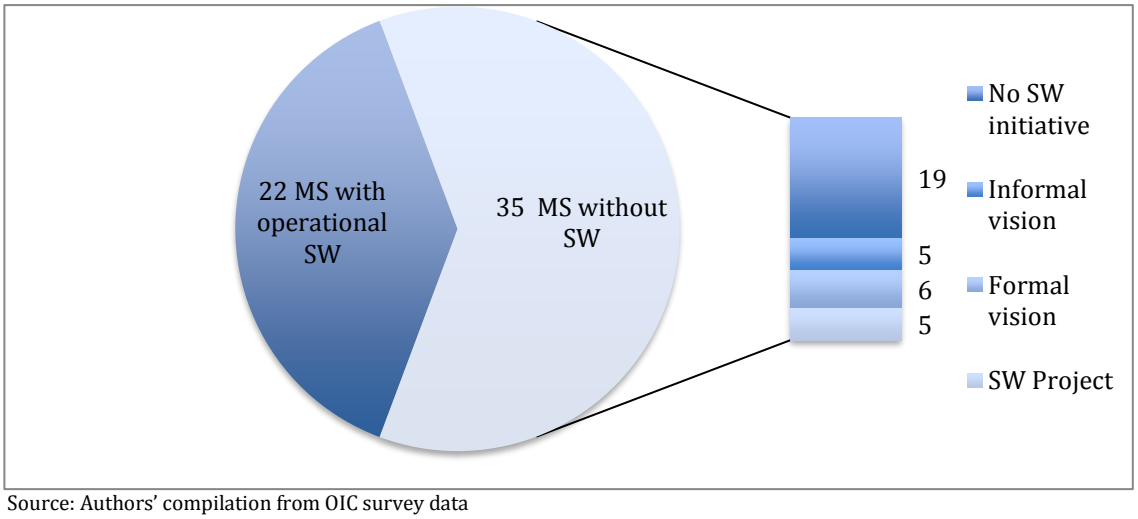
Governments set up Single Windows as a trade facilitation tool to simplify import, export and transit formalities, and to improve processing efficiency and effectiveness. There is not a unique model to follow and Single Windows are implemented in many different ways. They vary on many aspects including organizational set up and funding, scope and coverage, and IT architecture.

This study focuses on the 57 OIC Member States in the Arab, Asian and African region. The intent of the study is to get an understanding of what is the state of Single Window implementation today for OIC Member States, what are the characteristics and specificities of these Single Window initiatives, and what are the actions governments can and should be taking to affect the success of Single Window over time.

This study looks at data and information in government publications and websites and research documents and also surveyed government officials and Single Window operators. 60 countries[1] were surveyed to understand the details of their Single Window efforts and input was received from 26 countries.

Single Window Implementation Status in OIC Member States

By the end of 2016, 22 of the 57 OIC Member States have an operational Single Window.



Source: Authors' compilation from OIC survey data

[1] 57 OIC Member States and 3 non-OIC Member States

These Single Windows can be found in diverse countries from all three geographical groupings; eight in low income, seven in high income, and seven in lower middle-income countries. The number of Single Windows in OIC Member States has really increased in the past five years. The majority of the 22 Single Windows became operational in the past five years. Five Single Windows however are now operational for ten years or more years – Cameroon, Malaysia, Saudi Arabia, Senegal, and Tunisia.

35 OIC Member States do not have an operational Single Window yet. But five of these 35 countries are currently implementing a development project and are expected to launch their Single Windows in near future. Six OIC Member States have a formally adopted Single Window strategy. 24 Member States do not have a Single Window initiative yet, but in six countries the Single Window is on the political agenda.

Collecting statistics on the implementation level was not the only intent of this study. Information was also collected to understand the diverse characteristics of the Single Windows initiatives.

Diversity of Single Window Approaches

The term Single Window for Trade denotes a variety of platforms for the exchange of electronic information between traders, government agencies and departments, and a variety of commercial service providers from the transport, logistics and banking sector. The objective is to offer a single point of submission of trade relevant data and single point of contact, and to speed up processing ideally in a paperless environment.

There are different ways to achieve this objective and the OIC Member States Single Windows reflect the diversity of approaches. This study compared the regulatory business process and services coverage, technical and technology and organizational aspects of the existing OIC Member States Single Windows.

OIC Member States chose amongst three different organisational models for the Single Window. More than half are fully government owned; eight have a mixed public-private ownership with public majority in four cases and private majority in four cases. The organisational entities are either a departmental or non-departmental public body, namely the Custom Services in seven countries, or a public benefit non-profit company in six countries, or a for-profit company, with majority private or public ownership in seven countries.[2]

The core activities of the Single Windows are government licensing and permit approvals, submission of documents to Customs services, port and transport activities, and transit movement control activities. The Single Windows predominantly focus on document filing and submission services. Few cover collaboration services, such as risk management and scheduling

[2] For two countries this information was not available.

of joint inspection. The payment of customs duties and fees or port charges is integrated into half of the Single Windows. In only six countries, paper has been removed from all or the majority of the procedures. The others often duplicate paper and electronic procedures and documents.

Challenges for Successful Single Window Initiatives

Single Window initiatives are complex projects because of the length and costs, depth of required changes, and number of actors involved. Governments face many challenges and impediments to successful Single Windows. This study finds that what matters for Single Windows to be effective is

- to have a shared integrated design that allows a maximum level of business process re-engineering and simplification from the perspective of a single point of submission;
- to match business strategy with an adequate IT architecture and infrastructure that includes high availability concept and business continuity and disaster recovery plan;
- to build an interoperable IT architecture that is flexible and can work effectively in a distributed, centralized or hybrid (mixed) IT architectural pattern on the basis of a common data layer;
- to have an adequate level of resources and funding that allows for the most appropriate design choices and recruitment and training of staff;
- to commit to a medium-term vision that keeps the attention on performance measurement and improvement.

Single Windows that make a significant contribution to trade facilitation have well performing end-to-end services that cover a large array off trade related processes from government licenses, to joint inspections, and control of the physical movement of goods, remove paper from processing and connect to external IT systems such as the Customs or Port Management systems.

OIC Member States face numerous challenges in their Single Window efforts. This study identifies 25 different challenges faced by national Single Window initiatives with regards to successfully driving and completing the implementation process, managing an efficient Single Window organisation, designing and maintaining an interoperable and flexible IT architecture and infrastructure, and continuously managing performance and quality.

OIC Member States that are launching a Single Window initiative try to work through the challenges of obtaining funding, conducting the preparatory work make appropriate design choices, and implementing the projects on time with the expected outputs.

OIC Member States that have a Single Window face the challenge of matching their business strategy and vision with the abilities of the IT architecture and infrastructure, scaling the Single Window services and users, and controlling the costs of operations. Notable, six of the OIC Single

Windows have been or are gradually re-designed and re-engineered to take advantages of technology changes and offer better services and performance.

Appropriate policy and management choices can help overcoming the challenges and the Single Window experiences shared by OIC Member States helped formulating relevant options. Technical assistance is important to overcome gaps and constraints, notably knowledge and skills gaps and financial limitations. Countries and Single Window operators may also benefit from peer-to-peer assistance, which entails sharing of experiences, peer assessment of initiatives, and peer support and advice.

Trend toward Regionalisation of Single Window

Finally, the past years has seen a growing attention to cross-border exchange of electronic information and regional Single Window initiatives. Whilst few OIC Member States currently engage in such initiatives this is likely to change in the future. The challenges of Regional Single Window initiatives are the interconnectivity and interoperability of the national Single Windows, harmonized data and process requirements, and integration at business process and data level. These issues have to be addressed in often-lengthy political process of collaboration and negotiation of a regional legal framework.

1. Conceptual Framework

In the past 15 years many governments worldwide have implemented Single Window (SW) initiatives to simplify import and export and transport processes. These Single Window initiatives do not follow the same model and each Single Window is set up in a different way. They vary on organisational and technological aspects and strategic design, but the initiatives follow the same conceptual ideas and approaches.

1.1. The Single Window Concept

The term Single Window for Trade is used to describe a variety of platforms for the exchange of electronic information between traders, government agencies, and commercial service providers. There is no unique model of a Single Window, and different organisations have adopted their own definition - see Box 1 – to describe the concept. The common elements of these definitions are:

A Single Window is a i) Single entry point, ii) for the lodgement of standardized information, iii) related to import, export and transit related formalities.

Box 1: Definitions of Single Windows for Trade

UNECE Recommendation No 33[3] defines a Single Window for Trade as follows: "... a facility 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-related regulatory requirements."

The World Customs Organisations (WCO) defines a Single Window as: "... a cross border, 'intelligent', and facility that allows parties involved in trade and transport to lodge standardized information, mainly electronic, with a single entry point to fulfil all import, export and transit related regulatory requirements."[4]

The African Alliance for E-commerce (AACE) defines a SW as "... a national or regional system mainly built on a computer platform initiated by a Government or an ad hoc entity to facilitate the performance of import, export or transit-related formalities, by offering a single point of submission of standardized data and documents in a bid to fulfil official requirements and facilitate logistics.[5]"

[3] UNECE, Recommendation and Guidelines Establishing A Single Window. Recommendation 33 (New York and Geneva: United Nations, 2005 (ECE/TRADE/352)
4 WCO, The Single Window Concept. The World Custom Organization Perspective available at http://www.wcoomd.org/~/media/wco/public/global/pdf/topics/facilitation/activities-and-programmes/tf-negociations/wco-docs/info-sheets-on-tf-measures/single-window-concept.pdf (accessed January 2017)
5 AACE, Single Window Guide for Africa (2013) under AACE http://www.swguide.org/single_window/ (accessed January 2017)

The majority of the Single Windows are now electronic platforms. Early Single Window initiatives, however also comprised physical versions, that brought together separate public entities in one physical location. These approaches are now referred to as One-Stop Shops as it is commonly understood that a Single Window rests on a shared Information Technology (IT) platform. The WCO for example recognizes that "countries may enjoy fuller benefits of a SW by using Information and Communication Technology (ICT)"[6].

Single Window approaches are not limited to the trade field. Governments adopted them for many government services, including business licensing, and vehicle registration. Single Windows as unified service platforms enable a cross-organisational delivery of service through simple and efficient procedures. The underpinning logic of a Single Window approach is to deliver fast and seamless services for the end users - as opposed to organisation centric formalities and processes that require people to come to their office and collect/consume the service.

1.1.1. Evolution of the Concept

The first Single Windows for Trade were launched in the late '90s to leverage opportunities of technological changes that occurred at that time. Information and Communication Technology (ICT) changes have continued to shape the evolution since than – see Box 2 below.

Box 2: IT Evolution Since 80's

1980's	Mainframe area	Customs management systems
late 90's	PC centric/client server infrastructure	Direct Trader Input/ Centralization of services
	Beginning of Internet	Early Single Windows
2005	Expansion of internet	Web-based Services Increase service coverage of the Single Windows
2010	Expansion of the IT Technology - Heterogeneity	Interoperability of systems Cross-border data exchange / SW

Since the mid-60s, ICT has been used in public administration and since the mid 80's ICT systems have been deployed worldwide to support customs clearance and trade statistics. During the so-called mainframe era until the mid-90's, these ICT systems were large and costly systems and they were deployed to automate frequently used and standardized business processes, such as customs clearance. Hence, whilst customs services were automated, other government agencies procedures were manual paper based processes.

[6] WCO, The Single Window concept

Technology developments of the late 90's changed this situation radically. The emerging PC centric/client-server infrastructure made IT support cheaper and enabled new services, such as Direct Trader Input (DTI). The rise of the Internet enabled centralization of services.

Until mid-2000 however, network connectivity constraints limited SW developments to few early adopters. Data resided on geographically isolated repositories and interoperability was near to impossible. From 2005 onwards the expansion of the Internet overcome these limitations and become more reliable. Usage of Internet was growing rapidly and the SW concept was put into practice in many countries.

Recent technology trends have created potentials for new applications, services, and ICT architecture design. It is possible to process faster, and have more complex algorithms. Costs for infrastructure have gone down because of virtualization and cheaper hardware components such as storage, changed networking. Processing is also less costly through the use of web services instead of client service architecture.

Web services allow applications to be located on centralized server where users access it, instead of applications being located on users' desktop and multiple information exchanges-submissions to central server for processing, submission to agencies' desktop for decision making, and exchange again to the users' desktop. The client service architecture was costly to maintain and time consuming in processing and offered limited accessibility.

Modern SWs now offer broad accessibility from a variety of different devices from traditional Windows, Linux and Mac based desktops, laptops, thin and zero clients, iOS and Android tablets and smartphones[7].

Due to the exponential growth of ICT in supply chain management and public administration the Single Window concept further evolved in the past six years. The focus is now on interoperability, which is the ability to exchange data and information across systems, including across-borders systems. In the current understanding, a Single Window architecture interconnects numerous Information technology (IT) systems on the physical and logical level. The Single Window concept also expanded beyond national borders to capture cross-border data exchange, in regional Single Window initiatives[8].

1.1.2. International Regulatory Framework

Recent international trade facilitation instruments, such as the WCO Framework of Standards to Secure and Facilitation Global Trade (SAFE) and the WTO Trade Facilitation Agreement (WTO

[7] UNESCAP, Technologies (ICT) for Trade and Transport facilitation: ICT related requirements and gaps in implementing Trade and Transport facilitation systems (UNESCAP, 2017), under https://unnext.unescap.org/sites/default/files/ICT%20related%20gap%20studies.pdf (accessed January 2017)
[8] For an overview of SW concept evolution Single see Jonathan Koh, "Single Window Development in the past decade"; in *Connecting International Trade: Single Windows and Supply Chains in the Next Decade* , UNECE (New York and Geneva: United Nations, 2013).

TFA), mandate governments to adopt national Single Windows. The WCO SAFE Framework adopted in 2005 urges governments to adopt a Single Window system *"for the single transmission to a sole designated point by international supply chain participants, including AEOs, of all relevant transport and cargo data*[9]*"*, and the WCO published the WCO SW Compendium and implementation guidelines to assist its members in the implementation.

The WTO TFA is the most comprehensive legal instrument on trade facilitation currently available. All WTO Members have signed off the Agreement in December 2013 – although not ratified it yet – and it contains rules in many areas from transparency, consultation and cooperation, appeal and review procedures, customs procedures, formalities, customs cooperation, transit procedures and formalities. Article 10.4 of the WTO TFA urges[10] WTO Members to establish or maintain a national Single Window.

Countries also commit to regional Single Window initiatives that mandate the establishment of a national SW and collaboration between members States for a regional Single Window. Examples are: ASEAN Single Window, Eurasian Economic Union, and the EU Single Window.

1.2. Single Window Functionalities

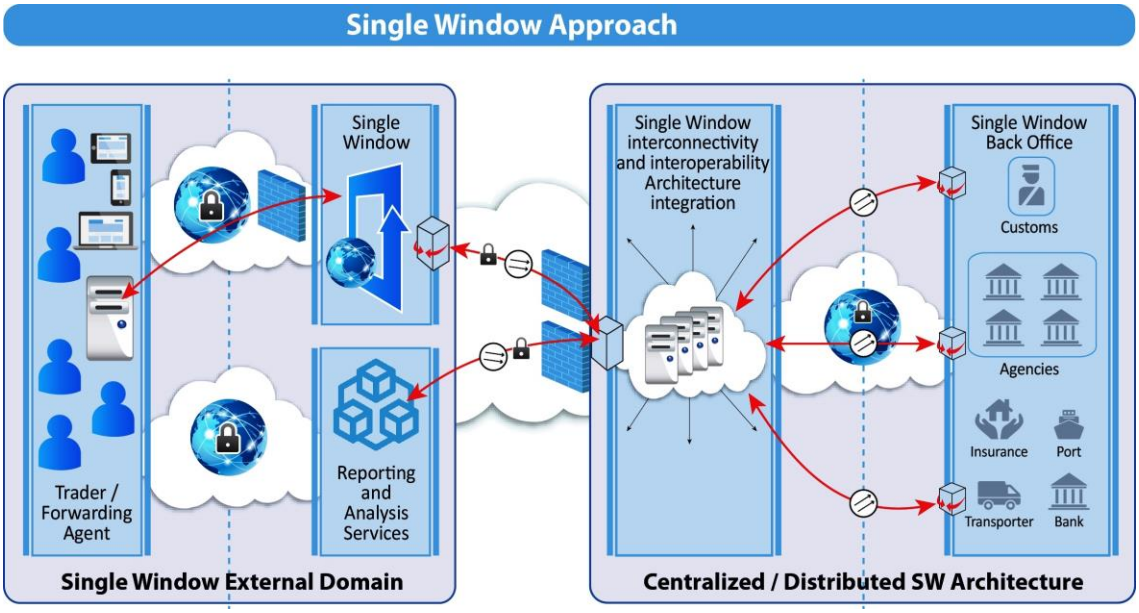
Single Windows for Trade are platforms for the electronic exchange of information for trade related processes. They integrate procedures and business processes from several organisational entities and offer trade related services covering activities such as government licenses, port procedures, physical movement of goods, and invoicing and payment.

1.2.1. Single Window Services and Users

A Single Window is an interface or hub between traders and trade intermediaries and government agencies (B2G2B), private service providers (B2B2B), and government agencies (G2G) – see the high level diagram of Figure 1.

[9] WCO, Framework of Standards to Secure and Facilitate Trade (SAFE), Adopted 2005
[10] The wording "shall endeavour" arguably only signals preferred behaviour rather than a strong legal obligation.

Figure 1: High Level Single Window Concept



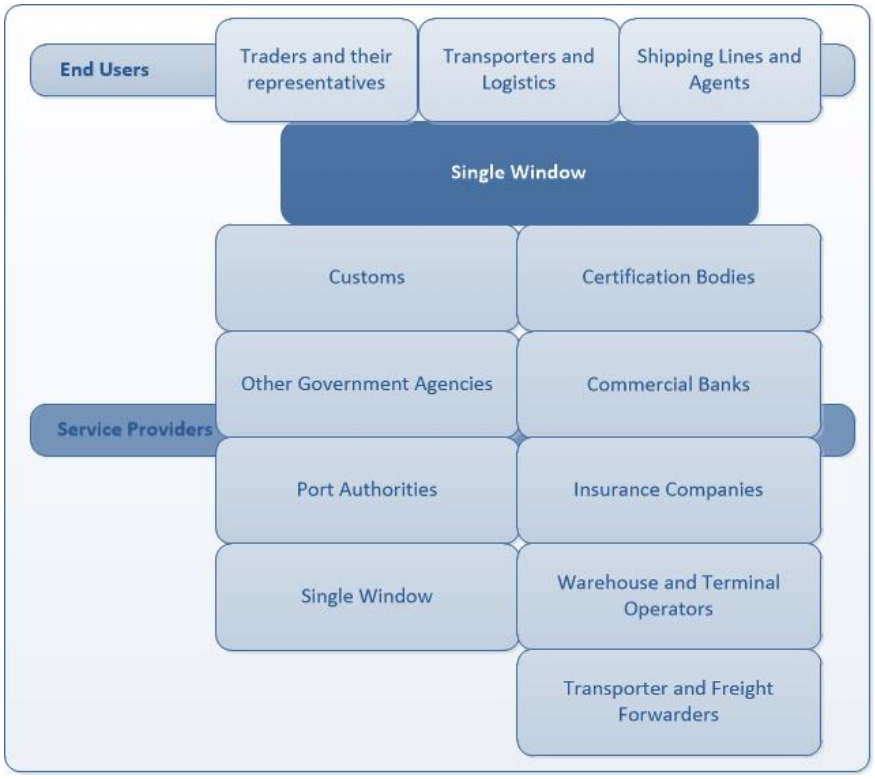
Source: Authors' own construction

A Single Window has two different types of users: end-users that request and consume a service from the Single Window, and service providers that deliver a service to the end-user through the Single Window. Together these two groups make up the stakeholders of a Single Window as shown in Figure 2. The stakeholders include traders and their representatives as end-users and the different service providers, which can be departmental or non-departmental public bodies as well as commercial entities.

Single Windows cover different trade related activities, such as:

- Activities of government agencies involved in the processing of trade procedures, such as government licenses, authorizations and certifications, customs clearance, food and sanitary inspection. The numbers of government agencies and their denominations varies according to the institutional set up but in some countries more than 30 government agencies may intervene in a trade transaction;
- Activities of government agencies and organizations involved in the physical movement of cargo and the means of transport, such as port movement notifications, arrival and departure procedure, dangerous goods declarations;
- Activities of commercial service providers involved in the physical movement of goods, such as warehousing, loading and unloading, transportation, and consolidation; and
- Other activities of business involved in selling and sourcing of goods, such as invoicing and insurance.

Figure 2: Single Window Users



Source: Authors' own construction

Each Single Window sets a different focus regarding the activities it supports. Often Single Windows are grouped into types based on general activity areas they support: Single Windows for clearance formalities; Single Windows for logistics coordination; Single Windows for B2B transactions[11] , or customs-centric, port-centric and license-centric Single Windows. In reality however, Single Windows nowadays integrate a large array of trade related activities across organizational and functional boundaries in order to offer a seamless service to traders.

The activity areas are integrated into the Single Window in form of business processes. A business process is a series of actions/operations that are interrelated and transform an input into an output. Examples of common Single Window business processes are: the application for a permit for the import of a specific good, or the submission of documents to Customs services, the submission and amendment of the ship/customs manifest to Port authority and Customs services.

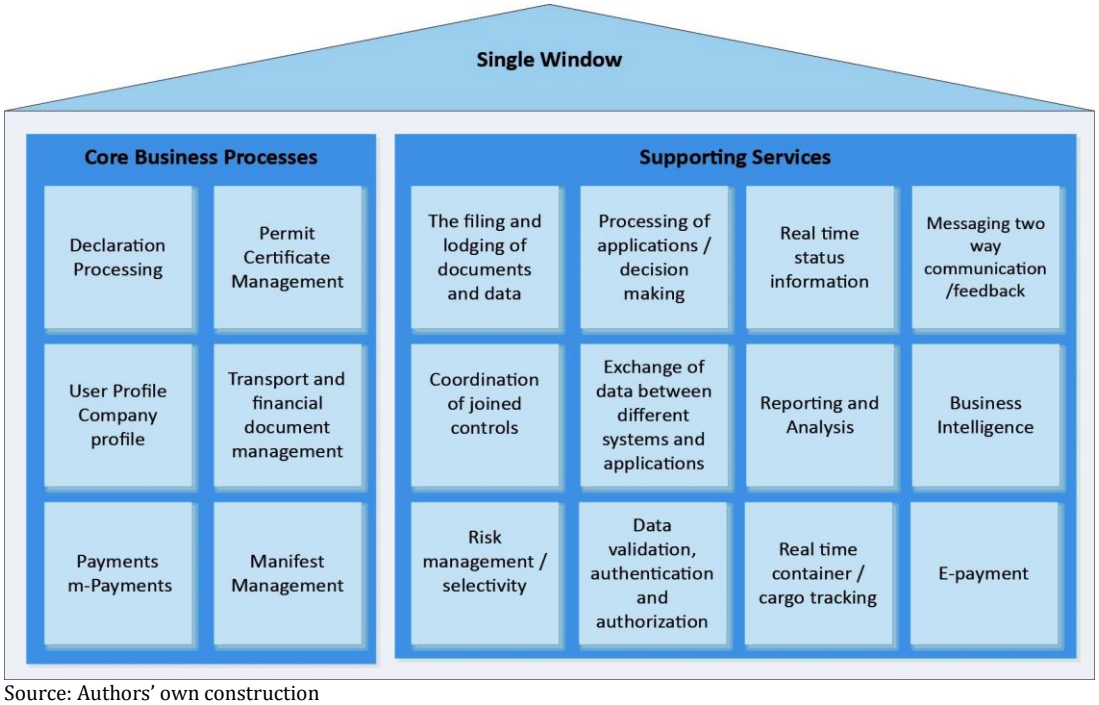
Each of the business process consists of a series of actions – from filling of forms, lodging of documents, to validation, decision-making, and notification. Figure 3 below presents a possible range of Single Window Business processes and services. Not all of these actions are necessarily

[11] AACE, *Single Window Guide for Africa (2013)*

integrated into an electronic process in the Single Window. The range of services Single Windows offer vary significantly and can include the following:

- The filing and lodging of documents and data
- Processing of applications / decision making
- Coordination of joint controls
- Reporting and Analysis
- Business intelligence
- Risk management / selectivity
- Data validation, authentication and authorisation
- Real time tracking of cargo
- E-payment

Figure 3: Single Window Processes and Supporting Services



Source: Authors' own construction

1.2.2. Governance and Management

In some countries Customs Services take the lead role in developing a Single Window. In others it is the Ministry of Trade or Economy, or the Chamber of Commerce or the Port Authority. Independent of who launches and drives the initiative, Single Windows are whole-of-government efforts and require cross-organisational collaboration. Governments choose different governance and management models for the Single Windows to deliver the organisational collaboration.

One approach is to entrust the development and management of the Single Window to a government department, commonly the Customs Services. This approach is attractive because

Customs Services are often advanced in terms of IT resources and skills, have an independent budget, and control all trade transactions. The challenge of this approach is to ensure involvement of other agencies and a strategy design that not only caters to the efficiency of the customs clearance process but also to the objectives of other government departments, i.e. the physical movement of goods and food and sanitary control.

Another approach is to set up a new entity for the Single Window operations that is neutral and specifically tasked to develop and manage the Single Window. Such an entity can take different legal forms; public or private. Governments contract out the development and operation of the Single Window through a contractual Private-Public Partnership (PPP) arrangement to a private or joint venture public private company, or through a special enactment to a public enterprise.

In terms of ownership and funding, Single Windows follow two different approaches. In the public model, the government funds the initial investment and, depending on the financial arrangement, and may also cover the operational expenses from its regular budget. In the public-private model a private company alone or in cooperation with the government provides the funding for the investment and operational expenses. In return, under a PPP contract, the profit generated by the Single Window is retained by the private company, which may also receive an annual payment from the government budget for its service.

The majority of the Single Windows charges fees for their services. There are different types of fees – see Table 1 below. Commonly Single Windows combine a registration/subscription fee and a usage based charge, which is either document a volume based.

Table 1: Type of Fees and Charges

Type of fee	Calculation basis	Single Window Examples
Registration fee	*Annual*	*Morocco: Annual subscription 300 US$* *Hong Kong: Annual Fee 129 US$*
	One-time	*Malaysia registration (one time): ~ US$125 or US$65 for SME* *Hong Kong registration (one time): 640 US$* *Senegal registration fees (one time): 200 US$*
	Mailbox charges	*Malaysia: ~40 US$ or 20 US$ for SME*
User charge	*Volume / transaction based*	*Morocco: 1,000 US$ to 2,400 US* *Senegal: per transaction: 10 US$ plus additional document: 2 US$ per document*
	Document based	*Malaysia: 0.25 US$/kilobyte; or 1.25 US$ per document* *Singapore: per declaration basis 2.8 US$* *Hong Kong: 0.64 US$ per document*
	Value based Percentage	*Ghana fixed fees at 0.4% of declared FOB value on import*

Source: Authors' own compilation from information on websites and different publications

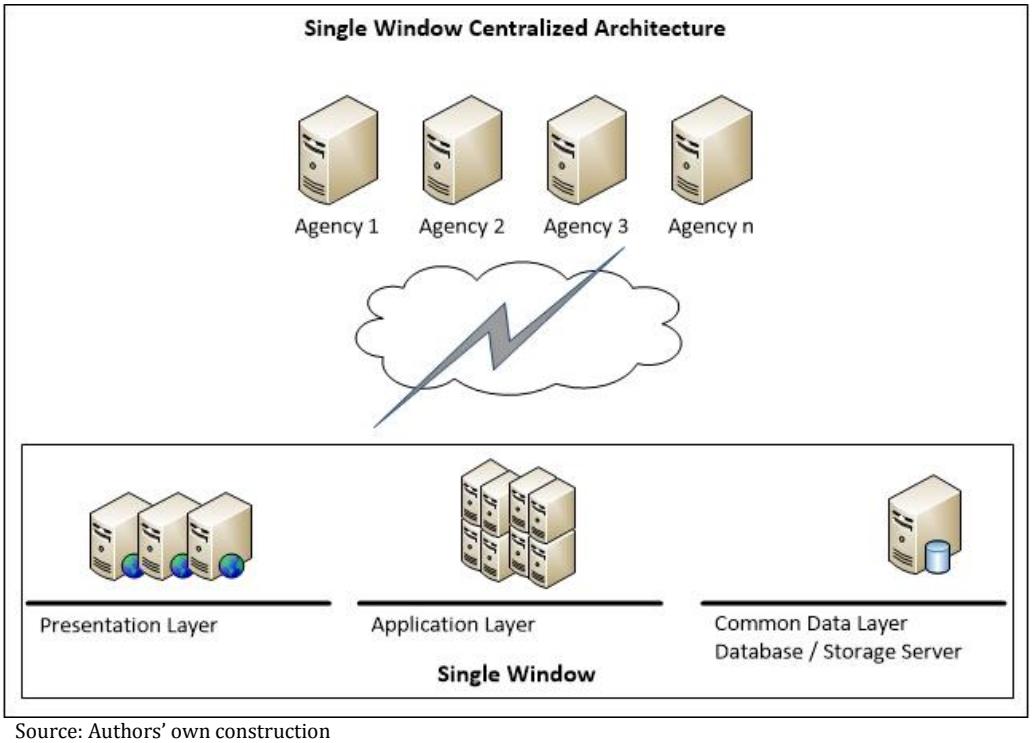
1.2.3. IT Architecture

Electronic Single Windows are complex IT systems that are either implemented through a centralised or distributed architecture. In a centralised architecture agencies and stakeholders use Single Window services through the Single Window infrastructure and system. In a distributed architecture agencies and stakeholder access Single Window services through their own IT systems and infrastructure, but ideally still use a common data layer.

The centralized architecture, see Figure 4 - represents the organizational setup where the Single Window is hosting the basic agencies processes and users access the Single Window services through a single portal, which is the presentation layer of the IT architecture.

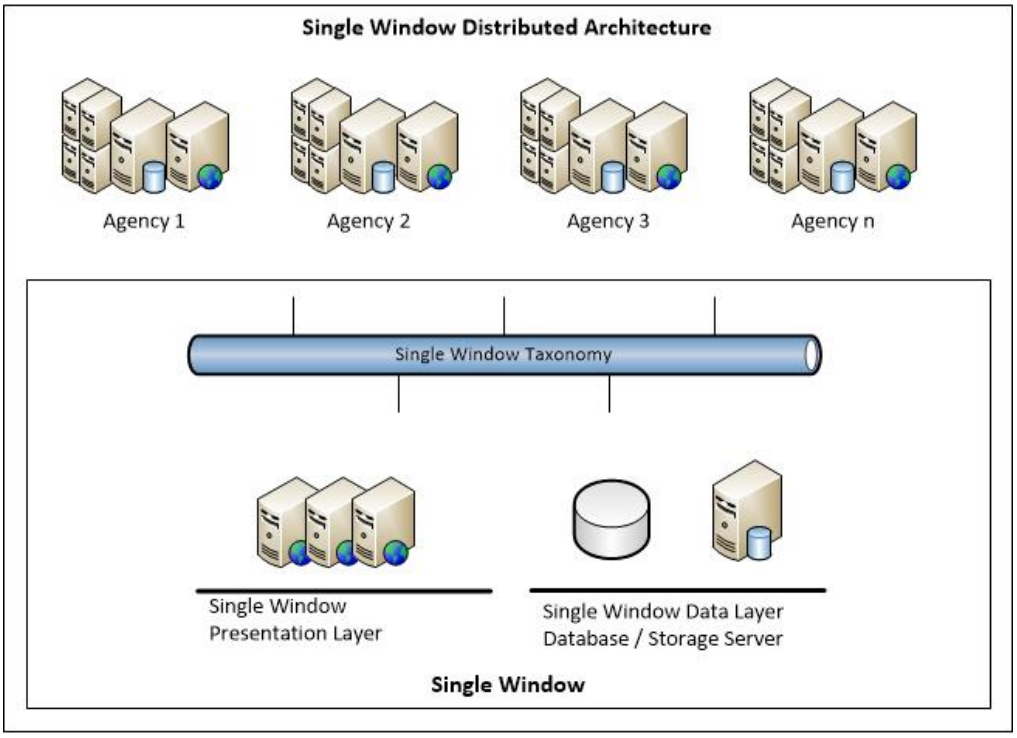
In a distributed IT Architecture, the Single Window is a platform for exchange of data and information and connects to other external system, see Figure 5. The agencies host their own IT applications and data in their internal IT systems and connect through the Single Window taxonomy, which is the exchange layer, and the portal services, which is the presentation layer, with the common Single Window services. Applications can be hosted on either the external or the Single Window system with, ideally, a common data layer on the Single Window system.

Figure 4: Single Window Centralised IT Architecture



Source: Authors' own construction

Figure 5: Single Window Distributed IT Architecture



Source: Authors' own construction

In some cases, a Single Window started with a centralised system, but changed with time. It either faced technological challenges to support the centralised architecture or agencies developed their own IT system that cover end-to-end decision making processes. Such a de facto move to a mixed IT architectural design becomes difficult to manage. Often it is easier and more costs-effective to re-engineer the IT system and hence adopt a new generation Single Window architecture.

A central feature of Single Windows is that they deliver a public service for a broad number of users and in some cases cover all trade transactions. It is therefore necessary that the operational data is handled with maximum security, confidentiality and privacy with different levels of user access control.

The Single Window overall IT architecture must be protected by a fault tolerant system and off-site data backup. Three international standards can be applied for business continuity sites; mirror site, data and services are mirrored (copied) to another site and there is no need for human intervention in case of and disaster recovery; hot / warm site, similar to mirrored site, but in order to restore the operations, human intervention is needed to put the hot / warm site online; and cold backup (offline) site that is just storing the data and identified critical services, human intervention is needed in order to restore the data and services on the primary site. The business continuity site keeps the data and services safe from human or natural disasters.

Business continuity is important as an incident can have vast implications for the SW services and data.

1.3. Contribution of Single Window to Trade Facilitation

Governments implement Single Windows for domestic efficiency consideration, and in response to international commitments. The main driver is to simplify trade formalities and speed up and secure processing with the objective to reduce clearance time and costs.

1.3.1. Policy Drivers

The array of policy objectives linked to Single Windows includes cutting red tape, eliminate waiting times, cut border-crossing times, reduce transport costs, improve freight management, and eliminate corruption. In general, Single Windows are set up to change an environment where

- Traders and intermediaries have to contact separately multiple agencies and stakeholders and transport documents back and forth to and between them;
- Government agencies operate in isolation and process sequentially without knowledge and information from other government bodies;
- Processes are handled manually without consistent targeting and selectivity;
- Handling and processing varies from one location to the other.

A successful Single Window project is expected to lead to

- Improved compliance management;
- Improved process efficiency with better resource allocation;
- Reduced process times through less idle times and agency collaboration; and
- Reduced indirect and direct costs of formalities.

1.3.2. Impact of Digitisation and Process Re-engineering

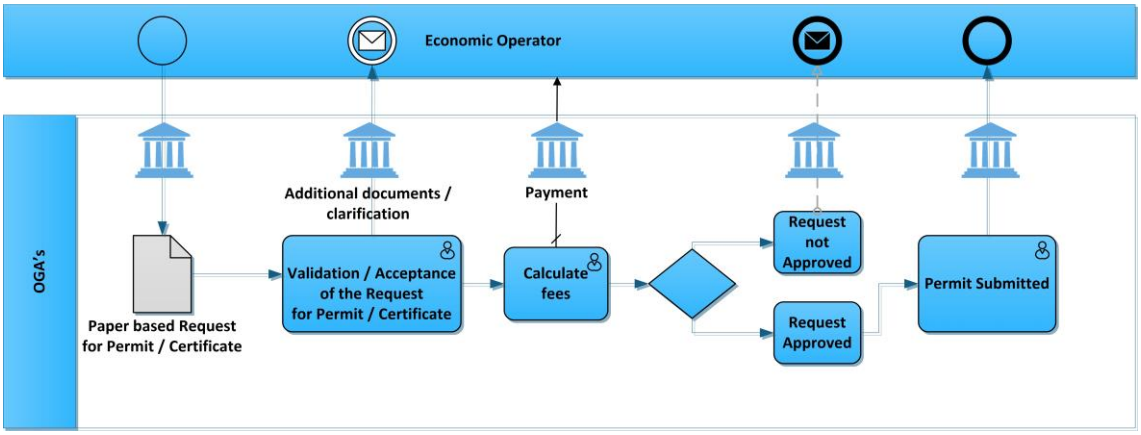
Single Windows can deliver a change impact through the digitisation and re-engineering of processes. The digitisation of front-end procedures and back office processing, including automated decision-making and shared and collaborative business processes, substantially change the operating environment for traders and government authorities alike. To illustrate these changes Figure 6 and Figure 7 present a business process, i.e. the application for a permit from a government agency, through a Single Window first as an analogue and then as a digital process.

In the analogue process, economic operators have at least three physical contacts points with a r government agency. The agency processes the request manually in a succession of at least five separate activities. This action is repeated for the number of agencies the trader has to contact.

In the digital process, economic operators have two digital contact points with the SW, and the request is processed digitally, with analogue decision making by the OGA. This analogue decision-making can be replaced by automated decision making if the necessary rules are

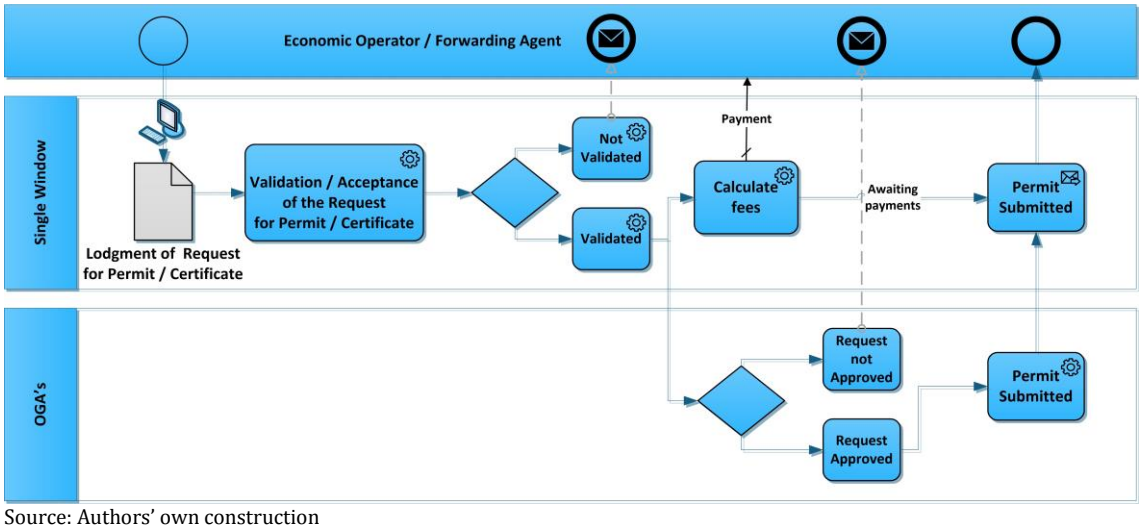
integrated into the Single Window. In the digital environment, multiple OGA's can be integrated into the Single Window but the increase in agencies does not increase the number of contact points for the trader, as it remains one digital contact point with the Single Window. The number of contact points for economic operators however remain two digital contact points.

Figure 6: Analogue Permit Application Process



Source: Authors' own construction

Figure 7: Digital Permit Application Process



Source: Authors' own construction

As can be seen in this example, the front office digitisation results in a single data entry location through which end-users access government agencies and other service providers, using a single submission or at least a common data set. In the back office, processing is automated so that faster and more secure decisions can be taken and returned to the end-users.

In the back office process, redundancies are eliminated and joined and shared processes enabled. Separate organisations and departments can exchange information and share

workflows for joined physical controls, integrated compliance management and combined computation of duties/taxes and fees/charges.

An additional advantage of the digital processing is that it is highly standardised on the level of business processes and data. It therefore ensures a consistent application of regulations and the harmonisation of operations at different locations. By removing physical contact points, a Single Window also limit the opportunity for bribes.

1.3.3. Single Window Deliverables and Impacts

If designed and implemented properly, a Single Window can deliver substantial benefits for traders, government entities, and commercial service providers - Table 2 below.

Table 2: Expected SW Benefits

Users	Expected benefits
Traders and Intermediaries (customs brokers and freight forwarders, transporters)	*Less paperwork through single data entry and uploading of structured and unstructured data* *Less contact points* *24h/7d/365d processing and location independent processing* *Less waiting and idle times and better information on status progress* *Improved predictability and certainty* *Less data and process errors through standardised data requirements and advance information*
Government	*Faster and less resources intensive processing* *Sharing of infrastructure* *Efficient allocation of resources to tasks* *More effective controls through data validation and authorization and information (risk) information sharing* *Visibility about Status quo of processing and revenue collection* *Revenue upsides* *Uniform application across territory*
Other service providers (i.e. commercial banks)	*Better service availability –additional service provision channel.* *Processing efficiency*

Source: Authors' own compilation

Figure 8 below gives examples of improvements achieved by Single Windows. These improvements are at the level of border crossing times, documents collecting time, cargo turnaround or dwell time, and customs clearance times.

Costs, time and predictability are decisive factors for companies' competitiveness in the global economy. In the past 20 years, supply chains have become increasingly geographically fragmented[12], offering companies from around the world new ways to integrate into global

[12] WTO, "The rise of global value chains", in *World Trade Report* 2014 (Geneva: WTO, 2014), 78-128, under publications https://www.wto.org/english/res_e/reser_e/wtr_e.htm (accessed January 2017)

value chains or regional production networks with their specialized products and services. Not tariffs but non-tariff measures, including border controls, administrative procedures and documentary requirements, constitute barriers to compete in international trade. Because these barriers increase costs, time and delays they limit the ability to integrate into global value chains and attract foreign investments.

An OECD study found that harmonizing trade documents, streamlining trade procedures, making trade-related information available and using automated processes could reduce total trade costs by 14.5% for low-income countries, 15.5% for lower-middle-income countries and 13.2% for upper-middle-income countries[13].

Figure 8: Single Window Impacts

Country	Processes	From	Reduction	To
AZERBAIJAN	Border crossing	180 min.	-160 min.	20 min.
SENEGAL	Documents collecting time	4 days	-3 days	1 day
BENIN	Cargo turnaround/dwell time	39 days	-33 days	6 days
MALAYSIA	Cargo turnaround/dwell time	4 days	-2 days	2 days
CAMEROON	Customs clearance	6 days	-357 hours	3 hours
SINGAPORE	Documents	3-35 documents	2 to 34 documents	1 documents

Source: Authors' own compilation

1.4. Single Window Implementation Process

Single Window initiatives are complex and lengthy projects. A project involves many different political and technical actors and requires activities of a different nature, including IT design and coding, business process analysis, legal assessment and drafting, and data harmonisation and simplification.

1.4.1. Gradual Implementation

Single Windows are often rolled out in phases, gradually increasing the capacity and functionalities of the Single Window over time. Three different scalability approaches can be observed.

1. Scaling existing functionalities/services

The objective is to offer the services to a board number of users and to integrate all relevant government agencies into existing business processes and services. It consists of

[13] OECD, Contribution of trade facilitation measures to the operation of supply chains (OECD, 2014) (TAD/TC/WP(2014)25/FINAL)

- Scaling the number of users: training and registering users from major companies and Small and Medium Enterprises (SME) and users in different locations;
- Scaling the number of government agencies: applying existing services and business process to more government agencies. This can be a new procedure/document or an additional version of an existing procedure.

2. Developing New Functionalities/Services

The objective is to develop additional services and business processes to deliver additional value to the users, notable seamless processing across functional and organisational boundaries. It consists of

- Adding services to a business process: developing services that complete existing processes such as adding notification services or amendment of documents to the government application business process;
- Adding new business processes/documents: developing new functionalities/services in relation to new process/documents, i.e. payment service, or port release and exit service.

3. IT infrastructure Scaling

The objective is to improve the performance of the IT system. It consists of

- Adding hardware with more processing power;
- Using maximum hardware processing power by implementing system virtualization technology[14];
- Data centralisation – moving towards private cloud (enable volumes of data to reside on single repository – i.e. government private cloud.
- Scaling is often possible within the existing Single Window architecture. In some instances however it is necessary to fundamentally change the architecture and or infrastructure. This leads to a re-design of the SW often referred to as second or third generation or second and third phase.
- A gradual implementation offers many advantages, namely overcoming resistance from stakeholders. The project starts with stakeholders that are mobilised and adhere to the project and extend others later – see Box 3 for the example of the Indonesian Single Window.

Box 3: Gradual Deployment of the Indonesian Single Window

The Indonesia National SW (INSW) has followed a gradual development process. The first trial end 2007, was limited to three Government Agencies in the port of Tanjung Priok; The second stage in July 2008 covered five sea ports; the third stage expanded the INSW to all import procedures in the ports; the fourth stage in July 2009 covered import procedures for Government Agencies (GA) in seaport, airport and dry-port; in January 2010; the fifth stage made the use of the INSW mandatory of all import procedures in five ports; and in the final phase the INSW was extended to 21 ports and all import-Export procedures.

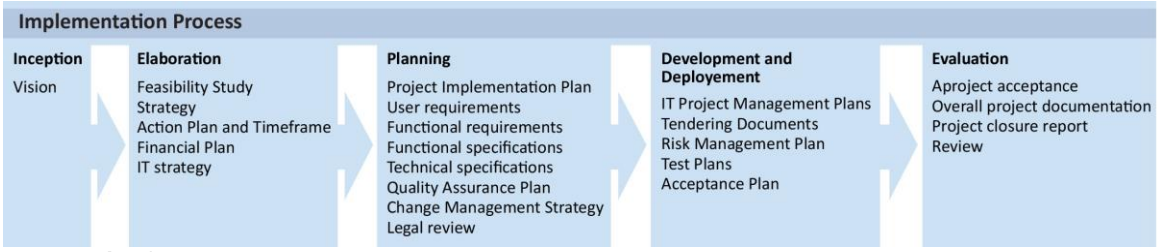
[14] System virtualization technology will provide abstraction layer between the physical hardware and the operating system, maximizing the use of the processing power

1.4.2. Implementation Steps

The Single Window implementation process is a succession of different steps necessary to mobilize political support and stakeholders, to undertake the preparatory assessments, to design and plan the future system, to develop and deployment the IT system, and to manage the change and build the performance capacity.

The logical sequence as shown in Figure 9 below includes the following steps: inception; elaboration; planning; development and development; and evaluation and feedback[15]. During the process many documents are developed that account for activities of each step, so that a logical flow of documents complements the flow of actions.

Figure 9: Implementation Steps and Related Documents



Source: Authors' own construction

Inception

The inception phase may also be referred to as setting the agenda and developing a policy vision. Single Window initiatives are driven by different policy expectations and may be championed by isolated branches of the government. Customs services, port Authorities or Ministry of Trade/Economy are the most frequent driver of Single Window initiatives. Through public awareness raising and media coverage, the Single Window is put on the political agenda and cross-government support is mobilised. A Single Window vision document may be developed at this stage to spell out in few pages the concept and its expected benefits. The formal adoption of the vision at government level, authorises and delegates the development of a Single Window strategy.

Elaboration

The preparatory work for a Single Window is conducted following the mobilisation of cross-government support and endorsement of the vision document. Governments implement the Single Window approach in many different ways, reflecting their particular institutional and regulatory context. The preparatory work is therefore necessary to take strategic design decisions. Domestic requirements and priorities are identified; different options for a SW including the technology, organizational and funding models discussed, and a cost and benefits analysis may be conducted. The documents that are developed in this phase are a feasibility

[15] The naming and grouping of activities follows UNESCAP and UNECE, *Single Window Planning and Implementation Guide* (New York and Geneva: United Nations, 2012) but the substance differs from it and builds on various resources.

study and a strategy document, which may carry many different names such as Single Master Plan, Roadmap, Blueprint or Strategy.

The feasibility study gathers and analyses the high level requirements, meaning what the users and stakeholders expect from the Single Window in terms of changes and benefits. It presents different options on how these requirements can be achieved and the organizational, legal and financial impact of the different options.

The discussion of the feasibility study will lead to the adoption of a strategy, which outlines and defines the approach taken by the government at high level. The strategy document defines the objectives, the high level functionalities of the SW, the organizational model, and the resources required for the implementation and operation. An action plan and financial plan is part of the strategy document.

It is useful, but not always common, to also elaborate an IT strategy[16] to define the possible IT architectural model and patterns of the SW strategic design.

Planning

On the basis of the strategy document, the government takes the decision to launch the Single Window, tasks an entity with its implementation and allocates resources to the project. The Single Window entity/operator undertakes further analytical work to plan the project implementation. This work is guided by a project implementation plan or Master Plan, which shows how the strategic goals and objectives will be achieved, by whom and when and how. The Master Plan is *"an important management tool to plan, execute, monitor, evaluate and adjust the project implementation"* [17] . Such a identifies the different aspects of the SW project; IT development, legal and institutional changes, training and capacity building, communication and change management, and deliverables and timeframe for delivery identified for each of them. A project plan, which can be part of the Master Plan or a separate document, establishes the project team and defines roles and responsibilities, budget and resources allocation and use, and risk and risk mitigation strategies.

The user and functional requirements of the Single Window are commonly defined using a Business process analysis (BPA). The BPA includes an inventory of the laws and regulations and administrative decisions covering the current state of formalities, and leads to the mapping of the AS-IS business processes and their legal and regulatory requirements. The BPA is than taken one step further to business process simplification and re-engineering through which the TO-BE business processes of the future SW system are defined. This leads to the drafting of IT

[16] The SW IT Strategy defines all possible architectural model that will cover information technology performance, stability and security; end-user high level workflows and overall productivity; IT management organization and workflows; business framework costs and expenses and IT management framework costs and expenses.
[17] UNESCAP and UNECE, Single Window Planning and Implementation Guide (New York and Geneva: United Nations, 2012)

Functional Requirements [18] and specifications, and IT technical requirements [19] and specifications.

The functional requirements and specifications are always developed in-house, but the technical requirements and specifications may be developed by the vendor, if the IT development is outsourced. In case of outsourcing, the vendor revises the user and functional requirements and proposes the technical specifications and requirements.

At this stage, the project management team should determine the project cost estimation, meaning the detailed allocation of project funds to specific components and activities. Necessary legal and regulatory changes also need to be identified and planned.

Development and Deployment

The development and deployment phase entails sourcing of infrastructure, development, production, and test[20] and training. The outputs of the development phase are produced by individual developers r development teams, which execute the Project Implementation Plan and Quality Assurance plan. Different elements of this phase may be outsourced to a third party but the Single Window project team ensures overall coordination, oversight and quality assurance. Usually the infrastructure components and services are outsourced separately; i.e. if the development of the IT system is outsourced, the vendor is responsible for the IT project development.

The development of the system evolves in different releases. Each release is an intermediate stage, which are tested and updated, and ultimately lead to the production[21] of the overall system.

Post implementation: Closure of the Project

The deployment of the Single Window closes with the acceptance activities that include internal and external testing, validation process, and conformance testing. Conformance testing provides for last-minute corrections (minor bug fixes) of the Single Window. The findings of these activities are entered in the Final Acceptance document. A large number of documents and specifications, such as the source code design, or the internal user's manual are finalised and handed over to the Single Window operator.

[18] The IT functional requirements define specific functionalities of the SW system.
[19] The IT technical requirements refer to the technical aspects of the system, such as performance-related issues, reliability issues, and availability issues. These types of requirements are often called quality of service (QoS) requirements, service-level requirements or non-functional requirements (http://agilemodeling.com/artifacts/technicalRequirement.htm)
[20] Testing is a physical (meaning hardware) and a logical setup (operating system, database, tested application and services, running environment, browser, etc.) of the environment used to perform the testing of the SW software application. Depending on the testing phases that are performed, more than one SW environment could be foreseen. The testing environment should be able to measure and test the capacity such as availability and performance SW requirements.
[21] Production is the deployment environment where the software applications go live and become accessible by the business or other users, and interface with other production back-end systems

2. Global Trends and Practice

The SW concept emerged in early 2000 in a context where few public administrations used Information and Communication Technology (ICT) and only limited abilities for electronic data and information submission existed. 15 years later this has changed. Many governments worldwide have now implemented a Single Window or are in the process of doing so. Countries implement Single Windows in different ways and no unique model to follow.

This chapter summarises common trends that shape Single Window developments at the conceptual and technological level presents three practice cases from non-OIC Member States that embodies many recent evolutions and best practices. The Ghana and Singapore Single Window are amongst the earliest Single Windows and are well established. The Czech Republic Single Window is a more recent initiative influenced by the EU regional Single Window initiative.

2.1. Current Trends

In the past 15 years, the concept and systems have evolved in response to technological changes and new political and strategic orientation; IT has become cheaper and more supportive of a flexible approach for the design and development of the Single Window; the public is more aware of Single Window approaches; and expectations of faster and more predictable government services have grown in the context of global supply chains and use of IT in professional services. These developments have influenced SWs to evolve at the technical, conceptual, and operational level.

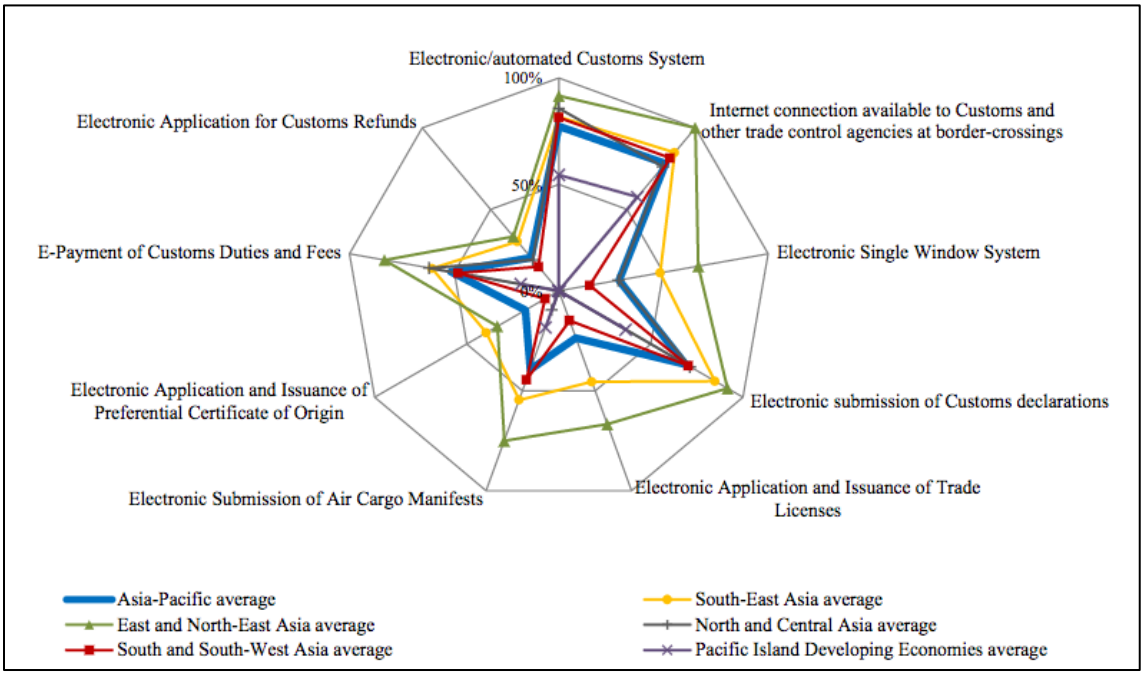
2.1.1. Worldwide Adoption of Single Window Concept

The Single Window concept is still a recent reform initiative but has gained a global expansion in the past 10 years. The joint United Nations Regional Commission Paperless trade and Trade Facilitation Survey 2015[22] identified a SW project or operational SW in 70 out of 119 countries. These efforts are truly global as Single Window initiatives can be found in Central Asia, East and South East Asia, West Asia, Africa, and Central and Latin America – see Figure 10 below. Single Windows are however still rarely to be implemented in island countries, such as the Pacific Island countries and Caribbean island countries. Although Single Windows are often considered to be expensive projects, and require a stable countrywide IT networking ad infrastructure ability, Single Windows are not high-income countries. Low-income and low medium-income countries also implement Single Windows, often with financial support from external development partners.

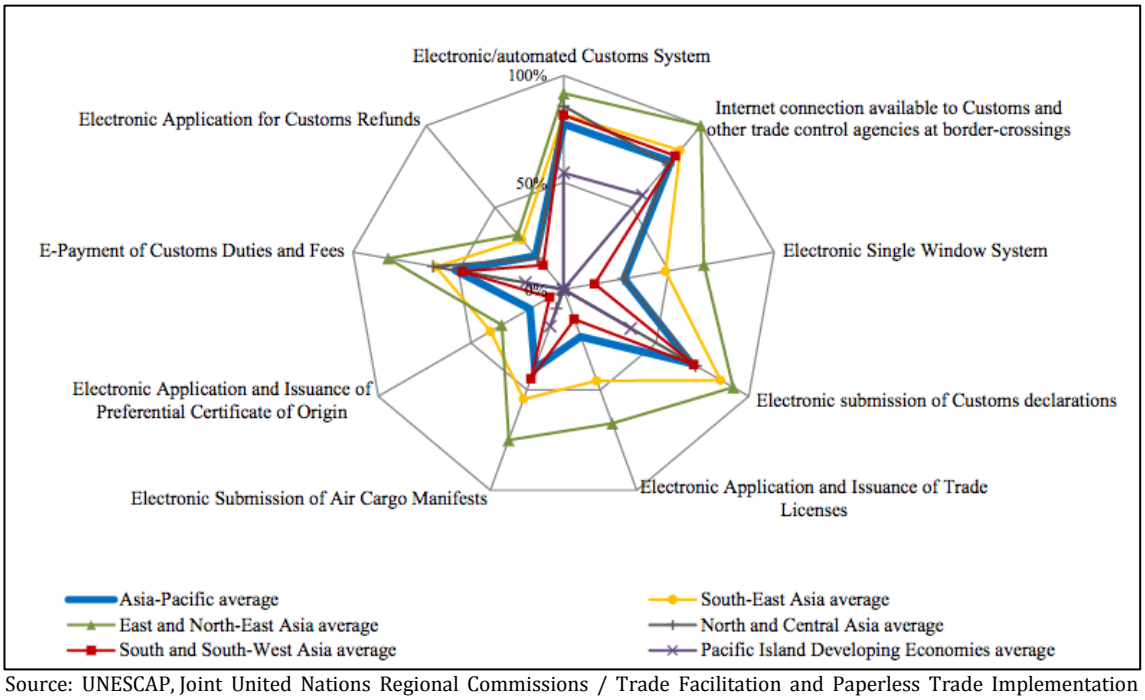
[22] UNRCS Paperless Trade and Trade Facilitation Implementation surveys is an initiative launched by the United Nations Regional Commissions ECE, ECA, ESCWA, ECLAC, and ESCAP in 2010. The latest published reports, the 2015 survey, are based on data collected in 2014

Figure 10: Single Windows in Asia and Pacific Region and in Latin America

Asia and Pasific Region



Latin America



Source: UNESCAP, Joint United Nations Regional Commissions / Trade Facilitation and Paperless Trade Implementation Survey 2015. Asia and the Pacific Report (UNESCAP: 2015), p.19 and UNECLAC, Joint United Nations Regional Commissions / Trade Facilitation and Paperless Trade Implementation Survey 2015. Asia and the Pacific Report (UNESCAP: 2015), p.24

2.1.2. Fostering Digitisation and Automation

Although zero paper is the ambition of most Single Windows, many Single Windows failed to render trade procedures paperless in the past. This is often caused by the lack of a legal framework and resistance, in particular in the public sector. This lead to a de facto duplication of digital and paper processes and limited the change impact and opportunities for cross-border data exchange. There is now a strong drive towards creating the necessary legal foundation for paperless national and cross-border trade[23].

Single Windows also adopt process and decision automation. Initially, Single Windows focused on document digitisation and paid less attention to automation, business process improvement and simplification. With time, trust in the Single Window processing ability and security has grown and stakeholders realise that automation can cut down processing time even further. The Ghana and Singapore SW prove that decision and process automation is possible and neither reduces the level of control nor prevents manual intervention when necessary.

2.1.3. Cross-functional Design

Many Single Windows now aim to design a more integrated Single Window, whereby integration refers to a broader coverage of trade related processes. The expansion of Single Window services has three directions:

- First, the integration commercial and regulatory transport and logistics processes either through integration with external systems or by integrating the services into the Single Window. This integration is driven by the objective to cut down times in port at border crossings and en route.
- Second, the addition of services to existing business processes. Previously, the focus was on document submission. Now Single Window services also cover write-off and reconciliation, notification, and payment of fees. Single Windows now also deliver cross-organisational services such as cooperative workflows, reporting and risk management.
- And third, additional services are also value-added services that cater to business-to-business marketing and selling processes.

[23] See the recently adopted Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific, June 2016

Box 4: Integrated Risk Management

Integrated Risk Management

Increased volume of international trade also increases opportunities for avoidance, evasion and fraud of regulatory requirements in an increasingly sophisticated and organized international manner. International security risks also increase due to international terrorism.

Governments increasingly use risk-based compliance management for Customs or other purposes such as food safety and protection of animal, plant and human health and life approaches to deal with these risks.

Currently, only few Single Windows support risk management and approaches are often limited to transactional Customs risk management and risk selectivity during customs clearance. Single Windows now integrate risk management services, namely Integrated Risk Management (IRM).

IRM supports the operational risk management processes of government agencies that are involved in the approvals of permits and certificates (pre-arrival), control of goods and post clearance control. The IRM engine is a rule-based approach to risk analysis, whereby the individual analysis objects (traders, permits, declarations etc.) are assessed for risk, primarily by assigning scores based on rules (risk indicators). Within this approach, the starting point of risk analysis is the definition of a structured rule base.

A cross-functional design requires the use of integrated common process design and business architecture, instead of an agency, procedure or business process centric design. Such a common process design allows for the comprehensive simplification and, reengineering of the business processes and, the re-use of IT services and processes for business processes with similar requirements. The trend towards common business process inventories can be observed in recent Single Window projects, such as the Cameroon second-generation project.

2.1.4. From Single Data Entry Location to Single Submission

Single Windows were designed to provide a single data entry point. A single portal was often understand to fulfil the objective of a single data entry point, even if the user still needed to prepare separate requests and data submissions for each regulatory requirement. In most Single Windows, users collected approvals and documents separately and linked these approvals/documents to the customs clearance at the moment of submission of the Customs documents. Each procedure/document has a specific data set and which uses a common data definition, in line with international standards, such as WCO Data Model and UNCCL and UNTDED.

The current trend is to adopt a single submission, whereby the Single Window will process a single data set and automatically launch applications for authorisations and permits based on the Harmonized System (HS) code, authorisations, registrations and other rules. Traders no longer have to launch individual requests and collect the approvals and no longer have to submit different data sets. This set up allows applying integrated risk management on submission, pre-arrival and on-arrival.

2.1.5. Cross-border Expansion

Previously Single Windows had a national orientation, focusing on supporting national regulatory processes and national agency collaboration. The past years have seen an increase in bilateral, regional and multilateral initiatives for data exchange and regional Single Window (RSW) Such regional initiatives aim for the exchange of structured and unstructured data across the borders.

The drivers for these cross-border exchanges are i) pre-arrival information submission, customs or manifest, ii) cross-border exchange of certificates, and iii) cross-border exchange of transit information.

Examples of Regional initiatives are:

- The ASEAN Single Window (ASW) [24]. Launched in 2007[25] pilot test was competed in 2013 by seven of the 10 ASEAN MS. The scope of the pilot test was the exchange of 2 documents: the intra-ASEAN certificate of origin (ATIGA Form D) and ASEAN Customs Declaration Document (ACDD). It is also planned to add a common commercial manifest to this set.
- EU Customs Single Window which launched as a pilot project the EU Single Window – Common Veterinary Entry Document (EU SW-CVED) in 2012 and entered into production in December 2014. In a second phase four more certificates and permits will be included;
- The Eurasian Economic Community (EEAU) aims to establish an "integration information system" for information purposes and exchange of data[26]
- Bilateral sub-regional projects for electronic exchanges of Certificates of Origin in the UEMA (Senegal and Cote d'Ivoire) and CEMAC (Cameroon and Congo).

The cross-border exchange of information can be on a peer-to-peer (country to country) basis, or like in case of ASEAN and EU Common Single Window, through a central "hub" (centralized connectivity layer).

Setting up a regional Single Window is a challenging task, as it requires interconnectivity and interoperability of national Single Windows, data harmonisation and the existence of a legal framework for the data exchange. The reality however is that national Single Windows use different IT technology and architecture, and data and messages are not frequently standardised across the border.

[24] For a summary on this initiative see: ASEAN, *ASEAN Single Window. Lowering the Costs of Trade through Faster Customs Clearance*, under http://www.asean.org/storage/images/2015/October/outreach-document/Edited%20ASEAN%20Single%20Window-2.pdf (accessed January 2017

[25] The ASEAN SW is based on the ATIG and the ASEAN SW Agreement signed in 2005. The first technical and legal working group met in March 2007

[26] The EEAU Treaty contains a Protocol that can be read as a blueprint for a regional SW and a working party has been set up

2.1.6. Trend towards Decentralization of IT Architecture

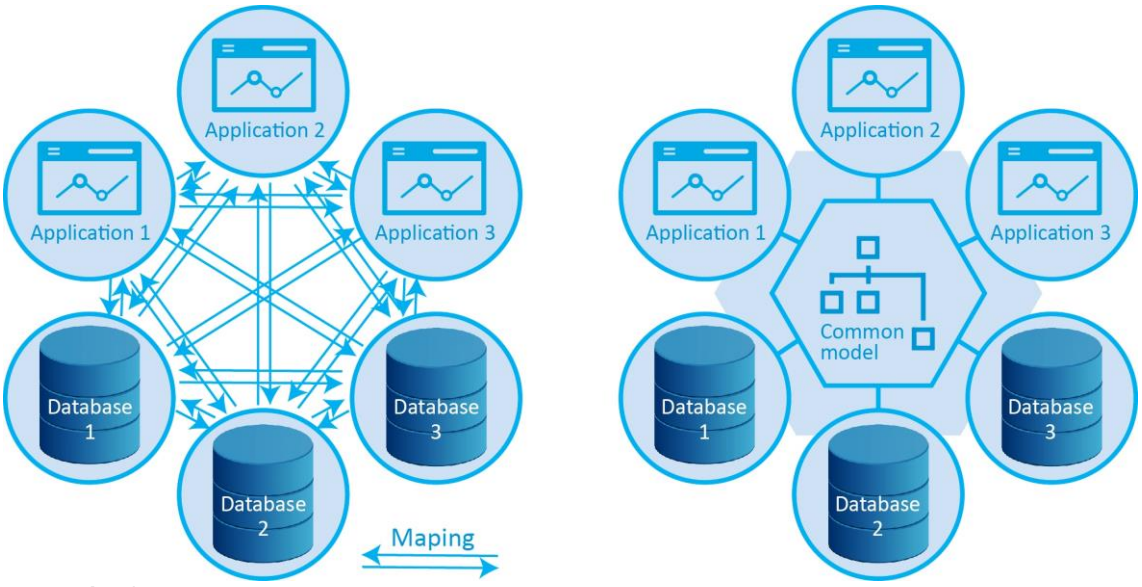
There are many changes in the Single Window environment that the IT architecture has to reflect. The Single Window business environment now demands more multi-dimensional coverage of services. In 2005, at the time when the UNECE Recommendation 33 was drafted, the focus of a SW was defined on a centralized architectural pattern and from the perspective of data submission from business to government agencies. Modern trade facilitation systems focus on the physical movement of cargo in the port and along the transport routes. To respond to these demands, Single Windows expand their coverage and offer new services that support Government-to-Government (G2G) cooperation and services such as Business Intelligence reporting and risk management. A distributed IT architecture seems more apt to respond to this challenge, as it is more flexible to changes.

An increasing number of public agencies now use their own IT systems to cover partial and end-to-end business processes and the Single Window architecture evolves from a centralised to a distributed architecture to reflect this. Through a distributed IT architecture, the Single Window becomes more "message" oriented, triggering exchange of data and information with agencies IT systems. In a distributed architecture, the Single Window can host the agencies' IT applications and data and thereby reduce costs for the agencies whilst providing high level of protection by a fault tolerant system and off-site data backup. The distributed architecture is, however, necessarily underpinned by extended data centralisation.

2.1.7. Single Window Data Centralization

Single Windows are complex IT environments in which managing data in standalone legacy applications is an inefficient and impossible task and poses threats for data availability, data protection and business continuity. Single Windows therefore modernise and build their architecture on the centralization of the data layer and the optimization of information exchange. Centralised data layer means that data from various organisational and application origins is integrated on a single common data repository-see Figure 11.

Figure 11: Single Window IT Data Architecture Model



Source: Authors' own construction

A Single Window common data repository provides a more complete view of business operations and deeper insight into critical business processes. It also enables additional services, such as business intelligence and data mining, and therewith allows for integrated risk management (IRM). It also makes integration of future change requests at the level of application and services simpler as these changes are implemented in one location on the level of the common data model.

2.1.8. Single Window Interoperability

Interconnectivity and interoperability, meaning the ability to exchange of data and information across systems, are now becoming important aspects of Single Windows. Recent Single Window visions such as the WCO Single Window perspective clearly stress the fact that Single Windows operate in an environment made up of multiple functional IT systems and only jointly have the ability to deliver trade facilitation services [27]. To better respond to complex regulatory challenges and to improve the delivery of services to traders, a Single Window has to embed system-to-system connectivity or services. This enables Single Windows to provide to agencies collaborative, networked and interconnected workflows and business processes.

[27] Jonathan Koh Tat Tsen, Single Windows and Supply Chains in the Next Decade. Ten years of single window implementation: Lessons learned for the future. Discussion paper (2011) under https://www.unece.org/fileadmin/DAM/trade/Trade_Facilitation_Forum/BkgrdDocs/TenYearsSingleWindow.pdf (Accessed January 2017)

Interconnectivity has three dimensions:

- The process level whereby standardised data and procedures build the foundation for a common process and data model. If two agencies or end -users administrations use different processes and data models, interoperability will be hard to achieve.
- Then there is message interoperability, whereby data is exchanged in a process based on the same semantic structures and definitions. As mentioned above there is always a certain amount of data translation or conversion but the aim is to minimize these requirements to increase efficiency and reduce operational costs, by using the same syntax and the same message implementation guidelines.
- And finally there is the technical interoperability which translates into infrastructure requirements to support technical exchange of information through interconnectivity patterns like network systems and communication standards, security devices and encryption etc.

Interoperability also requires data translation and conversion, but the extent of this can be minimized through data harmonisation/integration [28] and alignment with international standards. Recent SW projects place an emphasis on this work to be done as part of the implementation.

2.2. Practice: Singapore Single Window

The Singapore Single Window, TradeNet/TradeXchange, is the world's first Single Window electronic platform and is operational since January 1989. It is a platform for secure interconnectivity and exchange of information between traders, government agencies and logistics service providers and covers all[29] trade regulatory requirements.

Since 1989, the Singaporean Single Window has gradually and continuously developed and is now in its 4th generation. The back office services that on a daily basis process approximately 25.000 requests for permits and certificates—out of which 95 % of the requests are automatically processed—are a critical success factor for the Singapore Single Window. TradeNet/TradeXchange has an integrated risk management system, which currently manages 8000 rules (agencies' taxonomy services and risk profiles), and the validation, reconciliation and write off of the requests are processed automatically.

2.2.1. SW Evolution in Singapore

The Single Window initiative was launched in December 1986, when the Singaporean Government formed the Executive Committee, led by Trade Development Board (TDB-Trade Agency) and National Computer Board (NCB IT agency). In mid-1988, Singapore Network Services Pte Ltd (late'88 renamed CrimsonLogic) was created to develop and operate the

[28] Data transformation / integration is the identification of common data elements' formats, compliant with the WCO and UN Data Model and the mapping of these data elements to the business processes.
[29] There is only one import permit that is currently not covered as it is rarely used.

TradeNet SW IT system. The pilot / test TradeNet Single Window environment was established in October 1988. The imitative has gone through four development phases since than.

- **1st Generation SW:** 1989 TradeNet SW becomes operational, allowing various parties from the public and private sectors to exchange trade information electronically[30]. The procedural coverage was for selected traders only. The SW IT system was based on client server architecture, dialup connection for submission of the data to agencies. The submission of the data was one way - from trader to the agencies, and the approvals were paper based, issued separately;
- **2nd Generation SW:** the SW was upgraded to a nationwide transactional document management system for exchange of structured data and information electronically. The SW had single interface for submission the data to agencies for processing. In 1994, TradeNet started with processing and collection of customs duties, GST and excise on all imported goods for the Government;
- **3rd Generation SW**: Integration of mobile services, SMS messages on approval of application. The SW was moving beyond B2G and G2B, and established B2B services to facilitate business community (B2B);
- **4th Generation SW**: 2007 The IT system was re-designed as a web-based architecture and TradeXchange was launched. TradeXchange offers a single electronic window for integrated workflow, submissions and enquiries to the Sea Ports, Airports, Maritime Authorities, Customs and Competent Authorities.

2.2.2. Organizational Aspects

Governance Structure

The TradeNet/TradeXchange SW was developed and is managed through a PPP arrangement for which CrimsonLogic Pte Ltd, a limited private company under the Singapore Corporate Law, was created in 1988. It is owned by International Enterprise Singapore (Singapore Trade Development Board) 55%, PSA Corporation Ltd (Port of Singapore Authority) 15%, Civil Aviation Authority 15% (since 2007) and Singapore Telecommunications ltd (Singapore Telecoms) 15%[31]. The PPP contract duration is 10 years and the current contract expires in 2017. In 2016, the Singaporean Government awarded a contract to build a new Trade Portal to another company.

A dedicated committee representing all shareholders and working groups from various governmental agencies with participation from the private sector is ensuring the political and strategic governance and oversight.

[30] Singapore Customs, *Trade Net*, under About us National Single Window https://www.customs.gov.sg/about-us/national-single-window/tradenet#sthash.RgPldc40.dpuf (accessed January 2017)
[31] Jonathan Koh, *Towards a Single Window Trading Environment: Singapore's TradeNet*® (Crimson Logic) under http://www.crimsonlogic.com/Documents/pdf/resourceLibrary/viewPoint/Towards%20a%20SW%20Environment-SG%20TradeNet.pdf (accessed January 2017).

Financial Model

The initial funding for the TradeNet IT System, 10 mil S$ (1998) was provided by the Government. The operating costs, continuous upgrade, investment in the IT infrastructure and maintenance of the TradeNet is recovered from the flat fee charged per declaration s (2.8 S$). In addition, CrimsonLogic is collecting the following fees from users:

- Subscription fee one-time registration fee;
- Monthly account ID fees;
- Monthly user ID fees.

The Singapore Government is providing a one-time and an annual recurring payment for the services of TradeXchange, which is not yet financially sustainable.

Human Resources

Approx. 500 persons are currently working for CrimsonLogic, out of which 50 people work on maintenance of the TradeNet/ TradeXchange IT systems[32]. They come from different academic background and experiences, including enterprise architects, database and software developers etc. and CrimsonLogic internal resources, management and administration, also support the Single Window solutions.

2.2.3. Strategic Orientation

The SW strategy is a comprehensive cross-government strategy that focuses on direct automation and digitalization of all trade related regulatory, transport business processes. The Singapore Single Window is also engaged in different cross-border data exchange initiatives and offers selected additional Business-to-Business (B2B) services.

Future and Planned TradeNet Integration

The new national trade facilitation platform, tendered in 2016, will integrate the previously separate systems of e-Customs, TradeNet, and TradeXchange and to become operational in 2017. It will be based on the latest IT technologies and will be enable rule-based automated approval (decision making and declarations). The integration of the business processes will be based on a Service-Oriented Architecture (SOA) in which the components offer services that can be reused across the new system. Data mining will be integrated for the purposes of the risk management.

Coverage, Services and Functionalities

The TradeNet/TradeXchange Single Window serves as the single entry point of transactions and communication between the trade community and Customs service, government agencies, port

[32] CrimsonLogic implements numerous other projects worldwide and staff is assigned to all these projects

operators, banks, logistics and insurance companies. It covers the business processes/services mentioned in Table 3.

The use of TradeNet/TradeXchange is mandatory per government decision for import, export and transit / transhipment procedures[33]. 100% of customs declarations are processed and approved via TradeNet; 100% of the payment collections are made electronically through Inter-Bank deductions; 90% of permits processed within 10 minutes - ca. 25.000 requests daily, 9 million annually.

Table 3: Singapore Single Window TradeNet Services

Inventory of Business Processes / services
Submission of Clearance relevant information (trade permits and customs clearance)
Notification of permits approval
Application for non-preferential Certificates of Origin
Application for marine cargo insurance
Upload, transfer and surrender of Bills of Lading
Exchange of invoice information between buyers, sellers and banks
Electronic submission of advanced manifest data to the US, Canada, Australia
Data exchange for customs clearance in Malaysia, Taiwan, Korea, Macau, Shanghai, Hong Kong, Philippines, Thailand, Canada and Australia
Connectivity to Inttra and GT Nexxus (supply chain management systems) for shipping relevant messages (booking, draft BL and status)
Connectivity to PortNet and CCN for vessels/flight schedules and status
Exchange of commercial documents (purchase order, packing list, and invoice) between major industry player
Registration and transfer of the Title of goods as needed in the export/ import trade process

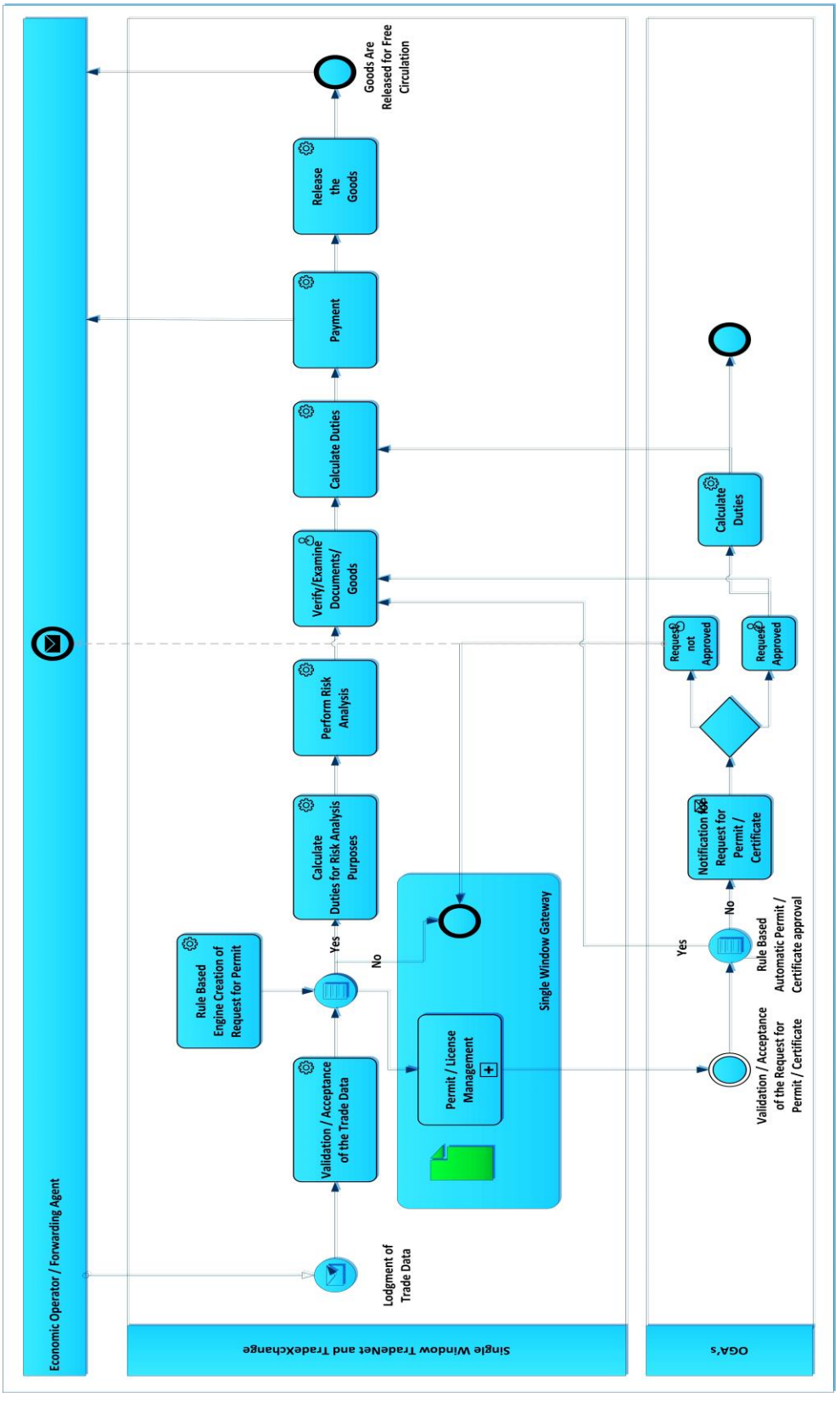
Source: Authors' compilation from various reports

The Singapore Single Window approach rests on the single submission of trade data and is fully paperless. It is the specificity of the Singaporean legal framework that government decisions do not need to be signed anymore, but a law on Public Key Infrastructure (PKI) and digital signature was introduced in 2003.

The trader submits the trade data to TradeNet/Trade Exchange. The rule-based engine is creating the request for permit and certificate and send to OGA's for processing of request. The TradeNet Single Window rule engine contains 8000 rules for creating the request for permit and certificate and risk profile rules for automated approval of requests.

[33] Permits are required for the transhipment or transit of strategic goods, and goods intended or likely to be used in connection with weapons of mass destruction- see more under Singapore Customs, under https://www.customs.gov.sg/businesses/transhipping-goods/transhipment-procedures (accessed January 2017).

Figure 12: Issuing of Permits and Certificates and Customs Clearance – TradeNet Singapore



Source: Authors' own construction

Benefits

The focus on process automatisation combined with risk management has resulted in significant improvements for the end-users. Previously, the TDB, Customs, and 35 Controlling Agencies managed approximately 10,000 declarations daily, and all of them were paper based. On average 4-20 documents had to be completed for each import / export handled manually. Now, the Single Window is processing the requests for permits and certificates within 10 minutes-see Table 4.

Table 4: Impact of the NSW

Key Indicator	Before TradeNet	After TradeNet
Processing time/permit	*4 hrs. to 2 – 7 days*	*10 minutes*
Submission of documents	*Multiple submission*	*Single document through a single interface*
Number of documents	*3 – 35 documents*	*1 document*
Trade documentation fees	*US$6.25/document*	*US$1.80/application*

Source: Crimson Logic, TradeNet, under
http://www.crimsonlogic.com/Documents/pdf/resourceLibrary/brochures/tradeFacilitation/TradeNet_Brochure.pdf

Freight forwarders have reported time savings of 25%-35% in handling trade documentation as TradeNet operates 24 hours. Benefits also accrued to government agencies using the system. By moving from a system of post-approval to pre-approval of applications, the Customs receive payments faster as duties are now pre-paid through electronic means[34].

2.2.4. ICT Architecture

The Enterprise IT Architecture of TradeNet/TradeXchange is based on a Service-Oriented Architecture (SOA), decomposed into various sub-systems offering specialized Single Window services. The Single Window is a taxonomy hub for exchange of information between the Single Window and end-to-end user's business processes (agencies, banks, port authorities, insurance companies, freight forwarders etc.) Web services are used for the exchange of information, data and additional documents, and common messages standards, such as UN/EDIFACT, XML, Web services – WADL, are used.

CrimsonLogic is using Business Process Modelling and Management and UML to create and manage the business process catalogue and to automate business processes.

High Availability / Virtualization

The TradeNet/Trade Exchange IT Architecture is based on the high availability concept using clustering and virtualization for providing 24/7 services—99,999 % availability of the services.

[34]Jonathan Koh, Towards a Single Window Trading Environment: Singapore's TradeNet® (Crimson Logic)

In addition, the high availability is extended with a fault tolerant and load balancing business continuity / disaster recovery mirror site.

Data warehouse and business intelligence (BI) are used for reporting and analysis services, and to monitor the system performance and Key Performance Indicator (KPI). CrimsonLogic Ltd. is ISO 9001:2008 certified, and is also a certification provider.

2.3. Practice: Ghana Single Window

The Ghana GCNet SW was launched in 2002 and is operational since 2002. It is a single data entry point for all [35] trade regulatory requirements including government permits and authorisations, and the customs declaration, allows for electronic payment of customs duties, submission of manifest and delivery orders.

Within more than 10 years of operation, the GCNet Single Window has gradually developed and extended the coverage of services and procedures and adopted new technology.

2.3.1. Single Window Evolution in Ghana

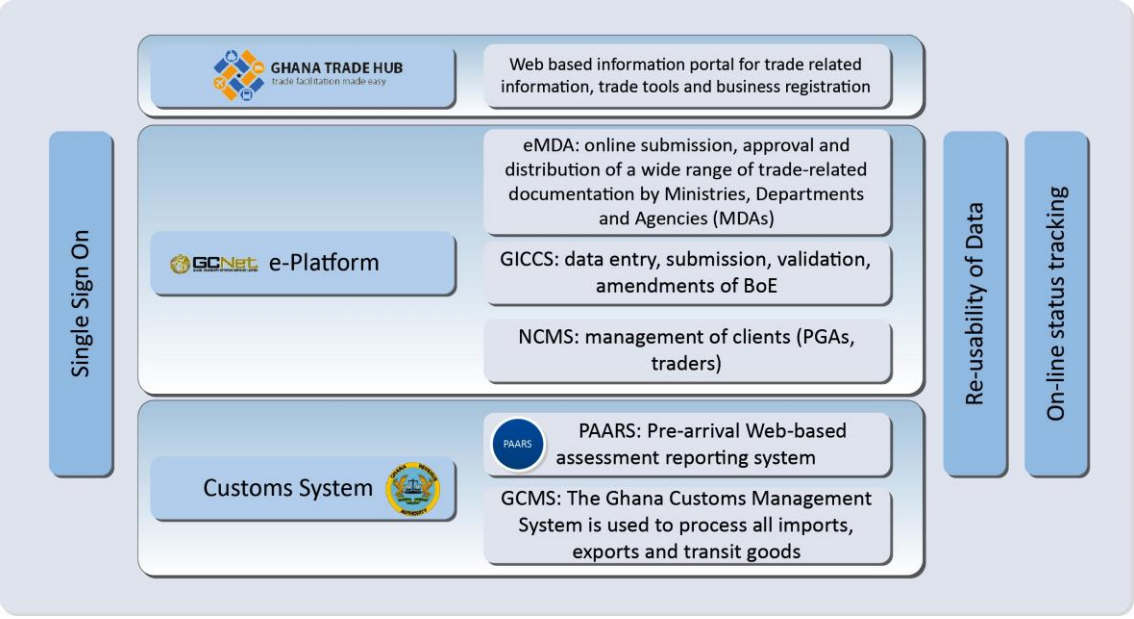
The GCNet evolution started in 2002 with the development of Ghana Customs Management System (GCMS) and TradeNet – Trade SW platform. Since then it has gone through several development phases:

- 2006-2008: the TradeNet platform was upgraded from client server distributed application structure to the eMDA platform, which is a web based Permits, Exemptions and License platform and the GICCS portal, which is a web based Declaration and Cargo manifest platform.
- 2010-2012: Upgrading of the GICSS portal with new services.
- Since 2012: Further integration of additional agencies and upgrading the to a SW Service Orientated IT Architecture. The latest integrated service is Electronic Payments; exchange and processing of data with banks, payment of Customs duties and taxes and fees for permits & exemptions.

The current Ghana Single Window environment consists of the GCNet Platform, the Ghana Customs Management system and the Ghana Trading Hub Portal. Recently, the Ghana Revenue Authority recently launched the PAARS – the pre-arrival assessment report system for submission of data to customs prior to arrival for customs valuation purpose.

[35] There is only one import permit that is currently not covered as it is rarely used.

Figure 13: Ghana Single Window Conceptual Environment



Source: Authors' own construction

2.3.2. Organizational Aspects

Governance Structure

The SW in Ghana is operated by Ghana Community Network Services Ltd (GCNet Ltd), which was set up as legal entity in 2000 and began operations in 2002. GCNet Ltd is a public private joint venture with 35% public shareholders (20% GRA, 10% Shippers' Council, 5% Ghana Commercial Bank), and 65% from the private sector (60% SGS and 5% Ecobank), set up for the purpose of developing and operating the SW. The Single Window is provided under a PPP arrangement and the latest contract was awarded in 2013 for 5 years.

The GCNet has a three-layer management structure: Steering Committee, Technical committees, and working groups.

- The GCNet Steering Committee meets once a year to formulate the objectives and adopt the annual strategy plan for GCNet. Representatives from all shareholders and the political regulator come together in the steering committee.
- An Executive Director, the Chairman of the GCNet Steering Committee, manages the operational activities of GCNet and is supported by the Management team.
- Four technical committees that meet regularly in a year, and represent the process owners. These four committees are Legal, Business Process and Data Harmonization, Change Management and Stakeholder Engagement and ICT and Infrastructure.

Financial Model

The initial investment of 7 million US$ for the e-platform and the GCMS, was provided by the private partner and in-kind contributions from the Government budget. Annual investments costs are estimated to be around 3-4 million US$ for the GCMS and the Single Window.

GCNet Ltd. is a profit making company and sustains its operation solely through the fee collected from end users. The amount and structure of the user fee structure is defined in the PPP contract and is fixed at 0.4% of declared FOB value on import. Certain sensitive transactions (e.g. petroleum imports, government and donor funded projects) are exempted from the fee payment and no fees are collected for export-oriented transactions. There are no annual or other subscription fees to be paid by the end users. The GCNet fee is calculated and collected together with the Customs duties and taxes. In terms financial sustainability, the fees are sufficient to *"cover operational expenditure and to finance new investments for replacement software, hardware, systems upgrades, and maintenance of systems"*[36] and pay out dividends to the shareholders since the third year of operations.

Human Resources

Currently, GCNet Ltd. employs approximately 200 permanent staff. The organizational structure consists of four groups of staff: senior executives, officers, junior management and administrative staff. The total number of employees in the IT Department is 80; approximately half of the IT staff is involved in development of the i-transit, part of GCMS systems, and the Ghana e-Government initiative[37]. GCNet has a mixed IT organizational structure. Agencies' IT departments are fully involved at all stages of the systems' development, including business process analysis, user and functional requirements, and software and hardware infrastructure.

The training of staff is a key consideration for retention of staff, in particular IT staff. The GCNet Ltd. is certified according to ISO:9001 Quality Assurance and there is an appointed Quality Assurance manager.

2.3.3. SW Strategic Orientation

The strategic objectives of GCNet are discussed and adopted in annual strategy meetings by the board and senior management jointly with the objectives for the GCMS. The strategy is geared towards delivering the performance results and objectives fixed in the PPP contract. Beyond their contractual commitments, GCNet sees the Single Window development and operation as

[36] ITC, *Public-Private Partnership for Integrated Customs Services in Ghana*, under http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&sqi=2&ved=0CCAQFjAA&url=http%3A%2F%2Fwww.intracen.org%2Fworkarea%2Fdownloadasset.aspx%3Fid%3D50096&ei=NyT2U_b3D6WM4gSkn4D4DA&usg=AFQjCNGYj_nt49E7aELo3f5pYZF6BuYinw&bvm=bv.73373277,d.bGE (Accessed January 2017)

[37] Ghana e-Government Interoperability Framework under http://www.nita.gov.gh/system/files/nita_resource/Ghana%20eGOVERNMENT%20INTEROPERABILITY%20FRAMEWORK.pdf

contributing to the overall goal of trade facilitation aligned to the trade policy objectives. The key objectives for the period 2016 to 2026 of the business strategy are:

- Reduce export costs by 50 per cent;
- Reduce export time by 50 per cent;
- Raise Ghana's global Trading Across Borders[38] ranking from 171 to 99.

Future and Planned GCNet Integration

The Government launched the Ghana National SW (GNSW) Strategic Plan and Roadmap programme on 1 December 2015 to enhance the country's trade and economic development, secure, and increase government revenue. The key recommendations for the development and implementation of the GNSW programme over the next 10 years[39] are:

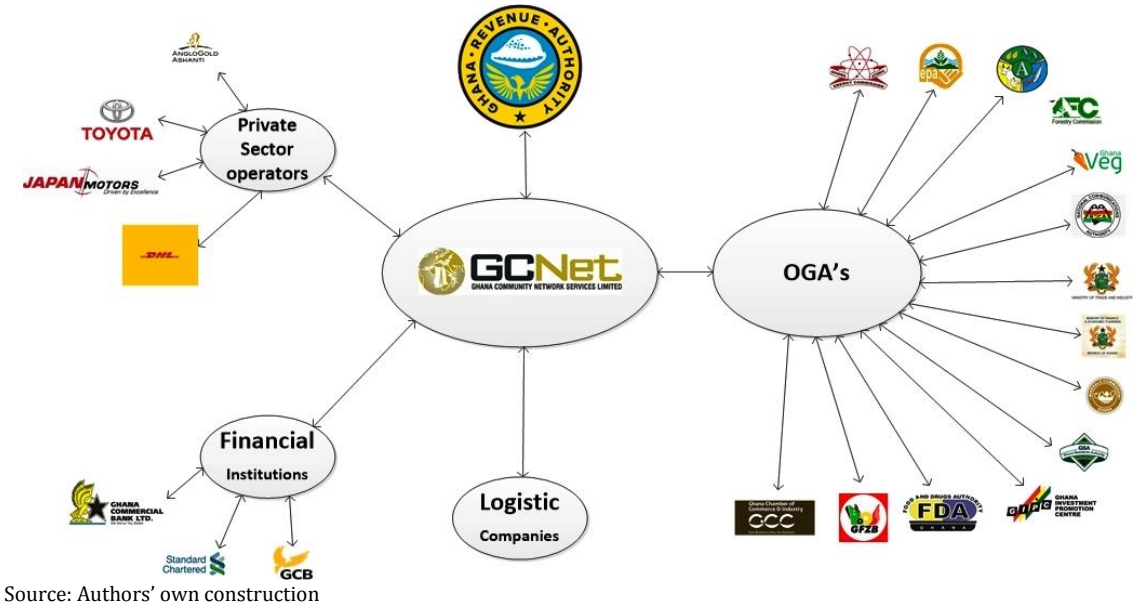
- Internal Workflow Automation of each government agency – Continuous simplification and automating of agencies business processes;
- Automation of the "Customs Long Room" – to fully transform the physical procedures into automated and paperless procedures;
- Paperless exchange control form- paperless exchange that will eliminate the paperwork and replace the current practice (form must be filled in by the exporter and then be submitted endorsed by the exporter's commercial bank at the bank's office).
- Integrated Risk Management and Inter-Agency Coordinated Inspection – integrated risk management system for balance of security control and facilitation of legitimate trade (over 90 % of goods are subject to physical control);
- Integrated Business and Product Registrations - one-stop service for business entities to register and obtain business licenses and service for product registrations;
- Port Community Integration - improvement and integration of the services among the various actors along the trade and transport chain of operations (traders, customs house agents, freight forwarders, terminal operators/ ground handling agents (GHAs), vessels/shipping lines/airlines and trucks, as well as with the authorities involved at the port of entry and exit).

[38] World Bank Group, *Trading Across Borders in Ghana*, under www.doingbusiness.org/data/exploreeconomies/ghana/ - trading-across-borders (accessed October 2016).
[39] Government of Ghana, Ghana National Single Window. Strategic Action Plan and Roadmap under https://www.ghanastradinghub.gov.gh/Tools/Logo/1E2EC473F6D1481439810943FE7F64560.pdf (accessed October 2016).

2.3.4. Coverage, Services and Functionalities

The GCNet connects different users from the private and public sector –see Figure 14.

Figure 14: GCNet Conceptual Diagram



Source: Authors' own construction

Since its inception the user coverage has increased to now include 22 out of 32 agencies for the licenses and authorisations module – see Table 5

Table 5: Public Users of the GCNet Single Window

Public users	*Total country*	*Total using the Single Window*	*SW % of Country Total*
MDA s and Customs	*36*	*22*	*62*
Transit Insurance Company (SIC)	*1*	*1*	*100*
Commercial Banks	*n/a*	*2*	*n/a*
Port Authority	*2*	*2*	*100*

Source: Authors' compilation from OIC survey

The SW e-platform serves as the single entry point for the transactions and communication between traders and government agencies (eMDA platform), Traders and port operators, logistics and insurance companies (GICCS platform), traders and Ghana revenue authority (GICCS platform), and commercial banks for the registration of payment of customs duties. It provides the services listed in Table 6.

At this stage, paper and digital processes co-exist as the digital signature is not used in the GNSW system, although the legal framework for e-documents and signatures is in place since 2008. Customs validation and clearance are still paper based, and the Customs declaration (Bill of Entry) and all supporting documents must be presented in paper. The digital signature is

however used for system-to-system communication (GNSW, GCMS, commercial banks and National Bank of Ghana – Treasury.

The GNSW system is fully integrated with the Ghana Customs Management System (GCMS) from the Ghana Revenue Authority (GRA) and delivers the front office services for the submission of the Customs Declaration for all Customs regimes, including re-export, re-import, temporary importation (procedures with economic impact), export, transit, and specific exemptions from duty and or tax payment.

Table 6: Ghana Single Window GCNet Services

Inventory of Business Processes / services
Request for Export and Import Authorizations, Licenses, Certificates and exemptions
Request for Customs Classification and Valuation Report (CCVR)
Submission and management of Cargo Manifest to Customs and other agencies including port authority
Electronic filing and submission of Custom Declaration and notification of release
Payment of Customs duties and taxes and fees for license and other processing fees
Application, issuance and termination of transit and warehouse bond
Creation and exchange of Delivery Order
Preparation of Road consignment document (CMR)
Notification of Vessel Arrival
Booking of transit truck assignment
Request movement goods from Port to ICD and other warehouse and confirm reception of goods

Source: Authors' own compilation from OIC survey

GCNet ICT Architecture

The GCNet ICT Architecture is fully centralized and interconnection with the GCMS and the Port System of the Tema Port Authority. Government agencies' business processes are integrated with end-to-end business processes integration.

The architecture three tiers based–web servers, application servers and common data storage. For load balancing the high availability concept (clustering) and visualization is used. The GCNet SW infrastructure consists of two mirrored sites with 98% availability of services. Data warehouse and Business Intelligence is used for reporting and analysis services, covering both, GCMS and GCMS.

2.4. Practice: Czech Republic Single Window

The Czech SW is a secure platform for the exchange of information and supports interconnectivity and interoperability between the traders, customs and agencies. It is integrated with the Czech Customs System and European Commission Directorate-General for Taxation and Customs Union (DG TAXUD) IT Systems.

2.4.1. Evolution of the Single Window

The Czech Republic SW (CZSW) was initiated in December 2011 following the EU decision on a paperless environment for customs and trade[40].

The Single Window was developed in phases. In a first phase a comparative analysis of the European and Czech Legislation, and adaptation of the business processes to the EU community level were undertaken. The IT development started on a modular basis in 2012 and the CZSW become fully operational in January 2015.

The objectives of the CZSW are

- improvement of customs services;
- reducing the cost and time of customs clearance;
- enhance the services to the traders;
- increase agency cooperation in the security of the supply chain;
- improved coordination of border procedures; and
- supervision, online checking of certificates of inspection and quarantine, to facilitate mutual recognition of AEO (Authorized Economic Operators).

2.4.2. Organizational Aspects

The Czech national Single Window is embedded in the Czech Republic Customs Service. The Directorate General for Customs is the Single Window operator and system owner.

Financial Model

The EU provided the initial funds for the development of the CZSW. The second and third phases are funded by the Czech Government, as the objective is to integrate the CZSW into the customs system. The use of the customs and Single Window systems is free of charge.

There are seven front service providers licensed by the Customs services to operate Single Window portals through which user can access the services. The front-end providers are validating the data (semantic validation, date and rules validation) and charge a user fee based per declaration, item or permit / certificate basis.

Human Resources

In total 5,400 persons are currently working for the Czech Customs service. Around 830 work on customs clearance, and eight permanent staff on the Single Window. Three are responsible for the maintenance of the CZSW IT system. The development and upgrade of the SW system and the Customs declaration processing system (CDPS) is fully outsourced due to lack of software architects and cost effectiveness.

[40] Decision No 70/2008/EC of the European Parliament and of the Council

2.4.3. SW Strategic Orientation

The Single Window strategy is part of the EU Electronic Customs Initiative, defined in the DG TAXUD Multi Annual Strategic Plan (MASP)[41].

Future and Planned CZSW / EU Integration

The Czech Customs service is one of the pilot countries of the EU Single Window. By end of 2020 the number of Member States that join the EU Single Window is expected to double. When implemented in 2020 economic operators will no longer have to submit trade certificates together with the customs declaration. The EU Single Window will use the Customs Declaration dataset to create a request for permit/certificate and the approvals are made directly electronically. The response time for the certificate validation is two seconds. The EU Single Window will therefore remove all paper and implement a true single data entry and submission. It is expected that this will reduce the administrative burden for the traders, but regulatory changes still need to be introduced to make this happen.

Pilot Project Single Window

The enhancement of the functionalities of the EU Single Window-Common Veterinary Entry Document (CVED) is another objective of the pilot project. A quantity management functionality is added, and the possibility to generate and transmit certificates in a human-readable format (i.e. PDF) for the three certificates currently available in the EU SW-CVED (CVEDA, CVEDP and CED) is piloted. The quantity management functionality will ensure that customs offices push back information on the quantities of goods that entered the EU territory to the EU certificates databases.

2.4.4. Coverage, Services and Functionalities

Common EU Customs SW

The EU adopted an implantation plan for the Common EU Single Window, which sets out the SW milestones[42]:

- 2006 Definition of user requirements;
- 2008 Functional specifications;
- 2009 Start of implementation;
- 2012 SW and single entry in place in all Member States and a Community SW[43].

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[41]European Commission DG TaxUD, *IT Strategy* (Brussels: EC, 2016) MASP ANNEX 5 Revision 2016 v1.3 http://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/customs/policy_issues/e-customs_initiative/masp_annex5_en.pdf

[42] Implementation, however, is delayed due to the complexity and diversity of the legislation in the EU Member States.

[43]European Commission DG TAXUD, *Single Window at Community Level* (Brussels: EC, 2006) Working Document: TAXUD/1241/2005 – Rev. 5 under http://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/customs/policy_issues/e-customs_initiative/ind_projects/single_window.pdf (accessed January 2017)

The first phase of the Common EU SW development is defined as the automated acceptance of electronic certificates submitted with a customs declaration. The EU SW – Common Veterinary Entry Document (EU SW-CVED) is the pilot project initiated in 2012 and entered into production in December 2014. The next phase of the project foresees the addition of certificates—FLEGT (timber import), Organic Products imports (COI), and CHED-PP (plant products import)—handled at the TRACES platform of DG SANTE-see Figure 15 below.

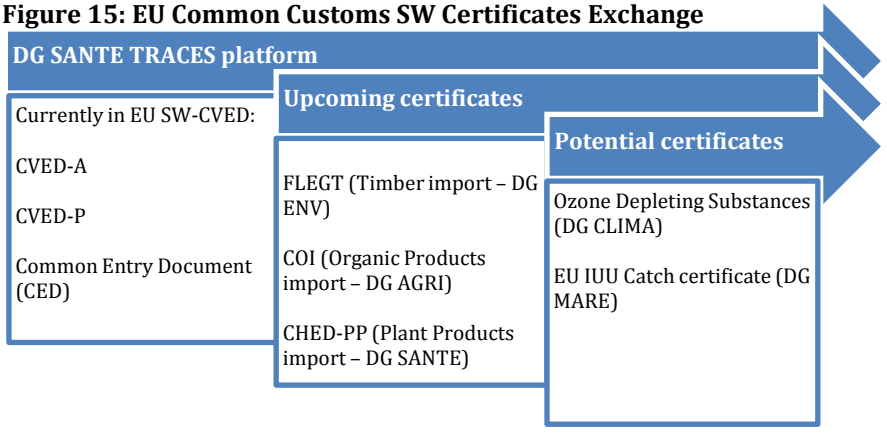
The EU certificates databases are managed by several European Commission Directorate Generals and is coordinated by DG TAXUD.

Single Window Coverage as part of the Common EU SW

The CZSW is operational since January 2015 and covers the submission of customs declaration, requests for permits and certificates in pre-clearance and clearance procedures, and activities such as the submission of the cargo manifest to Customs, and issuances of permits and certificates on state and community level. The CZSW is developed primarily at national level, based on agreed standards to ensure interoperability within the EU.

CZSW is part of the Common EU SW pilot phase – the Common Veterinary Entry Document (CVED) and so far, the validation of CVED and CITES permits numbers and SASP notifications are integrated.

Figure 15: EU Common Customs SW Certificates Exchange



Source: Authors' own construction

The second phase is under development and will include the validation of REX number, FLEGT license number[44], and sending data about used CITES back to Czech Ministry of Environment. The third phase will start in 2017 and will process the Certificate for COI.

Coverage, Services and Functionalities

The Czech Republic Single Window serves as the single entry point of transactions and communication between the trade community and Customs service, government agencies, port

[44] EU Flegt Facility, *FLEGT Licensing* under http://www.euflegt.efi.int/flegt-licensing (accessed January 2017).

operators, banks, logistics and insurance companies. It covers the business processes/services mentioned in

Table 8.

The use of Czech CDPS and Single Window is mandatory. 100% of customs declarations are processed and approved by the Czech Customs services using the CDPS/CZSW; 100% of the payments are made electronically through bank transactions; 100 % of permits and certificates are processed by government agencies; 100 % of declarations and permits are processed thought risk management system - 85% of permits and declarations processed within 10 - 15 minutes – see Table 7

Table 7: Processed Customs Declarations with Permits / Certificates – Czech SW

Customs declarations with permits / certificates		
Year	***Import***	***Export***
2012	*217303*	*48165*
2013	*231499*	*60735*
2014	*271978*	*67060*

Source: Authors from OIC survey

Inventory of services

The CZSW is the interface between traders and the government agencies for trade related permits and certificates that are presented jointly with the initial, not supplementary, customs declaration. In 2012 the number of national government agencies delivering certificates through the Single was 12. In the meantime, responsibilities for many regulatory procedures have been transferred to the EU level and EU institutions deliver certificates through the EU Single Window. Only three national agencies continue to deliver certificates/permits based on domestic regulation (weapon, dangerous materials / dual use goods and export of objects of cultural value).

Table 8: Czech Republic SW Services

Inventory of Business Processes / services
Request for permits and certificates
Submission of Customs declaration
Risk management at all levels
Exchange of Common Veterinary Document (CVED) with all EU MS.

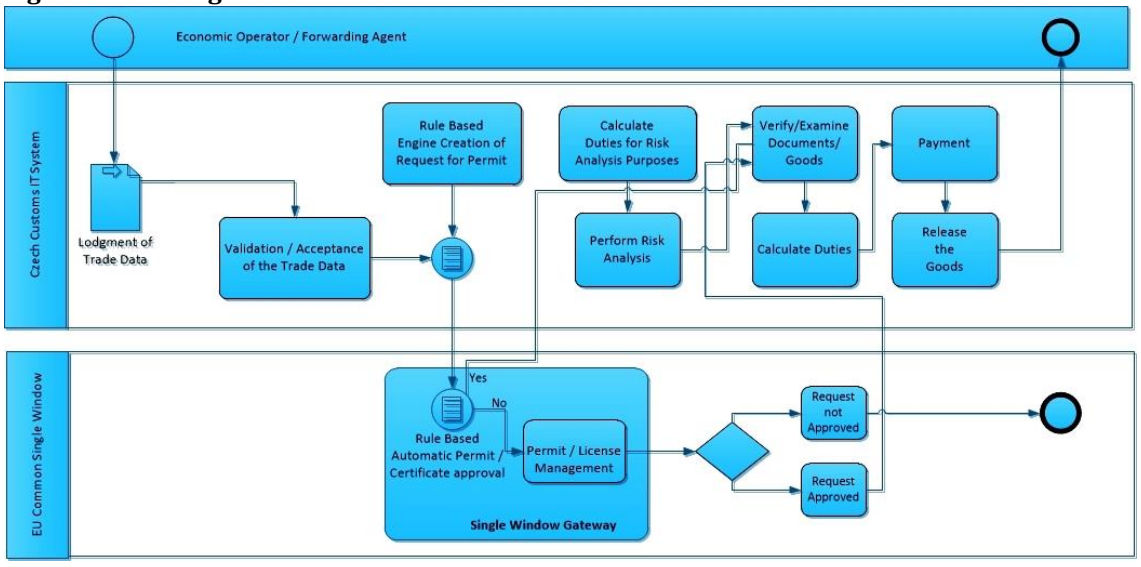
Source: Authors from OIC survey

The CZ Republic SW rests on the single submission of trade data as shown in Figure 16.

The trader is lodging the Single Administrative Document (SAD) to the EU Member States (MS) Customs Declaration Processing System. After authentication and validation, the SAD is accepted. The rule-based engine, integrated in the Integrated Tariff Environment (ITE) is

creating request for permit and certificate according HS Code. The request for permit and certificate is then sent via EU Common Communication Network / Common System Interface (CCN/CSI) to the EU Common Single Window - competent Directorate General (ex. DG AGRI, DG Health and Food Safety etc.). The DG rule / risk profile based system is automatically approving the request for permit and certificate. Manual intervention is possible but only required for a limited percentage of all transactions. The process from creation of the request for permit and certificate to approval is few seconds. The approved permits and certificates are sent back to the MS Customs Declaration Processing System and linked with the SAD for further processing.

Figure 16: Issuing of Permits and Certificates and Customs Clearance on EU Level



Source: Authors' own construction

The digital signature for every transaction between traders and the Single Window and CDPS is mandatory[45]. The digital signatures are issued by Accredited Certified Authorities based on the Authorization for e-communication for all customs procedures[46].

Czech Single Window ICT Architecture

The CZSW is integrated within a centralized IT Architecture with customs declaration processing system (CDPS). The Enterprise IT Architecture of the Czech Customs is based on a Service-Oriented Architecture (SOA), managing the CDPS and further DG TAXUD IT Systems[47]. The interconnectivity and interoperability with the DG TAXUD IT Systems and EU certificates

[45] Art. 199(4b) of EU Reg. 2454/93 and Law 227/2000 Coll. on e-signature
[46] Rules & conditions are in Art 199(4a) of EU Reg. 2454/93 (used for identification and verification of the traders).
[47] These IT systems include, inter alia, the databases for Authorised Economic Operators and for Electronic Binding Tariff Information. For a an overview and description see http://ec.europa.eu/taxation_customs/online-services_en (Accessed January 2017).

databases is via secure communication network - CCN/CSI (common communication network/common systems interface).

Web services are used for exchange of information, data and additional documents, messages standards UN/EDIFACT (the latest upgrade of the CSI is converting EDIFACT to XML messages standard and vice versa).

CZ Customs is using the business process catalogue from DG TAXUD (ARIS Business Process Analysis Platform) for Business Process Modelling and Management.

The CZ Customs IT Architecture is based on the high availability concept using clustering and virtualization for providing fault tolerant, load balancing and 24/7 availability of the services. CZ Customs is using Czech Government mirror site for business continuity / disaster recovery. Data warehouse and business intelligence are used for reporting and analysis services, as well for monitor the KPI's and performances of the IT system. In the short term it is planned to certify Customs according to ISO 9001 and ISO/IEC 17025.

2.5. Success Factors and Best Practices

Single Windows have the potential to drive trade facilitation reforms, but just being an IT platform is not enough. Several success factors for implementing a SW project and achieving long-term transformation have been identified by this and previous studies.

2.5.1. General Success Factors

Single Windows operate in a specific political, legal and institutional environment that impacts the design and delivery of a SW project. There is not one single or one-size-fits all models that governments could follow and adopt. Whilst each SW is tailored to the context these success factors apply to every possible set up and therefore can guide planning and implementation of a Single Window. General success factors are:

- Political support and will to achieve cross-government adherence necessary for the allocation of funds and the implementation of changes in each of the agencies concerned by the Single Window. Single Window entities do not have executive powers and depend on regulatory decisions by the Government. Cross-government support to the SW vision needs to be mobilised prior to launching the project;
- Enabling legal framework, which includes both a framework for the use of e-documents and signature and a regulatory framework that has been streamlined and simplified. Going paperless has a significant impact on cutting down times. Supporting a paperless environment is not difficult from a technological point of view, but is often limited for legal reasons;
- Solid business model and allocation of resources, which enables long-term visibility of funds to cover expenses and investments. Scarcity of resources can lead to focus on low-costs changes and solutions over deeper and more complex but also more costly changes;

- Engagement and adherence of stakeholders, including end-users, during the project development phase. A Single Window is a deep organisational transformation and requires changes of the daily practice of technical staff and administrative instructions;
- Business Process simplification and reengineering so that the Single Window does not replicate the web of complex and overlapping trade regulations and formalities but operates in a streamlined and simplified environment;
- Interoperability on the data and business level that enables the Single Window to exchange data with external system and offer extended end-to-end services. International standards are necessary to achieve interoperability;
- Common process design. Scaling and improvements are difficult without proper tools to continuously monitor changes at the business and service level. Each of the Single Window stakeholders follows its own regulatory and standard operational procedures and regulatory requirements and it is challenging to map all of them and identify opportunities for process simplification and reengineering. Not capturing this complexity at the early design stage can turn into wicked problems that explode the timeframe, budget and resources, or are impossible to address. Common process design or business architecture is therefore a necessary tool for Single Window. It assists in the design of simplified business processes and re-use of IT services and processes for business processes that have similar requirements. It is therefore an efficient way to adapt faster and in a more cost effective manner to changing needs.

2.5.2. Best Practices

The Singapore, Ghana and Czech Republic Single Window efforts can inspire other Single Window developments. The best practices are:

Singapore TradeNet Best Practices

The main success of TradeNet lies in the Singaporean Government's foresight in identifying the problems, finding a solution and championing the implementation. The close cooperation of all the stakeholders, the systematic planning with a phased implementation strategy, and the adoption and use of appropriate technology all contributed to the success of the SW. Specific aspects of the Singapore Single Window experience are:

- Rule-based risk management: over 95% of the requests for permits and certificates are automatically approved; only 5% require human intervention. After introducing Single Window in Singapore, the time to process trade documents was reduced from four days to few minutes.
- Strong commitment of the highest level of government, dedicated committee, and working group (multi-stakeholder committees and subcommittees), participation of the private sector, multiphase implementation, education, continuous training and change management, and a proper legal framework.
- The costs of building and running TradeNet are quite high (ninety-five percent of resources for investing in people with only five percent in IT system). The Singaporean government injected significant resources to build TradeNet and implemented an

operational model that requires more resources to run it but it is justifiable because of high trade transaction.

Ghana GCNeT Best Practices

Ghana's GCNet Single Window has constantly evolved over 10 years in order to improve its services and performance. Specific aspects that make the Ghana experience a model for other countries are:

- The Ghana SW team developed the system by looking at other existing experiences, and practices from the international community.
- Detailed preparatory work was conducted. The project team developed a blue print of the GCNeT system, put in place a roadmap and implementing strategy as a guidance document before taking stocks of all business requirements, system design, system development and implementation and an overarching committee to oversee the project development.
- Close collaboration and involvement of all stakeholders at all levels: overall project level; in each government agency; technical working group and committee level.
- Identification of a champion or resource persons in each stakeholder, who knows the system well and understands how to make the changes.

Czech Republic Best Practices

The CZSW is a specific Single Window development that fully integrates into a regional Single Window initiative from a technical and regulatory perspective. Responsibilities and functions are shared and transferred to the EU level, and information exchanged automatically between all Member States. This makes the CZSW a unique experience. Nevertheless the CZSW shares some new practices with the Singaporean Single Window that should be highlighted as models for future developments.

- The CZSW and the Singaporean SW both apply the single submission approach which eliminates burdensome formalities on the traders side
- The CZSW and the Singaporean SW both do not provide front services but allowed multiple private companies to deliver this service. The advantage of this approach is that the SW operator does not invest into development and maintenance of front services, that there is competition of service providers that leads to improvement of quality of services.
- The CZSW and the Singaporean SW both integrate automated decision-making based on integrated risk management, authorizations and registration, and other rules. This speeds up dramatically decision-making times: two seconds in the EU SW, and 1 min in Singapore SW.

3. Analysis of OIC Member States Efforts

The subject of this study is the Single Window efforts of OIC Member States. It is the first time that all 57 OIC Member States are reviewed in a single study. The Single Window efforts in the Member States show a great variety in terms of progress and organisational and IT. This chapter presents the general findings of the study. Detailed information on specific country efforts can be found in the Annex I and in the three case studies of Chapter 4.

3.1. Previous Surveys and Assessments

In the past years, several international and regional organizations have launched surveys on trade facilitation and Single Windows. These surveys capture the current state of implementation of different trade facilitation concepts, including Single Window. Examples of such global surveys that do report on the status of Single Window implementation are the OECD Trade Facilitation Indicators[48] and the United Nations Regional Commissions (UNRC) Joined Paperless Trade and Trade Facilitation implementation surveys[49]. The Doing Business Index from the World Bank Group will include Single Window as an indicator in the Trading Across Borders Index starting in 2017[50].

The OECD survey covers 152 countries and the data is collected from governments' own submissions and expert reports. The joined UNRC surveys cover 119 United Nations Member States and the data is collected through governments' own submissions.

The UNRC Paperless Trade and Trade Facilitation Survey 2015 covered 40 OIC Member States. It reported – see Table 9 – a Single Window implementation level of

- 33% of OIC Member States with full or partial Single Windows;
- 28% of OIC Member States with pilot stage Single Windows; and
- 39% of OIC Member States with no Single Window.

[48] OECD, *Trade Facilitation Indications*, Under Trade http://www.oecd.org/trade/indicators.htm (accessed January 2017).
[49] An UNRCS Paperless Trade and Trade Facilitation Implementation survey is an initiative launched by the United Nations Regional Commissions ECE, ECA, ESCWA, ECLAC, and ESCAP in 2010. The latest published reports, the 2015 survey, are based on data collected in 2014.
[50] See Doing Business Trading Across Borders Technology gains in trade facilitation, Doing Business 2017 report. The data is however not yet available. http://www.doingbusiness.org/~/media/WBG/DoingBusiness/Documents/Annual-Reports/English/DB17-Chapters/DB17-CS-Trading-across-borders.pdf

Table 9: United Nations Regional Commissions Survey Results 2015

Status	*OIC Member States*
Fully Implemented (5)	*Indonesia, Malaysia, Azerbaijan, Bahrain, Qatar*
Partially implemented (8)	*UAE, Turkey, Sudan, Senegal, Mozambique, Kyrgyz Republic, Jordan, Cameroon,*
Pilot stage (11)	*Tajikistan, Brunei Darussalam, Uganda, Togo, Niger, Nigeria, Morocco, Djibouti, Cote d'Ivoire, Burkina Faso, Benin*
Not implemented (16)	*Yemen, Uzbekistan, Suriname, Palestine, Pakistan, Mali, Maldives, Libya, Lebanon, Kazakhstan, Iraq, Gambia, Egypt, Comoros, Bangladesh, Afghanistan*

Source: Joint UNRCS Paperless Trade and Trade Facilitation Implementation survey data (http://www.unescap.org/resources/joint-unrcs-trade-facilitation-and-paperless-trade-implementation-survey-2015-global)

The survey further noted, that in the OIC Member States, Single Window implementation lacks behind digital customs clearance: 85% of OIC Member States have an automated Customs system; 83% allow for the electronic submission of the Customs declaration.

The survey also noted that only few Member States engage in cross-border paperless data exchange: Only nine OIC Member States participate in a cross-border exchange of data, three OIC Member States exchange the Certificate of Origin (CoO) and two the Sanitary and Phytosanitary (SPS) certificate.

The findings of the UNRCS survey are in line with this study's findings. Differences in countries' implementation status can be explained by i) the additional 2 year's time that allowed many countries to launch their operational Single Window in the meantime; and ii) a broader definition of a Single Window which led to a high number of reported partial Single Windows in the UNRC surveys compared to this study.

3.2. Assessment Approach

This study uses a multi-dimensional assessment framework and information collected through three data collection methods.

3.2.1. Assessment Framework

The Single Window efforts in the OIC Member States are compared on five dimensions: implementation level, regulatory coverage, business processes, organizational aspects, and technical technology aspects. This allows a description and comparison of the Single Window efforts at a detailed but still comparative level. Table 10 below presents the five dimensions of the assessment framework in more detail.

Table 10: Assessment Framework

	Implementation level reflects the different implementation stages of a Single Window effort. SWs are long-term developments and it can take many years to move from a political vision to a fully operational IT supported SW. Seven different stages are defined • *No Single Window initiative/plan* • *Single Window Initiative but no formal vision yet* • *Formal Single Window Strategy adopted by Government* • *Single Window Project in execution* • *Operational Single Window first generation* • *Re-design project for second generation Single Window* • *Operational Single Window second generation*
	Regulatory coverage describes the procedures, user, and geographical coverage of the SW. Procedure coverage describes the regulatory and commercial procedures that are integrated in the SW. User and geographical coverage is an important aspect as some services may be available only in few locations due to technical limitations, or are very specific to a particular location, i.e. a seaport facility. The coverage is determined by the strategic orientation of the Single Window but may change with time through scaling.
	Business process / Services coverage complements the regulatory coverage by describing the specific services and functionalities' offered by the SW. SWs exhibit a wide variance. To compare, these services can be grouped into front office and back office services. Front office involves, inter alia: • *Lodging of documents and data* • *Notification, archiving, printing of documents* • *Payment (e-invoicing)* • *Information portal* *Back office involves, inter alia:* • *Decision making* • *Back office cooperation* • *Risk Management* *It is furthermore important if services can offered paperless or if there is a duplication of paper and e-documents.*
	Organisational management describes the organizational arrangements that are adopted to ensure the functioning of the SW. This includes • *financial arrangements;* • *legal status of the SW;* • *internal quality management;* • *human resources and skills; and* • *alignment of business with IT strategy.*
	Technical and Technology regroups aspects regarding the IT Architecture and infrastructure, Data and Business Harmonisation, and electronic signature.

Source: Authors

3.2.2. Information Collection

Country level information was collected using three different methods: survey method, desk research and in-country assessment.

A survey questionnaire was designed and circulated to official contact points in OIC Member Countries. The survey was sent out to all known Single Window operators, and in the countries where no Single Window was known to exist, it was sent to relevant contact points in the Government, such as trade facilitation committee coordinator, or the WCO coordinator-see Annex III for list of contact points. 19[51] replies were received and one country was covered through an interview.

Desk research complemented the survey information to fill gaps where no reply was received, and to double check information. Desk research covered previous studies, presentations made by Single Window operators or government officials, and content published on the Internet. More than 400 documents and power point were consulted.

Desk research and personal interviews were used to collect information for the six case studies. Two missions were undertaken to the Kyrgyz Republic and to Morocco where interviews with representative from the Moroccan, Ghana and Cameroon SW were conducted. Personal interviews were furthermore conducted with representatives from the Indonesian Single Window and the CrimsonLogic in Singapore.

3.3. Comparative Findings

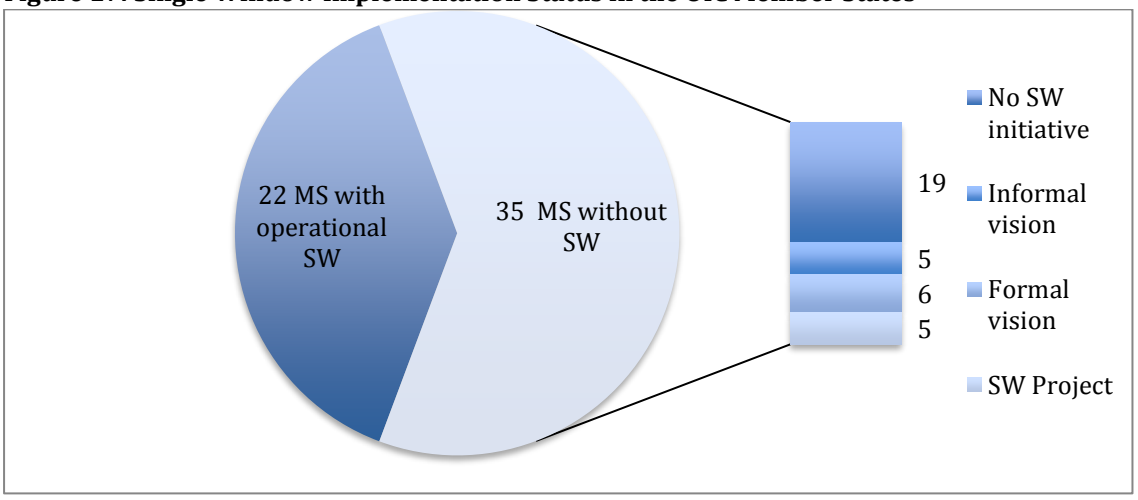
The 57 OIC Member States covered by this study are from three different regional groupings, the African Group, the Asian Group, and the Arab Group, and are at different stages of economic development from high income to low-income countries. This diversity is also reflected in the diversity of the Single Window efforts.

3.3.1. Status of Implementation

Within the OIC, the level of Single Window implementation is 39%. Figure 17 shows that 22 Member States have an operational Single Window and 35 Member States do not have a Single Window. Moreover, Table 11 shows the implementation status per country.

[51] One survey had to be disregarded as it reported on the SW for Business registration

Figure 17: Single Window Implementation Status in the OIC Member States



Source: Authors' own compilation from OIC survey

Out of the 22 OIC Member States with an operational Single Window

- 15 Member States have an operational Single Window first generation;
- 6 Member States are in the transition to second generation Single Window; and
- 1 Member States already has a second generation operational Single Window.

Out of the 35 OIC Member States without a Single Window

- 5 Member States with on-going Single Window developments;
- 6 Member States with a formal adopted Single Window visions; and
- 24 Member States with no Single Window and Single Window initiative/plan.

Table 11: Single Window Implementation Level in the OIC Member States [52]

Member Country	*No plans*	*Informal plan*	*Formal vision*	*In project*	*Operational*	*2nd phase in project*	*2nd phase Operational*
Afghanistan	✓						
Albania		✓					
*Algeria**				✓			
Azerbaijan					✓		
*Bahrain**					✓		
*Bangladesh**	✓						
Benin					✓		
Burkina Faso					✓		
*Brunei Darussalam**					✓		
Cameroon						✓	
*Chad**	✓						
*Comoros**	✓						

[52] Uzbekistan and Côte d'Ivoire are not included due to lack of information.

Member Country	No plans	Informal plan	Formal vision	In project	Operational	2nd phase in project	2nd phase Operational
*Côte d'Ivoire**					✓		
*Djibouti**	✓						
*Egypt**				✓			
*Gabon**	✓						
*Gambia**	✓						
Guinea		✓					
*Guinea - Bissau**			✓				
*Guyana**		✓					
Indonesia						✓	
Iran					✓		
*Iraq**	✓						
*Jordan**			✓				
*Kazakhstan**	✓						
*Kuwait**					✓		
Kyrgyz Republic						✓	
*Lebanon**		✓					
*Libya**	✓						
Malaysia						✓	
Maldives			✓				
Mali					✓		
Morocco						✓	
*Mauritania**	✓						
Mozambique					✓		
Niger	✓						
*Nigeria**			✓				
Oman				✓			
*Pakistan**		✓		✓			
*Palestine**	✓						
*Qatar**					✓		
*Saudi Arabia**					✓		
Senegal							✓
*Sierra Leone**	✓						
*Somalia**	✓						
*Sudan**			✓				
*Surinam**			✓				
*Syria**	✓						
Tajikistan						✓	
Togo					✓		
*Tunisia**					✓		
*Turkey**				✓			
*Turkmenistan**	✓						
*Uganda**				✓			
*UAE**					✓		
*Uzbekistan**	✓						
*Yemen**	✓						
Total	***19***	***5***	***6***	***5***	***15***	***6***	***1***

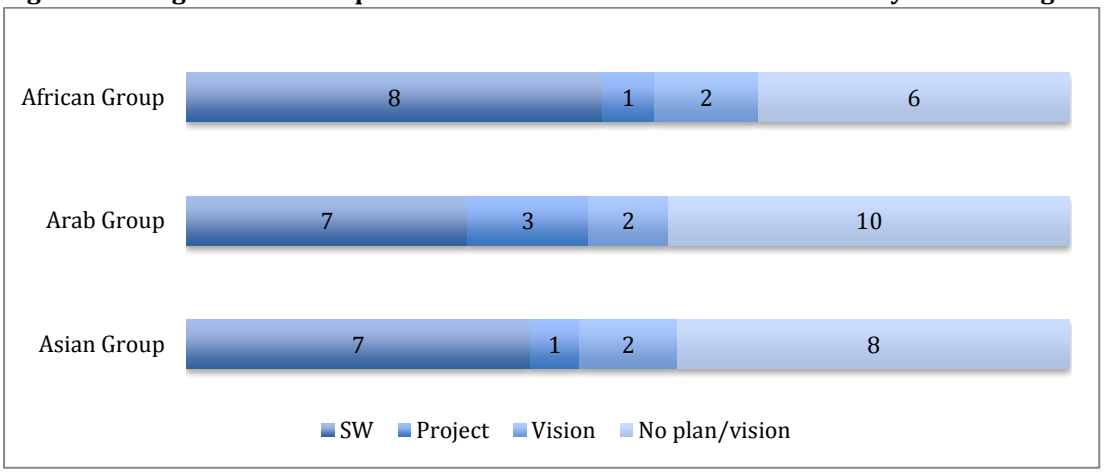
* No reply to the OIC survey questionnaire. Classification is based on other reports and publically available information.

Source: Authors' own compilation

The level of implementation differs between the three different regional groupings. The African Group has the most and the Arab Group the least Single Window –see Figure 18 below

- African Group: 47% Member States have an operational Single Window;
- Asian Group: 39% Member States have an operational Single Window;
- Arab Group: 32% Member States have an operational Single Window.

Figure 18: Single Window implementation Status of OIC Member States by OIC Sub-regions



Source: Authors' own compilation

OIC MS at all level of economic development engage in Single Window efforts. Of the 22 operational Single Windows,

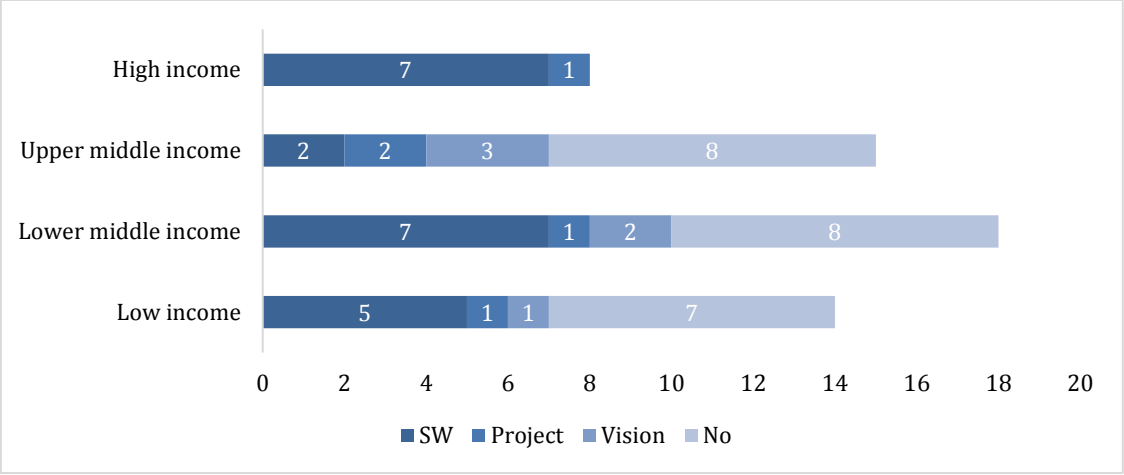
- 6 are in low income OIC MS;
- 7 in lower middle income countries;
- 2 in upper middle income countries; and
- 7 in high-income countries[53].

High-income OIC MS have however a higher level of SW implementation as 100% of them either have an operational SW or are in the final stage of a SW project.

Lower middle-income countries follow with 44%, low-income countries with 43%. The lowest level of implementation is in the upper middle-income countries group with only 27% of them having an operational SW or a SW project – see Figure 19 below.

[53] World Bank Country and Lending Group classification under https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

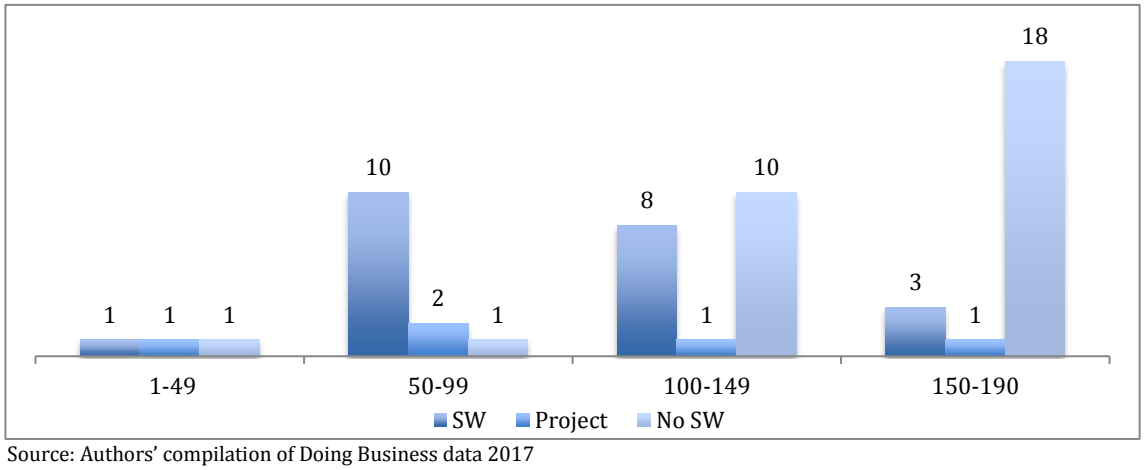
Figure 19: OIC Single Window Implementation Status by Development Level



Source: Authors' own compilation

Combining the Doing Business (DB) Trading Across Border (TAB) 2017 data with the survey data in OIC Member States shows that 80% of the Member States that rank low in the TAB index (rank 150-190) do not have a Single Window, whilst 76% of the countries in the upper ranking (rank 99-50) have an operational Single Window System.– see Figure 20.

Figure 20: Doing Business Ranking and OIC Single Window Implementation Level

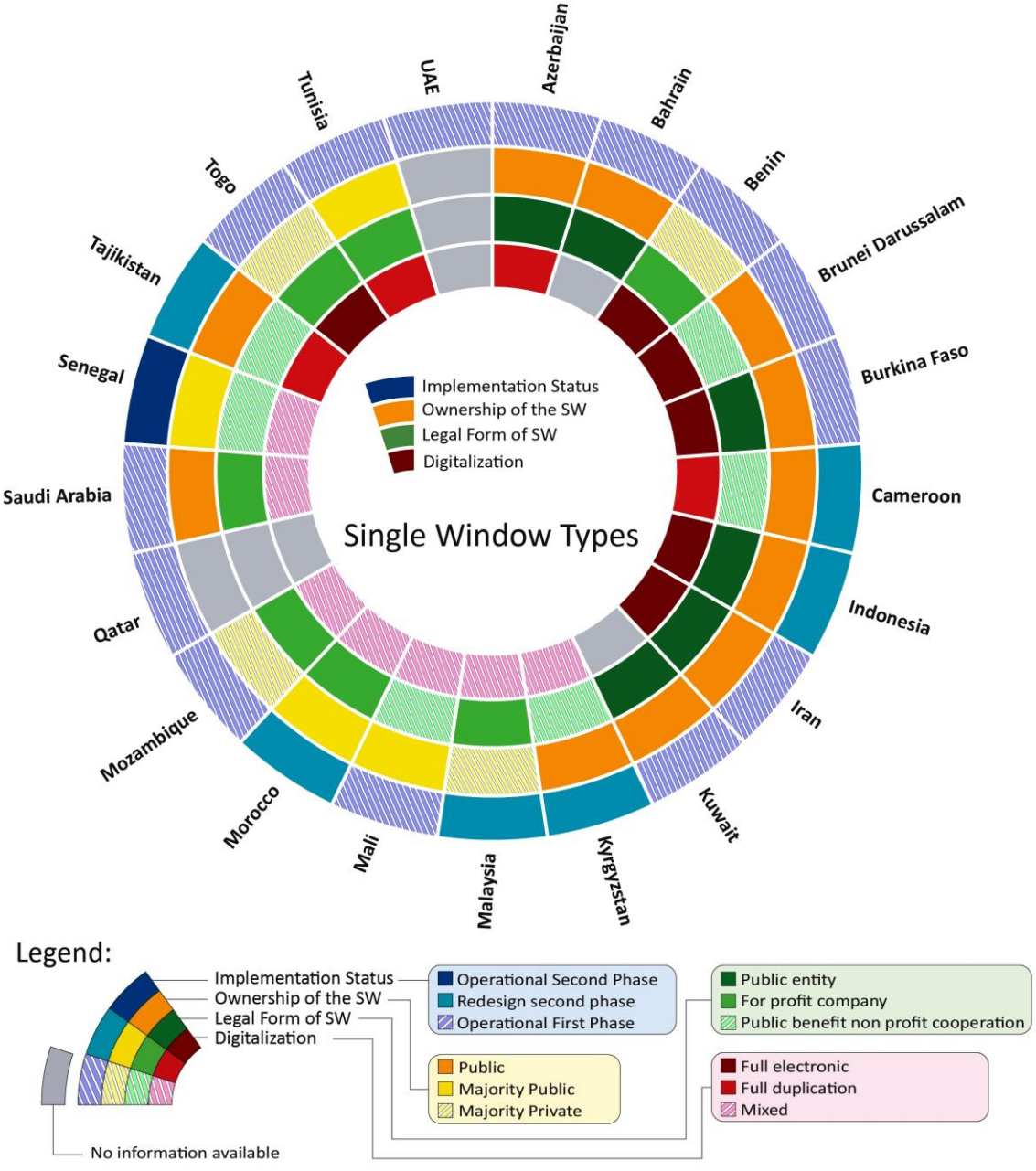


Source: Authors' compilation of Doing Business data 2017

3.4. Diversity of Single Windows

The 22 operational Single Windows do not follow a single model. They differ on many aspects i.e. organisational management, business process and service coverage and IT technology and infrastructure-see Figure 21.

Figure 21: Diversity of the Operational Single Windows



Source: Authors' own compilation from OIC survey data

3.4.1. Implementation Timeframe

2010 has been a turning point for many Single Window efforts. More than half of the 22 Single Windows became operational in or since 2010. The earliest initiative however, the Senegalese Single Window, already dates back 20 years. In fact, as can be seen in Table 12 there were few "early adapters" that launched a Single Window initiative in the late '90s, and a larger group of

"followers" that started only from 2008 onward. The early adapters were Senegal, Tunisia, Malaysia and Cameroon. The most recent initiative is the Single Window in Algeria that was initiated in 2015 and is still in the project phase

Table 12: Time Periods of Single Window Efforts in OIC Member States

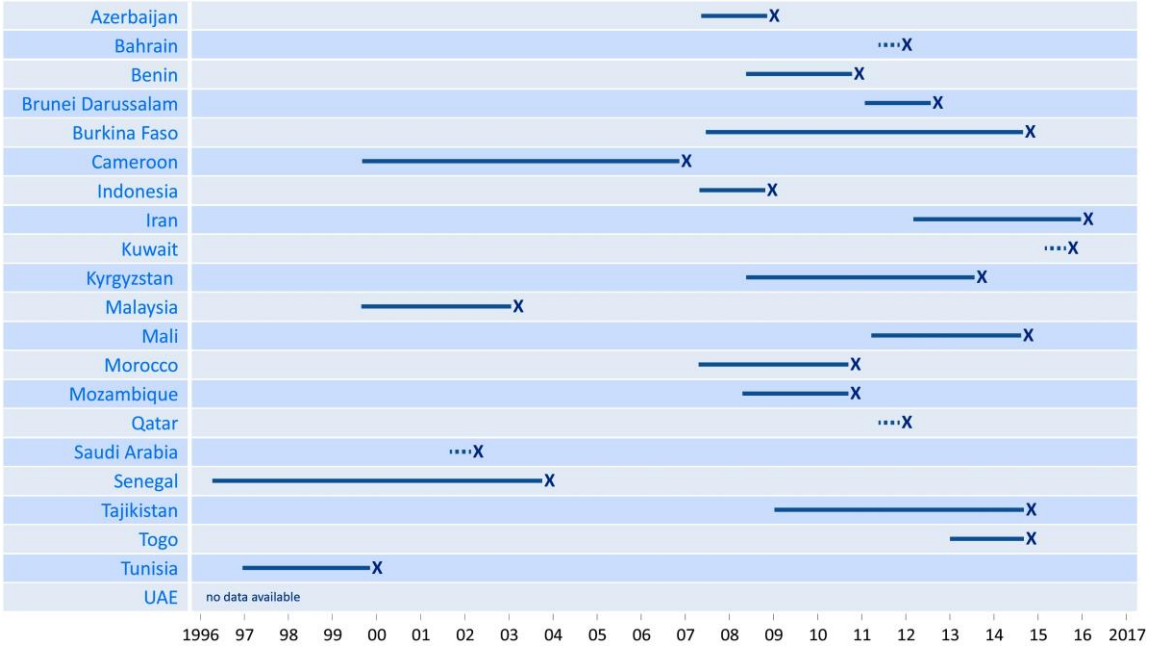
	1996-2000	*2000-2009*	*2010 -*
Launch of SW initiative	*4*	*8 (2008-2009)*	*4*
Realisation of SW	*0*	*7*	*12*

Source: Authors' own compilation

The implementation time from the political decision to the realisation of the operational Single Window varies significantly – see Figure 22. On average OIC Member States needed three and a half years from the political decision to the first operational Single Window. Indonesia, Azerbaijan and Brunei Darussalam only needed one year whilst Senegal needed eight and Burkina Faso more than six years.

In the Senegalese case the first initiative was launched in 1996 but only gained traction when the Customs Services took ownership of the project in 2001. The processes speeded up so that the Single Window went operational in 2004. In Burkina Faso, three years were necessary to move from the government decision to the strategic plan and the launch of the project with the creation of the Single Window project entity / operator. Once launched, the project lasted four years until completion.

Figure 22: Implementation Speed of OIC Member States Single Windows



Source: Authors' own compilation from OCI survey data

3.4.2. Organisational Model and Ownership

OIC Member States chose amongst three different organisational models for the Single Window:

- A departmental or non-departmental public body, namely the Custom Services, (7 countries);
- A public benefit non-profit company (6 countries); or
- A for-profit company, with majority private or public ownership (7 countries).

The for-profit companies operate under different contractual arrangements. Benin, Malaysia, Mozambique and Togo use a PPP arrangement and formed a joint private-public enterprise as a special purpose vehicle. The joint venture companies commonly have a private majority shareholding. Morocco, Tunisia, and Saudi Arabia created companies that operate under special enactment from the government and can have mixed public and private ownership. In such a case, the government often takes a majority stake in the early stage and sells its shares to the private sector later.

Table 13 shows that out of the 22 operational Single Windows in the OIC Member States, 12 are fully owned by the government, eight have a mixed ownership with public majority in four cases and private majority in four cases[54].

Table 13: Legal Status and Ownership of Single Windows in OIC Member States

Country	*Ownership*	*Legal Status*
Azerbaijan	*Public*	*Non-departmental body*
Bahrain	*Public*	*Departmental body*
Benin	*Majority Private*	*For profit company*
Brunei Darussalam	*Public*	*Public benefit non profit cooperation*
Burkina Faso	*Public*	*Departmental body*
Côte d'Ivoire	*Not available*	*Not available*
Cameroon	*Public*	*Public benefit non profit cooperation*
Indonesia	*Public*	*Non-departmental body*
Iran	*Public*	*Non-departmental body*
Jordan	*Public*	*Departmental body*
Kuwait	*Public*	*Departmental body*
Kyrgyz Republic	*Public*	*Public benefit non profit cooperation*
Malaysia	*Majority Private*	*For profit company*
Mali	*Majority Public*	*Public benefit non profit cooperation*
Morocco	*Majority Public*	*For profit company*
Mozambique	*Majority Private*	*For profit company*
Saudi Arabia	*Public*	*For profit company*
Senegal	*Majority Public*	*Public benefit non profit cooperation*
Tajikistan	*Public*	*Public benefit non profit cooperation*
Togo	*Majority Private*	*For profit company*
Tunisia	*Majority Public*	*For profit company*
UAE	*Not available*	*Not available*

Source: Authors' own compilation from OIC survey data

[54] No information for the Single Windows in Cote d'Ivoire and the United Arab Emirates

The Single Window operator is commonly set up for the purpose of developing and managing the Single Window. In few cases the government assigns additional functionalities or projects to the Single Window operator. Examples are the Kyrgyz Republic, where TULPAR staff also deals with export promotion, and Senegal, where GAINDE 2000 staff is assigned on projects outside Senegal. As Table 14 shows the number of staff of the Single Window operators varies from 10 employees in Tajikistan to 100 in Senegal.

Table 14: Staffing Numbers of Single Window Operators in OIC Member States[55]

	Number of staff	*Outsourcing IT development*
Tajikistan	*10*	*Yes*
Mali	*20*	*Yes*
Morocco	*22*	*Yes*
Indonesia	*32*	*Yes*
Kyrgyz Republic	*38*	*Yes*
Mozambique	*41*	*Partially*
Cameroon	*60*	*Partially*
Iran	*60*	*No*
Senegal	*100*	*No*

Source: Authors' own compilation from OIC survey data

3.4.3. Functionalities

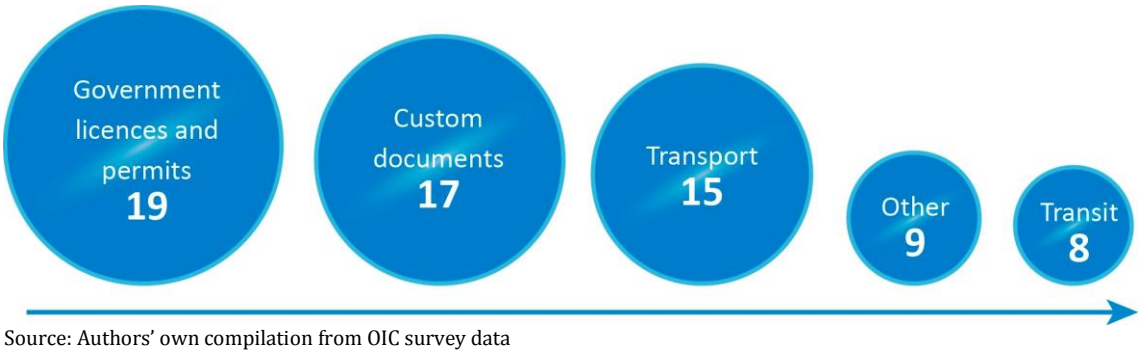
The operational Single Windows differ substantially with regards to functionalities and service coverage. The Single Window business processes were grouped into these five categories.

1. Government license, permits and authorisations
2. Submission, processing and notification of Customs Clearance
3. Control of Transit movement
4. Logistics and transport related activities
5. Other activities (FOREX control, insurance certificates etc.).

Figure 23 show the core activities of the Single Windows in the OIC Member States: These are government license and permits activities, followed by the submission of Customs documents to the Customs services, transport activities, transit control activities and other activities.

[55] Information is only available for few countries

Figure 23: Business Process Frequency in Member States Single Windows



Source: Authors' own compilation from OIC survey data

Specific services provided by OIC Member States Single Windows are:

- Two Single Windows, Brunei Darussalam and Cameroon, integrate activities related to Business registration;
- 11 Single Windows offer payment services in relation to the customs duties and taxes and/or port fees and charges[56]; and
- 14 Single Windows offer information services, mainly with regards to Customs regulation. The information provision service entails dynamic content on the website, notification through RSS feeds or similar technology, and as tariff simulators.

The use of the SW services is not mandatory in all countries; only nine countries have made it mandatory to use the SW to request permits and certificates, lodge the Customs manifest, or submit documents to Customs[57].

With regards to cross-border exchange of data

- Two OIC Member States, Togo and Cameroon, provide a service for the submission of data for clearance purposes in third countries, namely for the Entry Summary Declaration data to the EU Automated Import system;
- Three OIC Member States that are also ASEAN Member States form part of the pilot ASEAN regional Single Window;
- Two OIC Member States, Senegal and Cameroon, are leading regional initiatives on the exchange of the Certificate of Origin.

The individual coverage of the Single Windows varies significantly as can be seen from the three examples in Table 15 below.

- Three Single Windows, Burkina Faso, Kyrgyz Republic, and Tajikistan, only cover activities related to government licenses and approvals. The Single Window also does not support the lodgement of the Customs declarations. This constraint is mainly due to technology limitations – a limitation that the Cameroon Single Window faces as well.

[56] This may cover the entire payment process or only the e-invoicing and, probably the e-accounting steps.
[57] There are different approaches to establish a mandatory service: some legal provisions state that Customs documents, including the Customs Manifest, and related approvals will no longer be accepted in paper or pdf form (exclusively or in addition to paper); under some legal provision requests for approval of permits are only accepted through the SW and in electronic form.

- Two Single Windows, Togo and the United Arab Emirates, do not cover government licenses and approvals, but cover the submission of the Customs documents in addition to transport, i.e. port related activities.

Table 15: Example of SW Business Processes in OIC Member States

Azerbaijan	*License Permits Authorizations , Submission, processing and Customs Clearance, Logistics and transport related procedures, Other non-mandatory procedures*
Kyrgyz Republic	*License Permits Authorizations*
Tunisia	*License Permits Authorizations, Submission, processing and Customs Clearance, Control of Transit movement, Logistics and transport related procedures, Other non-mandatory procedures*

Source: Authors' own compilation

These different functionalities' portfolios reflect different strategic choices that underpin the Single Window efforts. But they also point to a challenge that all Single Windows face. The challenge to encompass a broad array of trade related activities.

3.4.4. IT Architecture

Only six of the OIC Member States' Single Windows have been able to remove all paper in its processing—Jordan, Malaysia, Morocco, Mozambique, Saudi Arabia, Senegal—whilst the others are either still operating in an entirely paper environment or duplicate paper and electronic documents.

The OIC Member States Single Windows also differ on the level of IT architecture. Out of 19 OIC Member States Single Window eight have a centralized, nine a distributed and two a mixed IT architecture.

Only 10 OIC Member States have operational data fault tolerant system and off-site Single Window IT system and data protection. Five of them have hot/warm back up site[58], and five have an online backup site that provides high availability and business continuity of the Single Window system.

[58] In case of incident, the hot site needs few hours to become operational

4. Country Case Studies

Three OIC MS were selected as case studies: The Kyrgyz Republic, Morocco and Cameroon[59]. The selection criteria were:

- Regional grouping (one MS per regional group)
- Implementation status (Operational Single Window)
- Characteristics of SW (variety of regulatory coverage, organisational design and IT architecture.

4.1. Cameroon Single Window

4.1.1. Implementation Process and Progress

The electronic Cameroon Single Window, Guichet Unique du Commerce Exterieur (GUCE), is operational as a web based platform since 2007. It has gone through several phases of transformation.

- In 2000, a physical Single Window became operational. Public and private stakeholders involved in the formalities of foreign trade in Douala were physically grouped in the same building.
- In 2007, a second phase, the electronic Single Window, was launched. This phase started with one paperless procedure, namely the government import permit for used cars.
- Since 2007, the web based platform and its services have been expanded to more procedures and now supports regulatory services, such as the importer/exporter registration with the Ministry of Commerce, the payment of Customs duties and taxes, and the manifest submission to Customs and the Port Authority.
- Since 2014, a re-design of the Single Window was launched to become operational in 2017.

On-going Evolutions Planned and Executed

Currently, the SW operator, GUCE-GIE, is implementing a paperless project to extend the platform in terms of services, processes and procedures and to change their IT architecture and business logic. The project aims to integrate all 70 formal procedures for cross-border trade in a paperless environment. Out of the 70 procedures, 20 are now paperless and brought online (approximately 35% ratio), and the business process planning, the operational and regulatory re-design has also already been achieved. A user guide for the paperless was launched in mid-2016 to anchor the paperless process into the daily practice of the economic operators.

The front office services of the new e-GUECE platform, the so-called government approval module, will regroup all the government-traders formalities. It is complemented by the Système

[59] The initial plan included Oman as case study as it is an integrated Customs and Single Window development. This could not be realized as the SW is not yet operational.

d'Information des Administration Techniques (SIAT) application that focuses on the back office functionalities of the Single Window.

Achievements

GUCE-GIE achievements so fare are

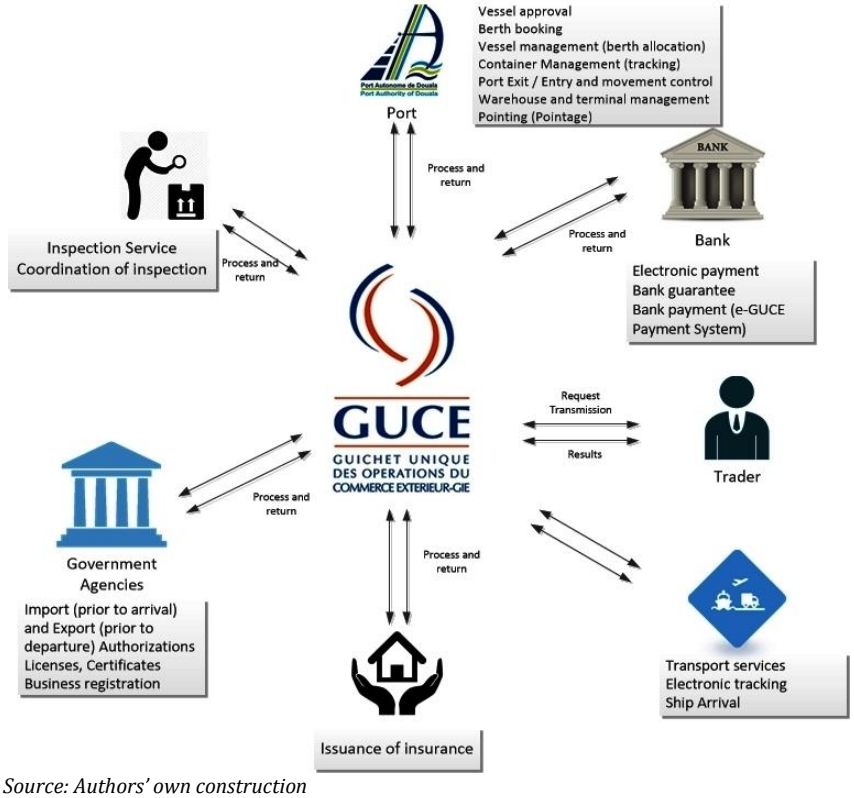
- Procedure average: 15 days and plus at the beginning of the project; Now approx. 3 days;
- Customs Clearance (import / export): 6 days; now less than 3 hours;
- Loading of Manifest (300 pages) approx. 7 days, now less than a minute.

4.1.2. SW Scope and Scale

In its current and new version the e-GUCE SW is a Single Window for regulatory services, that links the actors of foreign trade through the exchange of information relating to foreign trade formalities –see the conceptual diagram in Figure 24 below. At this stage, users can access data and processes in the e-GUCE system using web-based application.

The e-GUCE platform integrates at data level with external systems, such as the Customs Management System ASYCUDA++, the CARGO system of the Port Authority of Douala (PAD), and the System of the National Shippers Council for the (BESC), but does not provide for interconnectivity with the Customs Management system due to technical limitations.

Figure 24: GUCE Conceptual Diagram



Source: Authors' own construction

Coverage of Trade Procedures and Formalities

The e-GUCE SW provides an interface between traders and their representatives and government entities, including entities mandated by a statutory act, such as the Inspection Companies. It covers regulatory procedures related to the clearance of goods upon arrival or departure from several ministries (MINEPIC, MINADER, MINFOF, MINMIDT, MINSANTE and MINEP, SGS[60]. It is expected that the new generation will integrate all government agencies and procedures and allow traders to create a complete set of documents for Customs submission.

The e-GUCE enables traders to submit and request government approvals and documents for general and specific trade transactions at the import, export and transit of goods – see Table 16.

Table 16: Cameroon e-GUCE Single Window Services

Inventory of Business Processes / services
Submission of Cargo manifest to Customs Authorities, Port Authority and terminal Handlers
Request for Export and Import Authorizations, Licenses, Certificates and exemptions, including request for inspection certificate of used cars, and the preferential Certificate of Origin (currently still in test mode).
Payment of customs duties and taxes and payment of Port fees (Douala)
Request for Harmonized Insurance Certificate[61]
Electronic Tracking of Cargo in the port
Trader Registration
Submission of advance cargo information to EU
Issuance of Container Stuffing certificate (certificate d'empotage)
Customs and tax fees simulator
Exchange of the Verification Certificate for Import with SGS.
Notification of vessel arrival
Submission of Cargo tracking note

Source: Authors

The e-GUCE integrates the cargo tracking note[62], which is issued by an external system. In addition, selected transport and logistics services are available, namely electronic tracking in the port, vessel arrival notification, and the de-stuffing certificate. This port related services are currently limited to the Port of Douala. The payment service allows banks to register the collection of the payment (port fees and customs duties and taxes) in the system, but the

[60] SGS delivers the import declaration DI-PVI) and the Valuation Certificate (AVI)

[61] The insurance certificate is obligatory for all importation of goods exceeding 500,000 FCFA FOB value. Loi No. 75/14 du 8 December 1975 and Decret No 76/334 dzu 6 Aout 1976

[62] Bordereau éléctronique du suivi de cargaison (BESC)

payment process is still mainly done manually in cash or cheques with some clients using online banking.

The use of the e-GUCE platform is obligatory by law as it is directly related to the Customs clearance process.

Currently, paper-based procedures and electronic data records co-exist. The legal framework for paperless procedures is in place and the Single Window provides for full electronic documents. Individual parts of the Customs services however still insist to receive paper documents.

User coverage

The current end-users comprise shipping lines, registered customs brokers, and traders –see Table 17. Traders have direct access to e-GUCE, but it is an established practice to use Customs broker or the so-called declarants[63] for the customs clearance process.

Table 17: Cameroon e-GUCE Single Window End-users

Type of end-user	Total (country)	Total using the SW	SW % of Country total
Shipping Lines	*18*	*18*	*100%*
Air Ground Handlers			*0%*
Transporters			*0%*
Warehouses			*0%*
Freight Forwarders	*200*	*140*	*70%*
Customs Brokers	*150*	*105*	*70%*

Source: Authors' from OIC survey

4.1.3. Organizational Management

The Single Window is managed by the "Guichet Unique du Commerce Extérieur" (GUCE-GIE), which was established in 1999 as a group of economic interest created by Government decree. Its members are from both the private sector and public sector.

- Private sector: insurance companies, banks, stevedoring companies, shipping companies, chamber of commerce and le Groupement Inter-Patronal du Cameroon (GICAM);
- Public sector: At ministerial level Ministry of Finance, Ministry of Transport, and the Ministry of Commerce, and at the executive administrative level, Customs Administration, Port Authority of Douala (PAD), National office for Cocoa and Coffee (ONCC), National Shipping Council (CNCC) and other technical administrations.

Three bodies are responsible for the political oversight of the e-GUCE Single Window; a General Assembly, a Board of directors and the General Administration. The General Assembly is composed of the state representatives by of the Ministry of Finance, Ministry of Transport and Ministry of Commerce. Traders and competent authorities are also represented as well as the

[63] Any individual can undertake customs clearance of cars. In practice however, most of the owner of the goods use declarants for the formalities. These formalities are not registered as are the customs brokers and do not have an access to ASYCUDA++, hence requesting the use of a Customs Broker for the submission of the Declaration in ASYCUDA++

Autonomous Port of Douala (PAD), the National Shippers' Council of Cameroon (CNCC), Chamber of Commerce, Industry Mines and Handicraft of Cameroon (CCIMAC), the Union of Ship owners and Ship Agents of Cameroon (UCAM) etc.

The Board of Directors is the executive body with the following responsibilities:

- Single Window Strategy and objectives of the Single Window;
- Consider and adopt the action plan and budget proposed by the Director General;
- Consider and adopt the organizational and internal regulations proposed by the Director General;
- Secure employees benefits and salaries;
- Recruit and discharge senior staff based on the proposal of the Director General;
- Closes the accounts of each financial year and prepares the annual report on the activity of the group, which is subject to the approval of the General Assembly Meeting.

Financial Model

The Cameroon Government is providing financial support to the GUCE-GIE annual budget, as e-GUCE does not generate sufficient revenues to cover its own expenses. The financial model is based on the financing of the operational expenses from the flat fee charged per transaction (Custom Declaration).

Since 2009, GUCE-GIE has been able to access project finance to fund their activities, namely funding from the World Bank for the paperless project. The ICT Department of the GUCE-GIE lacks financial / cost estimation methodology-the Total Cost of Ownership (TCO)- to manage the costs of existing against planned resources. The current cost estimation methodology is applied on an ad-hoc basis, sketching from a number of non-reliable sources, and using non-standard techniques.

Human Resources Skills and Management

The GUCE-GIE is structured in three departments: the Operations department, the ICT department, and Administrative and Finance department. In total, 60 persons are permanently employed;15 of them work in the ICT department. GUCE-GIE has built a partnership with Polytechnic High School of Engineering (University of Yaoundé) and allows IT students in their last year to conduct an internship with GUCE-GIE to concretely work on a technical project during this internship.

The e-GUCE ICT organizational structure is a federated structure that consists of members from ICT departments from relevant agencies. The agencies IT staff are involved only during the business process analysis, functional requirements acceptance, testing, deployment and training of the end users. They also provide valuable input in the Business and ICT Strategies of the Single Window.

GUCE-GIE is combining in-house development with outsourcing. A third party vendor has been contracted to deliver the government approval module(s) in the current project phase. The

Single Window architecture and infrastructure of e-GUCE itself is developed and maintained in-house.

Performance and Quality Management

There is a no clear business architecture that provides a business process catalogue for all business processes to be integrated in e-GUCE. The ICT Department however uses ArgoUML[64] to create activity diagram visual models for software engineering. The identification and harmonization of a Single Window data set was performed before the integration of e-GUCE project, and the data elements were mapped and aligned to international standards.

GUCE-GIE has a service-level agreement (SLA) with vendors uses fully support and acquire related vendor services, but has no defined Quality Assurance (QA) policy to control the quality standards. The ICT Department has developed administrative and procedural activities to compare the requirements and deliverables but this is not done according to QA standards and methodologies and there is no appointed QA manager. In the short term, it is planned to certify the Single Window with ISO: 9001 and 27001 standards as the ICT security standards are already on the level of the ISO/IEC 27001 standards.

Stakeholder and Client Management

E-GUCE SW has established a three level client support.

- Tier l (help desk) – email support and hotline for the users providing support for traders and agencies operators and low level technical support, working hours from 08 -16 hours on working days;
- Tier II (level 2) is providing in-depth technical support on the level of services, operating system / database troubleshooting. The SW ICT Department is fully covering this level of administrative and advanced technical troubleshooting;
- The tier III (Level 3) is the highest level of maintenance in a three-tiered technical support model applied in e-GUCE responsible for treatment the most advanced problems related to the SW system functionalities. This level of support is fully covered by the ICT Department, as well form the vendors.

4.1.4. Information Technology and Architecture

E-GUCE IT Architecture

In the first implementation phase, the e-GUCE was designed as a distributed architecture - client server application structural model. Each service had its own physical and logical topology limited to the particular business process. As a result, the e-GUCE was a combination of several undefined topologies instead of standard topologies (bus, star or ring). It was a client – server model for simple data entry and submission to the processing unit (server) and data exchange with external systems on the data layer and documents level.

[64] Tipis Org, *Welcome to AgroUML* under http://argouml.tigris.org/ (accessed January 2017).

In 2010, a decision was taken to migrate the client server application model to a web based, service oriented portal. Today, the e-GUCE Single Window architecture is a fully centralized architecture. It hosts the agencies application with a taxonomy engine that cover end-to-end business process needs.

Centralized / Common Architecture

The e-GUCE centralized architecture is designed to cover end-to-end (E2E) business process integration. The strong E2E taxonomy of the e-GUCE architecture is based on nodes that are organized into four layers: the upper tier web servers, middle application and business nodes and the lower tier common data integration layer. The single common data layer and the taxonomy provides more efficient data sharing among agencies and simplification of data processing.

Interconnectivity and Interoperability

The e-GUCE presents an interoperable model of regulatory, procedural and business processes and requirements. A "AS-IS" Business Process Analysis was performed in 2014 prior to designing the new generation architecture and its "TO-BE" business processes. This approach provided a dynamic integration of the different regulatory and business models applied in e-GUCE at the planning and design stage and enhanced the ability to interconnect and interoperate. The interoperability with the ASYCUDA ++ is limited for technical reasons. Regarding the network capacity, e-GUCE has two fibre optic hubs for connection with the agencies and Customs services that have enough capacity to support the network connectivity requirements.

Integration at Data Level / Application Level

The operational data reside on a common mirrored storage system that provides data integration and application processing in real time. The e-GUCE is based on a centralised ICT Architecture for data submission and processing. The Extract, Transform and Load (ETL) function is used to transform and prepare data in data warehouse for analysis and reporting services. This process converts the extracted data into a desired form for the presentation layer. By combining heterogeneous data sources (e-GUCE, Port system, ASYCUDA++), the operational data is not used for reporting and analysis services and increase the e-GUCE overall system performances.

Business Continuity / Disaster Recovery

A Business Continuity (BC) and Disaster Recovery (DR) Plan have been developed as a part of the SW IT policies. The BC and DR infrastructure consist of two backup sites, fully mirrored with load balancing. The DR match appropriately with the criticality of the SW business functions, meaning that the first restoration is on the critical services and then the "less" important services are restored. The backup policy is according to highest standards and allows

restoration of services without interruption of processes. This is due to the mirrored architecture of e-GUCE.

IT Infrastructure

The e-GUCE is organized in logical and physical shared multi-layered IT infrastructure. The three-tier infrastructure allows any of the three tiers to be upgraded or replaced autonomously in response to changes in business processes, services or technology.

The infrastructural layers are:

- Presentation layer, web based user interface hosted by ORACLE Glass Fish application server allocated in demilitarized zone (DMZ);
- Application layer, ORACLE Glass Fish application / service layer;
- Data persistence layer, High Availability ORACLE RAC with mirrored data storage mechanism.

Flexible and extendable IT infrastructure

The e-GUCE Architecture is designed to fully avoid the loss of service (maximum tolerable downtime) whether planned or unplanned through the use of the High Availability (HA) approach. The current ICT Infrastructure is providing the hardware / software clustering for HA and virtualization services in which the SW is effectively providing the required level of service (e-GUCE target level 99,999%). Virtualization is used at all level, on test, development and production environment in order to utilize the maximum of the processing and hardware resources.

Data storage and warehousing

e-GUCE operational data is stored on a clustered version of the Oracle Real Application Clusters (Oracle RAC) that utilizes shared storage architecture. The storage shared proprietary infrastructure represents a private cloud system to store the operational data in a 24/7 high-availability and business continuity infrastructure. In addition, the storage is setup in mirror mode (two identical storages) for direct input / output (I/O) operation mode on both storage systems.

The e-GUCE data is integrated in ORACLE Data Warehouse and Pentaho Business Intelligence System for reporting and analysis services. For statistical purposes, ASYCUDA++ data is integrated in the e-GUCE data warehouse. This approach offers timely and accurate reporting and analysis services to all users.

Electronic Signature

The authentication procedure of the users of e-GUCE is based on single sign-on protocol using the unique identifier for companies and private persons is the taxpayer number. The authorization service is set to particular roles that share the same security privileges within the e-GUCE.

Under Cameroonian law, a written signature is not required for a valid contract[65]. The Laws on Electronic Commerce and Cyber Security and Cyber Criminality specifically ascertain that contracts cannot be denied enforceability merely because they are concluded electronically.

The e-GUCE digital signature development was finalized in January 2015 and is the first secure platform that is integrated with the Cameroon National Public Key Infrastructure (PKI). GUCE-GIE is now a PKI Registration Authority. The e-GUCE SW has integrated the digital signature for signing of data and information on a system-to-system basis.

4.2. Single Window System in the Kyrgyz Republic

4.2.1. Implementation Process and Progress

The Single Window in Kyrgyz Republic, called TULPAR Centre, has been created in 2009 and the IT SW is operational since 2014. It has been developed in several phases:

- 2009-2011: Preparatory work, creation of TULPAR, pilot IT system
- 2011-2014: Tendering of SW platform development;
    - 2011-2012 Development
    - 2013 Testing
    - 2014 Production
- 2014-2016: Second phase: Analysis and design

The SW project started in 2006-2007, when a trade facilitation survey was conducted in the Kyrgyz Republic with the cooperation of the Gesellschaft für Internationale Zusammenarbeit (GIZ) and USAID. As a result of the trade facilitation survey, a Trade Facilitation action plan was adopted in 2008[66], which included a SW as a recommendation. The Kyrgyz Single Window initiative was precursor in the Central-Asian region.

A government resolution approved the feasibility study for the purpose of establishing the Single Window and the organizational structure, the Centre for the Single Window, TULPAR, was set up in August 2009 by a Government decree. From thereon, TULPAR drove the preparatory work with support from donors such as GIZ and USAID. Jointly they conducted and drafted the feasibility study, a matrix of requirements, and legal documents for the creation of the Single Window enterprise. Three study visits were undertaken; in 2009 and in 2012 to Senegal and in 2016 to Malaysia.

An IT pilot system covering 6 agencies was financed by GIZ to help to overcome doubts of stakeholders. A first Asian Development Bank (ADB) grant covered the development of the system that is currently operational. A second ADB grant is currently used for the preparatory work of the second phase.

[65] Cameroon Civil Code; Uniform Act on General Commercial Law and Loi N°2010/012 Decembre 2010
[66] President Kyrgyz Republic Decree "On state policy development in the field of foreign trade and measures to improve export-import procedures" of 18 December 2008 № 452

On-going Evolutions Planned and Executed

The SW IT system became operational in 2014 and has not been changed since then. TULPAR focused on scaling the system by bringing more specialized state agencies and their procedures within its scope. The majority of resources, including Human Resources (HR), where devoted to training users from these state agencies as well as from the business community.

The Single Window strategy and business strategy as well as the organizational structure also remained unchanged since 2009, but TULPAR received an additional mandate for export promotion in 2014.

As soon as the IT system was in production the limitation of the SW design emerged. The current system is an automation of the AS-IS processes with a focus on data standardization and exchange of message. Therefore, a second phase of development was launched soon after the first generation went operational. The second phase focuses on re-engineering business processes, advice and expertise, and analysis of legal framework and aims to result in recommendations for legal changes, the redesign business processes, and a matrix of requirements for the IT system. A re-design of the IT system will be implemented in phase three using the results of the second phase.

For all phases including the preparatory work, TULPAR relied on outsourcing of key activities. A third party developed the pilot project, the design and development of the IT system was outsourced to a third party through a tender, and the current second phase is also outsourced to a third party.

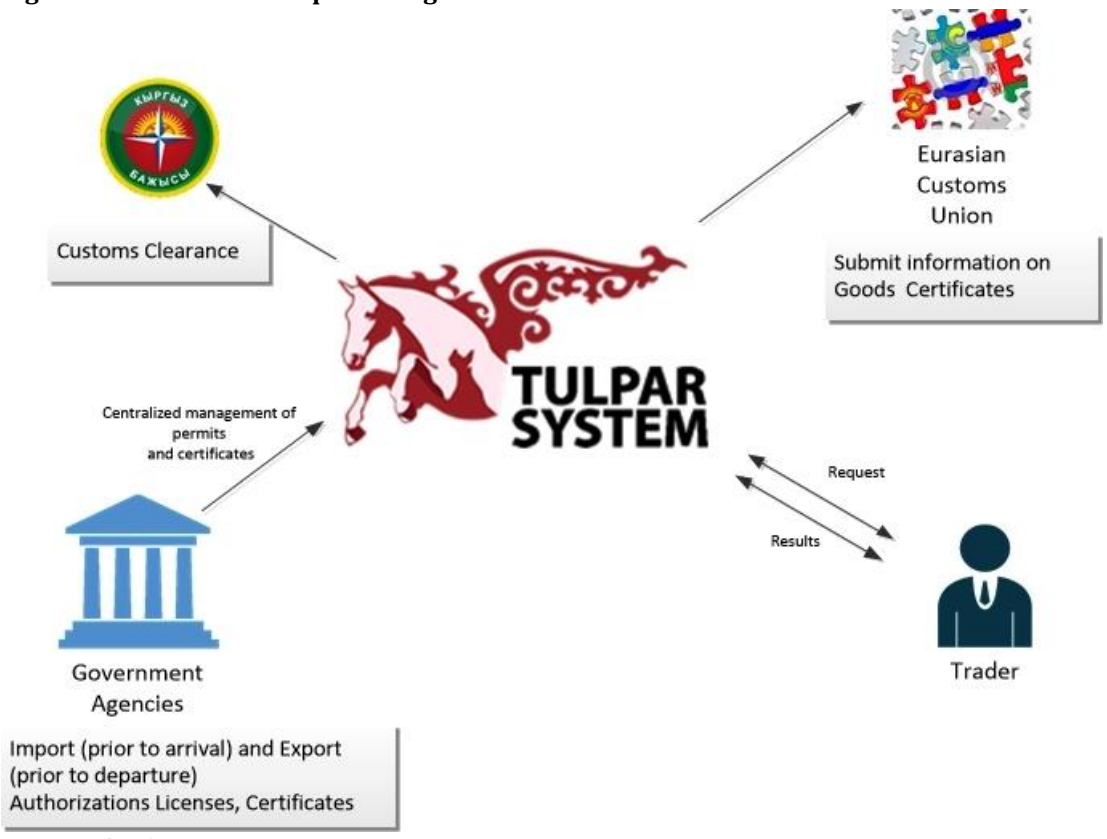
As the Single Windows faces challenges to reach scalability and financial sustainability the Single Window strategy and business strategy are currently also under review.

4.2.2. Single Window Scope and Scale

The Single Window was designed to act as a one-stop shop for trade transactions, namely import and export licenses and authorizations. At the time of the Single Window development, few administrations in the Kyrgyz republic were using IT and the objective was to enable electronic processing and the digitisation of documents for these agencies.

In line with its strategy, the SW provides functionalities and services for the processing of authorizations, certifications and licenses prior to arrival or departure of goods – see the conceptual diagram in Figure 25 below.

Figure 25: TULPAR Conceptual Diagram



Source: Authors' own construction

Regulatory Coverage

The services focus on the request for such licenses, approvals and authorisations. The procedures entail the submission of information to specialized state agencies and ministerial departments, and the communication of the decision, which commonly takes the form of issuing a signed and dated documents – see Table 18below.

Table 18: Kyrgyz Republic Single Window Services

Inventory of Business Processes / Services
Request for Export and Import Authorizations, Licenses, Certificates and exemptions from Government agencies and private standardization bodies
Sharing of documents with Customs Services
Sharing of standard certificate with Eurasian Community Commission

Source: Authors

As of today, the regulatory coverage of SW covers all regulatory requirements with the exception of trade in animal and animal products and plants and plant based products. 10 specialized state agencies and Government departments and five private companies that provide regulatory

services are now integrated into the SW and in total 33 documents can be requested. Procedures from three state agencies, including the state agency for sanitary and phytosanitary inspection, are not yet covered by the SW but are in the process of being incorporated. These procedures have to be accomplished prior to presenting the goods to Customs for clearance.

In addition, TULPAR exchanges licenses data with the Customs Management System and the Goods Standard certificate with the Eurasian Community Commission. This data exchange allows both entities to verify documents presented to them in paper or electronic format. Traders and/or their representatives have to provide the number of the decision in the Customs declaration and Customs officials can view and download the electronic documents issued by the other state agency using the reference numbers.

At this stage, the registration of importers/exporters/producers is not covered by the Single Window, although multiple registration requirements exist and the procedures are reported to be lengthy. TULPAR is currently developing the customs fees duty simulator and is expected soon to be integrated and operational.

The Single Window services are accessible over the Internet from everywhere in the country, but because procedures my differ in each of the regions, the SW currently covers only Bishkek based procedures

At this stage all procedures are paper based because of the lack of legal framework for electronic documents and e-signature. All 33 documents are available in electronic format, but as paper documents are still required by the agencies, there is a de facto duplication of digital and manual procedures and documents.

User Coverage

The SW has two types of users:

- 10 specialized state agencies, and 5 private companies providing a certification services mandated by law;
- traders and customs brokers.

In 2013, a government decree made it mandatory for Custom service officers to accept electronic. This does however not mean that the application for government license and permit has to be made through TULPAR. In fact, no custom broker or trader is using it for this purpose. The requests are filed in person with each government agency. The government agencies than enter the data into TULPAR and issue the electronic document – in addition to a paper document.

The number of documents thus issued in the SW was 24,000 in 2014 and in 2015 and 7,000 in the first 7 months of 2016. The decrease can mainly be attributed to the trade policy change. Eurasian Community goods no longer require customs declaration, and there is a lack of clarity regarding other legal requirements.

4.2.3. Organizational Management

Institutional Framework and Governance Model

The SW operating entity TULPAR was created by a Government decree in August 2009. It has the legal status of a public enterprise and operates under the Ministry of Economy. The Ministry of Economy also chairs the Single Window observatory that provides operational supervision and decision-making. All government agencies integrated with the Single Window, currently 10, and representatives of the business community and the international development community assemble in the Observatory that meets twice a year. TULPAR reports on activities and present plans for future development to this governing body.

Within TULPAR, there are six operational units; Administration, Finance, Information and Analysis, Economic development, Export promotion, and IT. TULPAR is managed by a Director, and each operational unit is managed by a department manager.

Resource Management

Public sources, a grant from ADB [67] and State contribution in form of equity, funded the development of the system. The operating costs are covered through the regular State budget that covers operational costs including salaries and infrastructure such as the building etc. On an annual basis, TULPAR submits an operating budget for approval to the Coordinating Committee and has found it difficult to obtain funding of new developments. The total operating costs of the system and the organization have not been assessed yet.

The use of the TULPAR services is free of charge for the public agencies. The fee model is based on fee per transaction basis for the private sector users. The cost per document is 100 Som (1.30 Euro). However, as there is no private sector using the service anymore, the Single Window does not generate revenues anymore and therefore entirely depends on the public sector support for its on-going operations. Because of its status as a public enterprise, TULPAR is also not able to access capital market or commercial banks as lender and has to rely on international financial institutions grants to the State budget.

Human resources skills and management

In total, TULPAR has 38 full time employed staff. The staff does not have the status of a civil servant, and have contract with determined length. Out of the 38 staff eight work in the IT department. Six of them are assigned to training of customers. The recruitment of IT specialist is challenging due to wage competition from the private sector. The current IT specialists are trained specialist but there is no internal training program to continuously upgrade their skills.

[67] Total amount of grant dedicated to TULPAR unknown but is estimated to be approximately 1 million US Dollar

Outsourcing external resources

TULPAR has fully outsourced the design and development of the ICT system with little involvement of TULPAR staff in the processes. TULPAR staff contributes to workings groups - legal, business processes, implementation software – they was foreseen to gradually hand over maintenance of the IT system to TULPAR staff. The training was part of the second phase but has been delayed.

The lack of control and involvement is due to the reliance on third-party funding. Vendor or proprietary lock-in makes TULPAR dependent on a single vendor products and services, without the possibility to use another vendor in view of cutting costs.

The vendor products integrated in the TULPAR IT system are with perpetual licensing meaning they never expire. With perpetual license the TULPAR is authorized to software upgrades when new products are released, and can receive 24/7 free and continuous vendor support.

Performance and Quality Management

Use of Business Process Modelling and Management data harmonization

There is no business architecture that provides an inventory of all business processes in order to plan and monitor changes. This is mainly due to the outsourcing of the IT development and the lack of process re-engineering in the Phase I.

The Phase II of the SW Project is changing current business processes, redesigning and improving flows and implementing new services that will cover the gaps and needs of the TULPAR SW. The Phase II is performing a business process analysis and studies the current processes in detail in order to recommend improvements. In this way, a better understanding of the current situation (AS-IS) will be gained and the recommendations and simplifications will be proposed for the target situation in Phase III (TO-BE).

Due to the absence of Business Architecture (process catalogue) it is likely that SW services are not fully aligned with the business processes and data, which they were intended to automate.

The identification and harmonization of a single data set was performed during the Phase I of the SW Project, and the data elements were mapped, reduced from 250 to 120, and aligned with international standards such as UNCCTL, UNTDED and the WCO data model.

Quality certification and manager

TULPAR IT Department has not defined a standard set of quality standards that can be used for quality assurance project development. Instead, the SW vendor has developed matrix requirements for project / module acceptance for control and follow-ups of quality of deliverables. The SW ICT security standards are on the level of security policies that aligned the ISO/IEC 27001 security standards.

Performance/Stakeholder management

There is a no quality performance management for continuous measurement of the overall trade facilitation objectives.

TULPAR SW has established four tiers for client support as follows:

- Tier 0 (or self-help) is available on the web site of TULPAR in the form of FAQs and email support. Statistics for this level of support is not registered;
- Tier l (help desk) is established in the Ministry of Economy. Two persons are trained to provide support for traders and agencies operators and low level technical support, working hours from 08 -16 hours on working days;
- Tier II (level 2) is providing in-depth technical support on the level of services, operating system / database troubleshooting, administrative support and advanced technical troubleshooting. For elevated issues of the SW system, the ICT Department of the TULPAR is not using the vendor technical support. They rely more to search the net to confirm the weight of the problem(s) and looking for known solutions linked to more complex problems. The ICT Department has developed the "specific scenarios for specific problems" that fully covers the tier II support and partially the tier III;
- The tier III (Level 3) is the highest level of maintenance in a three-tiered technical support model applied in TULPAR responsible for treatment the most advanced problems related to the SW system functionalities. This level of support is fully outsourced, covered by the contractor based on the ADB contract agreement (warranty period) for one year, after which the contractor is providing support on the goodwill basis, without any agreement.

4.2.4. Information Technology and Architecture

TULPAR IT Architecture

The current IT system is a centralised IT architecture for data submission, data processing and decision-making. Data entry and integration is processed by the Single Window component application layer. Users and stakeholders' access use and share the data for the decision making-either by interfacing with agencies' ICT systems and allowing for an exchange of data, or processing within the SW at the application layer.

This design choice leads to challenges today as the TULPAR IT architecture is not flexible enough. The architecture has limited capacity and possibility for adjustment and extension in order to accommodate / host agencies' IT applications and data. TULPAR is accommodating change where possible and two external IT systems are interconnected and exchange the data and information with TULPAR. The IT architecture and design can however not accommodate a distributed architecture to accommodate more IT systems. In the meantime however, more government agencies developed their own IT system, and in view of the e-government initiative more agencies are expected to follow. It is therefore obvious that the centralized architecture is no longer reflecting and adapted to the reality.

Business Continuity / Disaster Recovery

There is no business continuity plan to guarantee the continuation of services and no backup site (mirror, hot or cold recovery site) that would enable TULPAR to recover the system efficiently from any type disruption. The TULPAR is implementing disk-to-disk backup (mirror copy) policy. This is also critical issue, since only two instances can be used for recovery of data and services. The best practice is to apply backup tape as an additional backup instance - disk to disk to tape backup concept.

IT Infrastructure

The TULPAR IT architecture consists of infrastructural components of a particular type. The implemented infrastructural model is divided into three layers according to the application burdens performed by the component types of each layer. These layers are:

- **Presentation layer:** Includes component types such as web based user interface and process components hosted by Web Server, Microsoft® Internet Information Services (IIS) allocated in demilitarized zone (DMZ);
- **Business layer:** Includes component types such as business processes and single service interface, which manage the processes and rules. The business components are hosted by Microsoft® Internet Information Services (IIS) as Application Server. The SW application layer consist of Customer Relationship Management (CRM), SharePoint Server and complicated hard coded core SW application that is difficult to maintain and further develop;
- **Data layer:** Includes component types such as single data layer and Microsoft ® SQL Server 2008 EE data tools components and Web services, encapsulating the complexities of distributing data across SW.

The TULPAR IT architecture is not designed to avoid the loss of service (downtime) whether planned or unplanned. This is due to lack of High Availability (HA) approach (the percentage of the agreed service timeframe for which the component or service is available). The current ICT Infrastructure is not providing the hardware / software clustering and virtualization services in which the SW will effectively provide the required level of service. The virtualization is used only for SW test and development environment.

The SW Infrastructure is setup on dedicated hardware, which dramatically increases the cost to expand the Infrastructure. The future plan is to combine the server clustering (N+1 spare node failover) and virtualization services in order to utilize the maximum of the hardware resources.

Centralized / Common Data Layer

The TULPAR operational data resides on a single database repository (MS SQL Server 2008). This represents a high risk in case of non-responsive or locked database thus is downgrading the performance and efficiencies in SW operations. As well, there is a no separation of operational and archive data (written off and expired certificates and licenses). The process of

archiving of data should be automated and configured to periodically archive data to data warehouse system. The data warehouse (for backup and archiving) and clustering systems will dramatically increase the performances of the SW System and simplify the restoration and recovery of the operational database. On the technical level, the Microsoft® SQL Server 2008 EE has integrated Transparent Data Encryption (TDE), designed to provide protection not only on data (cell) level, but also for the entire database, without affecting existing applications. SQL Server encrypts data with a hierarchical encryption and key management infrastructure. Each layer encrypts the layer below it by using a combination of certificates, asymmetric keys, and symmetric keys. Asymmetric keys and symmetric keys can be stored outside of SQL Server in an Extensible Key Management (EKM) module[68].

With regards to reporting and analysis services, the current setup of TULPAR produces complex ICT administrative tasks. The reporting and analysis services are performed by querying the operational database. The TULPAR application and enquiry systems are not flexible; in case of minor changes or request for additional report and analysis would require an enormous amount of administrative efforts.

Authentication and Authorization Services

The authentication service of the TUPLAR Single Window is based on the single sign-on protocol for all provided services. The authentication combines entry of user name and password for registered users and is not supporting strong password policy, or any additional authentication mechanism (e.g. SMS or email validation). The TULPAR authorization services are role-based. The agencies have three levels of roles – operator (acceptance and validation of structured and unstructured data set), officer (processing of requests) and director (decision making level).

The TULPAR Single Window is supporting electronic signature for submissions to the system and from the systems and system-to-system signature for interconnected systems. There is only one Certificate Authority (CA) in the Kyrgyz Republic and the Certificate Revocation List (CRL) (expiration of validity, verification, revoked / invalidated certificates etc.) is available online. The price of the digital signature is approximately 22 USD per year and all registered users have to obtain the digital certificate prior to subscribing to the TULPAR platform.

4.3. Moroccan Single Window

4.3.1. Implementation Process and Progress

The Moroccan Single Window, called PortNet, was launched in 2008 and the IT platform is operational since 2011. The SW development was part of the Morocco Trade Facilitation Program (TFP) and e-Government initiative and has gone through the following stages:

[68] Microsoft, Encryptions Hierarchy under https://technet.microsoft.com/en-us/library/ms189586(v=sql.110).aspx (accessed January 2017).

- 2008: Preparatory work including feasibility study
- 2010: Creation of operator PortNet, and launch of development of platform
- 2011: Launch of SW operations in Port of Casablanca – Phase 1 which consists of 4 services modules focusing on the shipping documents and manifest management, and tallying
- 2012: Extension to other ports (9 in total)
- 2013-2015: Launch of SW operations – Phase 2 focusing on goods related import and export documents from 10 Government agencies
- 2016: Launch of the development of the second generation of the SW which is expected to become operational in 2017.

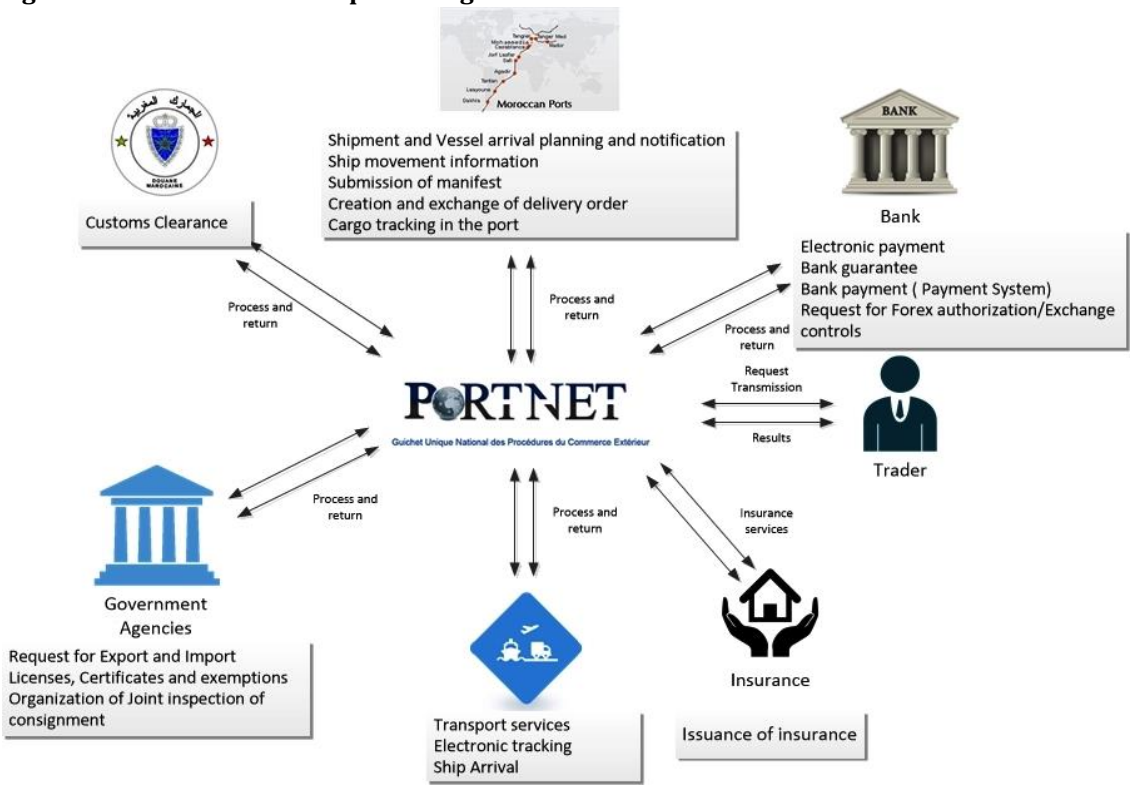
The main objectives of the second generation include:

- Paperless filing with non-customs government departments and agencies such as Ministry of Commerce Extérieur (MCE);
- Integration of additional procedures;
- Coordinated management of joint physical inspections of containers at the port of Casablanca between customs and other non-customs control agencies such as MCE and Office National de Sécurité Sanitaire des produits Alimentaires (ONSSA), and terminal handlers;
- Implementation of an electronic circuit via EDI for the exchange of test results and the digitisation of the market access certificates.

4.3.2. Single Window Scope and Scale

The PortNet Single Window is an electronic platform for the exchange of data between shipping agencies, shipping companies, the national Port Authority, Airport port operators, freight forwarders, commercial banks, insurance companies, government departments including Customs, and control agencies at the national level – see Figure 26 below.

Figure 26: PortNet SW Conceptual Diagram



Source: Authors' own construction

The PortNet Single Window is operating in a distributed IT architecture, whereby data is exchanged automatically with external IT systems, such as the Customs Management System–BARD (Base Automatisé des Douanes en Réseau) and the IT system from ONSSA. This allows for a seamless submission of all documents through PortNet and the exchange of information and data with all relevant agencies.

Regulatory Coverage

The PortNet SW emerged from a Port centric vision supporting first the paperless submission of shipping documents and the port. It has expanded its services to the collection of government approvals required for the importation, exportation or transit, the submission of customs documents, and includes other services related to the transport processes, such as the removal of goods from the port and the insurance certificate–see Table 19 below.

Table 19: Morocco PortNet Single Window Services

Inventory of Business Processes / Services
Request for Export and Import Licenses, Certificates and exemptions
Submission of documents for Customs clearance and notification of release
Shipment and Vessel arrival planning and notification
Ship movement information
Submission of manifest
Creation and exchange of delivery order
Cargo tracking in the port
Organisation of Joint inspection of consignment
Payment of Customs Fees and Charges

Source: Authors

The Government gradually phases out paper based procedures and the use of PortNet for most of the procedures is now de facto mandatory. In November 2016, 100% of the Dangerous and Specialised goods Declarations, 91% of all ship manifests are submitted through Portnet, and 100% of Arrival Notice were exchanged between Shipping agent and importer[69] through PortNet.

User Coverage

PortNet is providing services to more than 25,000 users, including more than 20,100 importers and exporters, 830 freight forwarders, 137 shipping agents, 10 Port operators, 16 banks (and 15 exchange offices approved by the Foreign Exchange Bureau) and 10 ministries and agencies:

- ANP: National Ports Agency;
- OC: Exchange office;
- CNCE: National Council of Foreign Trade;
- ADII: Administration of Customs and Indirect Taxes;
- ONSSA: National Health Security Office of Food Products;
- Ministry of Industry, Trade, Investment and the Digital Economy;
- Ministry of Foreign Trade;
- Ministry of Agriculture and Maritime Fishing;
- Ministry of Health;
- Ministry of Energy, Mines, Water and Environment.

[69] PortNet, *Tableau de Bord, November 2016* under http://www.portnet.ma/portail/index.php/fr/services/statistiques (Accessed January 2017).

Achievements

The SW had an impact on the dwell time in the ports and the inspection time in the clearance locations, Magasins et aires de dédouanement (MEADS). Port dwell time has been brought down from an overage of more than 13 days to 5,72 days. Process performance achievements however vary for type of products and government agencies that intervene on the goods. [70]

4.3.3. Organizational Management

In 2010, the National Ports Agency (PNA) established the subsidiary company called PortNet S.A., with an initial registered capital of 6 million Moroccan Dirham (MAD), equivalent to 700,000 USD (2010), to develop and operate the SW. Ownership of PortNet was transferred to the private sector shortly after the creation of the company.

PortNet S.A. is a community structure in which different actors from the maritime transportation sector and government bodies are represented in the management - in this case the PNA, shipping agents, freight forwarders, customs administration, handlers, the National Board of Trade, the Chamber of Commerce Casablanca road and rail carriers.

Sources of Funding

The overall cost of the initial investment in the SW is estimated at 4 million USD of which 3,8 million USD were provided by the PNA 0.2 million from PortNet S.A. own capital. Operational and maintenance costs are covered internally from the PortNet S.A. budget.

PortNet collects different fees – see Table 20. A user fee per transaction that has remained unchanged since 2011. The transaction fee includes a limited number of document requests from public users.

Table 20: Morocco PortNet Fee Structure

Number of transaction per month	**1 - 600**	**601 -1200**	**< 1200**
Monthly rate in USD/MAD	*1000 USD/10000 MAD*	*1600 USD/1.000 MAD*	*2400 USD/24000 MAD*

Source: Authors's compilation from OIC survey

All clients have to pay an annual subscription fee of 3'000 MAD at the beginning of each year. The services covered by this subscription are:

- Connectivity services;
- Helpdesk support services via phone and email;
- Messaging services for EDI, file transfer; and
- UN-EDIFACT exchange services.

[70] From PortNet, *News letter October 2016*, page 4.

Human Resources Skills and Management

The PortNet S.A. is structured in five departments: General direction, Marketing, Communications and Business Development, the Operations department, Compliance and Risk Management and IT Department.

In total, PortNet has 22 permanent employees out of which six are in the IT Department. Training strategy for PortNet staff is developed and financed. This core group of IT experts are full time dedicated to the SW project and agencies IT staff are involved only specific phases, such as business process analysis, acceptance, testing and training of the end users.

PortNet S.A. outsources the IT design and development activities to a third party. During the development of the first generation of the SW, PortNet S.A. Staff was only involved in the feasibility study. In the current second generation development phase, PortNet S.A. Staff remains closely embedded in the projects and workings groups, and the maintenance of the IT system will be gradually handed over to PortNet S.A. staff

Performance and Quality Management

PortNet has developed a Quality Assurance (QA) plan for measuring the performances and quality of the services provided by PortNet but has not appointed QA manager. It publishes monthly statistics on: number of users; processing times; and project progress (measured through number of paperless procedures). A newsletter also informs of the continuous expansion of PortNet services. The methodology adopted for measuring processing time, breaks down the overall process from arrival of the ship to the exit of the goods from the port into 7 phases to allow a detailed measuring of delays and improvements.

Client Support

PortNet has established four tiers for client support starting with email support, help desk support, in-depth technical support on the level of services, operating system / database troubleshooting. The tier III (Level 3) is the highest level of maintenance for treatment of the most advanced problems related to the SW system functionalities and is fully outsourced and covered by the vendor under the warranty period.

A special service for Small and Medium Enterprises (SME) has been set up. It consists of a Facilitation Centre in Casablanca, a so-called kiosk approach that allows data entry for operators that do not have online access to the system.

Business and ICT Strategy

The PortNet S.A. business strategy focuses on three strategic areas:

- An efficient organization and management;
- Satisfaction of the users of PortNet as resilient system is in the centre of interest;
- An international reference for Single Windows.

The PortNet business strategy is not based on the contractual relationship with the Government of Morocco. It is instead more focused on creating services to its user by providing its core operational SW and other value-added services, and to achieve financial sustainability through the collection of service fees. A separate IT Strategy is under development and will incorporate the second generation IT architecture developments.

4.3.4. Information Technology and Architecture

The PortNet IT architecture is based on a distributed architectural pattern - agencies that participate in the SW operate independent IT Systems that are interconnected and interoperable with PortNet; i.e. BARD operated by Customs. In this set up PortNet is an exchange layer of data and information in organized manner –a hub for data exchange.

The PortNet SW IT Architecture was designed as single layer architecture with open communication channels with other users.

The PortNet IT System through interconnectivity services is providing a structured, but not centralized management of data. The data after validation is shared across users. Regarding the interoperability, the PortNet is not providing any service that can be classified as processing or interpret the data.

The PortNet SW is based on decentralised IT Architecture distributing the data by submission to the end users. Data entry and integration is processed by the Single Window component application layer (validation rules) and routed for submission to the end users for further processing. After processing of data, and decision by the agency, the agency's IT system are submitting the data and information back to the PortNet to the end users (traders, customs, port authorities, logistic / transportation etc.) Since the PortNet system is using web technology and web services for exchange of information, there is a no geographical limits for using the SW services.

A business continuity and disaster recovery plan is finalized and a backup site will be set up with the implementation of the second generation of the PortNet.

IT Infrastructure

The PortNet IT architecture consists of infrastructure components of a particular type that are defined by the functional components of the SW. The implemented infrastructural model are divided into three layers according to the service and application burdens performed by the functional component. The components of the SW IT Infrastructure are production, disaster recovery, development, test and training.

The IT infrastructure consists of a web-based portal for submission of data from external users and service bus that is disseminating the data to users. The IT infrastructure is dedicated to the Single Window and the PortNet SW system is not hosting or supports the end-to-end systems of the agencies. The PortNet Single Window is a single point of data entry. After the data is

submitted, the exchange layer is distributing data to end users according to taxonomy rules and engine integrated in an enterprise service bus.

Electronic Signature

The SW authentication services are based on user credentials (user name and password). An additional layer of security is provided with usage of digital signature.

The legal framework for electronic signature is in place. The law[71] is allowing for the electronic exchange of legal information and the usage of digital signature.

4.4. Case Study Findings

All three OIC Member States have an operational Single Window for Trade, but each has Single Window has different characteristics and challenges.

4.4.1. Characteristics of the Single Windows

In Cameroon, the Kyrgyz Republic, and Morocco the Single Windows are web-based platforms that connect traders and intermediaries, such as shipping agents and transport companies, with government authorities and service providers for the accomplishment of import/export and transport related formalities.

The electronic Single Windows became operational in Cameroon in 2007, in Morocco in 2011 and in the Kyrgyz Republic 2014. The development period was seven years in Cameroon, three years in Morocco and five years in the Kyrgyz Republic. Since their operational launch the Cameroon and Morocco Single Window have scaled their services and users. In 2011, the PortNet was rolled out to all nine ports in Morocco and additional business processes were integrated, such as the import license procedure. The e-GUCE also added new services such as e-payment and increased the number of agencies and procedures that are integrated in the Single Window.

All three countries launched a complete re-design of their Single Window IT and business architecture in the past two years and the second generation Single Windows should become operational in 2017.

In terms of procedures and agencies that are integrated in the Single Windows, each Single Window has a different focus. The Single Window in the Kyrgyz Republic focuses on import and export licenses, authorities and certificates. Traders and their representatives can apply for these documents and submit documents through the Single Window. The Cameroon Single Window has a similar focus on goods import and export documents but was initially limited to the importation of cars before being extended to all products. The Moroccan Single Window

[71] Law No. 53-05 from 30th of November 2007.

started off with shipping documents and port procedures before being extended to import and export licenses, customs documentation.

All Single Windows aim to go paperless but have not reached this objective yet. Morocco gradually extends the paperless processing to all procedures. In the two other countries, there is a de facto duplication of paper and electronic procedures in the two other Member States.

The three Member States also do not follow the same organizational model. Cameroon and the Kyrgyz Republic have set up a public and Morocco a private enterprise. The size of the entity varies from 90 employees in Cameroon to 13 in the Kyrgyz Republic and 22 in Morocco. The IT development has been fully outsourced in Morocco and the Kyrgyz Republic and partially in Cameroon.

In all three countries, the investment for the first and second-generation Single Window IT platforms is provided by public sources, including external partners. The operational expenses of the Cameroon and the Kyrgyz Republic Single Windows are also funded by the regular government budget. The Moroccan Single Window is financially sustainable and can cover operational expenses from the fees (an annual subscription and a transaction fee).

The initial IT architecture varies from a centralized to decentralized architecture, but in all three cases the architecture lacked flexibility and cost effectiveness to follow the planned expansion and interoperability of the Single Windows.

Notably only PortNet has a transparent and publicly available performance measurement covering processing times, user numbers and project achievements.

4.4.2. Challenges

The three case studies reveal typical and common challenges for Single Window projects.

One weakness of all three SW is the lack of in depth business process analysis and data modelling prior to the development of the Single Window.

- In the Kyrgyz Republic the simplification and re-engineering of the business processes were pushed to the second phase.
- In Cameroon business process were integrated in an ad hoc manner lacking an overall strategy and coherent business process view.
- In Morocco the interoperability of the system was limited because of a lack of a common data and application layer. Such an approach leads to sub-optimal designs that do not deliver the full advantages of single data entry and simplified processing.

This weakness was aggravated by the IT architecture choices that led to inflexible systems that were expensive to maintain and update.

- In the Kyrgyz Republic the current IT architecture design as a centralized architecture is not flexible enough to support additional service developments and data management. The SW IT architecture is not efficient and cost-effective as maintaining

and changing applications a disproportionate level of technical and human resources because of hard coded applications.

- The decentralised architecture in Morocco lacks a centralized data layer, which hikes up infrastructure costs, maintenance costs, and disaster recovery costs.
- The legacy client server systems in the Cameroon Single Window made difficult increased maintenance costs and made changing to newer technology impossible without a complete re-engineering. The Cameroon SW lacks of interoperability and interconnectivity with the Customs Management System, ASYCUDA ++, due to the distributed architecture of ASYCUDA++. Even in the new second generation the Cameroon SW will face this problem and will only centralize the data for reporting and analysis.

This explains why all three Single Window operators launched a second general design phase that fundamentally changes the IT architecture and SW strategic design.

The second generation developments in Cameroon and Moroccan are comprehensive designs that attempt a broader flow of procedures and processes from the arrival of the vessel to the exit of the goods, including goods and documents centric interventions.

The three Single Windows also struggle to introduce paperless procedures.

- The lack of legal framework for electronic documents and signature in the Kyrgyz Republic leads to the de facto duplication of electronic and paper based procedures. Duplication reduces adherence of users to the Single Window.
- In Cameroon, the duplication of paper and electronic procedures is due to individual resistance by some agencies.
- The Moroccan Single Window gradually integrates paperless procedures into the Single Window through legal acts and despite resistance from traders/transporters and agencies.

The financial management is a major challenge for many Single Windows.

- The Cameroon and Kyrgyz Republic Single Windows both face revenue constraints as the fees only cover a minor part of their operational expenses. They are therefore dependent on government budget support and third parties funding for updates and innovation. When relying on third party funding they have limited involvement in the procurement, development, and acceptance of the system.
- None of the three Single Windows adopted a cost estimation methodology that would allow appropriately predicting budget requirement and allocating resources. The current budget process is done on an ad hoc basis and this cannot provide a proper planning.

The outsourcing of the design, development and production of the IT system has caused difficulties in all three Single Windows. The internal staff was little involved and trained for maintenance and changes. Vendor or proprietary lock-in it makes the Single Window operator dependent on a vendor products and services, without possibility to use another vendor.

5. Conclusion and Recommendations

At the end of 2016, 22 OIC Member States have an operational national Single Window and five are implementing a Single Window project. This is a significant increase in number in six years. At the beginning of 2010 only seven Single windows were operational. More OIC Member States may launch Single Window projects in near future - six have already adopted a formal Single Window plan/strategy and five have started discussions and exploratory work on the issue.

Single Windows are long-term, costly and complex reform initiatives. Deliverables and objectives are achieved gradually rather than radically and projects therefore need to be implemented with a long-term vision of continuous improvement. Not all Single Window projects deliver on their expectations: Project costs explode; IT architecture can not adapt to design changes and new technologies; a limited number of government agencies are integrated; Procedures have not been simplified and re-engineered. Those are only few examples of the challenges Single Window initiatives encounter.

This chapter presents the challenges faced by OIC Member States, policy options that can influence the success of a Single Window initiative, and technical assistance needs of OIC Member States.

5.1. Challenges and Policy Options

Successful Single Window initiatives depend on enabling conditions to be in place and appropriate policy and management choices. For Single Windows to be effective, governments have to be clear about the choices they make, and which policies and actions can influence a successful Single Window delivery.

The surveys and case studies of this comparative assessment helped to better the challenges faced by OIC Member States. The following challenges were identified:

Table 21: OIC Member States Single Window Challenges

Dimension	Challenges
Driving the initiative/ project Challenges to accelerate implementation, maturity and scale, and innovate.	There are two critical moments in the SW process. • In the initial stage: Support has to be mobilized, resistances have to be overcome and preparatory work needs to be conducted in a context of financial uncertainty. • In the test or production phase: Design choices, errors or omissions of the preparatory phase are revealed, but it is too late to make chances to the IT and business architecture.
Organisational management Challenges to manage daily operations of the Single Window and deliver outputs	Single Window operators face multiple pressures: • Operating under tight budget; • Lack of strategic and financial autonomy from the government; • Drive for constant innovation and evolution and value delivery.
IT architecture and infrastructure Challenges to design and deliver a cost effective and flexible IT architecture that support the business objectives	The IT architecture and infrastructure is the backbone of every Single Window. Single Windows face challenges on the level of • Control of development and operating costs; • Alignment of IT strategy with the business strategy; • Interoperability at the data and business process level; • Data harmonization and management.
Performance management Challenges to measure performance and ensure quality of service	Performance measurement and management are important to ensure a long term impact of the Single Window, and organizational improvement and planning. Challenges faced are • Lack of common measurement methodology, indicators, and data; • Lack of awareness of quality assurance and commitments.
Regionalisation Challenges related to cross-border cooperation and definition of standards, procedures and legal framework	Regionalisation aims to connect national Single Windows share data across national borders. Challenges for cross-border initiatives are • IT interconnectivity and interoperability; • Agreement and implementation of common standards, business process, documents, technical specifications; • Cross-border legal framework for e-documents and signature, privacy and data retention; • Mechanism to share financial costs.

Source: Authors' own compilation

5.1.1. Initiation Phase of Single Window Initiatives

Four challenges occur or relate to the initiation phase of Single Window initiatives. The table below shows these challenges and possible strategies and options to overcome these challenges.

Table 22: Initiation Phase - Challenges and Options

Challenges
1. Weak Vision Process Vision and strategy documents are often too general and not the result of an inclusive strategy development process. Visions and strategies also lack quantifiable objectives and performance indicators. Why does this matter? Vision and strategy documents are important to build commitment and adherence across organizational boundaries that can sustain government rotation.
2. Resistance to the Project Often there is an insufficient mobilisation for the project due to resistance from stakeholders from the public and private sector. Why does this matter? Political overseers need to support the project as they have the ability to make regulatory changes and allocate resources. Stakeholders from the trading community need to be brought into the process early to ensure a design that caters to their needs as much as the needs of the government agencies. Ideally, the project has support from end users and service providers, i.e. government agencies.
3. Limited Scope of Support SW initiatives may be pushed by one particular part of government; i.e. Customs, Ministry of Trade, or Port Authority. Why does this matter? A limited reach of support may negatively impact the design choice as it does prevent a comprehensive planning and strategy. Agencies may not adhere to a project that is perceived as being driven by one agency instead of the whole of government.
4. Financial Constraints Some governments depend on financial assistance to conduct the preparatory work and to provide the funding for the investment. Why does this matter? Scarcity of funding and visibility of available funding can impact design choices in this phase. This increases the risk to focus on low cost changes taking precedence or replying high costs changes.
Policy Options
1. Idea Champion or Broad Coalition Projects with high costs, long timeframe and broad efforts require broad support but also find it more difficult to get this support. Two strategic choices can be made when faced with the difficulty of mobilising support: • using an idea champion; or • building a broad guiding coalition. These two options have their advantages and disadvantages that need to be considered.

An "idea champion" approach rest on one person who is highly respected and can coordinate and overcome obstacles through leveraging close personal ties and pursuing informal avenues of influence. The problem of linking progress to personal ties is that this person may disappear.

A broad coalition rests on formal channels of decision-making but is more stable as it is based on institutional rather than personal ties. It is more likely to sustain a change in government and political appointees, but takes more time and persuasion to build, and requires more preparatory work to mobilise support.

2. Adaptation of the Implementation Speed

SWs can adopt different paces and depths of implementation. The options are:

- a radical pace of change in a shorter timeframe with a deep scale of change and delivery of all objectives in one go
- a gradual pace that has a longer timeframe and starts at a small scale to reach intermediate goals before realising the full objectives.

The two options have their advantages and disadvantages that need to be considered.

Radical changes are often appealing to political decision makers because of their fast delivery of results. The comprehensive view also supports cross-organisational design. The flip side is that there may be high resistance to change as insufficient time is spent on building an understanding and momentum, and that the complexity and breadth of changes to be achieved in short-time drive up costs and are difficult to manage.

Gradual implementation tries to build on past successes to build momentum and support for a deeper array of changes to follow. The risk is that it may results in too limited transformation and insufficient change to make an impact on the overall. It is therefore necessary to carefully select high impact changes and to signal future changes. Using a gradual approach leads to an overall longer implementation process and there is the risk that political support can drop throughout the process, or that an idea champion that drove the process disappears.

Examples from OIC Member States

Senegal

The first implementation phase achieved high adherence of stakeholders and built the conviction that change is possible and leads to benefits. This helped to support the second phase, which was a more radical transformation in terms of timeframe (1,5 years) and in terms of removing paper from all procedures.

Indonesia

Indonesia has a similar experience where the first generation SW built a behind-the scene integration of all agency processes with agencies adopting modernization and digitization on their level. This lays the ground for a more comprehensive approach and SW design in the second phase.

5.1.2. Project Implementation Initiation

Four challenges occur or relate to the project implementation. The table below shows these challenges and possible strategies and options to overcome these challenges:

Table 23: Implementation Phase - Challenges and Options

Challenges
1. Weak Quality of Preparatory Work Often project teams or operators lack the capacity and experience to prepare the project and undertake the analytical work and documents, namely on the Business Process Analysis side. This capacity gap is often addressed by external technical donor support but the results lack ownership and the capacity of project teams is not built. Why does it matter? In this phase fundamental choices are made about the design and the implementation of the SW. These choices have to be made understanding the implications and dependencies. If the analytical work does not provide this information wrong choice may be made leading to sub-optimal choices.
2. Lack of Control of Execution SWs may depend on third party financing. This often leads to non-control over funding and the use thereof. With a third party funding, there are three layers of communication in the project, and the third party may only be accountable to the funding party but not the SW operator. Outsourcing IT development often leads to disconnect the SW entity and the third party and lack of communication on delays and implementation difficulties. SW operators often do not have the absorption capacity to fully engage as equal partner in the project delivery, and often is it not recognized that both vendors and SW entity need to make investment in staff, technology, and equipment and infrastructure. Why does it matter? Without a good and timely communication between all partners delays and difficulties cannot be noted and addressed in time. This can put a project under pressure if the financing scheme does not provide for flexibility. It also increases the risk of not matching visions to the development.
3. Weak Control of Project Execution Single Window projects are complex projects and often fail to deliver on time and on budget. Single Window Project teams seldom use consistently an accepted project management methodology to steer the projects. Commonly, an IT management framework is implemented by the third party solution provider, but no equal level of scrutiny applies to the overall implementation process, including the changes necessary within the external SW parties.

Why does it matter?

Weak project management result in loss of control over the SW project and is frequently the reason for poor project integration. As consequence, the project will be delayed and the quality of the deliverables will not meet the SW objectives and expectations.

4. Non-Implementation of Necessary Changes

Single Window projects require changes of the legal framework, business processes and operational practices of agencies and stakeholders. These changes are decisive for a successful Single Window implementation but often fail to be delivered at all or on time for the following reasons:

- Changes to the legal and regulatory framework: The SW operator itself does not have the capacity to make regulatory changes and relies on the legislator and government agencies to do so.
- Changes at the business process level: Business process engineering and simplification is a critical aspect of SW project, but often it is not done or delayed. Frequently business process analysis and simplification falls victim to fast implementation speed.
- Changes at the agency level: SWs are transformational changes on how government agencies and commercial entities deliver service to end-users and collaborate with each other. It is necessary that agencies integrated into the Single Window change their practices and behaviour and regulatory framework. Many SW projects face resistance from government agencies that do not want to change their processes and way of operations.

Why does it matter?

Many SW report delays or lack of impact because of changes of the regulatory framework not moving fast enough or not moving at all. This is particular the case for the legal framework for e-documents and signatures, which are not difficult form the technical but from the legal point of view.

If business process simplification and re-engineering is not done, there is the risk that the SW business processes are electronic versions of the traditional paper based processing and metal filing cabinets. The change impact will be limited. It is common to see that services and IT processes are designed and tested only to see that they cannot be adopted for lack of legal support and changes are sought only post development.

A SW also cannot deliver on its expectations, when agencies resist to change their operational practice; i.e. Staff may still require paper documents or actions that are no longer necessary out of habit.

Policy Options

1. Increase Absorption Capacity of the SW Entity and Project Management Team in Particular

The SW operating entity should be integral part of the technical committee that decides on partner and sourcing strategy and, if a third party implements part of the solution, a sufficient number of trained staff need to be assigned to work full time with the third party contractor.

2. Hand Over Control to Single Window Operator

Some financing instruments allow transfer of funds directly to the SW entity. This allows better control and engagement of the SW operators.

3. Use of Accepted Project Management Methodology

Use consistently an accepted project management methodology that provides monitoring tools, quality assurance, risk management and the definition of roles, tasks and responsibilities.

4. More Attention to Preparatory Work

Embed Business Process Management into preparatory work to prepare business process catalogue.

Include the assessment of the required legal change in the preparatory phase and include an administrative/legal expert in the Business Process Management (BPM). Ideally required changes to the regulations and processes are identified during the BPA, legislation is revised, and then reflected in the services / processes.

5. Monitor Implementation at Agency Level

As the implementation of changes at agency and stakeholder level is crucial, the adherence and pace of agency implementation can be monitored during the implementation process using change indicators. This monitoring enables the project team to be aware of the extent to which members have adopted the change.

The resistance to change can be on the organisational and personal level. On a personal level, a SW comes with changes in daily practices: Desk officers see their role and discretionary power disappear. Whilst previously they had visible responsibility they operate behind the computer. Some fear uncertainty with regards to their responsibilities and legal liabilities, and others may fear job loss. On an organizational level, organizations may fear that tasks, responsibilities and budgets are taken away from them and that their regulatory objectives are compromised.

Strategies to overcome resistance can include the following three elements

- Recognition and persuasion can be combined to overcome resistance on a personal level. Recognition requires that the role of the agency is reflected and recognized in the BPA. Persuasion can be achieved by different approaches:
    - Involving front office desk officers in pilots and testing of the system to allow them to experience and provide feedback.
    - Rewarding supportive behaviour and performance is also a useful approach.

- A separate change management programme can be designed to spell out how desk officers and senior officers in the government agencies will be engaged and motivated for the required changes, how users will be trained, and how the changes are communicated.
- Pilot projects and test runs can be used to institutionalise change within agencies and users as they engage front line officers and diffuse the innovation.

Examples from OIC Member States

Senegal

GAINDE, the Single Window operator, is compiling and disseminating monthly reports of agencies' performance in which good contributions are acknowledge, and on the basis of which operators may also be awarded a bonus payment.

The second phase of the SW in Senegal obtained project financing from a private credit facility and was fully accountable for these funds. The implementation timeframe was very short but significant changes were delivered thanks to this funding

The Kyrgyz Republic

A pilot SW system, covering only 6 agencies and few services, was built prior to the project to mobilise support for the real SW development by giving stakeholders a practical understanding of the concept.

5.1.3. Operational Single Windows

Four challenges occur or relate to the operating phase. The table below shows these challenges and possible strategies and options to overcome these challenges:

Table 24: Operation Phase- Challenges and Options

Challenges

1. Delivery Gap

When the SW becomes operational, there is often a gap between the expected deliverables, the initial requirements and the output. This can be due to a lack of communication between the project team responsible for the implementation and the political oversight, and internal and external project teams, or insufficient preparatory work.

Why does it matter?

If the operational cross-agency complexity is not fully captured in the initial project, it becomes very costly and difficult to make changes later on. At this stage it is often too late to make fundamental changes.

2. Cost Explosion of the Single Window

Often it is only at this stage that the government and the SW operator realise the real costs of the SW organisation and IT system, and the discovered real costs do not match the initial financial planning. Few SW operators use a cost methodology that would capture the total costs.

3. Limited Scalability

Single Windows face difficulties to scale their services and to expand its user base. This may be caused by

- weak cross-government support that inhibits the integration of additional or deepening of existing services ;
- lack of a comprehensive business architecture view; and/or
- technology limitations

Why does it matter?

There is a risk for SWs to get stuck with a bad design and to try to tweak user habits and regulations to fit them to the systems. This causes criticism by government and the trading community, which leads to a lower acceptance of the SW and support for future investments.

4. Maintain Quality and Performance

SWs, like any other organisation, face the challenge to maintain and improve performance over time.

Policy Options

1. Cost Assessment Methodology

Use of a costs assessment methodology, such as Total Costs of Ownership (TCO), that can better guide investment and resource allocations at different levels of budgeting. It allows costs to be properly assessed and monitored in a comprehensive manner including procurement, development, operation, personnel, training, logistical support and engagement of assets.

2. Common Business Process Design and Inventory

Changes at the business and service level can be planned using a common business process design and inventory that is shared by all stakeholders, at least the service providers of the back end side. Using a common process design assists in the design and delivery of simplified business processes and re-use of IT services and processes for business processes that have similar requirements. It is therefore an efficient way to adapt faster and in a more cost effective manner to changing needs.

Examples from OIC Member States

Cameroon

As part of the second generation SW project, e-GUCE undertook an extensive BPA and simplification. The duration for the full re-engineering and analysis of the business processes (AS-IS to TO-BE) including process validation sessions and the feedback workshop with agencies was eight months. It had received financial and technical assistance from the World Bank to build in-house capacity for BPA.

5.1.4. IT Architecture

Three challenges occur or relate to the IT architecture. The table below shows these challenges and possible strategies and options to overcome these challenges.

Table 25: IT Architecture - Challenges and Options

Challenges
1. Inflexibility of IT Architecture The IT architecture may not be flexible enough to adapt changes and re-use services. This makes it costly to adapt a centralized architecture model to a decentralized environment, and maintenance and changes come with high costs and risks if services are hardcoded Currently, many SW software applications still rely on hardcoded services often due to inheritance from legacy IT systems. In hardcoded software, the data is directly inputted into the source code of SW software, instead of obtaining data from the common data repository. Why does it matter? Changes or integration of new functionalities with a hard coded approach is very costly and complex. Changing hundreds of thousands lines of code with a many dependencies and linked functionalities is an expensive and complex process that requires upmost effort, even for the most skilled programmers.
2. Lack of Interoperability at the Data and Business Process Level The IT architecture needs to have the ability to connect, integrate and support diverse and legacy IT systems and applications. SWs therefore have to embed system-to-system connectivity or services. This allows SWs to provide collaborative, networked and interconnected workflows and business processes. Interconnectivity has the following three dimensions: • process level whereby standardised and procedures build the foundation for a common process and data model. • message interoperability whereby data is exchanged in a process based on the same semantic structures and definitions. • technical interoperability, which translates into infrastructure requirements to support the technical exchange of information. Why does it matter? The lack of interoperability is a major obstacle in view of compromising SW's ability to provide services, data and information to the users in a timely and accurate manner.
3. Ensure Data Protection Security of the overall system and protection of stored data and data in transit is a crucial requirement for SW. Data needs to be protected from unauthorized use with encryption

techniques used for all traffic from point-to-point. SWs must develop and maintain sophisticated user authorizations system for both end-users and service providers.

Why does it matter?

Security is closely linked to the need for trust and is growing in importance sue to increase public awareness. It is even more crucial when there is a direct linkage to the financial activities, i.e. payment activities.

Policy Options

1. Re-use of Services

The re-use of services is the linking of individual services to one or more new or pre-existing services. A service generally contains most or all of the presentation and process logic, and it may also have same or similar data set. The majority of business processes in a SW application and server layer are provided by services that were previously deployed and could therefore be re-used. Re-use can reach up to 80 % but is more likely to be at maximum 20% in most organisations.[72]

2. Multiply Number of Solution Providers

Allow multiple independent providers of solutions to supply hardware, services and software components that can be integrated in the SW Architecture, seamlessly on a platform of choice. This approach supports incremental transformation through a step-by-step introduction of components that may originate from various end users IT systems. Transforming the functionality into the service components must be driven by proper business process analysis.

3. Prioritise Interoperability of IT Architecture

Interoperability is the only way to resolve system-to-system connectivity. There needs to be a drive for continuous improvement of interoperability between the SW and the IT systems of the other users. . SW system must be flexible and adoptable to provide full interconnectivity and interoperability with the stakeholders' IT systems.

The SW stakeholders (agencies, customs, port etc.) must have absolute autonomy to select the architecture (where possible) for their IT solutions, and to develop it, without being dependent on the SW architecture system. Using Service Oriented Architecture pattern is one option to overcome interoperability challenges.

4. Internationally Recognised Security Standards

The security should be focusing on authenticity, integrity, confidentiality, non-repudiation of origin according to internationally recognised standards, such as ISO/IEC 27005:2011 Information security risk management.

[72] http://www.davidchappell.com/HTML_email/Opinari_No16_8_06.html

5.1.5. IT Infrastructure

Three challenges occur or relate to the IT infrastructure. The table below shows these challenges and possible strategies and options to overcome these challenges.

Table 26: IT Infrastructure - Challenges and Options

Challenges
1. Lack of Backup and Business Continuity There is insufficient awareness of the crucial importance of backup and business continuity. Only few S's have adopted the high availability concept that includes business continuity and disaster recovery plans, procedures and backup site. Lack of funds is a major obstacle for the implementation of backup site. Why does it matter? Lack of backup and business continuity highly exposes SW to risks of ensuring availability and system continuity and disaster recovery[73]. There may be a low probability of an incident, but impact/damages are high, in particular because it is a public service – unavailability of port or customs clearance process can cause serious delays and the direct and indirect cost of downtime are high.
2. Lack of Cost-effectiveness Underutilization or lack of use of the hardware components' performance and resources leads to incorrect and less cost effective infrastructure design. The usage of dedicated clustering technology dramatically increases the cost for expansion of the infrastructure and the required level of services.
3. Performance Limitations It is difficult to increase performance of the system if the operational data is not divided. To store and manage the SW data is difficult task from the physical (repository) side, but also from the logical point of view, taking into account the complexity and amount of data. Many SW keep the operational data and archive (write off, expired permit and certificates data) on the same physical and logical repository. The management and enquiry of such a large amount of data decrease the overall performances of the SW infrastructure.
Policy Options
1. Use of High Availability Concept The High Availability concept can maximize the accessibility of the SW IT infrastructure and its supporting services. The advantages are

[73] ISO Security.com, ISO/IEC 27031:2011 Information technology — Security techniques — Guidelines for information and communications technology readiness for business continuity under http://www.iso27001security.com/html/27031.html (accessed January 2017).

- to deliver a cost efficient and continuous level of availability;
- to provide a proactive, approach for the identification and correction of breaches in services levels;
- and reduced duration of downtime.

Availability is critical for business and user satisfaction as it is the most visible process for outside users. High availability requires the definition of mission-critical services and applications, which need to be designed for high availability.

A business continuity and disaster recovery minimize the downtime of the SW IT infrastructure and services. It also prevents loss of data and services in the event of infrastructural failure. To reduce costs of of a mirror or hot (warm) back up site, only the critical SW services can covered by the business continuity plan.

2. Virtualization

Use of virtualization, which is a concept that applies on services and application, storage and networks to use the maximum resources and performance of the infrastructural components, to enhance efficiency and dramatically reduce IT expenses. It also allows simple expansion of additional resources. In addition, the virtualization concept is providing load balancing, security isolation and advanced resource controls t manage the system performances.

3. Data Storage Strategy

Dividing the operational data storage (ODS), where data from multiple sources are stored and historical data will dramatically increase the performance of the SW system.

One of the widely recommended approaches is to divide the data on a separate physical and logical repository. When used (written off and expired) permit and certificates are considered closed, with extract, transform, load (ETL) process the data should be pulled out from the source repository and placing it into a data warehouse. Data warehouse will also support reporting and analysis services of the SW.

5.1.6. Data and Business Harmonisation

Five challenges occur or relate to the data and business harmonization. The table below shows these challenges and possible strategies and options to overcome these challenges:

Table 27: Data and Business Harmonisation - Challenges and Options

Challenges
1. Lack of Systematic Approach for Business Process and Data Mapping The lack of use of a systematic approach to design the business processes is one of the biggest challenges for the design and development of the SW. Many OIC Member States SWs are not or only partially using the business process methodology to collect, map and define the workflow. In

addition, there is a no proper business processes catalogue to document, and define dependencies and data associated with the workflow.

Why does it matter?

Lack of coherent data and process mapping and syntax on reference data lead to processing errors, especially in the statistics, analysis and reporting services.

2. Lack of Integration into End-to-end Business Processes of Agencies

At present, one of the main problems facing SWs is that there is no harmonized IT strategy across the government. Many government agencies therefore don't have a vision and operate isolated IT systems, partially covering they business processes.

The result is that data and knowledge information exists in isolation from each other and IT systems do not communicate with each other.

Why is it important**?**

In such an isolated environment there is no easy way to exchange data between systems, o implement higher-level intelligence, and to enhance and upgrade these systems to support the SW functionalities The Single Windows also cannot leverage the totality of data that exists across government.

3. Lack of Analysis and Reporting Services

Most of the OIC Member States SW do not use data warehouse and business intelligence services. The reporting and analysis services are based on enquiry of the SW production system on ad-hock basis. This approach is reducing the SW IT system performance and reports and analysis are not delivered in accurate and timely manner.

Why does it matter?

Ad-hoc produced analysis and reports can lead to wrong or inaccurate decision-making.

Policy Options

1. Business Process Management Concept and Reference Data

BPM becomes widely accepted as a mechanism for business improvement and simplification of the workflow. With the implementation of BPM concept costs can be reduced, business process quality improved. The BPM must be properly labelled, linked with dependencies, defined and documented, and organized in a Business Process Catalogue[74]. With this approach, the business processes can be re-used with minimum changes[75].

[74] SW Business Process Catalogue contains detailed description for Business Processes, Business Transactions, Message Flow Diagram (Message Scheme – EDIFACT or XML) and data models associated with the business processes.
[75] https://www.iso20022.org/understanding_the_business_process_catalogue.page

Reference data is the definition of a data set that permits values to be used as a reference by other data fields. The reference data must be coherent in mapping and syntax since they are data objects used in processing and data transactions.

2. Data Warehousing

Data warehousing provides the separation of operational and retention data. The Data warehouse is integrating data from one or more data sources in data cubes, organized in dimensions. Data warehouse is a core component for Business Intelligence (BI)

SW should use BI systems to monitor of key performance indicators, analytic services, governance and risks. The BI has an integrated portal as a presentation layer with a variety of dashboards, graph and gauges presenting data in real time and in accurate manner. This is important analytic tool to support the decision-making. .

5.1.7. Organisational Management

Three challenges occur or relate to the organizational management. The table below shows these challenges and possible strategies and options to overcome these challenges.

Table 28: Organisational Management-Challenges and Options

Challenges
1. Financial Stability Many SW operating entities report challenges to achieve financial stability and pressure due to difficulties meeting revenue generation expectations. They operate under financial constraints, and are dependent on budget allocations from the treasury or on own revenues, which often are just sufficient to cover operational expenses. Often there is a mismatch between the official business model of a self-reliable SW entity and the reality of dependence on funding from the annual government budget. Different funding and fee models are adopted for Single Windows. • the public model where the government entirely funds the building and, in some cases also the operating expenses of the SW, • the public-private model where the funding for investment and operating costs are shared between the government and a private partner[76], and a private model where all the costs are paid for by a private entity[77]. Each of these models has different implications for the financial management and stability.

[76] In these models the government contribution to the initial investment is commonly an equity investment.
[77] The private model is very rare for Single Windows for Trade but frequent for Cargo Community systems

- The private-public model SW usually has a stable financial situation and makes profits that can be injected into the system's upgrade. User fees may however be criticised because the SW services are perceived as public service.
- The public model where government assumes funding of investment and operating expenses. This model does not rely on the user fees and can therefore offer good services at little costs of the end-users. A problem occurs if the government wants to phase out funding for does not provide funding for upgrades and investment.

2. Skills and Knowledge Gap

Human capacity and knowledge resources are critical components for SWs, in particular given the constantly changing technological environment. SW operators faces challenges because A big knowledge gap exists with regards to the capacity for business processes analysis, which is necessary in the design and implementation phase as well as to monitor performance of a system. And may furthermore be difficult for SW operators to recruit and retain sufficient and adequately trained staff, in particular IT staff. The IT environment is fast changing and knowledge needs to be continuously updated to provide for innovation and ability to integrate new services. The return of investment into IT training is very high as they have a critical role for maintaining the system.

Policy Options

1. Costs Assessment Methodology

Costs need to be properly assessed and monitored in a comprehensive manner including procurement, development, operation, personnel, training, logistical support and engagement of assets. A realistic costs assessment using an accepted international methodology such as TOC can better guide investment and resource allocations at different levels of budgeting.

2. Value Added Services

Some SW divide their services into services that are subsidized by the government as a "public good" and others that are paid for by the end users.

3. Skills Training

To address human resource constraints during peak and general times, internal and external IT resources can be combined where possible and appropriate to cover skills and knowledge and be able to cope with peak time requests.

SW operators can also use vendor support actively for training and transfer of knowledge and design a training plan, with resources allocated to it, for maintenance and upgrading of skills.

SW can introduce a business process management methodology, which is comprehensible for both IT and operational staff and staff needs to be trained in Business Systems Analyst, Business Requirements Analyst, and Business Process Analyst.

Examples from OIC Member States

Cameroon

GUCE-GIE has built a partnership with Polytechnics High School of Engineering (University of Yaoundé) allowing IT students in their last year to conduct an internship with GUCE-GIE and concretely work a technical project during this internship. Such a partnership is win-win situation for both, the students and the SW, as students bring latest knowledge, motivated and not expensive.

5.1.8. Performance and Quality Management

Two challenges occur or relate to the performance and quality management. The table below shows these challenges and possible strategies and options to overcome these challenges:

Table 29: Performance and Quality Management – Challenges and Options

Challenges

1. Lack of Continuous Performance Measurement

Measuring the impact of a SW is still work in progress and lacks recognized and common methods, indicators and data. This creates uncertainty with regards to what to measure, how to measure and when to measure. One can also observe that pre-and post assessments are seldom done or published. It is more common to see measurements when a SW goes operational than in a continuous manner.

Currently, some Single Windows measure and publish their impacts, in terms of i) Reduction in time (procedure specific or overall as in clearance time or border crossing time); ii) Reduction in costs from an end-users point; and iii) Reduction of documents. Others measure "coverage", i.e the numbers of users and % of trade or % of trade transactions using the Single Window.

Why does it matter?

Performance and impact measurement is an important tool for project planning and execution, government impact assessments, and organizational improvement. The lack of performance measurement is a reason for concern as government involvement, including financial involvement, has to be justified and as expectations of performance improvement drive the SW project.

2. Quality Management

Once the SW is operational, project management transfers to quality management that helps achieve and maintain performance, service delivery and efficiency. Very few OIC Member States SW however have adopted a quality management and assurance plan and structures.

Quality management sets standards that need to be achieved and against which performance can be measured regularly. As part of the quality management, performance indicators, which ideally cover service delivery and process efficiency, and IT availability, are defined.

Why does it matter?

Quality assurance and management is a crucial aspect of maintaining an organisations performance and making it accountable.

Policy Options

1. Develop Measurement Methodology

In the absence of a common methodology, SW operators can develop their own methodology.

Borrowing from digital service measurements, it would be possible to measure the status of digital service delivery by i) the ratio of electronic and personal contact points; ii) the quantity and length of breaking points in the process due to idle or waiting time; iii) and quantity of change in channels in interaction, meaning the change from electronic devices to paper and human based processes.

The BI reporting and analysis services of the SW system can be used as a basis for quality performance measurement.

2. Use of International Standards

Standards are widely and effectively used to ensure safety and reliability of the processes and infrastructure, to enable interoperability[78], and to harmonise processes and requirements. By using standards one can incorporate and rely on tested specifications and avoid wasting efforts for "re-inventing the wheel". These standards can be international standards such as the WCO and UNECE data model and messaging standards, and ISO standards for quality management (ISO:9000) and Information Security Management (ISO: 27000), or regional reference data models, or model laws for a harmonised legal framework applicable to e-document and e-signatures, and cross border data exchange.

Advanced SW use quality management as an instrument for performance control and management and are certified according to international Standards-ISO:21000 certifications. Some OIC Member States SW use so-called Service Level Agreements (SLA) to define expected service quality from external parties in order to maintain the overall performance of the SW processing.

Examples from OIC Member States

Morocco

PortNet publishes monthly performance statistics. They report on measured delays at individual process levels and overall processing times. Other elements that are measured are number of users and project implementation process.

[78] Meaning the ability to exchange data across applications and systems

5.1.9. Regional Single Window

The table below shows the challenges and options for a Regional Single Window (RSW) architecture:

Table 30:Regionalisation – Challenges and Options

Challenges and options

1. Regional Standards for Cross-border Integration and Interoperability

Regional Single Window (RSW) aim for the electronic and automatic exchange of information in real or near real time. Prior to a RSW implementation and integration, participating countries must agree on common standards in many areas including

- IT standards and technologies: Service-Oriented Architecture (SOA) Architecture, XML and UN/EDIFACT data schemas and formats, synchronous / asynchronous communication (Web services / Message Queuing), asymmetric data encryption (public / private keys), digital signature (system-to-system) etc.
- Semantic data standards;
- and IT Systems technical specifications and requirements.

2. Legal Framework for Cross-border Cooperation

The cross-border cooperation requires a legal framework that governs aspects of recognition and validity of e-documents and e-signatures, data protection and privacy, as well as practical matters and technical aspects.

This legal framework needs to be broad and general enough to cover the specificities of all participating countries and at the same time specific enough to be applied by the countries in their national legislation and judicial system.

The follow instruments are commonly used alone or in combination

- Regional framework conventions that cover the broader principles and requirements;
- Technical annexes that provide practical details for the implementation in specific areas; and
- Memorandum of Understanding (MoU) between government entities to set the terms and principles of the cooperation.

MoUs, are frequently used to define the technical details of electronic data exchange; i.e. definition of data set that is subject to exchange, detailed scope and usage of data and information subjected to exchange and the messaging standards and security.

4. Managing the Political Process

Multilateral cooperation is complex and time consuming and can frustrate by its slow pace. For example, in the case of the EU, defining the common IT architectural segments related to the interconnectivity and the interoperability, took approximately 3 years of intensive work before an agreement on the common procedures, standards and architecture could be reached.

5. Regional Single Window IT Architecture

The IT architecture model is a critical aspect of a RSW. Two IT architecture models are applicable:

- Peer-to-peer model or distributed (decentralised) IT Architecture;
- Centralised IT Architecture.

The peer-to-peer model or distributed IT Architecture requires a common exchange layer to dispatch messages and to co-ordinate the distribution of messages (data and documents) between two participating IT systems without any centralised middleware platform. Without any routing services this model relies on direct communication between the various services / applications. This is compromising on the re-usability of communications and networking services. The interoperability logic is separated out into an isolated IT infrastructure and serves the needs of bi-directional communication between the national SWs and their respective stakeholders.

The centralised RSW IT architecture model implies the establishment of a common centralised service - middleware software architecture (example enterprise service bus - ESB). This provides a communication system between service consumers and service providers on the interoperability and the interconnectivity level, such as message transformation, protocol conversion and routing services. This model supports the heterogeneity of national IT architectures, and incorporates requirements for service-oriented architecture and interoperability.

The RSW centralised IT architecture must offer a range of services to fulfil the RSW integration requirements with the other national SW (internal and external portal services / applications and interacting stakeholder's subsystems within the NSW domains. These architecture components are: service / application server, portal server, database server (for the reference data) and the ESB and supportive infrastructure components - demilitarized zone (DMZ), security services and users directory. Another important element of the RSW centralised IT architecture is the reference data repository that must be used by the RSW participating countries.

Examples from the World

One of the operational peer-to-peer IT Architecture model for exchange of customs data is EU SEED project[79], that exchanges data between six Western Balkan Customs Administrations on a pre-arrival basis. The EU SEED IT architecture is fully based on the peer-to-peer model with common middleware platform that is replicated in participating countries. The EU SEED system has an integrated computerised data matching that contributes to the minimization of human interventions.

[79] http://www.eu-seed.net/pages/projectinfo.aspx

5.2. Technical Cooperation Needs

Many governments rely on technical and financial assistance to implement Single Window projects. In some cases, the development of the SW IT solution was entirely financed by a development partner or a development bank—i.e. the EU in the case of Tajikistan, ADB in the case of Kyrgyz Republic, and World Bank in the case of Cameroon and Burkina Faso. Technical assistance also frequently takes the form of advice and capacity building and support the preparatory work.

5.2.1. Technical Assistance Contributions

Single Windows are costly, lengthy and complex projects. Many Single Windows have reported that they received technical assistance for the development of the SW, namely advice, capacity building, and funding[80].

Box 5: Contribution of Technical Assistance in the Kyrgyz Republic

In the Kyrgyz Republic, GIZ and USAID jointly conducted and drafted the SW feasibility study, a matrix of requirements, and legal documents for the creation of the SW enterprise, and GIZ also funded three study visits. An IT pilot system covering 6 agencies was financed by GIZ to help to overcome doubts of the feasibility study. The technical assistance was not only useful in providing expertise. It also helped building government support over a long period of time.

Preparatory Work

From the case studies it appears that technical assistance is mainly requested during the initial phase in support of the preparatory work. Technical assistance contributes to feasibility studies, the development of the Single Window strategy and IT strategy. Technical assistance can make an important contribution during this phase as different technical expertise and knowledge of other SW systems need to be pulled together.

The quality of the preparatory work can only be ensured if technical assistance only contributes but does not run this process and in case of analysis and drafting procedures, is not operating without involvement of the national project team. Strategies that are drafted by an external consultant never reach the required level of buy-in and may not adequately reflect the specificity of the country.

Business process analysis and data analysis and harmonization are activities that are frequently conducted by consultants contracted by development partners. A business process analysis is necessary to develop the functional requirements and specifications and should ideally be done in a comprehensive manner.

Data harmonization is based on a standardized approach and tools that can be easily sourced in and the results can be translated into practice by a local team. Business process analysis is

[80] Funding is no longer discussed as this is financial assistance

slightly more difficult and over-reliance on technical assistance is not recommended for the following reasons:

- Capturing the regulatory and institutional situation in the country is difficult for an external consultant when the work is conducted in isolation;
- Knowledge and capacity for Business Process Analysis (BPA) and Business Process Management (BPM) needs to be built in-house in order to use BPM throughout the life cycle of the Single Window;
- Funding of BPA from development partners tend to be not adapted to the complexity of a SW project. A BPA should be conducted by a team of three people with dedicated knowledge and experience for a) user requirements analysis based on the regulatory and operational practices, b) business process analysis and simplification, c) business process re-engineering and reverse engineering. The results of the BPA, including simplification and re-engineering need to be shared and discussed with the parties that will be integrated into the SW. Technical assistance commonly tends to bring all three functional aspects of BPA together in one role and assigns them to one person, who rarely has knowledge of all three aspects.

The Cameroon solution cited above, whereby technical assistance is used to build in-house BPA capacity and coach the project team throughout the analysis seems to be a very good example of technical assistance that builds capacity, delivers an output that reflects the reality of the situation, and achieves adherence of all stakeholders.

Review and Gap Identification

External technical expertise can also make an important contribution in situations where rapid change or transition is required, e.g. when Single Windows need to address bottlenecks or strategic issues.

An outsiders view can assist identifying needs and gaps, and formulate proposals on how to solve the problems. Some development partners for example fund experts to review the performance of existing systems and recommend changes.

Capacity Building

Technical assistance can contribute to capacity building of the Single staff and agencies, when a Single Training Plan is in place. Technical assistance can then fund or deliver targeted training and awareness raising activities. In practice it is more frequent to have ad hoc training requests that are not embedded into an overall framework and objective to build a structured training plan and intervention and to identify relevant technical experts to deliver the training.

The type of skills and knowledge that could best respond to the technical assistance needs often reside in the public sector or consultancy firms that specialize in IT projects and modernization of the public sector. Often, staff from other countries' SW projects would be the ideal resources and expertise to use. It is not easy to access this expertise through traditional technical assistance projects. In many countries, the law applying to civil servants or public employees

does not allow them to provide consultancy services for fees. Specialized experts from consultancy firms or other Single Windows may be linked to a specific vendor and technology and therefore not perceived or not able to deliver neutral advice. In this context, peer-to-peer support may be another avenue for delivering technical assistance to SWs.

5.2.2. Peer to Peer Assistance

Peer-to-peer support can be understood as the sharing of knowledge and experience between equals, hence in this case Single Window staff. It can take different forms including peer review and peer mentoring, which may be of particular relevance for Single Windows.

Peer mentoring is useful when the Single Window management encounters a situation or challenge that is new to them. Other Single Windows may have gone through similar situations and may be able to provide specific advice regarding solutions to overcome the challenge. It does not mean that the solutions are copied one-to-one. The focus is on sharing lessons-learned and experiences of a similar situation.

Peer review is a tool that is already used in the private sector. It is useful as a general management tool to improve performance or in situations in which the Single Window management itself is too close to identify the errors and gaps and therefore require an external regard. Another form of peer review is compliance oriented reviews.

The African Alliance for Electronic Commerce (AAEC) launched a peer review of five African Single Windows in 2014. The process was based on staff from one Single Window visiting and assessing the Single Window in another country in collaboration with an international expert. Peer review was chosen as an approach to provide knowledge and experience to another Single Window whilst at the same time building the capacity of Single Window staff.

In peer-to-peer support, the role and quality of the reviewer(s) is critical. A reviewer need to be experienced, respected and trusted. Trust can be built through the use of training and certification of the peer reviewers. UN Network of Experts for Paperless Trade (UNNExT) is the result or the venue for such training. The idea was to build a network of experts that can provide different type of support to Single Window or other IT related trade facilitation projects using shared tools and methodologies and the endorsement from the United Nations (UN) as a trust maker.

There is specificity in the Single Window context that makes it more difficult to establish trust. Single Window solution providers and operators may have vested interested or may be perceived as having vested interests because of their situation as a private company or solution provider that competes for Single Window contracts. Sharing knowledge and experience may therefore meet resistance that can only be overcome through managed and successful use of peer-to-peer approaches.

Annex I: OIC Member States Profile Information on Single Window Efforts

By the end of 2016, out of the 57 OIC Member States, 22 have an operational Single Window and 35 currently do not have a Single Window. Table 31 below shows the status for each of the OIC Member States.

Table 31: SW Implementation Status in OIC Member States

No Plan (19)	*Afghanistan, Bangladesh, Chad, Comoros, Djibouti, Gabon, Gambia, Iraq, Kazakhstan, Libya, Mauritania, Niger, Palestine, Somalia, Sierra Leone, Syria, Turkmenistan, Uzbekistan, Yemen*
Not formalized Vision (5)	*Albania, Guinea, Guyana, Lebanon, Pakistan*
Formally adopted vision (6)	*Guinea - Bissau, Jordan, Maldives, Nigeria, Sudan, Suriname*
In implementation process (5)	*Algeria, Egypt, Oman, Turkey, Uganda*
Operational First Phase (15)	*Azerbaijan, Bahrain, Benin, Brunei Darussalam, Burkina Faso, Cote d'Ivoire, Iran, Kuwait, Mali, Mozambique, Qatar, Saudi Arabia, Togo, Tunisia, United Arab Emirates*
Redesign second phase (6)	*Cameroon, Indonesia, Kyrgyz Republic, Malaysia, Morocco, Tajikistan*
Operational Second Phase (1)	*Senegal*

On the following pages country-by-country profiles for 38 OIC Member States. The OIC Member States that are included in the country profiles are in red color in the Table 31 above.

For 19 OIC MS no profiles were drafted due to insufficient information[81]. Out of these 19 OIC MS, 15 Member States do not have a Single Window or a Single Window plan/ formal vision. Two, Egypt and Turkey, are currently undertaking a Single Window project, and one MS has an operational Single Window, Cote d'Ivoire.

[81] Insufficient information means that the no reply to the questionnaire was received and no information from reliable government sources is available.

A- Country Profiles - No Single Window Plan

Islamic Republic of Afghanistan Single Window

With assistance of the World Bank (WB), Afghanistan is currently in the process of undertaking a Feasibility Study for SW, expected to be completed by mid-2017. The Government of the Islamic Republic of Afghanistan will develop the SW Strategy after acceptance of the Feasibility Study by the stakeholders.

The WB has previously assisted the Afghan Customs System to migrate to ASYCUDA World and launched the "Second Customs Reform and Trade Facilitation Project" in 2015. The main objective is to:

• Update and develop as necessary the functional, technical and operational requirements for the Afghanistan National SW such that the implementation and operational services may be established, implemented and procured expeditiously;

• Understand and plan for the business process and procedural changes necessary across stakeholder agencies in the Government of Afghanistan (GoA) .

The SW initiative is supported and implemented jointly by the Ministry of Commerce and Industry and the Ministry of Finance (Afghan Customs Department), and appears to have, according to the WB, support from the traders.

The Republic of Bangladesh Single Window

Bangladesh has finalized a strategic plan of action for customs for 2013–2016 with the assistance of the WCO. In 2013, the National Board of Revenue (NBR) has identified high-priority actions including modernizing and automating customs procedures, applying risk management tools, and developing a national SW in line with the Revised Kyoto Convention (RKC).

The Republic of Bangladesh is in the process of planning for establishing SW. National Board of Revenue (NBR) had formed the working group at the end of year 2015 for faster clearance in view of an increased trade volume. The 39 members group of "National SW Working Group" had their first meeting in Jan 2016. It is planned to create a public enterprise for operating the Bangladesh SW.

The national Board of Revenue, Internal Resources Division and Ministry of Finance have developed a SW Strategy – "Development Project Proposal (DPP)". The SW strategy is not yet approved by the Government and SW stakeholders. It is envisaged the SW to be operational by end of 2016.

The funds are not allocated for development of the SW. The Government of Republic of Bangladesh sends Request for Expressions of Interest (REoI) to the World Bank (WB) the procedure is in the process of approval. No funds for the SW development have been allocated yet, but the Government is in discussion with the World Bank.

The SW implementation Strategy is based on a gradual approach, whereby 10 procedures from 30 OGA's and private entities will be integrated: Import Permit, Import Registration certificate (IRC), Export Registration certificate (ERC), Quarantine Certificate, Certificate from Bangladesh Standard and Testing Institute (BSTI) for particular Products, Certificate from Department of Explosives for particular Products, Certificate from Bangladesh Atomic energy Commission (BAEC) for particular Products, Clearance Permit (CP) for particular Products, Certificate from Bangladesh Telecommunication Regulatory Authority (BTRC) for specified Products and Certificate from Different Association for Specified Products.

In total, 33 Government and private entities will be integrated in the SW. The integration in the SW of above listed Government and private entities will be successively starting with few and moving to others later. It is planned to design the Centralized IT Architecture, a shared service integration platform that all service providers will use. The design and development will be fully outsourced (external provider will design and develop the IT architecture but IT infrastructure is acquired by SW operator).

Republic of Chad Single Window

There is no Single Window in the Chad republic yet, due to lack of political will, lack of support from Government agencies, lack of technological capacity, notably telecommunications infrastructure.

To this end, the Government of Republic of Chad should take the following steps implementation of the SW:

- Development of a Feasibility Study: This study will identify the main barriers to successful implementation of SW;
- Reorganization of the legal, regulatory and administrative: Chad needs to reform all legal, regulatory and administrative structures in order to adjust to the new environment. This would define the project objectives, one of the key success factors of the SW;
- Public-Private Partnerships: The worldwide experience show needs a strong partnership between public and private sector. It will be the most appropriate to launch an international tender to allow selection of company with extensive experience in the SW field;
- Involvement of all stakeholders: The experiences highlight the importance of the involvement and need analysis of all stakeholders in order to identify bottlenecks.
- Experience Sharing: To better management of the SW environment, it would be ideal for Chad to share the experiences of other countries. Participation in experience sharing will allow Chad to identify the various factors that led to the success or failure of the SW in some countries and copy good practices.

Republic of Kazakhstan Single Window

The Republic of Kazakhstan is at the very beginning on the process for establishing SW.

The Kazakhstan Management Committee of the Ministry of Finance is initiating the project for carried out the export-import regulatory requirements through a SW. The SW services will manage the permits and certificates related to export and import procedures and exchange of information with the Kazakhstan National Bank, the Ministry of Agriculture, Health and Social Development, the Ministry of Justice and other government agencies. Currently, it takes about 1.5 - 2 days for processing of permits and certificates, with implementation of SW; it is expected to reduce the time to few hours.

The Government of Republic of Kazakhstan has begun to set up and organization for operating the SW. with support from the United Nations. The Government of Republic of Kazakhstan has allocated 3.5 million USD.

Each of the EurAsEC member countries creates its own SW system, which subsequently will be integrated with each other based on regulatory requirements of the Eurasian Economic Commission. The Kazakhstan SW project is part of the action plan for the implementation and integration of the Eurasians SW.

The Republic of Niger Single Window

The Republic of Niger is at the very beginning on the process for establishing SW. In March 2016 the Government of the Republic of Niger appointed the Directorate General of Customs (Ministry of Finance) as a leading agency for establishment of Niger SW. The main objective of the SW project is to facilitate and simplify the procedures and formalities in foreign trade. The implementation of SW in Niger has broad support across Government and among traders.

B- OIC Member States with No Formalized Vision / Planning

Republic of Albania Single Window

The Republic of Albania is at the very beginning on the process for establishing a SW and has conducted a series of exploratory workshops. UNECE, UNCTAD organised jointly with the Albanian Customs Administration and the Ministry of Economy, Trade and Energy of Albania (METE) in 2010 a conference on trade facilitation, SW and Data harmonization. The WCO conducted a national SW workshop for Albanian Customs in 2015 during which SW implementation requirements such as initial functional assessment, business process analysis, data harmonization, and the WCO Data Model were discussed. The WCO Secretariat continues to support Albanian Customs in their modernization efforts, including the realisation of national SW. UNECE conducted another workshop in 2016 to train experts from public and private sector in the planning, preparation and implementation of a SW.

Currently, Albanian Customs is already exchanging selected customs data on pre-arrival basis in real time with the Customs administrations from Montenegro, Kosovo and Macedonia (FYRoM), using the Systematic Electronic Exchange of Data (SEED) system. This system that is used by Western Balkan States will in future also exchange goods permits and certificates along with the customs data.

The one-stop-shop concept is implemented on the border crossing between Albania and Montenegro and Albania and Kosovo.

Republic of Guinea Single Window

The Government of Guinea recently initiated a plan for the implementation of a Single Window and the draft of the SW Strategy is completed and is expected to be adopted by the Government of Guinea soon. The Ministry of Commerce, the General Directorate of Customs and port services are appointed as lead agencies. The objectives and expectation of the SW are: simplify and reduce the costs of trade transactions, compliance with international standards for trade facilitation, modernize administrations involved in trade facilitation, and secure state revenue. At this stage the SW only has partial support as the trade community is sceptical due to insufficient information.

The Cooperative Republic of Guyana Single Window

The Cooperative Republic of Guyana started preparatory work for SW Automated Processing System (SWAPS) in 2012. A company was contracted to develop a feasibility study for introduction of SW and to reviewed legislation and regulations for enhancement of trade. The final report was presented in June 2013 but the recommendations were not implemented. The SWAPS report contain recommendations to improve Guyana's trade transactions, reviewed organizational capacity, business processes and procedures, IT systems of all trade stakeholders.

In October 2016, the Ministry of Business organized a presentation on "The implementation and full usage of the SWs System or SWs Automated Processing System (SWAPS)". The Ministry of Business is leading the SWAPS project and has established a steering committee involving the Ministry of Business, Ministry of Public Telecommunication, Private sector (traders), Ministry of Finance, Guyana Revenue Authority and Shipping Association of Guyana, administer the implementation of SWAPS.

Funding for the project is being sought from the Caribbean Development Bank (CDB). In August of this year the Bank hired a consultant to conduct a review of all documents and reports associated with the project as well as to evaluate the cost of the project. The CDB is currently reviewing the consultant's draft report; meanwhile another appraisal mission is planned for the end of October 2016.

The Lebanese Republic Single Window

The Lebanese Republic is planning to develop a SW for OGA, but it appears likely to start life as a one-stop shop before morphing into a SW, which is itself a prerequisite for a formalities SW. The authority overseeing this effort is the office of the Ministry of State for Administrative Reform (OMSAR). It is undertaking a harmonization project, intended to align Government forms (INFORMS) and high level business processes.

To summarize, there is currently no SW in Lebanon, but the NAJM (Star) Customs ASYCUDA system is being upgraded to provide customs SW functionality. OMSAR is in the early stages of preparatory work for an OGA SW. When both of these are fully operational, then the next step will be a National SW.

C- OIC Member States with Formally Adopted Vision

Republic of Guinee-Bissau Single Window

The Government of the Republic of Guinea Bissau launched assessment activities for the development of a Single Window, funded through a World Bank financed project. The objective is to turn the currently existing physical SW in Bissau, Guichet Unico, into a real Single Window that will combine the main entities involved in the import, export and transit process. Currently, external experts assist the Government in drafting a feasibility study, business process mapping, process re-engineering, and training. The consultants are expected to identify equipment needs, including minimal investments in ICT, such as computers, for the proper functioning of the SW.

At this stage, only preliminary assessments for development of the SW are undertaken. They build the SW using the SW for business registration experience; a mixture of physical and little develop IT system. More details on the project are not found.

Republic of Maldives Single Window

As part of efforts to establish a paperless trading environment, the Maldivian authorities are working towards the development of a SW for trade facilitation. Collaboration with Asian Development Bank/WCO, the United Nations Economic and Social Commission for Asia and the Pacific and United Nations Commission on International Trade Law in the area of SW has helped push the Government's reform agenda on trade facilitation. To increase wider stakeholder support and initiate work on harmonizing various IT systems in support of introducing a National SW, the ASYCUDA World and the National SW Project were merged with the National Centre for Information Technology and other concerned agencies.

The national SW efforts are also supported by regional initiatives, notably in the context of the South Asia Sub regional Economic Cooperation (SASEC), the ADB financed Regional Trade Assistance (RETA). Both focus on national SW, Risk management, and the implementation of the Revised Kyoto Convention.

Challenges identified:

- Changes in business process;
- Information management issues – Data harmonization;
- Political and legal issues;
- Different degree in computerization;

The Hashemite Kingdom of Jordan Single Window

History and Evolution

Jordan has implemented physical Single Window in several locations in Sahab, Aqaba Special Economic Zone Customs, Zarqa, Jordan Customs Aqaba Directorate, Jaber, Queen Alia Airport, and Amman Customs house. In addition to the Customs Department, other government agencies that are involved in the SW include the Ministry of Agriculture, Jordan Institute for Standards and Metrology, and the Jordanian Food and Drug Administration.

Currently, Jordan Customs only operates a Customs Declaration processing system (ASYCUDA World) with a risk management module that allows the integration of other agencies' risk profiles into the selectivity module. The Government of Jordan is currently studying plans to move to an electronic Single Window and undertakes field visits, including to Indonesia, to learn about existing experiences. The Jordanian SW is a customs centric electronic declaration SW and apparently does not include OGA/NGO licensing and permit lodgement and approvals to date. It is still at an early, pilot Implementation stage. No references are available on either the Jordanian Ministry of Trade and Industry or Jordan Customs websites at the moment.

In October 2016, USAID and Jordan Customs (JC) launch project to strengthen efficiencies within its existing National SW (NSW) system. Supported by the United States Agency for International Development (USAID), the project will contribute to:

- Shifting all Jordanian trade processes to electronic methods, with automated straight through processing using exception based management and oversight;
- Establishing Jordan as a trade and logistics service center hub and model for trade facilitation for the Middle East.

The project should assess:

- The technical capacity and personnel requirements within JC's relevant departments as they relate to the proposed plan;
- Necessary information technology equipment needed to achieve the goals of the NSW;
- Current cost estimates for the first stage of the Project's implementation;
- Data availability and assumptions for meeting Project objectives on time and on budget;
- Appropriate milestones and indicators to monitor Project performance and support adaptive management.

The assessment's design should ensure an appropriate analysis framework is in place to accurately identify potential implementation challenges and solutions.

From the publicly available information, there is some confusion regarding what is a customs direct entry system and what is a SW.

Federal Republic of Nigeria Single Window

Nigeria NSW proposed a roadmap for the implementation of the NSW, based on different maturity levels in the SW evolution. This model has five steps: Paperless Customs; Regulatory SW; Logistics SW and fully integrated SW. The SW Nigeria is currently at the first step of the model, namely the paperless Customs phase. Its ambition is to implement a fully integrated SW by 2018, and to achieve a 50% improvement in its position in the World Bank Trading across Borders Rankings by 2015. Delivering in these goals requires the introduction of a holistic SW and the implementation of the necessary Customs, regulatory, logistics and commercial procedures, as well as the commitment of all stakeholders to the vision.

History and Evolution

SW lead Agency: Nigeria Customs Service, The SW is managed and operates by Westblue Consulting.

The Nigeria SW Master plan focuses on the business process a and data harmonization and delivered the following: review the 'AS-IS' situation and came up with better 'TO-BE' processes, a business process model, and a NSW data set based on the WCO Data Model (Version 3) and its implementation recommendations.

General Information

The Nigeria SW will be developed to enhance trade facilitation, improve communication and exchange of information amongst stakeholders in the international trade supply chain and most importantly reduce the time and cost of the clearance of goods coming into and out of Nigeria.

The comprehensive Feasibility Study conducted underpins the creation of the SW Environment in Nigeria. This provided the Blue Print and Roadmap for implementation, supported by the relevant stakeholders.

Service Coverage

Trade Information Portal:

The Nigeria Trade Hub (NTH) www.nigeriatradehub.gov.ng is a web based interactive portal providing information about international trade in Nigeria. It is a one-stop shop information portal, where the trading community can obtain trade information (import and export) to enable them make decisions about doing business in Nigeria.

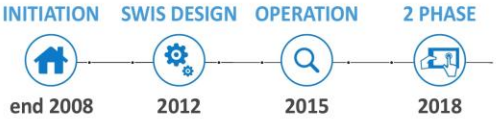
D- OIC Member States in Implementation Process

Algeria

Single Window

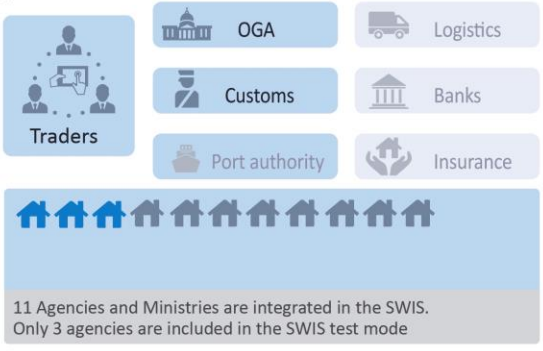
Evolution of the Single Window

On 23th February 2015 Transport Minister Amar Ghoul announced in Oran, the establishment in 2015 of an electronic single window for managing the country's ports. 3th January 2016 - Launch of the portal "Guichet Unique Electronique"



User and services coverage

Type of user



Services coverage of the SWIS is:

Front-end services

Filling and submission of application for import and export

Relevant permits

Reception of electronic permits

Exchange of e-permit with Customs Service

Monitor the status of the request in the system, and custom brokers can search, filter and access their multiple requests

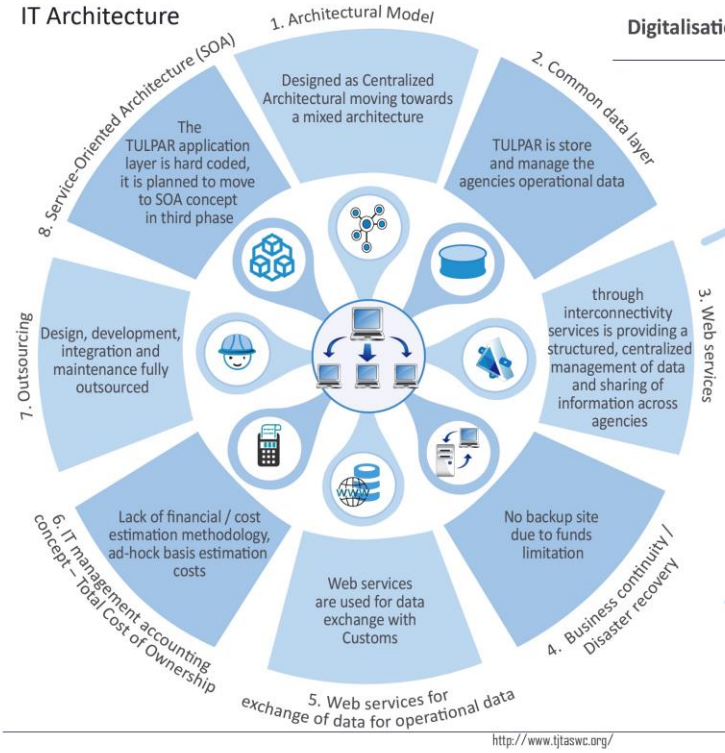
Support of unstructured data: Scanned

Digital signature: Not in use

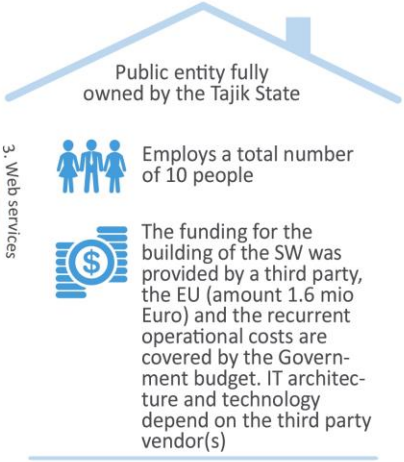
Legal framework for digital signature: No

Digitalisation:

IT Architecture



Organisational aspects



http://www.tjtaswc.org/

Oman

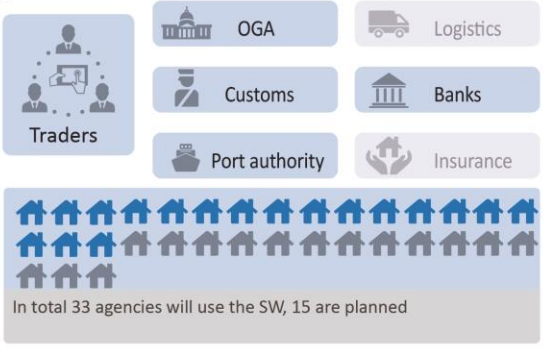
Oman Single Window (Bayan SW)

Evolution of the Single Window

The Sultanate of Oman SW project was initiated by the Oman Government in 2011. The SW strategy was adopted end of 2011, the initial idea for establishing the SW comes from Royal Oman Police – Customs Department. The design and development started in January 2013 months and is expected to become operational in end of September 2016.
The SW project was not delivered on time (18 months delay).

User and services coverage

Type of user



Key Services coverage:

Import license/permits/ authorizations management;
Export licenses/ certificates
Customs Clearance in filing, validating, decision, communication
Control of Transit movement - application, management and release of bond
Logistics related procedures: ship arrival notice, Port entry/Port exit management, Container Movement, Cargo and house manifest.

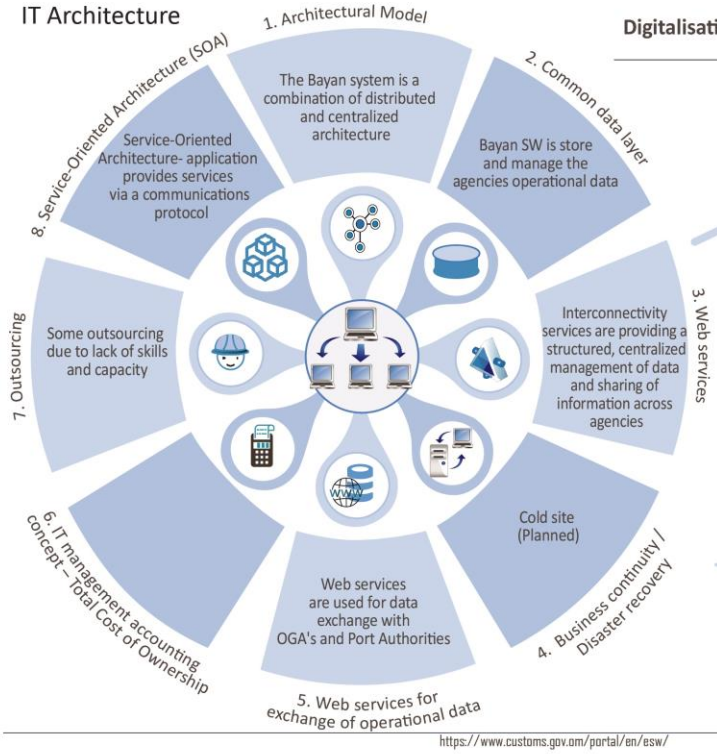
Support of unstructured data: Scanned

Digital signature: In use

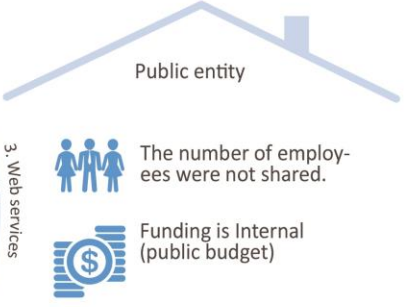
Legal framework for digital signature: Yes

Digitalisation:

IT Architecture



Organisational aspects



https://www.customs.gov.om/portal/en/esw/

Uganda

National Single Window (NSW)

Uganda National Single Window

Evolution of the Single Window

The Republic of Uganda National Single Window (NSW) project was initiated by the Uganda Government in 2011. The SW strategy was adopted end of 2011, the initial idea for establishing the SW comes from Ministry of Trade Industry and Cooperatives. The design and development started in January 2013 months and is expected to become operational in end of September 2016.

User and services coverage

Type of user

The fully operational SW will cover 40 GA, but now is integrated 9. There is a no geographical limitation to the SW services.

Key Services coverage:

Filling and submission of application for import and export
Relevant permits
Reception of electronic permits
Exchange of e-permit with Customs Service
E-Invoicing, e-Payment.

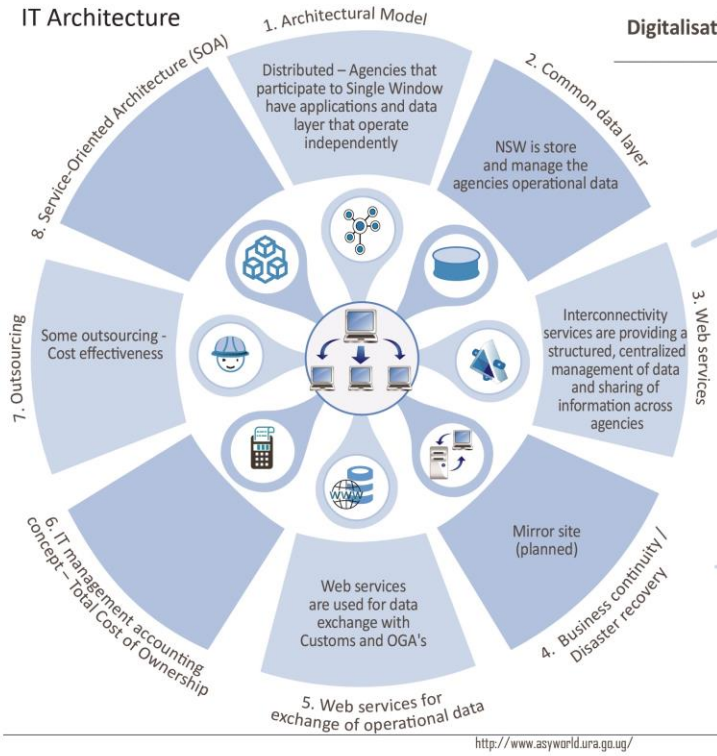
Support of unstructured data: Scanned

Digital signature: In use

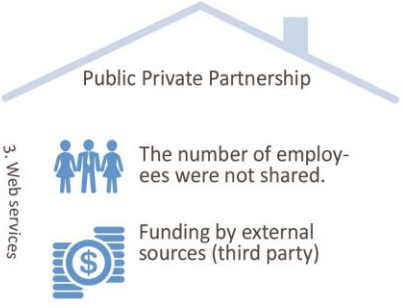
Legal framework for digital signature: Yes

Digitalisation:

IT Architecture



Organisational aspects



http://www.asyworld.ura.go.ug/

E- OIC Member States with Operational Single Window - First Phase

Azerbaijan

Azerbaijan Single Window (ASW)

AZƏRBAYCAN RESPUBLİKASI
DÖVLƏT GÖMRÜK KOMİTƏSİ

Evolution of the Single Window

The Government initiated the Single Window ASW project, who was leaded by the chief of Head Department for Performance Measurement and Development Programs, end of 2008.
SW was issued in 2008 and the system was launched from January 2009. The ASW become operational in January 2009. ASW has been going through improvements since 2009.

User and services coverage

Type of user

In total 11 agencies collaborate with the ASW.
There is a no geographical limitation to the ASW services.

Key Services coverage:

Permit Application / filing
Payments
Information Portal
Feedback (2 way communication)
Processing: Validation and decision making
Processing: Back off cooperation
Processing Write off and reconciliation (licenses, manifest, quota)
Law enforcement and risk management
Reporting and Analysis services

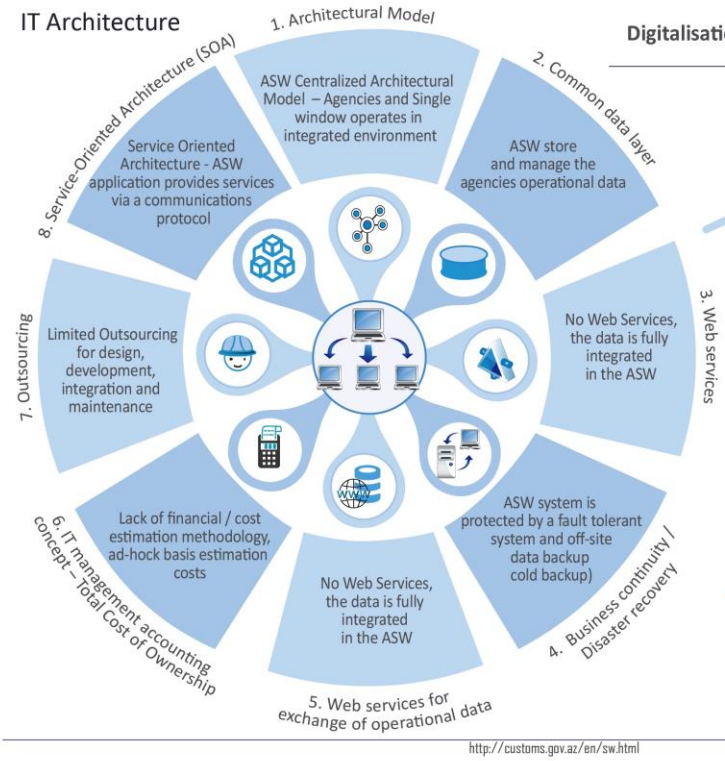
Support of unstructured data: Scanned

Digital signature: Not in use

Legal framework for digital signature: Yes

Digitalisation: Duplication

IT Architecture



Organisational aspects

The number of employees was not shared

Use of ASW is free of charge. The Azerbaijan Government is financing trainings, expansion and development of the ASW through the annual budget of State Customs Committee of Azerbaijan Republic

http://customs.gov.az/en/sw.html

Bahrain

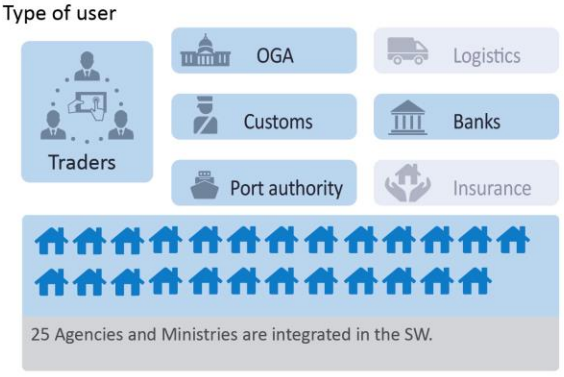
Integrated Customs and Single Window System (OFOQ)

Evolution of the Single Window

The Government initiated the SW project on 2009. The design and development of the Single Window System took 2 years starting in 2009. Since 2011 the SW is operating. Integrated Trade Facilitation System (ITFS) for the Kingdom of Bahrain (Complete Customs System and Single Window) - OFOQ' (meaning Horizon in Arabic)

User and services coverage

Type of user



Key Services coverage:

The system is based on TradeWorldManager Portal and its inherent technology which provides a common platform for integrating electronic trade documents from Customs, Regulatory Authorities, Cargo Scanning Facilities, Freight Forwarders, Shipping Lines, Banks and Port Authorities

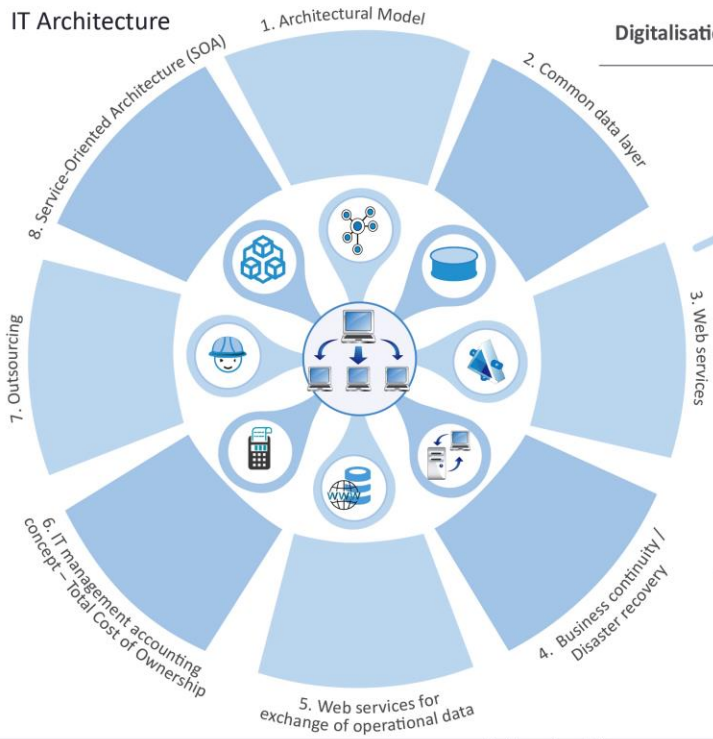
Support of unstructured data: Scanned

Digital signature: In use

Legal framework for digital signature: Yes

Digitalisation:

IT Architecture



Organisational aspects

http://www.ofoq.gov.bh/

Benin

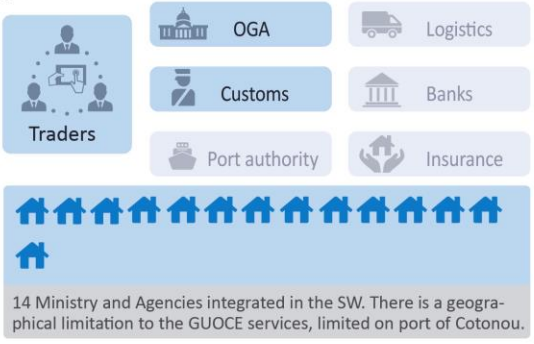
Single Window Operations of Foreign Trade of Benin (GUOCE)

Evolution of the Single Window

After several failed attempts, the country launched an international tender for the implementation and the operation of its GUCE. The tender was awarded in November 2010 to consortium Bureau Veritas BIVAC and SOGET as a concession. In November 2011, Benin has proceeded to the inauguration of its Single Window.

User and services coverage

Type of user



14 Ministry and Agencies integrated in the SW. There is a geographical limitation to the GUOCE services, limited on port of Cotonou.

Key Services coverage:

Electronic submission of all documents required for trade via a web application or by interfaces

Secure data and only accessible by authorized entities via an Internet application or interfaces

Processing and transmission of decisions of various authorities and members of the port community

Securing the supply chains through the tracking and tracing of goods

Providing additional services such as a risk management system, GPS monitoring and scanners.

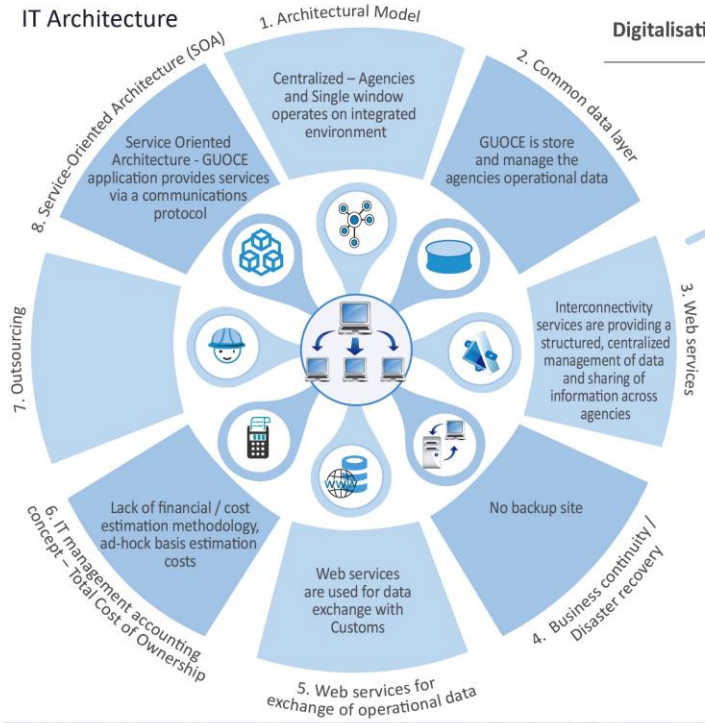
Support of unstructured data: Scanned

Digital signature: In use

Legal framework for digital signature: Yes

Digitalisation: Full

IT Architecture



Organisational aspects

22 people are permanently employed

The GUOCE stated that the fee revenues that are not sufficient at all to cover the operational costs. The Government is financing trainings, expansion and development of the GUOCE on ad-hock basis, without planned annual budget.

https://guocebenin.bj

Burkina Faso

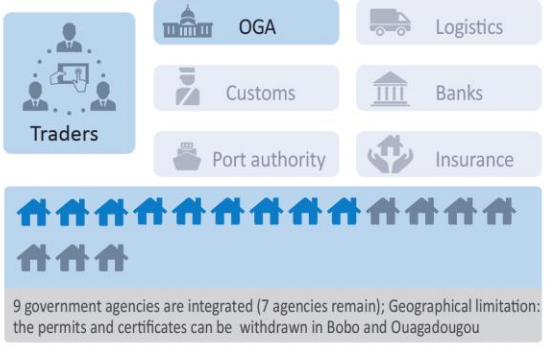
Système de liaison virtuelle pour les operations d'importations et d'exportations (SYLVIE)

Evolution of the Single Window

The SW project was initiated by the Government of Burkina Faso in 2008, and the development of the Sylvie (Système de liaison virtuelle pour les operations d'importations et d'exportations) took 4 years starting in 2011 with development of the SW strategic plan. The Sylvie SW is operational since February 2015. The limited company SOGESY SA was created to implement and operate the Single Window.

User and services coverage

Type of user



Key Services coverage:

Traders can lodge their requests for import and export relevant permits and certificates

Follow up of the status of the request in the system and notified if additional documents and information are required

Issuing of order for payment and e-accounting

Control of expiry of authorizations

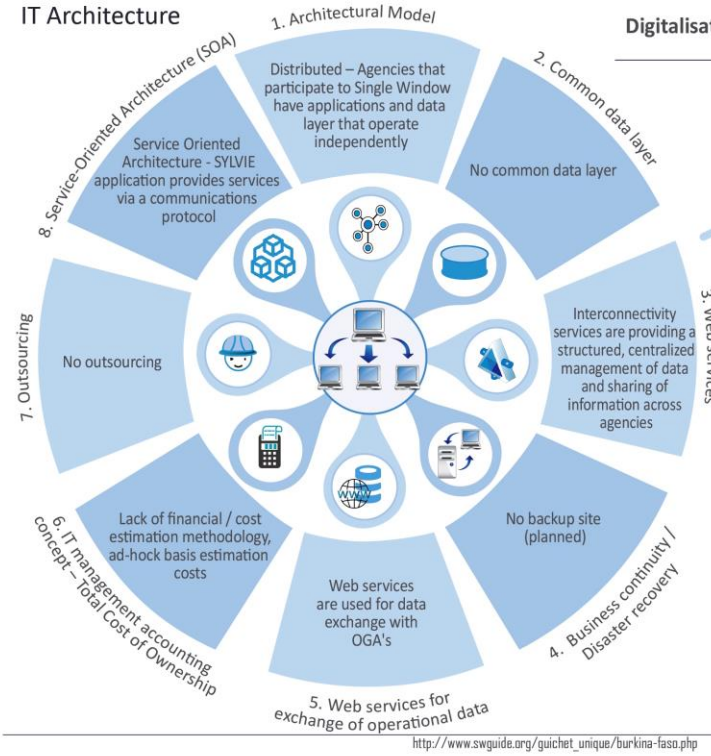
Support of unstructured data: Scanned

Digital signature: In use

Legal framework for digital signature: Yes

Digitalisation: Full

IT Architecture



Organisational aspects

28 people are permanently employed

The fee model is per transaction. The fee model is partially covering the SYLVIE SW operation, maintenance and training expenses. The investment expenses of the SYLVIE SW are covered through annual revolving budget

http://www.swguide.org/guichet_unique/burkina-faso.php

Brunei Darussalam National Single Window

The Brunei Darussalam National Single Window (BDNSW) project was initiated by Ministry of Finance as part of an e-administration reform initiative. Royal Customs and Excise Department is the operating agency.

BDNSW is a common online platform for electronic exchange and submission of trade information. The BDNSW System is a single point to submit standardized information and documents to meet legal import, export and customs-transit requirements and documents by business and public to the government agencies. Multiple trade application is consolidated into single IT system that automatically submits electronically the data to multiple agencies for approval and decision-making.

BDNSW has been developed since 2012 and is gradually scaling its functionalities. The last development is the e-Payment system in 2016 which enables traders to pay CID through bank transfer or at the counter.

Current unctionalities:

- Customs Declaration
- End-to-end internet based Certificate of Origin (CO) certification system
- Import permits
- Business Registration

State of Kuwait Single Window

Little information is publically available on the Kuwait SW. The Kuwaiti SW is operational since September 2013, allowing trades to submit the requests for permits and certificates related to various agencies and ministries through the SW.

The Ministry of Trade and Industry is responsible for providing trade licence and permits; Kuwaiti Customs is responsible for up-to-date customs regulations. A customs-based, or customs-centric, single window is under development and will be implemented during 2013. Similarly, port community/single windows are currently under development but not yet implemented.

The single window debriefs provided by the Kuwaiti delegation contained the following, liberally translated:

"The General Administration of Customs is seeking to raise the level of their services by developing an automated link with the GA involved in international trade, assumed to be a single window. Note: Kuwaiti customs automation is based on a PWC MicroClear system".

The following Kuwaiti entities and OGA's are scheduled to participate in the Kuwaiti formalities single window:

1. Kuwait Ports Corporation.
2. Public Authority for Industry.
3. Kuwait Municipality.
4. General Administration of Civil Aviation.
5. Ministry of Trade and Industry.
6. Environment Public Authority.
7. Ministry of Health.
8. General Directorate of Fire.
9. Ministry of the Interior.
10. Chamber of Commerce and Industry.
11. Central Bank of Kuwait.
12. General Authority for Civil Information.
13. Public Authority for Agriculture and Fisheries.
14. Ministry of Health.
15. Kuwait Petroleum Corporation.
16. Environment Public Authority.
17. Ministry of Transportation.

Iran

Single Window for Cross-Border Trade (ISWCBT)

Evolution of the Single Window

The Iran Single Window for Cross-Border Trade (ISWCBT) project was initiated by the Iranian Government in 2013. The design and development took 3 years and become operational in June 2016. The ISWCBT was created to implement and manage the Single Window, and reports to the Ministry Of Trade, Mine and Industry, the SW governance structure (decision making structure) is managed by National SW committee.

User and services coverage

Type of user

In total, 32 Government Agencies and private entities are using ISWCBT; two agencies are not integrated (planned).

Key Services coverage:

Traders electronically submit requests for regulatory procedures

Processing, validation and decision making write off and reconciliation processing

Automatic notification of the trader for decision on requests for permits and certificates

Joint decision Two or more agencies to manage the same application for permits

e-Payment / e-Accounting payment slip

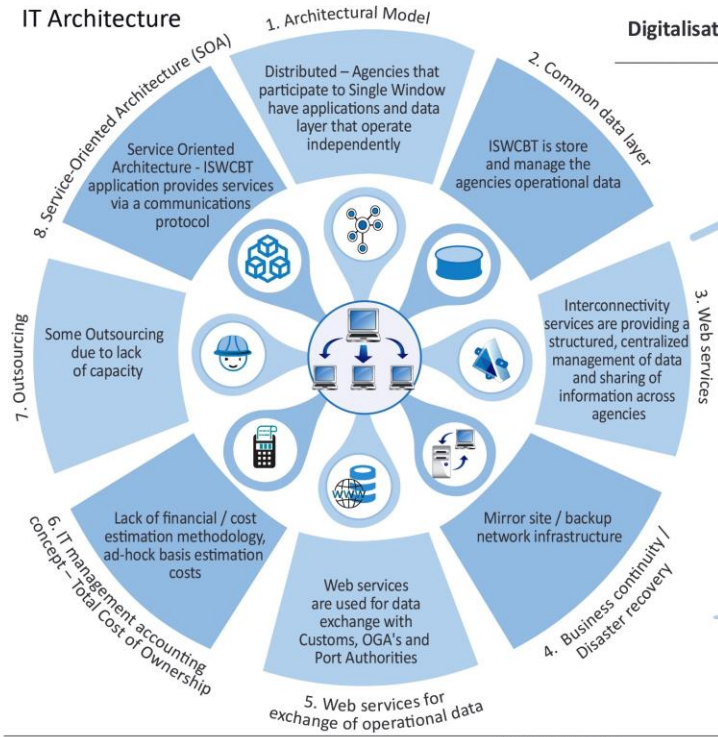
Support of unstructured data: Scanned

Digital signature: In use

Legal framework for digital signature: Yes

Digitalisation: Full

IT Architecture



Organisational aspects

Employs a total number of 60 people

The ISWCBT is financed by the Government through the annual revolving budget. The revenues from the fees are not sufficient to cover expenses; the operational, development and expansion expenditure are financed from the state budget and partially from the fees.

https://www.ntsw.ir/EN/

Mali

Single Window Information System (SYGOCE)

Evolution of the Single Window

Systeme De Gestion Integree des Operations du Commerce Exterieur (SYGOCE) project was initiated by the Mali Government in 2012. The design and development took 3 years and become operational on 2015. The SYGOCE was created to implement and manage the Single Window and reports to the National Directorate of Trade and Competition (DNCC) and Ministry of Trade.

User and services coverage

Type of user

8 GA are using SYGOCE; six agencies are not integrated (planned). Due to technical reasons, there geographical limitations to the SW services.

Key Services coverage:

Traders electronically submit requests for regulatory procedures

Automatic notification of the trader for decision on requests for permits and certificates

Processing, validation and decision making

Reporting and analysis services

Issue Permit/Certificate

e-Receipt from the banks Exchange, confirmation record for payment to the SW

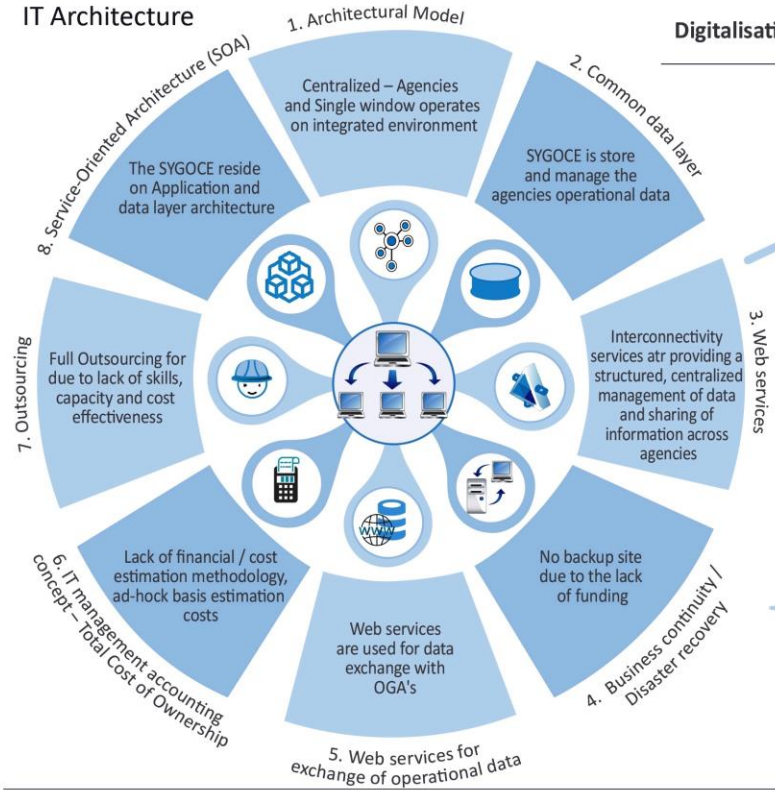
Support of unstructured data: Scanned

Digital signature: Not in use

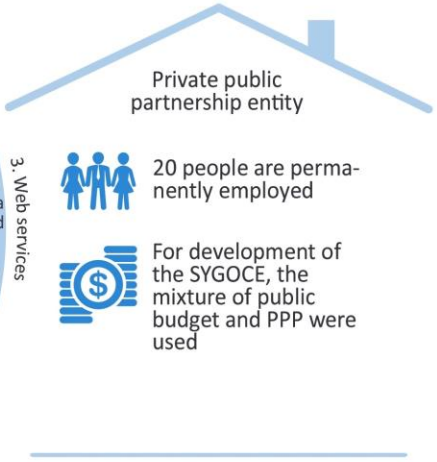
Legal framework for digital signature: No

Digitalisation: Mixed

IT Architecture



Organisational aspects

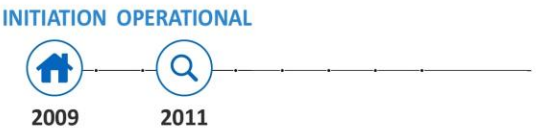


Mozambique

Single Window TradeNet

Evolution of the Single Window

The Mozambique SW TradeNet project was initiated by the Government in mid-2009. The design and development took 18 months and become operational in 2011. The MCNet – Mozambique Community Network was created to implement and manage the SW. MCNet is a PPP with the Government holding 20% of the total shares, another 20% held by CTA (Confederation of Trade Associations) and 60% held by a consortium of Escopil and SGS who are responsible for the implementation and operation of the Single Electronic Window (SEW).



User and services coverage

Type of user

In total 11 agencies collaborate with the TradeNet SW.
There is a no geographical limitation to the TradeNet SW services.

Key Services coverage:

Traders electronically submit requests for regulatory procedures

Automatic notification of the trader for decision on requests for permits and certificates

Processing, validation and decision making

Issue Permit/Certificate

Customs clearance: filing, validating, decision and communication;

FOREX certification, Goods insurance certifications

Logistics and transport related procedures

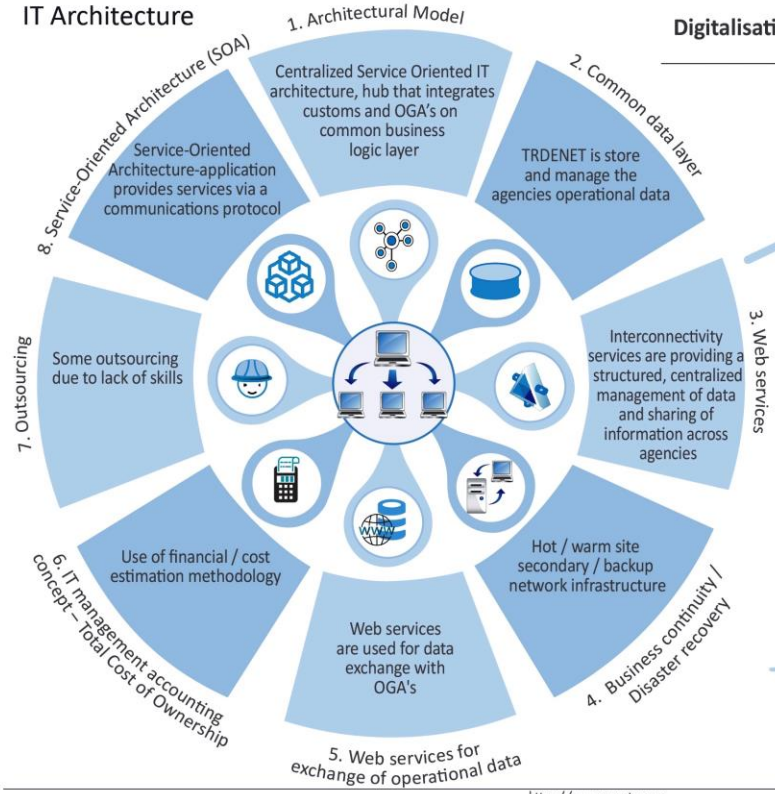
Support of unstructured data: Scanned

Digital signature: Not in use

Legal framework for digital signature: No

Digitalisation: Mixed

IT Architecture



Organisational aspects

141 people are permanently employed

The TRADENET is financed from the fee revenues that are sufficient to cover the operational costs; the fee model is based on transactions. The Government is financing trainings, expansion and development of the TRADENET through the annual revolving budget.

Qatar

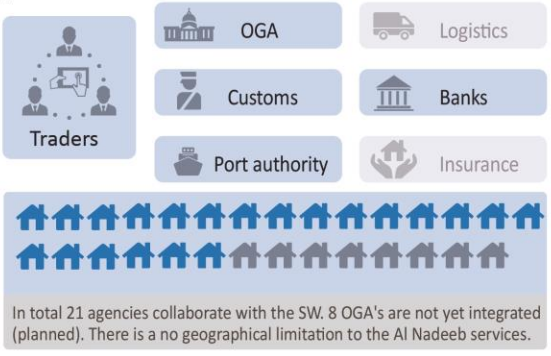
Qatar Single Window (Al Nadeeb SW)

Evolution of the Single Window

The Qatar Single Window Al Nadeeb project was initiated by the Ministry of Transport and Communications (ICT Qatar) in 2011. The design and development took 6 months and become operational in 2012. The Al Nadeeb SW is operated by General Authority of Customs. The SW is managed by three committees: CAB committee, Operations Committee and Steering Committee. The Al Nadeeb SW is fully integrated with Qatar Customs Management System.

User and services coverage

Type of user



In total 21 agencies collaborate with the SW. 8 OGA's are not yet integrated (planned). There is a no geographical limitation to the Al Nadeeb services.

Key Services coverage:

Traders electronically submit requests for regulatory procedures

Processing, validation, decision making, management of the submitted requests

Issue Permit/Certificate; scheduling / coordination of controls

E-Accounting; e-Payment through SW Portal; Mobile payment (m-payment);

Law enforcement and risk management

Reporting and Analysis services

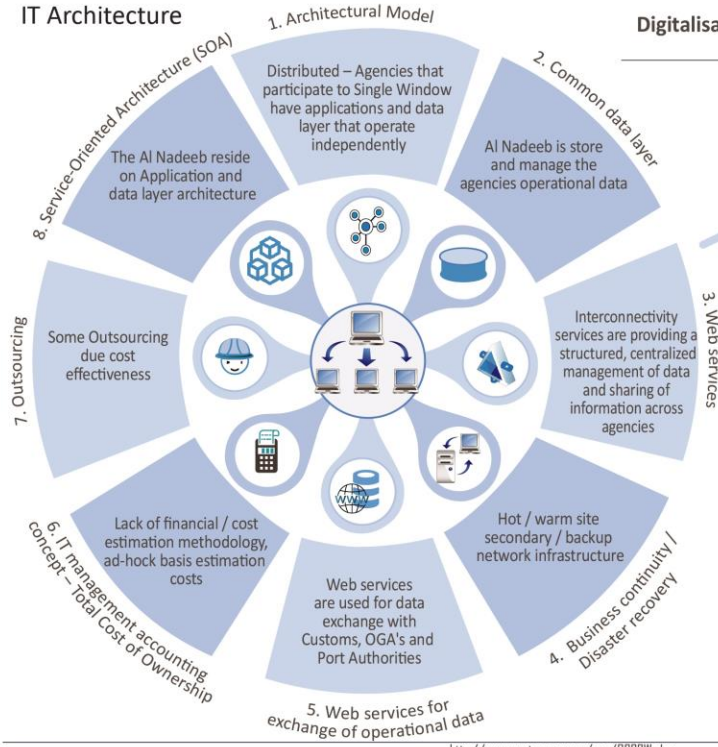
Support of unstructured data: Scanned

Digital signature: Not in use

Legal framework for digital signature: No

Digitalisation:

IT Architecture



Organisational aspects

The number of employees is not shared

The Al Nadeeb is financed from the fee revenues that are sufficient to cover the operational costs; the fee model is based on transactions. The Government is financing trainings, expansion and development of the Al Nadeeb through the annual revolving budget.

http://www.customs.gov.qa/eng/QCCSW.php

Togolese Republic Single Window

History and Evolution

The Single Window in Togo is operational since 2015 in the port of Lomé. With the SW, the Togolese government aims to improve the safety and efficiency of the clearance procedures through the securitization, automation and optimization of the international trade procedures.

The concession for the establishment and operation of the SW was awarded in 2013 to the Societe d'exploitation du guichet unique pour le Commerce Exterieur au Togo – SEGUCE Togo. SEGUCE is a joint venture of Bivac Bureau Veritas and SOGET. SEGUCE operates under the political control of the Ministry of Tradeand Private Sector Promotion, Ministry of Economy and Finance and the Ministry Transport of Togo. Bureau Veritas and SOGET have created a joint venture for the implementation and the operation of the SW.

The SW concession is 10 years (from 2013 to 2013) and includes the development, project management, training actors and change management.

In total, six ministry and agencies are connected to SEGUCE: Port of Lomé (PAL), Management General of Customs, the General Tax Directorate, the National Shippers Council Togo (NCTC), the Chamber of Commerce and Industry of Togo (CCIT), the Maritime Agents, the Forwarders accredited agents in Customs, Material Handlers, carriers, Veterinary and phytosanitary services, and commercial banks.

Service and Regulatory Coverage

The SEGUCE is managing the following services:

- Port management, limited to port Lomé;
- Lodging of customs declaration in ASYCUDA;
- The notice for validation and liquidation of customs declaration from ASYCUDA;
- Order for payment for port and customs fees;
- Bank payment reconciliation;

Tunisia

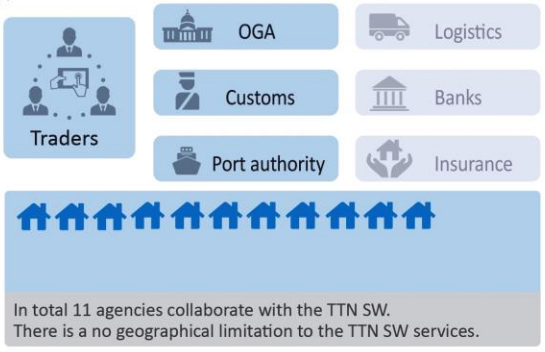
Tunisian Single Window (TTN)

Evolution of the Single Window

The Tunisian Single Window TTN project was initiated by the Tunisian Government - Council Decision National export in 1997. Public Private Partnership entity TTN SA was established in 2000. The design and development of the TTN took six year and become operational in September 2001. TTN is launching a new version of its SW system TTN 2 in 2005; the TTN system becomes fully paperless in 2006.

User and services coverage

Type of user



In total 11 agencies collaborate with the TTN SW.
There is a no geographical limitation to the TTN SW services.

Key Services coverage:

Filling and submission of application for import and export

Relevant permits

Exchange of e-permit with Customs Service

Monitor the status of the request in the system, and custom brokers can search, filter and access their multiple requests

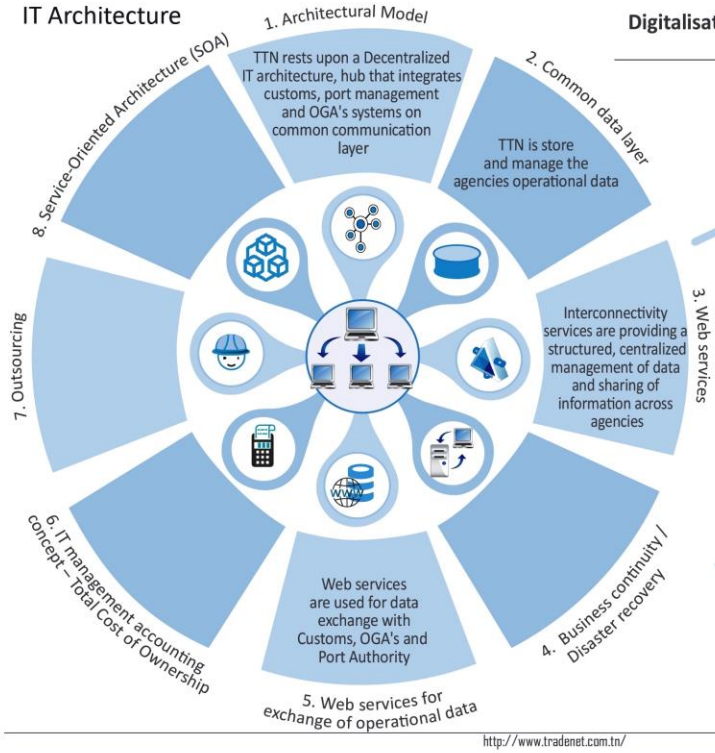
Support of unstructured data: Scanned

Digital signature: In use

Legal framework for digital signature: Yes

Digitalisation: Duplication

IT Architecture



Organisational aspects

No information available

The TTN is financed from the fee revenues that are sufficient to cover the operational costs; the fee model is based on transactions.

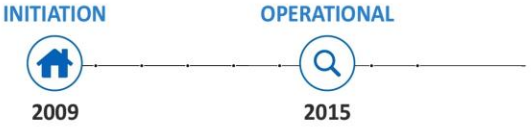
http://www.tradenet.com.tn/

Saudi Arabia

Single Window Information System (TABADUL)

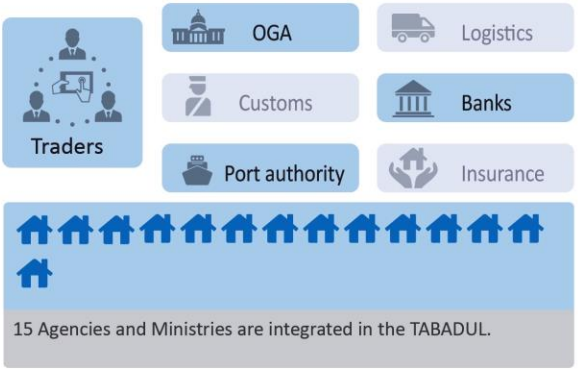
Evolution of the Single Window

The approval of the Council of Ministers issued on 2009, the license for the establishment of a joint stock company called Saudi Electronic Data Interchange (exchange). In 2015 the KSA Sw was taken over by the SAUDI e-Tabadul. The SAUDI e-Tabadul Company is government company establish at 2009 by royal cabinet announcement to own & manage all SAUDIEDI project and to be the professional arm for the government regarding IT as e-Services provider



User and services coverage

Type of user



e-solutions G2B & G2G of TABADUL SW is:

Automating Customs regulations in coordination with all related stakeholders

Establishing, managing and implementing governmental e-procurement services in the Kingdom

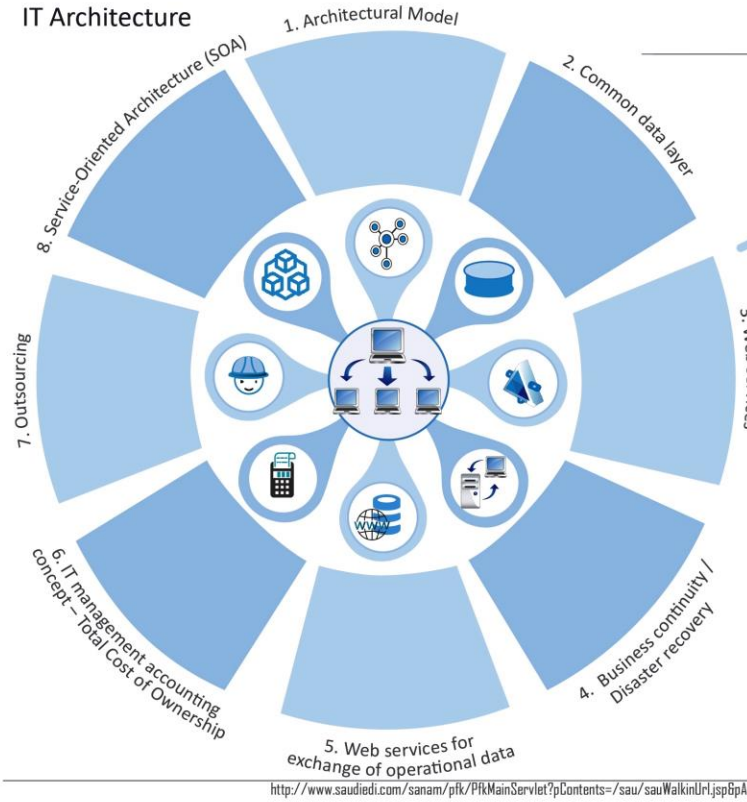
Formulating e-procurement sourcing strategies across governmental agencies

Standardizing and streamlining governmental e-procurement processes

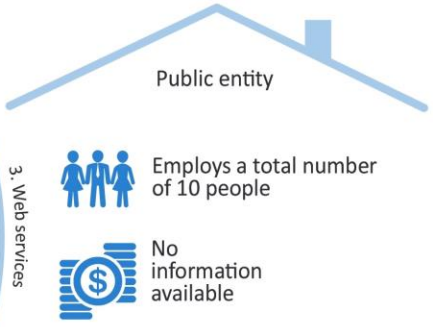
Building a reliable and efficient infrastructure to ensure business continuity

Providing consultation to government and business related to e-services

IT Architecture



Organisational aspects



http://www.saudiedi.com/sanam/pfk/PfkMainServlet?pContents=/sau/sauWalkinUrl.jsp&pAction=FIRST&pPortalId=SAU

United Arab Emirates Single Window

History and Evolution

Dubai Trade FZE is a trade facilitation entity that integrates the electronic services of various trade and logistics service providers in Dubai under a single window, operational since 2006. Dubai Trade is the premier trade facilitation entity that offers integrated electronic services from various trade and logistics service providers in Dubai under a single window.

Regulatory Procedural Aspects

Dubai Trade is the trade facilitation entity that offers integrated electronic services from various trade and logistics service providers in Dubai under a single window. The SW provides seamless processes across the private sector and government agencies. Dubai Trade Portal is a single window for the online services of its stakeholders and provides a streamlined flow of services, rendering more than 740 online services available 24/7 and provides key information on trade processes, procedures and reference documents.

Dubai Trade SW Portal services are on a continuous growth curve and currently include services for Traders, Shipping Lines and Agents, Clearing and Forwarding Agents, Haulers, and Free Zone Licensees. These services include Cargo Handling and Marine services, Cargo Booking & Clearance services, Transportation, Free Zone Administration services and Insurance services.

Cargo Booking & Clearance

- Customs Declaration
- Container Tracking
- Customs & Ports Payment
- Air/Sea Schedules
- Cargo Booking
- Freight Enquiry

Cargo Handling & Marine

- Berth Booking
- Manifest services
- Load List/Discharge List Submission
- Delivery Orders
- Container Release/Acceptance

Transportation

- Time slot booking for Terminal Gates Entry (E-Token)
- Cargo Gate Pass
- Truck Registration & Renewal with DP World

Trade shield

- Insurance coverage for marine cargo
- Single Shipment or Annual Open Cover
- Request, compare, pay and receive policy online

Authentication – Token

Use of Digital Signature is mandatory

F- OIC Member States Single Window Redesign Second Phase

Indonesia

Indonesia National Single Window (INSW)

INSW — INDONESIA NATIONAL SINGLE WINDOW — TRANSPARENCY CONSISTENCY EFFICIENCY SIMPLICITY

Evolution of the Single Window

The Indonesia National Single Window - INSW project was initiated 2006. The first phase of the INSW gradual approach for design and development started with early trial in end of 2007. The second stage Jul 2008, fourth stage (Jul 2009), January 2010, in the fifth stage. In January 2011, the final sixth stage, implemented the ASEAN Single Window requirement. The first phase of INSW has gradual approach for design and development, from 2007 till 2015.

User and services coverage

Type of user

There is an 18 GA under 15 Ministries that are managing the permits and certificates.

Key Services coverage:

Support Submission, processing of CD and Customs Clearance

Law enforcement data and risk management

Processing write off and reconciliation (licenses, manifest, quota)

Reporting and analysis services

Two way communication for traders

Allowing monitoring of status of the requests

Lodgment their requests for import and export relevant permits and certificates.

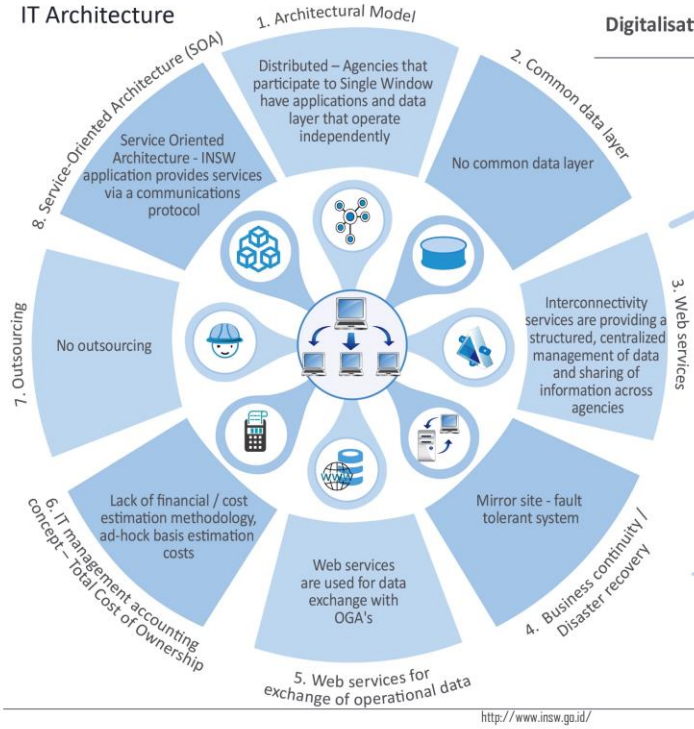
Support of unstructured data: Scanned

Digital signature: Not in use

Legal framework for digital signature: Yes

Digitalisation: Duplication

IT Architecture



http://www.insw.go.id/

Organisational aspects

The INSW employs 32 staff on permanent basis

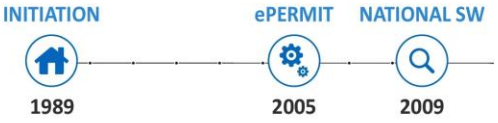
The INSW is financed from the state budget through the annual revolving budget; usage of INSW is free of charges. The Government is financing trainings, expansion and development of the INSW through the annual revolving budget.

Malaysia

National Single Window (NSW)

Evolution of the Single Window

Ministry of Commerce and Industry has been selected as the Lead Agency for implementation of NSW.
In September 2009, Dagang Net was appointed by the Government of Malaysia as the service provider to develop, manage and operate the National Single Window (NSW) for trade facilitation. Ministry of International Trade and Industry has been selected as the Lead Agency for implementation of NSW.



User and services coverage

Type of user

Key Services coverage:

- e-Declare Customs Declaration forms
- e-Permit Import/export permits from Permit Issuing Agencies
- Electronic Funds Transfer (EFT) for online Customs Duty Payment
- e-Preferential Certificate of Origin for online application of Certificate of Origin
- e-Manifest for online submission of manifest

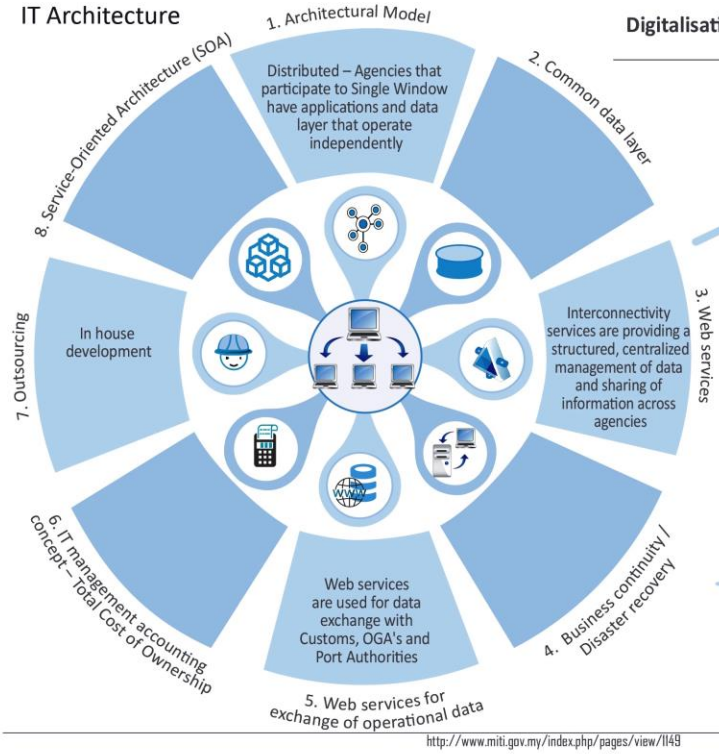
Support of unstructured data: Scanned

Digital signature: In use

Legal framework for digital signature: Yes

Digitalisation: Mixed

IT Architecture



Organisational aspects

240 people are permanently employed

The fee model is per transaction. The fee model is covering the NSW operation, maintenance and training expenses. The investment expenses of the NSW are covered by running fees

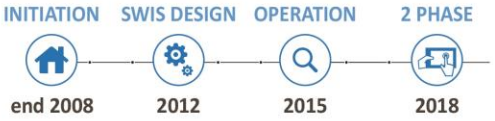
http://www.miti.gov.my/index.php/pages/view/1149

Tajikistan

Single Window Information System (SWIS)

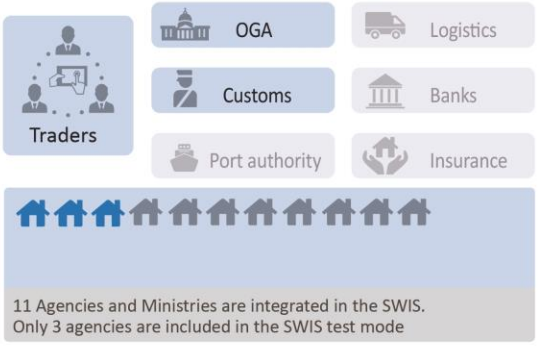
Evolution of the Single Window

The Government initiated the SW project on 31 December 2008. The design and production of the Single Window Information System (SWIS) took 3 years starting from 2012. Since 2015 the SWIS is operating in test mode. Currently, a second development phase is ongoing to extend SWIS services, adopt new technologies, and re-engineer and optimize the business processes. The SWIS is expected fully operational In 2018.



User and services coverage

Type of user



Key Services coverage:

Filling and submission of application for import and export relevant permits

Reception of electronic permits

Monitor the status of the request in the system, and custom brokers can search, filter and access their multiple requests

Scanned documents can be attached to the official request forms

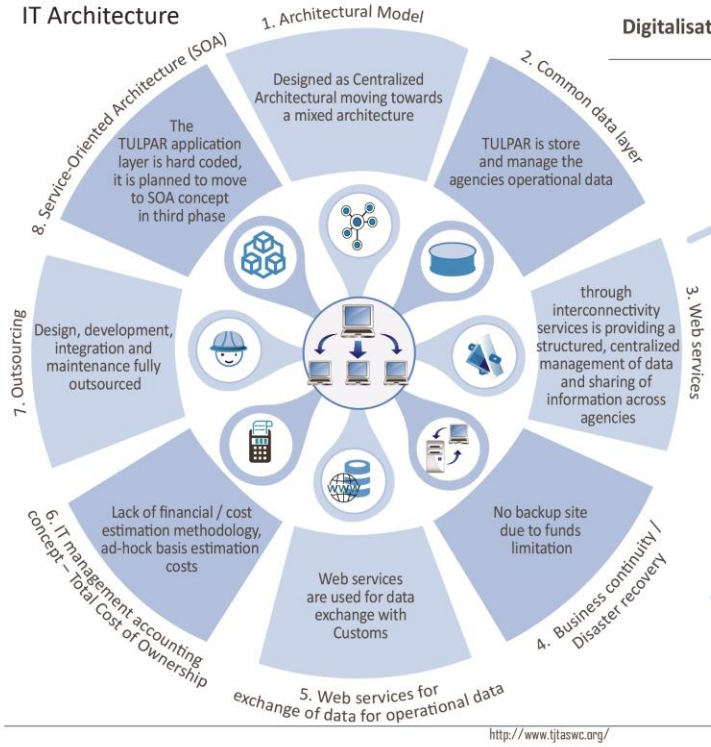
Support of unstructured data: Scanned

Digital signature: Not in use

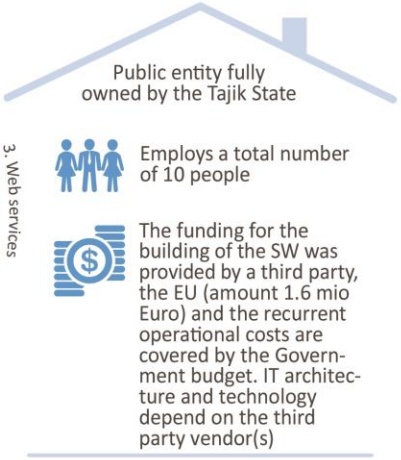
Legal framework for digital signature: No

Digitalisation: Duplication

IT Architecture



Organisational aspects



http://www.tjtaswc.org/

G- OIC Member States with Operational Single Window - Second Phase

Senegal

Foreign trade Single Window

GAINDE 2000

Evolution of the Single Window

The evolution of the foreign trade Single Window initiative started in early 1996. The project was led by Ministry of Commerce. However, in 2001, the project was transferred to Ministry of Finance. In 2008, the Prime Minister had endorsed a policy strategy towards more paperless trade transactions among government agencies and trade community. This lead to the re-design of the SW IT system adn the second generation went operational in 2010.

User and services coverage

Type of user

In total 10 Government agencies collaborate with SW (two are not yet integrated)

Key Services coverage:

Traders electronically submit requests for regulatory procedures;

Processing, validation, decision making, management of the submitted requests

Issue Permit/Certificate;

Provide joint decision / to facilitate effective decision-making;

Support the risk management in selectivity;

E-Accounting;

Reporting and Analysis services.

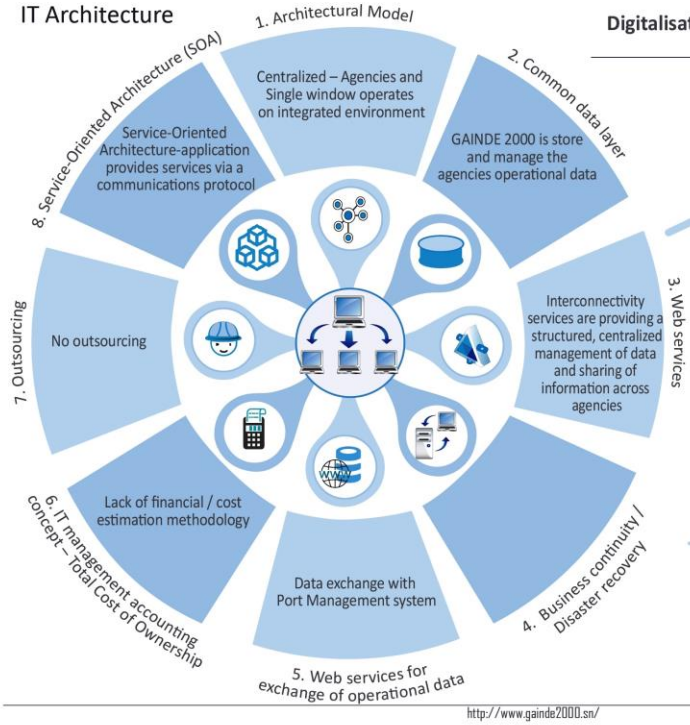
Support of unstructured data: Scanned

Digital signature: In use

Legal framework for digital signature: Yes

Digitalisation: Mixed

IT Architecture



Organisational aspects

100 people are permanently employed

The operational expenses of the SW are covered by the collection of the service fees. GAINDE 2000 collects a user fee per transaction and a one-time registration fee.

http://www.gainde2000.sn/

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