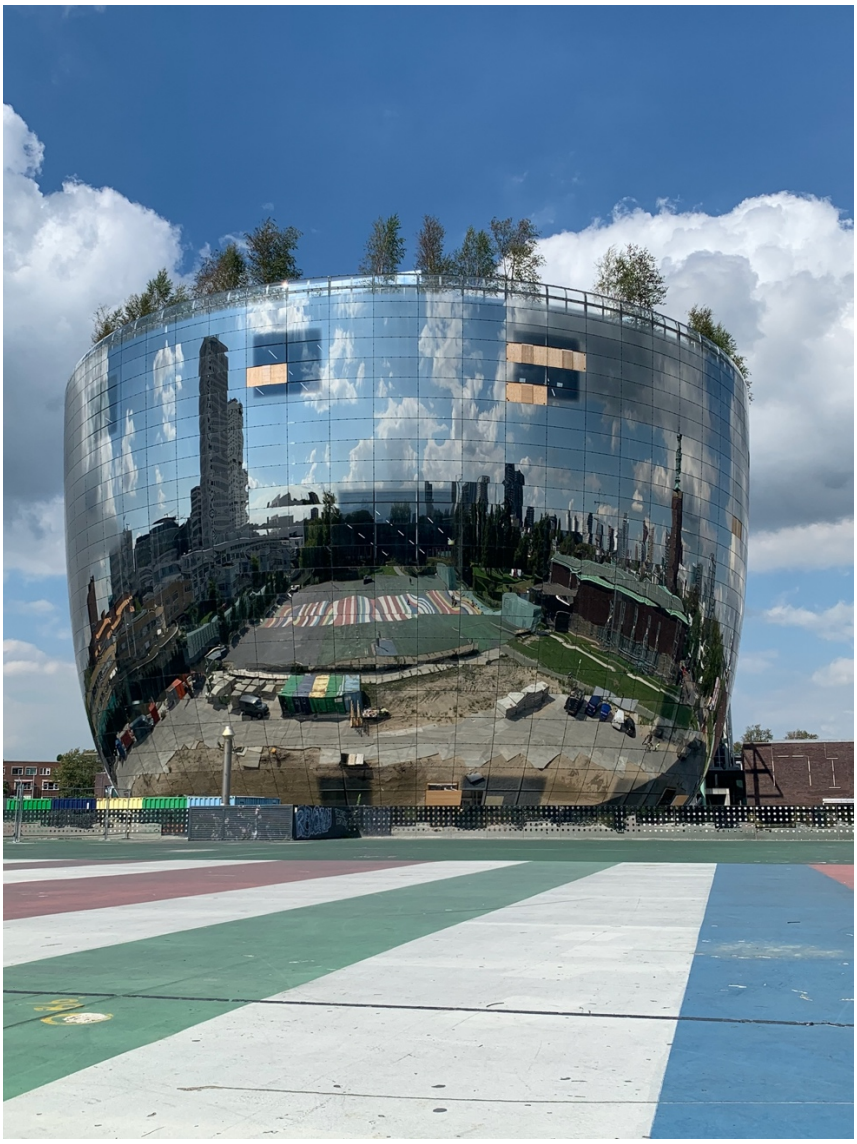
SINGLE WINDOW

To what extent does the Dutch national Single Window solution contribute to Coordinated Border Management and trade facilitation, and does it meet the original objectives?



Author:	Martijn van Kruining
Student number:	502981
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Master Program:	Executive Master in Customs and Supply Chain Compliance
Faculty:	Rotterdam School of Management (RSM)
University:	Erasmus University Rotterdam (EUR)
First Supervisor:	Prof. Dr. Yao-Hua Tan
Co-reader:	Dr. B. Rukanova
Company Supervisor:	D.G.J. Romp
Company Supervisor:	mr. J.M. Koster

Preface.

It was in 2011 when I was asked to join a team that participated in the EU-funded project, called Cassandra. The Dutch Customs project leader needed a project secretary, and for me this was the opportunity to develop and learn new things. How little did I know at that time this step would change the course of my career so drastically. By the time the project was finalized, the project leader asked me, and others, to stay involved and participate in the follow-up project CORE. In this project I got the real opportunity to be part of the substantive side of the project.

The project consisted of many work packages and I participated in a number of those. One of them was the development of a so-called living lab, where it was the goal to investigate in which way the data pipeline concept would work in a real situation. Whereby a supply chain of goods between Kenya and the Netherlands was developed, consisting of freshly grown flowers, specifically roses. The trade lane was subject of research based on the contribution of stakeholders, such as the Customs Administration of the Netherlands, the Netherlands Food and Consumer Product Safety Authority (NVWA), FloraHolland, and the Technical University (TU) Delft on the Dutch side. On the Kenyan side, the Kenyan Revenue Authoritiy (KRA), Kenya Plant Health Inspectorate (KEPHIS) were closely involved.

Since I had joined with the projects, I was able to evolve myself likewise. This eventually led to the application and admission of this Executive Master in Customs and Supply Chain Compliance. The course started in September 2017 and since that date I have enjoyed every moment. I am one of those students that have had every layer in the Dutch school system. After primary school, high school (MAVO), secondary vocational (MBO), higher professional education (HBO-bachelor), and, finally, this university program. It has been a long way, sometimes difficult and always a challenge, but I managed to overcome them all.

It used to be a paraphrase that some people used in my childhood: ‘You might want to stop this, you are not capable to do this, it is not for you’. That only made me more determined to achieve my goals and prove to myself, and others, that I can achieve all that I really want. I only needed some self-confidence and support from people that believed in my capabilities, even when they were not immediately manifested. Both within my private and professional surroundings, I am grateful that I have such people who do.

In the Summer of 2019, I was asked to fill in an WCO enquiry on Single Window on behalf of the Netherlands. It was then I began to think about using this as a subject for the master thesis I had to write to complete the master program. After some talks with colleagues, thinking about what I would like to investigate, the plan came to life. During the last module on Research Methods and Methodologies, the thesis pre-proposal was written. Which have led to the official thesis proposal and got approved in the beginning of December 2019. The journey had started…

Acknowledgments.

I want to thank the following important people that stood by me during this journey. To name all would be too much to write in this preface, but I will name a few in a comprehensive list. First, of course, my partner Mariska de Kogel. Before I decided to sign-up for this program, we have had many conversations that led to my belief to join and take on

this challenge. She believed in me, supported me and helped me during the whole period of time. For this, I am truly thankful! If I had to name one colleague who is very important in my career in the last decade, it cannot be anyone else than Frank Heijmann. He was the one that needed a secretary for the projects Cassandra and CORE. He made it possible for me to grow constantly and gradually and gave me confidence to sign-up for this Master program. His support, outspoken and unspoken, was most important. Thank you, Frank!

To make this thesis possible I have had huge support from my two academic mentors, prof. dr. Yao-hua Tan and dr. Boriana Rukanova. They both have contributed to this thesis by providing me structure and academic guidance throughout this period. They gave me insights on what is needed to write this thesis. It was far from easy, but they kept on supporting in different ways. I want to express my gratitude to you both, thank you! Next, my internal sponsors also have contributed to this thesis. They have guided me through the process and provided me with substantive content on my subject. Dick Romp, also my team leader, and Melle Koster, colleague of our Enforcement Department in Dutch Customs, thank you for your support and guidance during the whole process.

To finalize, I want to thank all my classmates and the team of this Master program. All my fellow students in this master program made it possible for me to enjoy this in full. We have had many very special moments, within class and outside. To point out three people I have worked closely with during the Integration Project, Esther Enning, Onno van Elswijk and Jeroen Borst, thank you for laughing, co-operating and our many talks.

It has been a ride!

Executive Summary

Purpose:
The (inter)national trade community suffers from huge amounts of costs, many due to various form of administrative burden. Both businesses and governments have historically built-up bureaucratic procedures and documents to follow. The reduction of these administrative burden and cost can be achieved by a number of trade facilitation measures. Paperless trade is one of the most effective ways to facilitate trade, by using an electronic exchange of data and documents that supports the trade transaction processes (UN/ECE, 2017). Paperless trade helps to provide for the simplification and harmonization of import, export and transport procedures, both on local and global scale. The introduction of the World Trade Organization's (WTO) Trade Facilitation Agreement (TFA)[1] in February 2017 was a major booster for the development of new methods of trade facilitation. One of those developments is the concept of Single Window as a tool enabling paperless trade.

Since the early years in the new century, major events took place that shook up worldwide logistics, supply chain management and the way Customs administrations were organized and deployed their supervision and controls. One of the most significant events were the terrorist attacks of September 11, 2001. After these, the world was different as a whole, and in particular the shipping of goods worldwide. On the one hand, it came to mind that trading must be handled with in a much more safe and secure manner. And at the other hand, this should not invoke such a strengthened and rigorous enforcement and controls on the movement of goods, that would inevitably lead to a practical stand-still of goods and logistics.

The EU strives to reduce the administrative burden and cost, for both business communities and governments and its agencies. By strengthening Europe's Digital Single Market, the EU is convinced to achieve this goal. This means that, amongst many other developments, the standardization of data is key. Also, close co-operation between Customs administrations, Other Government Agencies (OGA's), and even cross-border initiatives are examples of important concepts that help to achieve these goals.

On the business side of closer collaboration, the SAFE FoS (WCO, 2018) describes in relation to Pillar 2 (page 23) Customs-to-Business that businesses *receive tangible benefits in such partnerships in the form of expedited processing and other measures*, based on programs such as the Authorized Economic Operator (AEO). This is a clear example of a form of trade facilitation, whereby both authorities and businesses benefit of the alignment in procedures and by means of coordination can reduce (administrative) burden and cost.

Another very important way of collaboration and coordination is by means of sharing information, between government agencies (G2G), businesses and governments (B2G) and vice versa (G2B), and between businesses (B2B). To establish Coordinated Border Management (CBM) and Single Window, the sharing of data has become important since it has been incorporated in the SAFE FoS.

[1] https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm

The use of structured, standardized and harmonized data models is key to achieve any success of the aims described. Data models help Customs, other government agencies and the trade and transport community to communicate with each other and share data that is being needed in international border-crossing trade and transport. To achieve this goal, some international standards have been developed in relation to Single Window environments.

The problem that can be described as the way the Single Window theory is being transcribed into (national) laws and regulations, and, by means of IT-solutions, is developed and implemented in sovereign stats, especially in the Netherlands, in order to scope the first parts of the research. To scope further, this investigation focusses on the data models that exist and are being used.

Method:
For this research The Netherlands has been chosen as the object to investigate its Single Window solution based on the Directive 2010/65/EU of the Directorate General MOVE of the European Commission (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010). The data is subtracted out of interviews specifically developed for the purpose of the single case study. The interviews were sent to each stakeholder or expert that had agreed to cooperate beforehand. Next to the single case study method, other methodologies have been chosen in order to be able to analyze in which way the concept of Single Window in its original definition has been met, specifically in the Netherlands. Desk research and literature study provides for the theoretical basis on which this thesis is structured. This knowledge is used to formulate semi-structured qualitative interviews and questions that have been asked to different experts and stakeholders in relation to Single Window and data models. The single case study provides for the in-depth analysis on how Single Window has been developed in The Netherlands, from its early start until present day.

The objectives of this thesis are to investigate and analyze whether the development and implementation of the Dutch national Single Window contributes to reducing administrative burden and cost. The aim of Coordinated Border Management (CBM) is to align and coordinate governmental institutions, in order to act as one government towards businesses of all kinds. In this particular case, between Customs and Phyto-sanitary agencies, and border control. The scope is further narrowed down to the situation of the Netherlands and in order to achieve this insight, the following research sub-questions will be answered.

- *What are the main characteristics to identify a Single Window?*
- *What are the difficulties occurring in developing and implementing a Single Window?*
- *What are the remaining issues to overcome to reach the objectives of Single Window?*

These research sub-questions will answer the main research question:

To what extent does the Dutch national Single Window solution contribute to Coordinated Border Management and trade facilitation, and does it meet the original objectives?

Results:
The path that has been chosen in developing a better trade facilitation, and a certain way of coordinated border management, has been the concept of Single Window. The idea behind this concept is that trade related information and/or documents need only to be submitted once at a single-entry point (UN/ECE, Rec.No.33, 2004). The definition of a Single Window is: *"…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 regulatory requirements. If information is electronic, then individual data elements should only be submitted once…"*
This definition incorporates the five key elements of a Single Window according the UN Recommendation No.33. Any other solution, lacking one of the five key elements, are not to be considered as Single Window but are best described as Other Collaborative Systems (OCS).

In historical perspective the starting point for every Maritime Single Window development within the European Union is based on the Directive 2010/65/EU issued by the European Commission. The so-called Reporting Formalities Directive (RFD) is considered as the most important *enabler* in realizing a Single Window in the European Union.
Nationally, the biggest steps were made by policy decisions that have led to action plans on reduction of administrative burden and cost. The mandatory use of the WCO Datamodel was very important *barrier* to take in the development of the Single Window. The Netherlands have developed and implemented not only a Maritime Single Window to comply with the MSW legislation but used it as a starting point to also incorporate air cargo; the Single Window for Maritime and Air (SWM&A).

The remaining issues to overcome are harmonization and standardization. These two concepts are both relevant on the side of co-operation between stakeholders and government agencies, and on the technical side when it comes to developing the IT-solution in relation to Single Window; which data model is going to be used. The objective of the reduction of administrative burden and cost was not reduced as foreseen, although it is recognized that the single-entry point is of great value. Single Window is still being considered as a one-way submission of information or data, after being used by government agencies, the feedback should also have the possibility to be resent by those agencies to the particular stakeholder(s) that have interest in the supply chain. This will enhance the status information and therefore trade facilitation. The objective to achieve a Single Window for all modalities has not been achieved, yet.

Conclusions and Recommendations:
This research shows it has been of great value to learn, especially during the interviews, that the establishment of real and solid-based co-operation between all government stakeholders is of utmost importance. It is, therefore, very important to investigate which parties are involved in the development and implementation of Single Window. For example, in this research, the case of the Netherlands showed that it was necessary to have all government agencies and Ministries that are involved in cross-border trade and transport, join the development. The next step, and important lesson learned is to map all interrelated interaction between government stakeholders. So, it forces stakeholders to really understand each other's laws and regulations, and, processes and particular

procedures. This makes it possible to align risk management between the different government stakeholders.

The Dutch national Single Window fulfils all five key elements which identify a Single Window solution according the UN Recommendation No.33 definition. The use of the WCO Datamodel as the only data model proved to be a critical success factor, in the Dutch Single Window development and implementation. It was also established by means of accomplishing a solid CBM, which is based on the co-operation between a number of Ministries in the Netherlands. The situation in the Netherlands has learned that the teaming-up of the Ministry of Infrastructure and Water Management, the executive branch Rijkswaterstaat and the Customs Administration of the Netherlands proved to be the *driving* force that have led to the successful development and implementation of the national MSW.

The development of anything starts with asking the question 'why is this necessary?', or 'which problem are we going to solve, and for whom?'. The lesson learned in the development of the Single Window in the Netherlands, is that the initial thought came out of the recommendation that a Single Window should be seen as a tool for trade facilitation.

It is important to listen to the business community in order to learn what their needs are. During the interviews it became clear that on the on hand the government often thinks what is best for the business community. The lesson learned is to be clear from the start why the development is necessary and communicate this necessity.

During the whole process of developing and implementing Single Window in the Netherlands, it has been one of the biggest achievements: the use of one data model. Dutch Customs had stated that it would only participate when the WCO Datamodel as the only standard was going to be used. In the Netherlands the use of the WCO Datamodel was a lesson to be learned that also relates to the co-operation between government agencies and Ministries. The lesson learned was that one data model should be made mandatory by law, and that all stakeholders should build their respective IT based on that data model. In this way, not only the much-needed standardization will be achieved (one data model), also the harmonization (of procedures and processes) and interoperability between stakeholders will be achieved.

Accordingly, the main research question:

"To what extent does the Dutch national Single Window solution contribute to Coordinated Border Management and trade facilitation, and does it meet the original objectives"?

First, it can be answered in the way that the Dutch national Single Window is an instrument for trade facilitation, by making information exchange between businesses and government simpler. This has been achieved by *standardization and modernization of information, documents, processes and procedures*. Especially the installment of the *single-entry* point did contribute to this goal, making it possible to the *single submission of individual data* and information. The *fulfilment of regulatory requirements* was achieved by the adoption of the mandatory RFD issued by the European Commission, drawn-up by the Directorate General MOVE. In this way, the original objectives of the Single Window have been met, in

accordance with the UN Recommendation No.33, the five key elements to identify a Single Window.

Next, the Single Window development and implementation in the Netherlands was also established by means of accomplishing a solid CBM, which is based on the co-operation between a number of Ministries. To name a few are the Dutch Ministry of Infrastructure and Water Management, and the Dutch Ministry of Finance. The first ministry contributed in the development and implementation by making policy on the issued RFD by the European Commission, since it was the national responsible ministry. The Dutch Ministry of Finance is the ministry in which the Customs Administration of the Netherlands resides. In this way, the ministry is responsible for issuing the executive power for Dutch Customs to participate in the development and implementation of the RFD. That allows Dutch Customs to become the leading organization in the development and implementation, as prescribed by the UN and WCO on how to approach the Single Window concept. Also, a number of other executive departments and agencies did contribute to this CBM. Rijkswaterstaat was the executive policy department, residing in the Ministry of Infrastructure and Water Management, that was in charge of writing the policy and coordinate and delegate what has to be done to other stakeholders. The Dutch Border Control and Harbor Police contributed to the development and implementation of Single Window in relation to immigration.

For the most part, the original objectives have been achieved. Some issues remain to exist, like the fact that not all modalities are incorporated in the Single Window solution. Besides the obliged regulatory replies from government side to the business side of the Single Window, real status information has not yet been achieved. Harmonization and standardization in the broadest sense, meaning besides using one standard data model also the processes and procedures, remain to be an issue to be overcome. To use one standard data model is key for the success of the development and implementation. Harmonization on the level of mapping data models is important when standardization proves to be difficult. Harmonization of (legal) processes and procedures can only be achieved when politics and policies are aligned between all stakeholders.

The reduction of administrative burden and cost remains to be an objective undecided, some stakeholders have stated in the interviews that Single Window proved to be an enormous investment without any benefits. One respondent even calculated that the Single Window for Maritime and Air costs, besides the huge investment that had to be made, extra every year only to be able to submit data. Those costs did not exist prior the Single Window, if it relates to the reporting formalities he already was required to fulfil. Also, some stakeholders do not see any real difference with the situation before the Single Window, and the present situation. The PCS did already exist in the Netherlands, handling all notifications. For other stakeholders, Single Window proved to be an instrument of great value in the effectiveness and efficiency of exchanging information between border crossing trade and transport and government agencies. The management of several data models, in pre-SW era, proved to be much more costly, in comparison to what is now achieved using one data model for all. And the claim that is posed that stakeholders have to cope with many different Member States where they submit data to, handle slightly different standards. The experiences from the beginning were that mainly parties who were making a living on this, and they are opposed to developments that will take away this business model. Think of

local agents. In the Netherlands it was decided to expand the MSW scope with other maritime Customs declarations and air cargo Customs declarations. Therefore, in the end it proved to be able to realize a significant reduction of administrative burden and cost for maritime and air cargo operators.

This thesis is only based on qualitative gathered data and literature study. The method and methodology used did not provide for quantitative data. It can be advised in future study to measure items, such as, for example, the actual reduction of cost, or administrative burden.

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List of Tables and Figures

List of Abbreviations

AEO	Authorized Economic Operator
AES	Automated Export System
AnNa	Advanced National Networks for Administrations
APEC	Asia-Pacific Economic Co-operation
B2B	Business to Business
B2G	Business to Government
CBM	Coordinated Border Management
CTPAT	Customs Trade Partnership Against Terrorism
CVB	Container Vrijgave Bericht / Container Release Message
DBMS	Data Base Management System
DG/MOVE	Directorate General / Mobility and Transport
DG/TAXUD	Directorate General / Taxation and Customs
EEC	European Economic Community
EMSA	European Maritime Safety Agency
EMSWe	European Maritime Single Window environment
ENS	Entry Summary Declaration
EU	European Union
EUCDM	European Union Customs Data Model
G2B	Government to Business
GATT	General Agreement on Tariffs and Trade
GUI	Graphic User Interface
ICC	International Chamber of Commerce
ICS	Import Control System
ICT	Information and Communication Technology
ICTAL	ICT en Adminstratieve Lasten / Administrative Burden
IGO	Inter-Governmental Organizations
IMO	International Maritime Organization
ISO	International Standardization for Organization
IT	Information Technology
LDC	Least Development Country

MIG	Message Implementation Guide
MSW	Maritime Single Window
NCA/SSN	National Competent Authority / SafeSeaNet
NCTS	New Computerized Transit System
NES	National Entry System
NLIP	Neutral Logistic Information Platform
NSW	National Single Window
NVWA	Nederlandse Voedsel en Waren Autoriteit, Netherlands Food and Consumer Product Safety Authority
OCS	Other Collaborative Systems
OECD	Organization for Economic Co-operation and Development
OGA	Other Government Agency
OSCE	Organization for Security and Co-operation in Europe
OSS	One-Stop-Shop
OTP	Overheids Transactie Poort / Government Transaction Portal
PCS	Port Community Systems
RFD	Reporting Formalities Directive
RKC	Revised Kyoto Convention
SAD	Single Administrative Document
SAFE	Standards to Secure and Facilitate Trade
SAFE FoS	Safe Framework of Standards
SUPD@X	Supply Chain Data Exchange
SW	Single Window
SWM&A	Single Window for Maritime and Airr
SWT&T	Single Window for Trade and Transport
UN/CEFACT	United Nations / Centre for Trade Facilitation and Electronic Business
UNCTAD	United Nations Conference on Trade and Development
UNECE	United Nations Economic Commission for Europe
WCO	World Customs Organization
WCO DM	World Customs Organization Data Model
WTO	World Trade Organization

Chapter 1. Introduction

The (inter)national trade community suffers from huge amounts of costs, many due to various form of administrative burden. Both businesses and governments have historically built-up bureaucratic procedures and documents to follow. The reduction of these administrative burden and cost can be achieved by a number of trade facilitation measures. Paperless trade is one of the most effective ways to facilitate trade, by using an electronic exchange of data and documents that supports the trade transaction processes (UN/ECE, 2017). Paperless trade helps to provide for the simplification and harmonization of import, export and transport procedures, both on local and global scale. The introduction of the World Trade Organization's (WTO) Trade Facilitation Agreement (TFA)[2] in February 2017 was a major booster for the development of new methods of trade facilitation. One of those developments is the concept of Single Window as a tool enabling paperless trade.

Since the early years in the new century, major events took place that shook up worldwide logistics, supply chain management and the way Customs administrations were organized and deployed their supervision and controls. One of the most significant events were the terrorist attacks of September 11, 2001. After these, the world was different as a whole, and in particular the shipping of goods worldwide. On the one hand, it came to mind that trading must be handled with in a much more safe and secure manner. And at the other hand, this should not invoke such a strengthened and rigorous enforcement and controls on the movement of goods, that would inevitably lead to a practical stand-still of goods and logistics. The latter is one of the main arguments that have led to trade facilitation measures.

Though it is a given fact that border control inspections of concerning agencies, like Customs and Phyto-sanitary, or, veterinarian agencies often are at some point a disruption on the supply chain. Whether it concerns a physical inspection or a verification on documents, it always at a certain stage will interrupt the smooth transportation of goods. Before electronification and digitization, the exchange of information was all done by paper-based documents, declarations and certificates. The complexity of modern communication slows down the global trade[3], since it was established that more than 200 documents are involved in, for example, one single container shipment. Information involves also huge costs, so the sharing, relaying and generating of information can eventually delay trade. Documents can go lost in the process from seller to buyer, which has implications along the supply chain. For example, when a Phyto-sanitary or veterinarian certificate does not accompany a shipment, the goods are being put on-hold.

The installment of proper and solid Coordinated Border Management (CBM) (WCO, 2015) and with the help of an instrument, called Single Window (WCO, sd), can contribute to the facilitation of trade. CBM refers to the coordinated approach of border control agencies, domestic and international, seeking for greater efficiencies that manages trade and travel flows, and at the same time maintaining the balance with required compliance, stated in laws and regulations.

[2] https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm

[3] https://www.youtube.com/watch?v=p8yH4e-Aafk

Even then, this was based on mostly standardized and harmonized formats, such as the Single Administrative Document (SAD) (Commission, European Commission, Taxation and Customs Union, Business, Customs procedures for import and export, General overview, The single administrative document (SAD), 2020), which is in today's world fully digitized. The SAD is a form used for Customs declarations and aims to reduce the administrative burden and increases the standardization and harmonization of data collected on trade, because it serves eight different functions in one document. That marked the beginning of data modelling, starting in the 1960's to 1999 with phase 1, including the development of the Database Management Systems (DBMS)[4]. (UN/ECE, 2017)

The European Union (EU) strives to reduce the administrative burden and cost, for both business communities and governments and its agencies. By strengthening Europe's Digital Single Market, the EU is convinced to achieve this goal. This means that, amongst many other developments, the standardization of data is key. Also, close co-operation between Customs administrations, Other Government Agencies (OGA's), and even cross-border initiatives are examples of important concepts that help to achieve these goals (WCO, 2018). This is referred to CBM and aims to a more efficient and effective border management where different agencies align their specific procedures and try to share information, risk management, and even inspect together where that is possible to do so. In practice, the collaboration exists between national Customs administrations and Phyto sanitarian or veterinarian agencies, or, the coordination and co-operation on international level between two different Customs administrations in certain trade lanes.

On the business side of closer collaboration, the SAFE FoS (WCO, 2018) describes in relation to Pillar 2 (page 23) Customs-to-Business that businesses *receive tangible benefits in such partnerships in the form of expedited processing and other measures*, based on programs such as the Authorized Economic Operator (AEO). The AEO is another method in the range of trade facilitation measures that have been developed. Businesses that are AEO licensed or certified, often can make use of the trade facilitation instruments, like a Single Window. This is a clear example of a form of trade facilitation, whereby both authorities and businesses benefit of the alignment in procedures and by means of coordination can reduce (administrative) burden and cost.

The aftermath of the attacks is still profoundly visible in today's society. Complete programs have been developed to ensure safe and secure trade lanes, enhance compliance by traders and industry, and invoke a high level of trade facilitation when sufficient measures have been taken by governmental agencies towards trade and industry. Some examples of these programs are Authorized Economic Operator (AEO) or Customs Trade Partnership Against Terrorism (CTPAT), based on the SAFE Framework of Standards (WCO, 2018), issued by the World Customs Organization in 2005 and updated in 2018 with the latest version (WCO, 2018). In the SAFE FoS it is stated that Single Window is one of the objectives to reach for in strengthening co-operation between Customs administrations and Other Government Agencies (OGA's), involved in international trade and security, as an instrument that is part

[4] https://www.dataversity.net/brief-history-data-modeling/

of CBM. The advanced Single Window functionality will help border control agencies to perform better control on goods.

Another very important way of collaboration and coordination is by means of sharing information, between government agencies (G2G), businesses and governments (B2G) and vice versa (G2B), and between businesses (B2B). There is a certain relationship between CBM and Single Window, whereby Single Window handles the collection of all data once and send these data to each relevant border agency. Therefore, the problem will be solved that businesses need separate IT-systems to send data to each agency, and also often the same data. When government agencies align policies and procedures, hence establish CBM, the Single Window contributes as a trade facilitation tool. To establish CBM and Single Window, the sharing of data has become important since it has been incorporated in the SAFE FoS. It has been written specifically in Pillar 3 (Customs to Other Government and Inter-Government Agencies) in the sections on standards 2.4 and 2.6. Here it is described how Customs should harmonize national control measures, by means of supply chain security, risk management and risk mitigation, and the harmonization of data filing requirements, by means of development of co-operative arrangements with OGA's that require data in order to facilitate the seamless submission, transfer and reuse of (international) trade data, and in consistency with the Single Window concept.

The use of structured, standardized and harmonized data models is key to achieve any success of the aims described. Data models help Customs and other government cross-border agencies and trade to communicate with each other and share data that is being needed in international trade and transport. Customs agencies often are internationally seen as the cross-border authority in relation to goods, logic dictates that Customs should seek the close integration with the commercial processes and information flows in the (global) supply chain. Many countries describe the Customs agency in policy documents as the leading authority in the development of CBM and Single Window and the implementation thereof. To achieve this goal, some international standards have been developed in relation to Single Window environments.

To name a few are, the United Nations/ Centre for Trade Facilitation and Electronic Business (UN/CEFACT) Recommendations, of which typically number 33, 34, 35 and 36 are most relevant on this topic of an international Trade Single Window, next, the WCO Single Window Compendium, and lastly, the World Customs Organization (WCO) Data Model. These examples form the basis of the establishment, development and implementation of the concept of Single Window. Recommendation 33[5] provides for a recommendation and guidelines for the establishment of a Single Window. The Simplification and Standardization for International Trade is incorporated in Recommendation 34[6]. Complementary to Recommendation 33 the Recommendation 35[7] was developed in order to establish a legal

[5] http://tfig.unece.org/contents/recommendation-33.htm

[6] http://tfig.unece.org/contents/recommendation-34.htm

[7] http://tfig.unece.org/contents/recommendation-35.htm

framework for international trade Single Window. And, finally, Recommendation 36[8] provides for details on the Interoperability of Single Window in the exchange of information in value chains between different Single Windows.

[8] http://tfig.unece.org/contents/recommendation-36.htm

Chapter 2. Problem definition

2.1. Introduction.

In this chapter the structure of the thesis is explained. First, the problem is described on how Single Window as a concept has landed in laws and regulations on the one side, and on the other side, developed into a technical solution. Then the research question, that has been formulated, gives the first scope, whereas the sub-questions will help to answer the research question.

2.2. Problem statement.

The problem can be described as the way the Single Window theory is being transcribed into (national) laws and regulations, and, by means of IT-solutions, is developed and implemented in sovereign states, especially in the Netherlands, in order to scope the first part of the research. Do these different versions contribute to a better working logistical flow of goods, smoother operating governmental agencies, facilitate trade, and possible higher compliance in the supply chain?

The Directive 2010/65/EU (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010) paved the way for Single Window in the European Union but let the development and implementation fully under the responsibility of each Member State. This has led towards many different outcomes, which in the Netherlands appears as *Single Window for Maritime and Air* (SWM&A). The Dutch solution extended the Maritime Single Window development with also messages for Customs purposes, and, since the national entry system (NES) for entry and exit does not recognize any differences in modality, also air cargo was incorporated. This means that the mandatory declaration of the Entry Summary Declaration (ENS)[9] for both maritime and air are being sent through the Single Window. The ENS is for the purpose of safety and security. In other EU Member States other solutions and implementations have been installed. This research aims to investigate the similarities and differences in comparison to each other and with the Dutch version.

In the Netherlands, the choice was made to base the development and implementation of the national Single Window, on the World Customs Organization Data Model (WCO, 2020). This is a set of combined data requirements, mutually supportive and used to meet legal and procedural needs for cross-border agencies, like Customs, in relation to export, transit, and import transactions. This, all in consistency with the United Nations Trade Data Elements (UN/ECE, 2005), which is the basis to standardize data elements for international trade. The United Nations / Centre for Trade Facilitation (UN/CEFACT) is a subsidiary, intergovernmental body of the UNECE. It serves as the focal point within the United Nations Economic and Social Council for trade facilitation recommendations and *electronic business standards*[10].

[9] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0952&from=EN
[10] https://www.unece.org/cefact.html

To scope further, this investigation focuses on the data models that are being used. Data models are used to translate certain specific items and descriptions, like a name of a ship, the specific good(s), weight, buyer or seller name, etcetera, into structured, standardized data elements. The structuration means that certain relations between standardized data elements are being made. For example, a seller is a legal entity that sells a specific good to a buyer, that is, too, a legal entity. The relation between those two entities is being structured as data elements.

There are a number of leading organizations that have developed a data model for its own particular purposes. Like the WCO, the International Maritime Organization (IMO, 2020), the European Union (TAXUD, 2020) and the International Organization for Standardization (ISO, 2020) have their own data model and serve different interests, but with the same ultimate goal: to standardize. The challenging part of this multitude of different data models of these different international organization lies in the fact that the standards represent different perspectives. The IMO uses the perspective of vessels in the international maritime shipping arena. The WCO has the focus on goods that are being shipped. While the ISO has many different perspectives of which they standardize. The harmonization of these standards proves to be really challenging to achieve. In the Netherlands it succeeded, as explained in the upcoming chapters, by developing the Single Window for Maritime and Air, as an extension of the Reporting Formalities Directive of Directorate General (DG) MOVE (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010).

The two directions that are being investigated in this thesis will help to give answer to the research question that has been formulated in the next paragraph.

2.3. Research objectives and Research questions.

2.3.1. Objectives.

The objectives of this thesis are to investigate and analyze whether the development and implementation of the Dutch national Single Window contributes to reducing administrative burden and cost. The aim of Coordinated Border Management (CBM) is to align and coordinate governmental institutions, in order to act as one government towards businesses of all kinds. In this particular case, between Customs and Phyto-sanitary agencies, and border control. This research limits the CBM analysis to the coordination between the Customs Administration of the Netherlands and the Dutch Phyto-sanitary inspectorate. A lack of coordination has been observed that causes increasing administrative burden and cost, like the explained certificate issue in the introduction (see Chapter 1). The scope is further narrowed down to the situation of the Netherlands and in order to achieve this insight, the following research and sub-questions will be answered.

2.3.2. Research question.

The research question that will be answered in the thesis, is the following:

To what extent does the Dutch national Single Window solution contribute to Coordinated Border Management and trade facilitation, and does it meet the original objectives?

2.3.3. Sub questions.

In order to be able to answer the research question, the following sub-questions are to be provided with an answer:

1. *What are the main characteristics to identify a Single Window?*

This research sub-question will provide for a necessary theoretical background that helps to provide for understanding the most important building-blocks of a Single Window. A Single Window must comply with certain standards in order to be recognized as such. This research sub-question investigates the legal and policy requirements. And also the way this concept is developed into laws, regulations and policy, nationally and internationally.

2. *What are the difficulties occurring in developing and implementing a Single Window?*

During the (earliest) development and implementation of Single Window in the Netherlands many difficulties arose that had to be overcome. This research sub-questions tries to answer what those difficulties were, which parties have been involved and how the whole Single Window came about.

3. *What are the remaining issues to overcome to reach the objectives of Single Window?*

The historical overview, provided by the answer of research sub-question 2, the last research sub-question will answer what the remaining issues are that have to be identified, in order to be able to judge whether the original objectives can be reached. This will also be a prelude to answering the main research question, as stated above (*Section 2.3.2.*)

2.4. Scope and structure of the thesis report.

The scope of this research is limited to the situation in The Netherlands. At first it was thought of to investigate the Dutch, Italian, Spanish, Belgian and Singaporean versions of Single Window. In this way, the idea was to compare the different outcome of the development and implementation in these different countries. However, during the preparation to the research the Covid-19 virus outbreak have led to the unavailability of the other EU Member States and Singapore. This was one of the reasons to limit to the Netherlands. In this way, the research is also more manageable, while having excellent access to experts of both Dutch government institutions and businesses. Next to this, the Netherlands is internationally highly recommended for its advanced Single Window solution. The single case approach can be helpful for the development in other countries. In essence this research study evaluates the theoretical development and practical implementation of Single Window.

Since the development of the Single Window theory, many different versions, laws, regulations and implementations have been established. Single Window has become something like a fashionable word, for which organizations have given different substances in practice (UNE171).

This thesis is structured in the following order: In Chapter 1 the introduction to the thesis is given, explaining the context in relation to Single Window, Coordinated Border Management, trade facilitation and data models. Next, in Chapter 2 the problem statement and research questions are described, based on international developments that have occurred. Chapter 3 describes in detail the research approach for this thesis report. Chapter 4 gives an oversight in the current international views on Single Window, to establish a sound basis for a theoretical framework on the subject, whereas Chapter 5 scopes down into, the typical Dutch variant of the Single Window solution and what different experts and stakeholders have experienced developing and implementing the Single Window solution in practice. In Chapter 6 the achievements, benefits and issues are discussed in relation to the findings about the Dutch Single Window, CBM and Trade Facilitation. Then in Chapter 7 a number of lessons learned are being described. Chapter 8 provides for Discussion, explaining the conclusions. Lastly, Chapter 9 explains the contributions to practice and theory, describes the limitations of the research, and gives recommendations also for future research.

3. Methodological approach.

3.1. Introduction.

For this research The Netherlands has been chosen as the object to investigate its Single Window solution based on the Directive 2010/65/EU of the Directorate General MOVE of the European Commission (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010). The data is subtracted out of interviews specifically developed for the purpose of the single case study. The interviews were sent to each stakeholder or expert that had agreed to cooperate beforehand.
Next to the single case study method, other methodologies have been chosen in order to be able to analyze in which way the concept of Single Window in its original definition has been met, specifically in the Netherlands. Desk research and literature study provides for the theoretical basis on which this thesis is structured. This knowledge is used to formulate semi-structured qualitative interviews and questions that have been asked to different experts and stakeholders in relation to Single Window and data models. The single case study provides for the in-depth analysis on how Single Window has been developed in The Netherlands, from its early start until present day.

3.2. Single Case Study.

The research for this thesis is based on the single case study methodology. It is based on qualitative material, scientific articles, papers and publications on the Single Window concept. However, there is no real consensus on what the definition is of this methodology. The following definition: *"Case study research is defined as a qualitative approach in which the investigator explores a real-life, contemporary bounded system (a case) or multiple bound systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information, and reports a case description and case themes. The unit of analysis in the case study might be multiple cases (a multisite study) or a single case (a within-site case study)''*, defines why this methodology has been chosen for this research (Creswell, 2014).

The case study object for this research is the Netherlands and it describes the real-life situation, and how the development and implementation of Single Window have taken place. The in-depth data collection is based on the qualitative interviews with stakeholders and experts from both businesses and government agencies. The analysis on the data was performed based on a longitudinal case study, whereby the development and implementation of Single Window in the Netherlands was traced over a long period of time. The choice to use this methodology is because the benefits of a single case study provides for a better and deeper understanding of the explored subject, in this case Single Window in the Netherlands (Gustafsson, 2017). The findings extracted from the coming about of Single Window in the Netherlands can also be relevant for other countries. The research experienced excellent access to the expertise, experiences and knowledge of many experts. This has really been proven a strongpoint that can be of help to other countries considering such a research approach.

3.3. Desk Research.

The data collection was performed with the help of scientific publications on Single Window and data models, professional literature, policy publications, and laws and regulations. This first step helped understanding how the concept of Single Window has been developed and described into laws and regulations of different governmental bodies and agencies. The literature study has been necessary to set clear boundaries in terms of scoping the research and be able to answer the research question. Online literature, legislation, white-papers and internet websites have been analyzed and were, too, of need as sources to base the research on. The goal of this first step in the research as a method, was to get a clear and in-depth view on what a Single Window should deliver, and which data models are being used, and what purposes were to be met.
The literature consulted was found online in a range of websites of institutions like the World Trade Organization (WTO), the World Customs Organization (WCO), United Nations Economic Commission for Europe (UN/ECE), and the affiliate websites of the European Union (EU). This first cohort of websites set the basis for this research, in relation to understanding the concept of Single Window and data models. Hereafter, policy documents and websites of national authorities of the government of the Netherlands were reviewed, in order to get a good understanding why, who, and how the Single Window solution should be developed and implemented into the Dutch situation.

Next, the research investigated what data models are being used in the world, the European Union, and specifically in the Netherlands. Some examples of these websites are of the Ministry of Infrastructure and Water Management, which is responsible for the development and implementation of the Maritime Single Window (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010), or the website of the Customs Administration of the Netherlands. (Douane, 2018). Also, the national website on data modelling has been a source (Standaardisatie, 2020) in relation to clarify why (national) data standards are important.

3.4. Qualitative Interviews.

Next to the literature study and desk research methodology, qualitative semi-structured interviews with stakeholders and experts have been conducted. The interviews were based on an interview protocol with open questions, in order to achieve a clear understanding of the way the stakeholders and experts have handled the development and implementation of the concept of Single Window. This approach fits the nature of the explorative nature of this research. Different stakeholders within government agencies and Ministries on a policy and legislative side, as well as experts on an Information Technology (IT) side have been interviewed. The interviews helped to understand in which way they have contributed to the development and implementation of a Single Window solution. And more important, why standardization and harmonization of data models is of utmost importance.

The business-users also have been contributing to the interviews, and they were, too, experts on policy or legislative matters, as were they data model and IT-experts.
Interviewees of the Port Community Systems (PCS) of the port of Rotterdam and the airport of Schiphol Amsterdam have been interviewed. Furthermore, representatives of cargo

handlers and shipping agents in both the port and airport were amongst the group of Single Window users that have been interviewed.

3.5. Overview of Data Collection Activities.

The validation of the analysis for the research was performed through a three-track interview strategy. In the first phase, experts and stakeholders were interviewed on their expertise in relation to the concept of Single Window. The experts and stakeholders that have participated were drawn out of several different backgrounds; Customs officers with the role of policy advisors on different subjects such as enforcement, IT and information management. But also, program and project managers involved in the development and implementation of Single Window in the Netherlands. Policy officers from the Ministry of Infrastructure and Water Management and the Ministry of Finance, representatives of Port Community Services, a representative of the national organization for maritime Shipping Agents and one of the national organizations for Air Cargo.

The second phase scoped the research further towards data models that are being used in the development and implementation of Single Window. The interviews were held with other experts in the field of data models and data modelling. Some experts of Customs and policy advisors were interviewed, alongside with a policy advisor of the Netherlands Food and Consumer Product Safety Authority (NVWA) which is also the authority that is responsible for the Dutch Phyto-sanitary and veterinarian inspections. Finally, a representative of the branch organization for Software Developers.

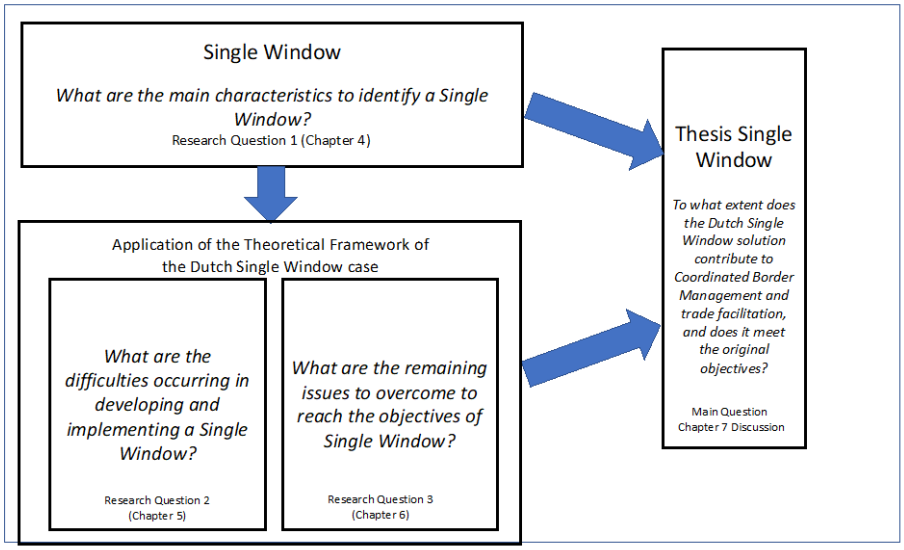
The third phase had the objective to investigate in-depth the historic build-up and clearly explain the evolution of the Single Window development in The Netherlands. Topics that are being investigated, like preceding developments on Single Window that might have played a role. Also, the eventual role key political stakeholders played. Further, to identify issues that have occurred during development and implementation, and how these have been resolved. The role of international and European Union influences that could have played a role in the development in The Netherlands. And describe what successes have been achieved and why they have been achieved, and do they contribute to the objectives.

In order to investigate other developments of Single Window, the interview protocol has been sent to representatives of both businesses and governments as well as of the EU Commission (TAXUD), WCO and the UN/CEFACT. The interviews have been conducted in the period of January till July 2020, transcribed and then analyzed, with the purpose to investigate how the processes were managed during the development and implementation of Single Window in The Netherlands.

In figure 1 on Research design, it is visualized in which way the thesis is being built-up. First, the theoretical framework is set, by giving insight in current views on Single Window, based on literature study. This will be explained in Chapter 4 and will answer research question 1. Next, in Chapter 5, the development process of a Single Window solution in The Netherlands is explained. On the basis of practical findings and on opinions of experts and stakeholders, research question 2 will be answered. Which effects the Single Window development has on Coordinated Border Management and Trade Facilitation, will be described in Chapter 6, answering research question 3. In Chapter 7 the lessons learned are being handled with,

providing insight on which key decisions were made and alliances were established. And why this research is interesting for other countries to use and use this as a template for their own research on analyzing their Single Window solution. Combined, these chapters will give a solid insight in whether the application of the theoretical framework in The Netherlands have been successfully established. In this way, the main and sub research questions will be answered and discussed in Chapter 8, Discussion. In Chapter 9, the contributions and limitations of this research will be handled.

Figure 1 Conceptual Framework and Visualization on the Research Design Single Window



Chapter 4. Current International Views on Single Window.

4.1. Introduction.

In the next paragraphs in this chapter, there will be given an extensive insight on different views on Single Window, Coordinated Border Management and trade facilitation. Inter-governmental organizations (IGO's) have described in their publications how these concepts have to be defined. The purpose of this chapter is to give an answer on research sub-question 1: *What are the main characteristics to identify a Single Window?* Based on desk research and literature study, this chapter provides for a basis on which this thesis is being built in order to answer the main research question.

4.2. Single Window.

In order to define what a Single Window is, and what the philosophy behind the concept is, this section describes the historic development thereof. This is necessary to get a clear understanding of the reasoning behind the concept, the purpose and the goals, and how this translates into national and even regional legislation and practical developments throughout the world. This will give way to the definition given by several international institutions. The next individual paragraphs describe the definitions given by the different IGO's, such as the United Nations (UN), the World Trade Organization (WTO), and the World Customs Organization (WCO). In their publications they have stated how Single Window is to be defined.

4.2.1. United Nations.

The path that has been chosen in developing a better trade facilitation, and a certain way of coordinating border management, has been the concept of Single Window[11]. The idea behind this concept is that trade related information and/or documents need only to be submitted once at a single-entry point (UN/ECE, 2004). To assist governments and trade in planning and establishing a Single Window facility for international import, export and transit related regulatory requirements. If the information is electronically available, then this should be submitted also in this way, and once. Data simplification and standardization are very import in developing a Single Window solution (UN/ECE, 2013). In the document Terminology for Single Window and other ePlatforms (UN/ECE, 2017), it is recognized that the term Single Window has been used to describe various mechanisms and computer systems. Although the definition in Rec. No. 33 states that a Single Window is: *"...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 regulatory requirements. If information is electronic, then individual data elements should only be submitted once..."*

In this definition five key elements are to be identified:

1. *Parties involved in trade and transport;*
2. *Standardized information and documents;*
3. *Single entry point;*
4. *Fulfilling regulatory requirements; and*

[11] https://www.unece.org/uncefact/tfrecs.html

5. *Single submission of individual data.*

These five key elements will help to analyze whether these are incorporated in the Single Window solutions that are being handled with in this thesis. Hence, if one of the elements is not identified, it means it does not meet the requirements described in the definition and thus is not to be considered as a Single Window as such. Any other solution that does not meet the total of five key elements, is to be seen as so-called Other Collaborative Systems (UN/ECE, 2017). The following explains briefly what is understood as OCS's, stated in the Technical Note on Terminology for Single Window (v1) of the UNECE, UN/CEFACT. This policy document describes, still based on the definition of Rec.No.33, what a Single Window should at least consist of, and if not, how such a facility should be considered.

Examples of such are the *Single Submission Portal;* allowing traders to submit all of the information related to a specific activity in a single platform, but have no regulatory procedures to be met with, and may also not be the only portal within a market.
Or, the *Single Environment*; that brings together ICT systems that work collaboratively to aggregate data related to a transaction, to satisfy a regulatory requirement. But this is only part of a larger trade facilitation procedure and covers only the technical part. It can lead to a Single Window environment if compliance is met with the five key elements of Recommendation No.33.

The designation National Single Window (NSW) indicates that there is only one official solution and all government agencies involved in all cross-border activities, in relation to trade and transport, should participate in the framework set out in the Recommendations No. 33, 34, and 35. No other Single Window solution should exist within that particular economy. In practice, the Single Window system is established with an economic operator as the main user, and could co-exist in that same economy, each targeting a different type of economy. Examples of role designations are a Single Window for:

1. importers and/or exporters;
2. maritime carriers;
3. air carriers;
4. financial institutions;
5. etcetera.

As long as the five key elements of Recommendation No.33 are being met with within the Single Window economy. The 'economy' is best described as the environment in which a particular Single Window solution provides for its trade facilitation needs. It is, therefore, important to note that the economic operator, acting in any particular role, should not communicate with multiple Single Window systems for the same operation, if the official Single Window system coexist in that same economy. This could lead to a focus on administrative functions of it, rather than on the economic operator, that leads to communication with multiple Single Window systems. Hence, trade facilitation objectives will not be reached, something that contradicts to objective of reducing administrative burden and cost.

In the co-operation between Customs administrations and Other Government Agencies (OGA's), multiple government mandated Single Window solutions may affect the role an

OGA within one particular economy, when there is no convergence between the data that is being submitted to probable different Single Window solutions. Its result could be that a data gap is the origin of decreasing effectiveness of the OGA in its specific operation. Another strong indication that standardization and harmonization is important.

4.2.2. World Trade Organization.

At the end of 1994, the former General Agreement on Tariffs and Trade (GATT) has been transformed into a new organization, called the World Trade Organization (WTO). The WTO also created a new branch, extending the old GATT mandate with trade services and intellectual property, on top of the already existing trading in goods activities. One of those trade services is the development and installment of trade facilitation activities.

This eventually has resulted in the so-called Protocol Amending the Marrakesh Agreement Establishing the World Trade Organization, of the General Council (WTO, 2014). In the Protocol is described what should be done in order to establish a Single Window. Article 10, paras 4.1 and 4.4. are particular interesting on what it means:
"*Members shall endeavor to establish or maintain a Single Window, enabling traders to submit documentation and/or data requirements for importation, exportation or transit of goods through a single-entry point to the participating authorities or agencies. After the examination by the participating authorities or agencies of the documents and/or data requirements, the results shall be notified to the applicants via the single window in a timely manner"* (WTO, 2014). The definition of the WTO is a more advanced notion of Single Window than the one in Recommendation No.33, since it suggests a trade facilitation item called status information. The objectives in this definition shall also be achieved with the use of information technology (IT) supporting the Single Window. That includes not only submission of data once and re-use by all government agencies, but also return via the same single-entry point.

The development of National Single Windows has been proved very helpful to maximize benefits in the cross-border exchange of electronic data on an individual level. But it still lacks a solid and smooth co-operation between other National or even Regional Single Windows, in order to facilitate trade and reduce administrative burden and cost (UN/ECE, 2017). This should be covered with the development of the interoperability between two or more electronic Single Windows, in different countries or economies, or regions.

4.2.3. World Customs Organization

The World Customs Organization describes (WCO, sd) in an info sheet that a Single Window is defined as "*a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfill all import, export, and transit related-related regulatory requirements"*. Where it is also stated that a Single Window should be recognized as a trade facilitation in its essence.

For the WCO a Single Window is seen as a trade facilitative measure, where traders or transporters submit all the data needed for determining admissibility of the goods in a standardized format only once to the authorities involved in border controls and at a single portal. The Single Window concept allows authorities to manage the Single Window and to ensure that the OGA's are either given access to the information or are actually given the

information by the managing authority. The trader or transporter do not submit the same data to several different border authorities or agencies any longer.

The WCO encourages the use of standardized data sets and ICT, in order to enjoy the full benefit of Single Window. And agencies that have been identified throughout the established Coordinated Border Management, should determine the essential and right amount of data necessary to their specific needs.

4.2.4. The Single Window in EU perspective.

In the European Union, the birth of the Single Window concept goes back till 2008, when the European Commission initiated the Decision No.70/2008/EC (Commission, DECISION No 70/2008/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 January 2008 on a paperless environment for customs and trade, 2008). From that so-called e-Customs Decision, the legal basis was set. Parallel to this development, another Directorate General (DG) in the EU started with its own initiative (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010) to ensure safety and security, competitiveness and efficiency, but this is limited to maritime transport on sea and inland waterways.

It says: "*For the facilitation of maritime transport and in order to reduce the administrative burdens for shipping companies, the reporting formalities required by legal acts of the Union and by Member States need to be simplified and harmonized to the greatest extent possible*. With the *efficient use of electronic data transmission and information exchange systems"*.

Aiming to reduce administrative burden on ships by digitizing the information exchange between businesses in maritime affairs at the one end and government agencies at the other end of the Single Window. The specific addition of 'maritime' signifies that the Directive 2010/65 should only be implemented for this purpose.

This give rise to the question in how to develop this, since for example, the Directive 2010/65/EU (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010) gave way to the development of many national Single Windows within the European, and therefore, Customs Union. This particular Directive was issued by a Directorate General of the European Commission (i.e. DG MOVE) that is involved with transport and mobility, and in principle not with Customs matters. Considering this, it can be argued that this would contradict with another development of another Directorate General of the European Commission, that is Taxation and Customs Union, or, TAXUD. This DG is still in the process of developing a paperless environment for Customs and trade (Commission, DECISION No 70/2008/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 January 2008 on a paperless environment for customs and trade, 2008) the so-called European Union Customs Single Window environment. What are the consequences of these separate developments in relation to the essence of the concept of Single Window and reduction of administrative burden and enhancement of trade facilitation? How does these developments influence the decision making and implementation of the national Single Window in the Netherlands? In

chapter 5 an extensive overview will be given on the approach, the development, and the implementation of the Single Window concept in the Netherlands.

4.3. Coordinated Border Management.

The definition of the World Customs Organization (WCO) for Coordinated Border Management (CBM) refers to *"the coordinated approach by border control agencies, both domestic and international, in the context of seeking greater efficiencies over managing trade and travel flows, while maintaining a balance with compliance requirements"* (WCO, 2015). Other organizations call the same principle Integrated Border Management (EU), Collaborative Border Management (World Bank), Comprehensive Border Management (OSCE), and Border Agency Coordination (WTO).

But the common denominators are that three key aspects are important to understand. There should be co-operation at a *local*, or *national*, level, between all the different border inspection agencies. For example, Customs, Phyto-sanitary, veterinarian, and border control agencies. Next, there should also be co-operation between *neighboring* states, such as co-operative management of common border crossing, and the organization of joint inspections or patrols. And lastly, co-operation on *multinational* level, aiming on the enabling of a more efficient approach to common fields of work in a particular region (such as the EU) or even globally. This would be, for example, between the EU and ASEAN entities, that co-operate to establish a form of CBM by recognizing their AEO programs, a start of the principle: 'your export is my import'.

The relationship between CBM and a Single Window environment is best described as the electronic realization of the first by means of the second, being an *intelligent facility*. It is not just an electronic portal enabling facilities, it is all about shared smart services provided to users. These include data submission, computation of duties and taxes, coordinated risk management, between for example Customs and veterinarian or phytosanitary inspectorates. And shared operational controls, like joint inspection facilities, and integrated inter-agency business process and workflows.

4.4. Trade Facilitation.

Businesses encounter numerous administrative obligations when moving goods from buyer to seller throughout the world. Many procedures in relation to Customs, industry service providers, in supply chains, on processing of data and transporting goods have to be handled with. It is recognized both from a governmental and commercial point of view that this is in fact a huge burden on trading goods. The World Trade Organization (WTO) has come to the Agreement (WTO, 2014) with its members on 22 February 2017, that trade should be facilitated with the help of simplification and standardization, modernization, and harmonization of import and export processes. The simplification of paperwork will help to reduce the administrative burden and cost for both businesses and governments.

The modernization is foreseen in the way data is exchanged and documented and trade procedures work (Zaki, 2013). Whereas Grainger (Grainger, 2011) looks at how procedures and controls can be governed more efficient in relation to the movement of goods across national borders and reduce trade associated cost burdens, while still meet regulatory objectives, meaning compliance and law-abiding. To make cross-border trade more efficient,

according to Persson (Persson, 2012), facilitation should start with taking out cumbersome procedures. Examples of such are documentation requirements are not harmonized or standardized, the regulations are not transparent, or, excessive delays at borders occur increasing total cost for businesses. These are definitions on trade facilitation from a business perspective.

When it comes to international organizations, definitions on trade facilitation do not differ that much, except on details. Whereas for example the Asia-Pacific Economic Co-operation (Bayhaqi, Kaur Sing, Zhang, & Duval, 2019) sees trade facilitation narrowed down as the simplification and rationalization of Customs and other administrative procedures, hinder, delay or increase cost of moving goods across international borders. The European Commission (Commission, European Commission, Taxation and Customs Union, Customs, 2020), however, broadens trade facilitation to simplification and harmonization of international trade procedures, with all import and export procedures. This means that it should enhance also coordinated border management. The International Chamber of Commerce (ICC, 2020) describes it that trade facilitation should encompass all improvements in the efficiency of the processes associated with trading in goods across national borders. What is understood with 'all improvements' is not made clear.

When it comes to policies and measures to take, the Organization for Economic Co-operation and Development add these components to the definition of trade facilitation. (OECD, 2019). These are a specific set of measures streamlining and simplifying the technical and legal procedures in relation to goods that are exported or imported in international trade. It covers, though, all border procedures, such as the electronic exchange of data about a shipment, and specifically, to the harmonization and simplification of trade documents.

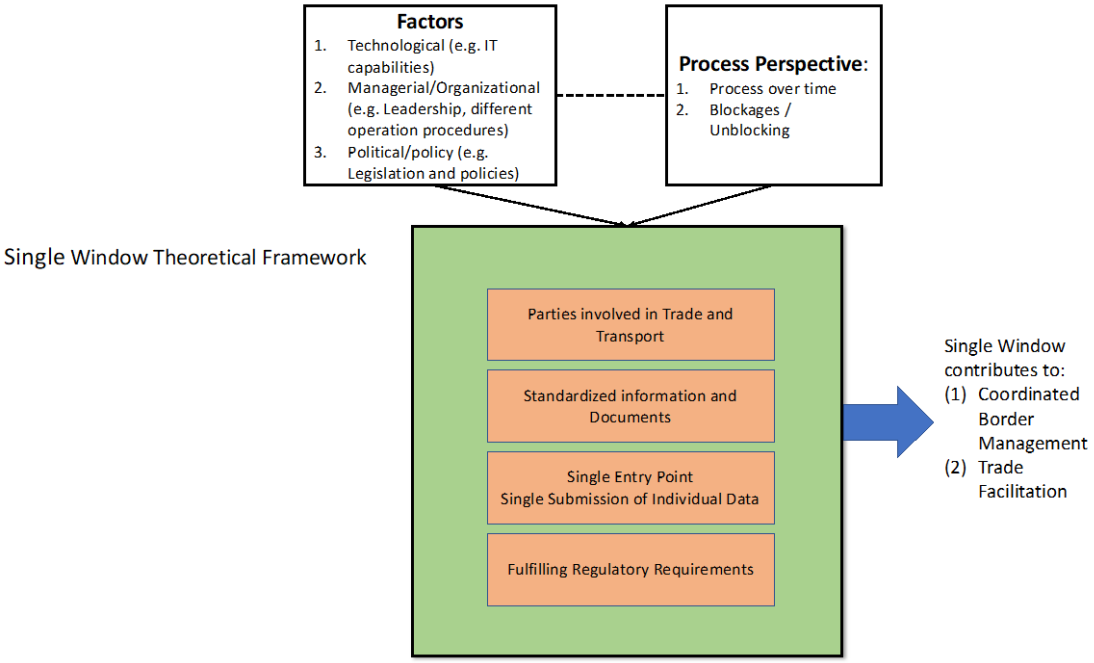
Both the United Nations Economic Commission for Europe (UNECE) and United Nations Conference on Trade and Development (UNCTAD) embrace the simplification, standardization and harmonization of procedures, where transparency is sought, and predictability is aimed for in the movement of goods between a buyer and a seller.

Global trading is changing very rapidly, due to falling tariffs, less transport and communications costs, and rising markets in Least Developed Countries (LDC's) are some notable reasons why trade should be facilitated. The world trade is highly interconnected, and the economy increases alongside. Still it is struggling to fully overcome the global financial crisis of 2008. Any reduction of trade costs will provide for a significant upward movement benefitting global economy (WTO, 2015).

4.5. Single Window Theoretical Framework.

To be able to analyze whether a certain solution can be identified as a Single Window defined by the UN, this research proposes the following conceptual framework. In figure 2 the theoretical framework for a Single Window is visualized. The five key elements identified by the UN out of the definition on Single Window *(UN/ECE, 2004)* and *(UN/ECE, 2017)* are at the center of the framework. Whereby two items are joined together; Single Entry Point and Single Submission of Individual Data, those are interrelated and often entwined.

Figure 2 Single Window Theoretical Framework



The sharing of information within and between organizations is very important, and key for an efficient and effective co-operation. There is a distinction between three layers of information sharing in public organizations *(Yang & Maxwell, Government Information Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011)*. The first is *interpersonal information sharing*, that encompasses the sharing of information between individuals. The second is *intra-organizational information* sharing, whereby information is shared within groups in organizations. The *inter-organizational information sharing* is the third variation, that will be used in this research. The study of Yang and Maxwell *(Yang & Maxwell, Government Information Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011)* identifies three levels of perspectives. To be able to identify which *barriers* had to be overcome, or, *drivers* and *enablers* that helped in the development, there are a number of factors which can contribute to sharing of information between organizations *(Yang & Maxwell, Government Information Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011)*. These factors are in perspective of *technological, managerial or organizational, and political or policies* points of view. In table 1, all factors are logically displayed, based on the research of Yang and Maxwell, especially on inter-organizational information sharing.

The table will be used in Chapter 6 in order to identify which factor relates to either the category *barriers, drivers,* or, *enablers*, suited for this case study. The *barriers* refer to factors

that oppose the voluntary and mandatory information sharing between businesses and government. The mandatory part comprises of the lodging of Customs declarations in the Single Window solution. While *drivers* relate to factors that, in contrary to the barrier factors, help to engage the voluntary information sharing between businesses and government. Lastly, also a number of factors help to *enable* the voluntary business-government information sharing.

Table 1 Factors adopted from Yang & Maxwell, 2011

Technological perspective	Organizational & Managerial Perspective	Political and Policy Perspective
• Heterogeneous hardware, Software, and Information Systems	• Organizational Boundaries of Bureaucracy	• Legislation and Policies
• Information Security	• Different Geographical Areas	• Information as Power and Authority
• IT Outsourcing	• Different Origin, Values and Cultures	• Partisan Dynamics in Government Agencies
• IT Capabilities	• Different Operation Procedures. Control Mechanisms and Workflows	• Public Scrutiny and Performance Evaluation
	• Lack of Experience (don't know the benefits)	
	• Competing Interests / Self Interest	
	• Resistance to Change	
	• Concern of Losing Autonomy	
	• Concern of Losing Valuable Assets and Completive Advantage	
	• Concerns of Information Misuse by Other Organizations	
	• Concerns of the Quality of Information Received	
	• Incentives and Rewards	
	• Comparisons of Risks and Rewards	
	• Leadership	
	• Negotiation and Commitment Development	*(Factor adopted from Yang & Maxwell, 2011)*

4.6. Conclusion.

This Chapter explained the theoretical views on the concepts of Single Window, Coordinated Border Management and trade facilitation, based on definitions prescribed by IGO's, such as the UN, WTO and WTO. In this way, the research sub-question (1): *What are the main characteristics to identify a Single Window?* can be answered. The United Nations have issued a number of Trade Facilitation Recommendations, of which Number 33 specifically describes what a Single Window should consist of. The five key elements drawn out of the definition must be identified when developing and implementing a National Single Window solution. Any other solution, lacking one of the five key elements, are not to be considered as Single Window but are best described as Other Collaborative Systems (OCS). The Single Window solution can be developed within the same economy, such as importers and/or exporters, maritime carriers, air carriers, financial institutions, etcetera.

For traders it is important to have a single-entry point to submit their data to authorities to fulfil regulatory requirements and the information should be re-used by all government agencies, and it must be resubmitted via the single-entry point in return to the trader. The WCO focuses on the trade facilitation factor a Single Window provides for, based on a standardized dataset to exchange information.
In the European Union the development and implementation of Single Window as a trade facilitation concept, is limited to the maritime sector, since the Directive 2010/65/EU came into effect, initiated by DG MOVE. The Customs Directorate, TAXUD, is still in the process of developing a paperless environment for Customs and trade; the European Union Customs Single Window.

Coordinated Border Management is to be seen as the foundation on which trade facilitation can be built, with the help of an instrument called Single Window.

In the next chapters this research investigates how theoretical assumptions and starting points are being translated into practical outcomes and results. What are the barriers to overcome, which drivers helped to develop and implement, and how enablers were able to establish interoperability in information sharing between government and businesses?

Chapter 5. Single Window in The Netherlands.

5.1. Historical overview of SW developments in the Netherlands

In the next paragraphs, it will be explained in which way the Netherlands has developed and implemented the (National) Single Window, which parties have been involved and how the co-operation has been established between stakeholders. The aim of this chapter is to provide an historical overview of the developments on Single Window in The Netherlands. This is being done with the help of a timeline giving insights on what has been developed at what time and by whom. Which key steps have been taken, which organization did exactly what and who was at what time in the lead? Next to this, identify the key, barriers, drivers and enablers, as identifying probable occurring blockages and in what way these blockages have been overcome. This chapter provides the answer on research sub-question 2: *What are the difficulties occurring in developing and implementing a Single Window?*

5.2. The Single Window Process in the Netherlands.

In this paragraph, the process of the development of the concept of Single Window in the Netherlands is described. First, the regulatory developments are being handled in subparagraph 5.2.1. Then the stakeholders involved will be displayed, and the dynamics that emerged when parties began to co-operate in subparagraph 5.2.2. The standards that have been considered will be handled in subparagraph 5.2.3. According to the UN Recommendation No.33 (UN/ECE, 2004) (UN/ECE, 2017) five key elements are to be met with when a Single Window is considered. Two of these elements are the Single-Entry Point and Single Submission of Individual Data. Between the two there is a certain dynamic interaction, which is being handled in subparagraph 5.2.4. To end this paragraph, there will be given a reflection with the help of the factors that are described in Chapter 4, ending subparagraph 5.2.5.

5.2.1. Regulatory Developments on Single Window.

One of the earliest developments in the sharing of government-business information was the initiation of the European Economic Council Directive 93/75/EEC, prescribing *minimum requirements for vessels bound or leaving Community ports and carrying dangerous or polluting goods* (Commission, COUNCIL DIRECTIVE 93/75/EEC of 13 September 1993 concerning minimum requirements for vessels bound for or leaving Community ports and carrying dangerous or polluting goods, 1993). The exchange of data should be done electronically between vessels and shore-based installations, and a competent authority had to be designated to coordinate and to receive the information. Important to note is that since this is a European Economic Council issued Directive, all Member States (at that time) have to develop and implement such provision. How this is achieved, the individual Member State can pursue it on its own terms.

It was in 1997 when important progress was made, described in a letter and presented by the Secretary of State of the Dutch Ministry of Internal Affairs to the House of Representatives. In this letter the importance of Information and Communication Technology (ICT) was endorsed by initiating the so-called National Action Program for an Electronic Highway (NAP) for the Netherlands. One of the projects within the overall program concerns the enhancement on government services towards businesses, and

society as a whole. The project Government Counter 2000 *(Overheidsloket 2000)* (Overheid.nl, Tweede Kamer der Staten Generaal, 20 644 No.27, Informatievoorziening Openbare Sector, 1996) (Overheid.nl, Tweede Kamer der Staten Generaal, 20 644 No.32, Informatievoorziening openbare sector, 1997) has been aiming for better services between government agencies and businesses by means of one single, integrated, window.

The Directive 2002/59/EC (Commission, DIRECTIVE 2002/59/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 June 2002 establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC, 2002) was the next step in the digitization of information exchange between government agencies and businesses. It concerns the establishment of a Community vessel traffic monitoring and information system. Whereby the transmission of information on cargo must be sent electronically to the competent authority, and between the competent authorities likewise. The interconnection and interoperability of national systems must be ensured, according to the Directive.

It was in 2003 when the letter on Market Forces, Deregulation, and Legislative Quality of the Dutch Secretary of State of Economic Affairs (Overheid.nl, Tweede Kamer der Staten Generaal, 24 036 No. 275, Marktwerking, deregulering en wetgevingskwaliteit, 2003) was sent to the Dutch House of Representatives. In the particular letter it is described in what way the Dutch government should cleverly make use of ICT in relation to the exchange of information and data between businesses and government agencies. With the implementation of the program ICT and Administrative Burden 2003 – 2006 (*ICT en Administratieve Lasten*, ICTAL) the Dutch government aimed to achieve:

- Reduction of administrative burden for entrepreneurs;
- Improve the exchange of information between the government and entrepreneurs.

That goal is going to be achieved with the deployment of:

- Full-scale exchange of information and data by means of ICT throughout the entire chain between government and businesses;
- The development of needed infrastructural services, such as a Business counter, Government Transaction Portal (*Overheids Transactie Poort;* OTP[12]) and a Basic Registery for Businesses.
- The gradually merging and harmonization of information that different agencies require, in order to achieve that the entrepreneur should only submit its information once.

To make it possible to exchange information and data throughout the chain, from business administrations towards government administrations, certain basic services had to be created. At the one hand, this concerns infrastructural services in relation to electronic data exchange of transport and registration, on the other hand, it concerns services and applications that make use of the infrastructure. The infrastructure consists of the following services; the business counter, a virtual counter where businesses are able to be informed and receive information of the government as well as perform transactions – the

[12] https://www.persberichten.com/persbericht/50830/DigiNotar-moedigt-ontwikkeling-Overheids-Transactie-Poort-aan Note: the original website www.overheidstransactiepoort.nl is no longer active and available. Therefore, the link hereabove explains shortly, in Dutch, what this portal contains of and what it does.

government transaction portal; the entrepreneur submits its information to one address, safe and secure, and is being reused by any agency, such as the Netherland Food and Consumer Product Safety Authority (NVWA) or Border Control, that has interest – the basic register for businesses is one register service that make it possible for government agencies to identify businesses. The realization of the infrastructure in relation to the electronically exchange of information and data in this context was a very important step in the reduction of administrative burden (Arendsen, Bisterbosch, & Oskam, 2004). Due to progressing technical developments the OTP was migrated the newly named Digipoort[13]. The migration included the transition from old technology towards new technology for the purpose of exchanging of information.

The Directive 2010/65/EU (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010) was the starting point of the development of the Single Window concept in the European Union, and thus for the Netherlands. Ships arriving in and/or departing from ports of the Member States must report their formalities by means of electronic transmission of data, through a single-entry point. Simultaneously to the development and implementation of the Directive 2010/65/EU (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010), a national initiative was deployed, called *Single Window for Trade and Transport* (SWT&T 2014)[14]. Based on the newly installed cooperation between government and businesses, established in the *Neutral Logistic Information Platform* (NLIP)[15] in order to maximize the national competitive position, the idea was born to develop one digital entry point for trade and transport. The NLIP is part of the Topsector Logistiek[16], where the aim is to achieve a close public and private collaboration and a seamless exchange of data relating to the trade and transport sector. The NLIP facilitates the development of tools that enables the possibilities to digitize standards, agreements and contracts. And the unlocking of sources of data and entering into new co-operation between stakeholders. It was, like it is prescribed in UN/ECE Recommendation No. 33 and the WCO Compendium, under full responsibility of one strong partner.

In a formal letter sent to the Dutch House of Representatives (Verzijden, 2011), in May 2011, the vision on how to develop the Single Window in the Netherlands was described. The letter includes important first steps in the development of Single Window in the Netherlands. These are, formulation of the scope, the realization of the vision, and the description who will have the lead in the development. The scope was initially set to maritime, air, and inland-shipping modalities, with the possibility to extend this with more modalities in future.

[13] https://www.logius.nl/diensten/digipoort (only available in Dutch)
[14] Visiedocument Single Window Handel & Transport (*Vision document Single Window Trade & Transport*), 2014
[15] NLIP: https://www.nlip.org
[16] Topsector Logistiek: https://topsectorlogistiek.nl

The realization of the vision was then being formulated by a working group, on the basis of three agreements, all related to the program. First, the use of the single-entry point called Digipoort, functioning as the electronic post box, to be able to submit once an electronic data set to the government and this set is reused by Customs and other government agencies (UN/ECE, 2004). The NVWA is also a customer for the Digipoort facilitation, because this agency is also interested to automate its processes in relation to businesses and government. The second was the use of the so-called Supd@x (Supply Chain Data Exchange) functionality, whereby certain data is joined and made accessible for both government agencies and business. Supd@x was the IT-solution to redesign the import process of, at first, veterinarian goods. Later on, phytosanitary goods would be added to the process. This has not been realized, however, when it became clear that only one major stakeholder would be facilitated. The purpose of it all was to align the procedures and processes of the NVWA and the Customs Administration of the Netherlands, in order to decrease lead times and make administrations more efficient. Supd@x should provide for the exchange of information between the NVWA and Dutch Customs and the stakeholders in the supply chain. The last agreement concerns about the mandatory use of the WCO Datamodel (Standaardisatie, 2020). The latter was a major breakthrough and will be, therefore, explained in more detail in subparagraph 5.2.3. on Standards in the Dutch Single Window environment.

At first, the Ministry of Infrastructure and Environment was designated to be the leading organization. In a later stage the Customs Administration of the Netherlands became the leading executive organization in the development. The SWT&T initiative became a program, incorporating several projects. One of these projects concerns the development of a National Maritime Single Window (MSW), as said, based on the earlier mentioned DG-MOVE Directive (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010).

As all Single Window initiatives pursue, the Dutch version of the National Single Window aims to reduce administrative burden and cost for businesses, as well for government itself. The main difference with the Maritime Single Window Directive (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010), commonly known as the Reporting Formalities Directive (RFD), is that the scope of the development SWT&T did not end with the maritime modality, but all modalities were to be incorporated. These are air, transport and transit, rail, mail and packages, and even pipelines (e.g. oil and gas).

In the Vision document on SWT&T the As-Is situation was clearly described. A company that has to lodge a declaration to the government about one single movement of goods or transportation, is bound to do so towards many different agencies, electronically or, even, on paper. Whereby:

1. There are different timeslots companies have to comply with to fulfil regulatory requirements; This means that for the purpose of inspections, a business stakeholder should make different appointments with different government agencies for the same goods. This is very ineffective and inefficient.

2. The same data has to be submitted to different agencies, and even towards the same agency at different moments; The same goes for submitting the same data toward different government agencies, businesses experience this as a burden.
3. It is not unambiguously clear which data has to be submitted, what the exact meaning a data element has, and what format has to be used; Using different data models with different meaning of data elements in relation to the submission of declarations does not contribute to harmonization and efficiency in the supply chain.
4. Data is often structured differently, both in perspective of technical and functional formats; The same as mentioned in 3.
5. It is not clear how the communication has to be fulfilled, for example, in case of a little change, should a message be altered or submitted again all together? This means, should a declaration only be updated, or, completely replaced by a newly submitted one.

The To-Be situation in the Vision document was described into the following exactly like this stated three possible scenarios:
The first scenario (0) assumed that two items were to be developed; MSW and Supd@x for veterinary status information. The second scenario (1) expanded the development with air cargo and Supd@x with also phytosanitary goods. The third scenario (2) was the most extended Single Window, all modalities were to be incorporated, and services to businesses were, too, extended by means of pre-completed declaration and based on the principle of One-Stop-Shop (OSS).

5.2.2. The stakeholder dynamics in the Dutch Single Window environment historic development process.

The idea to establish a Single Window began at the time a European project, called Platina[17], on inland shipping was running, based on the advice given by 22 parties involved in different domains of infrastructure to the European Commission. Inland shipping is specifically aiming for the transport of goods by vessels on inland waterways. The project Platina consists of five activities and was, in short, aiming for the elimination of digital limitations. Those digital limitations evolved into thinking about harmonization between countries on the so-called river information service[18] (Commission, DIRECTIVE 2005/44/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community, 2005), consisting of reporting electronically, electronic geographical maps, and harmonization of those maps. Important achievements to develop were Electronic Reporting International (ERI), Inland Electronic Chart Display and Information System (Inland ECDIS), Notices to Skippers (NtS), Inland (AIS), and Vessel Tracking and Tracing (VTT). That was the basis for the first initial thinking of developing a Single Window solution.

Due to the formation of expert's groups, it came to light that if harmonization of inland shipping should be established, there should definitely be alignment with sea-going

[17] https://www.icpdr.org/main/activities-projects/eu-platina-project-platform-implementation-naiades

[18] https://ris.cesni.eu

maritime affairs and shipping. The idea was introduced to the European Commission by the Dutch Ministry of Infrastructure and Water Management and written in a proposal for legislation. Eventually, it led to the Reporting Formalities Directive (RFD), 2010/55/EU, which was essentially based on the Customs legislation that regulates all reporting formalities for Customs. This was the starting point of the Single Window approach, which was at that time under development for Customs purposes, but never succeeded to that date, but then became the domain part of the development of the MSW. At the same time, another Directorate General of the European Commission called TAXUD (Taxation and Customs Union Directorate General) is working on the development of a Customs Single Window solution. This is goods oriented, focused on Customs formalities, and involves stakeholders that deal with cross-border movement of goods. The preparatory phase (starting in 2010) concentrated on standard specifications based on the e-Customs Decision, relating to automated checks of validity of documents and licenses submitted with Customs declarations. It can be argued that these two Single Window developments were not aligned at that time.

It was in 2009 when the executive department of Rijkswaterstaat (at that time part of the Ministry of Infrastructure and Environment) participated in the European project on inland shipping. An interviewee represented the department in the project and states that the project consisted of different domains in infrastructure and aimed to achieve efficiency in digital limitations. However, the objectives to develop the Single Window inland shipping were not achieved. The thinking was that the approach on Single Window should be established on the front side for sea-going and maritime affairs and on the back end for inland-shipping. The Directive was approved by the Council of the European Union and had to be implemented. By means of the installment of an expert group, the first step was taken. This group received a budget to be able to develop and implement the Directive, and if possible, as harmonized as possible. One of the processes that proved to be difficult and proceeded slowly, was the agreement on which data standards must be used. A number of interviewees confirmed this by stating that the WCO Datamodel was not immediately accepted by every stakeholder and it was even discussed in the co-ordination counsel of SWT&T. To achieve this goal the so-called AnNa project[19] (Advanced National Networks for Administrations) was initiated, consisting of 14 member States that had participated. Two civil servants of the Dutch government were actively involved int the project. The project leader of AnNa was an employee of the executive department Rijkswaterstaat, the other an employee of the Dutch Customs Administration.

One of the first things that had been completed was the Masterplan, based on the idea on how to map all the data. An interviewee pointed out that the expert group AnNa had many discussions with another group, that should have been experts on data. But unfortunately had little real knowledge about data and had to be advised by EMSA[20] (European Maritime Safety Agency) on the subject. However, the same interviewee states, the innovation that came out of the AnNa project was the very basic start for the mapping of data based on the WCO Datamodel, a revolutionary step. This led to the dynamic setting where some conflicts emerged and discussions were held between EMSA, the AnNa project team, and the EU. In

[19] http://www.annamsw.eu/

[20] http://www.emsa.europa.eu/

the end, holding true to the idea to map the data based on the WCO Datamodel was proved successful, and for the first time a subject in the transport domain was joined with the world of trade and Customs domain. Hence, the starting point of the harmonization between Customs and trade and transport.

In the Netherlands there are several stakeholders involved in the development that is based on the Directive (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010) to establish and implement Maritime Single Window (MSW). This is one part of the national Single Window development and implementation. Since the Directive was issued from DG MOVE, the (current) Ministry of Infrastructure and Water Management, which is the successor of the former Ministry of Infrastructure and Environment, is formally the policy holder in the Netherlands. However, DG Taxud is formally the Directorate General responsible for taxation and customs affairs in the European Union. This distinction is important to acknowledge and understand, an interviewee pointed out, in relation to the explanation how stakeholders are dynamically interconnected. An interviewee responded on this, by stating that one of the reasons certain developments are not achieved or successful, due the so-called *"silo thinking of Directorates General in the European Union".*

The department of the Ministry of Infrastructure and Water Management, called Rijkswaterstaat[21] has the executive mandate for the execution of the RFD. As part of a looming Coordinated Border Management, Rijkswaterstaat, border patrol[22], the Royal Netherlands Marechaussee[23], the National Competent Authority/Safe Sea Net[24] (NCA/SSN), and the Customs Administration of the Netherlands[25] were engaged in a full-scale co-operation to develop and implement the MSW according to the Directive, as joined government agencies. Dutch Customs was asked to perform the implementation because of their extensive IT landscape and very advanced IT capabilities and software experts, being at the central focal point in cross-border trade and transport, and because of the largest volume of declarations and data of all Member States in Europe. One interviewee claims that due to the parallel development of the SWT&T and the head start this gave, the involvement of Customs in MSW was made easier. It was only logical to develop and implement it like this, because Dutch Customs by far has the largest stream of declarations and data. If this had not been the case, Customs would not have been the major contributor, and it would be likely that a smaller part was being developed for Customs purposes.

In the SWT&T program a number of stakeholders were involved, both from businesses and government agencies. Chaired by a Dutch Customs officer, the program also consisted of a

[21] https://www.rijkswaterstaat.nl/english/index.aspx motto: Working to make the Netherlands safe, secure, attractive and accessible for all.
[22] https://english.defensie.nl/organisation/marechaussee

[23] https://english.defensie.nl/organisation/marechaussee and https://www.politie.nl/themas/zeehavenpolitie.html as part of the Port of Rotterdam.
[24] http://www.emsa.europa.eu/
[25] https://www.belastingdienst.nl/wps/wcm/connect/bldcontenten/belastingdienst/individuals/abroad_and_customs/abroad_and_customs

special counsel to co-ordinate between all stakeholders. Next to this, the directional steering group was installed with the purpose to handle the planning and follow all developments, populated by sitting directors-general of different government departments, and people involved in trade, as a co-operation between government and trade. Initially, all modes of transport should have been developed within SWT&T, but to this day, only the maritime and air cargo modalities are incorporated in SWT&T. Discussions were held on the design, and questions like "*are we going to install a government platform?"* or *"do we co-operate with port community systems?"* were asked. An interviewee states that at that time the relationship with the different PCS's were not at its best, and, for example, the Port of Rotterdam was not enthusiastic about the development. The argument was that the maritime PCS, Portbase, already functioned as a sort of Single Window solution. In the end, Rijkswaterstaat argued that the design and development lie within the mandate of the Ministry, and therefore, the government should be in the lead. Later on, the question on the design was also determined alongside the development and installment of the Digipoort, and the joining of the Customs Administration of the Netherlands, too. The participation of Portbase also was established and all efforts delivered the Graphic User Interface (GUI). It was, however, not incorporated into the government domain but strictly limited to be used by Portbase.

Other important stakeholders in the technical development of a Single Window are the so-called Port Community Systems (PCS). The PCS is a neutral and open electronic platform enabling the intelligent and secure exchange of information between public and private stakeholders, and it optimizes, manages and automates ports and logistics efficient processes through a single submission of data and connecting transport and logistics chains (Morton, 2011). This is a strong example of how an institution like a PCS, sets a vision concerning trade facilitation, using a Single Window as a community undertaking and a strong leading body to promote the benefits. This can be achieved with the help of political support and an appropriate project-centric organization.

In the Netherlands, the development of the Maritime Single Window (MSW) has been executed by the Customs Administration of the Netherlands, under supervision of the Ministry of Infrastructure and Water Management. There are two large PCS's to identify in the Netherlands, and they handle different modalities as well. For maritime, Portbase is the main contributor in the development of the national Single Window for maritime and air, as is the PCS Cargonaut of Schiphol Airport for the air cargo version in their particular role as port community service providers.

Based on findings from the qualitative interviews, the difficulty in developing a Single Window starts with asking the question: what does it mean to develop a Single Window, what does it produce, and what must be done to realize it? For example, for one interviewee, the Directive (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010) was the real enabler that came at the right moment to start a Single Window development. Every stakeholder was forced to think more structured, what is needed to be done, and what deadlines could be set. In Chapter 6 and in Annex II, this will be elaborated further, whereby the framework of Yang and Maxwell is being used to analyze the historical findings.

5.2.3. Standards in the Dutch Single Window environment.

The Revised Kyoto Convention (RKC) of the WCO is the blueprint for the modernization of todays' Customs administrations throughout the world. It aims for non-intrusive control through data driven risk management, while reducing the arrival process with the help of advanced electronic information, paving the way towards post clearance auditing. To be able to achieve these objectives, the use of international standards for data requirements is very important, and the first and foremost step to take.

This subparagraph investigates which data models exist. When there are several different data models identified, is it necessary to harmonize if the data elements are not standardized? What is used within the European Commission by the different Directorate Generals (DG's) in relation to data models? Which data model is being used in the Netherlands? The harmonization of (Customs) procedures is not in scope for this thesis, but some basic background information will be provided.

The text of the RKC, about the simplification and harmonization of Customs procedures, contains of five chapters and twenty articles. In the general Annex to the protocol, ten chapters, ten special annexes and nine specific Annex Guidelines are described. Of which the following are used in order for standardization.

These are the Articles 3.11, 7.2, 3.18 and 3.21 of the RKC, saying that:

- *The use of UN Layout Key and for automated Customs clearance processes;*
- *The format of the electronically lodged Goods declaration shall be based on international standards for electronic information exchange as prescribed in the Customs Co-operation Council Recommendations on information technology*;
- *When introducing computer applications, the Customs shall use relevant internationally accepted standards;*
- *The Customs shall permit the lodging of the Goods declaration by electronic means* (WCO, 2008).

It should be evident that these requirements have been implemented in the European Union and in the Netherlands. The legal text of each annex is accompanied by these Guidelines, of which those texts are not binding upon the so-called Contracting parties. It is a set of explanations of provisions which indicate some of the possible courses of action to be followed in applying the Standards.

The ideal situation in future is that all government agencies operate as one, based on standardized and harmonized exchange of data and information. It is necessary to use data models; the data must be constantly fully available and actual. The general idea is that when this is achieved, enforcement and supervision will be possible. The National Platform Data Model (NPDM), as part of Logius, which is the national institution for a Digital Government, has made it national policy to use the WCO DM as the standard (Forum, 2020) (Verzijden, 2011). Logius is the digital government service of the Netherlands Ministry of the Interior and Kingdom Affairs[26]. There is a relationship between Logius and other Dutch government

[26] https://www.logius.nl/english

agencies and Ministries. For example, the Netherlands Ministry of Infrastructure and Water Management, since Logius provides for the digital government service, e.g. Logius provides for the Digipoort service, of which the other government agencies (like executive branch Rijkswaterstaat) purchase the service.

The WCO DM must be used in the Netherlands for the exchange of all information concerning cross-border movements of goods, persons and transport means, relating to formalities on storage, arrival, import, transit, export, departure, and bringing into free circulation. Eventually, an interviewee states, the WCO Datamodel was adopted by all parties. Dutch Customs had worked on a data model based on the specifications of the UN/CEFACT, responsible for the development of the WCO Datamodel. In the period of 2009 and 2010 a new Customs import declaration system was in development and this was based upon the WCO Datamodel, which gave leverage to use this as mandatory and made it possible to further standardize.

Based on the Directive 2010/65, which was foreseen to be implemented no later than 2015, first the Maritime Single Window (MSW) project was incorporated into the Single Window for Trade and Transport (SWT&T) program. The MSW project uses the data model of the WCO, which is also accepted as the data model in the EU, since its compatibility with the development the European Union Customs Data Model (EUCDM) was established (Commission, European Commission Taxation and Customs Union, EU Customs Data Model (EUCDM), 2019). The European model is suited for use in trans-European systems such as NCTS (New Computerized Transit System), AES (Automated Export System) and ICS (Import Control System), and also for the use of national Customs clearance systems existing within the EU member States. The data model is seen as a technical instrument, providing the modelling of data requirements that are funded in the EU Customs legislation (Commission, European Commission, Taxation and Customs Union, EU Customs Data Model, 2019) and at the same time make it possible for national Customs authorities to develop new IT systems to their own needs.

Businesses provide the data to Customs authorities, in the many different declarations and notifications they have to comply with according the EU Customs legislations, and at the same time provide for as the foundation for the EUCDM. In the Union Customs Code (UCC) and the Delegated Acts (DA's) and Implementing Acts (IA's), the requirements, formats and codes can be found in the Annex B (Commission, Commission Delegated Regulation (EU) 2015/2446 of 28 July 2015 supplementing Regulation (EU) No 952/2013 of the European Parliament and of the Council as regards detailed rules concerning certain provisions of the Union Customs Code, 2015), in an extensive legislative overview on how the data set and requirements translate to what is called the data requirements table. The EUCDM is fully compatible to the WCO DM, according to their own statement, since the mapping of the data requirements of the EUCDM has been conducted based on the WCO DM. This has been achieved by linking the data elements of the EUCDM with their corresponding data elements of the WCO DM. It has been stated that the EU Member States may complement the EUCDM for their own national purposes.

It was decided in the project to not use only maritime as modality, but also air, which enables the use of messages in the Entry process for Customs purposes. The so-called Entry Summary Declaration (ENS)[27] is incorporated in MSW, according the Annex to the Directive[28], where it states in the list of formalities referred to, that, under 6, the ENS shall be provided for. This development has led to the implementation of the MSW in the Netherlands into the so-called Single Window for Maritime and Air (SWM&A)[29].

The messages that are being sent via the SWM&A are the FAL1 – 7[30] messages, which are displayed in table 2, as follows:

Maritime: To Customs; Entry, Exit, Provisions, Bunkering, pre-notification of the entry or exiting of a ship/vessel, Customs declaration in relation to goods, Ship's stock, provisions.
To Border control; pre-notification of the entry or exiting of a ship/vessel, persons boarded the ship/vessel.

Air cargo: The same as maritime but specified with the pre-notification of arrival of an aircraft, notification of arrival of an aircraft and the Customs declaration in relation to goods.

FAL form #	Explanation
1	IMO General Declaration
2	Cargo Declaration
3	Ship's Stores Declaration
4	Crew's Effects Declaration
5	Crew List
6	Passenger List
7	Dangerous Goods

Table 2 FAL Form http://www.imo.org/en/OurWork/Facilitation/FormsCertificates/Pages/Default.aspx

The new European Maritime Single Window environment (EMSWe)[31] repeals the Directive 2010/65/EU and stating that reporting obligations shall be done in electronic format, via a Single Window in order to facilitate maritime transport. This should be further simplified and harmonized, based on the existing National Maritime Single Windows, in the Netherlands developed as the SWM&A, constituting a comprehensive reporting entry point, performing the functionalities of data collection and data distribution to all relevant competent authorities. The SWM&A is, as stated before, part of the overall program Single Window for Trade and Transport (SWT&T). A comprehensive EMSWe data set covering all information

[27] Article 127 UCC: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0952&from=EN

[28] List of Reporting Formalities Referred to in this Directive: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:283:0001:0010:EN:PDF

[29] https://www.belastingdienst.nl/wps/wcm/connect/bldcontenten/belastingdienst/customs/reference_books_and_other_information/single-window/

[30] http://www.imo.org/en/OurWork/Facilitation/FormsCertificates/Pages/Default.aspx

[31] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R1239&from=EN

elements, while the National Single Window shall accept this particular data set without any modification.

Another successful innovation in the government domain was the development of the so-called Message Implementation Guide (MIG), that is based on the WCO Datamodel. The MIG became leading in the development of the IMO (International Maritime Organization) Compendium and the subsidiary FAL Committee, and therefore, the data elements for Single Window for the IMO. An interviewee claims that the use of the WCO Datamodel and the mapping are the two most strategic and fundamental choices that have been realized. At the same time, the Hinterland on inland shipping was not a success, since the mapping of this modality proved to be a bridge too far. This means that the mapping, or harmonization, of all inland shipping data elements to the WCO Datamodel could not be reached and therefore the connection to the MSW could not be established. It could be argued, the interviewee states, that the value of a Single Window can be debated, since the back end has not been realized. On the one end there was the opinion of the EMSA and Commission, that Single Window should be some sort of central database perspective, where data is being stored and sent to. The other end has been advocated by the AnNa project group, that this Single Window solution is not much more than a digitized post box. The difference between a centralized data base solution and a digitized post box solution is the first option provides for exchange of data between EU Member States. The latter one is less advanced, since this only provides for exchange of data between government authorities within an EU Member State. The technical solution that makes it possible to fulfil the obligation to submit your information once. Behind the portal, the information is being sent to the right authority and reused where possible.

5.2.4. Single-Entry Point versus Single Submission of Individual Data.

The third and fifth key element identifying a Single Window are closely related. A single-entry point has to be established in order to electronically exchange information in the first place. In the strategic vision document on Single Window Trade and Transport it has clearly been described that at the one hand a separate development had to be established; the Digipoort. This development provided for a new way of exchanging information from businesses to the government in relation to logistics and goods. The development of the Maritime Single Window (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010) was also to be done in this development. The other development related to Supd@x, which is about delivering status information based on the single submission of individual data, whereby government agencies are able to reuse the data and, based on their findings, could resubmit status information about a certain shipment.

An interviewee states that, for example, shipping companies only have to submit once their information in the SWM&A, whereby after the submission the Single Window pushes the data towards to correct government agency. But things like returning status information, is to the knowledge of this interviewee, something that goes beyond the Single Window. A distinction must be made between decisions on regulatory requirements and decisions on certain events. This means that providing a message that a shipment is released for further transport, is one. But a development like the Container Release Message (CVB) is to be seen

as status information of an event and is an upgrade. It goes further than legal or regulatory requirements and what is laid down in the UN Recommendation No.33 (UN/ECE, 2004) on benefits for trade. Those are:

- Cutting costs through reducing delays;
- Faster clearance and release;
- Predictable application and explanation of rules;
- More effective and efficient deployment of resources; and
- Increased transparency.

The faster clearance and release of goods is being based on the regulatory requirements for Customs purposes, whereas the CVB is status information on a certain event and is to be seen as an enhanced trade facilitation. This distinction is important to note when identifying the Single Window solution based on Recommendation No.33, and if the requirements are being met. The CVB as a trade facilitation provides for a real status information where supply chain stakeholders both government and businesses can benefit from, since it makes procedures and processes more effective and efficient.

5.3. Timeline overview of the development and implementation of Single Window in the Netherlands.

This section provides for an oversight view on the development and implementation of Single Window in the Netherlands, using the 5 key elements (UN/ECE, 2004) (UN/ECE, 2017) of a Single Window as referential framework. By means of a table the information described in paragraph 5.2. is displayed chronological, from the earliest beginning of electronic information sharing between the government and business(es) until the implementation of Single Window. Two of the key elements are closely interconnected and therefore joined together in the table; *Single-entry point* and *Single submission of individual data*.

The first row shows the year some event has taken place. That event is based on the fulfillment of regulatory requirements, most always based on new legislation, or national policy. The parties involved in trade and transport are being explained, in order to get a clear understanding of the interaction between government agencies and businesses. Standardization and harmonization of data models has become very important and the table provides for a view which data model became mandatory and when that was initiated. To conclude, the table explains at what time steps were taken towards a single-entry point and what the single submission of individual data means in practice. It might occur that the year column does not correspond with some policy documents because they became activated or implemented in a different year than that particular document was written. For example, in the year 2000 the letter to Parliament dated 18-11-1997 was made actual by developing the Government Service 2000 (OB2000).

	1993	2000	2002	2003	2009
Fulfilling Regulatory Requirements	Directive 93/75/EEC Minimum requirements for vessels bound or leaving Community ports and carrying dangerous or polluting goods.	House of Representatives, Letter to Parliament 18-11-1997, 20 644 (No.32)	Directive 2002/59/EC Establishing a Community vessel traffic monitoring and information system.	National Program ICT & Administrative Burden. (2003 – 2006)	Technical migration OTP to Digipoort Trade & Transport,
Parties involved in Trade and Transport	European Economic Counsel. Competent authority to be designated.	Ministry of Internal Affairs.	European Commission. EMSA		Ministry of Internal Affairs (Logius) Ministry of Finance. Ministry of Defense.
Standardized Information and Documents	Unknown	Unknown	In-house standards of EMSA		WCO Datamodel in relation to development of new Customs declaration system.
Single Entry Point Single Submission of Individual Data	Electronic data interchange systems between vessel and shore-based installations	Government Message Service 2000 (OB2000)	• Transmission of information on cargo be sent electronically to competent authority and between competent authorities likewise. • Data exchange must be electronically. • Ensure interconnection and interoperability of national systems.	Development of the OTP: Government Transaction Portal	The Government Transaction Portal is being technically migrated to a new modern version, called Digipoort Trade & Transport. First step towards Single Entry Access Point.

	2010	2011	2014	2016	2018
Fulfilling Regulatory Requirements	Directive 2010/65/EU On reporting formalities for ships arriving in and/or departing from ports of the Member States (RFD).	Letter to Parliament (12/05/2011), Minute on Vision and Approach Single Window (Maritime), based on RFD. Starting point of the national program: Single Window Trade and Transport (SWT&T).	Vision document on Single Window Trade and Transport. Initiation of Project Maritime Single Window (RFD, 2010/65/EU)).	First stage of development and implementation of RFD 2010/65/EU, maritime modality.	Development and Implementation of RFD 2010/65/EU
Parties involved in Trade and Transport	Ministry of Infrastructure and Environmental Affairs. Ministry of Finance / Customs Administration of the Netherlands. Border patrol. Harbor Police Rotterdam. Royal Netherlands Marechaussee. Ministry of Security and Justice. Port Authorities	Ministry of Infrastructure and Environmental Affairs. Ministry of Economic Affairs, Agriculture, and Innovations. Ministry of Security and Justice. Ministry of Internal Affairs. Ministry of Finance. Ministry of Public Health, Well-being, and Sport. Ministry of Defense.	Ministry of Infrastructure and Environmental Affairs / Executive Department Rijkswaterstaat Ministry of Finance / Customs Administration of the Netherlands.	Ministry of Infrastructure and Water Management. Ministry of Finance. Ministry of Agriculture, Nature and Food Quality. Ministry of Defense. Ministry of Justice and Security NCA SSN	Ministry of Infrastructure and Water Management. Ministry of Finance. Ministry of Agriculture, Nature and Food Quality. Ministry of Defense. Ministry of Justice and Security NCA SSN
Standardized Information and Documents	Member States are free to develop. The Netherlands uses the WCO Datamodel.	WCO Data model is being made mandatory in The Netherlands. (Compliance with UN Recommendation No.33)	WCO Datamodel	WCO Datamodel	WCO Datamodel.
Single Entry Point Single Submission of Individual Data	Electronic transmission of data, always digitally encoded by means of computers.	Digipoort. Supd@x. Single submission and multiple (re)use of data.	One Stop Shop. Status Information. Multi- or synchro modality.	Maritime Single Window	Single Window for Maritime and Air (SWM&A), Digipoort.

Table 3 Timeline on Single Window Developments in the Netherlands

5.4. Conclusion.

This chapter aims to provide an answer on which difficulties were met during the development and implementation of the Single Window concept in the Netherlands.
The starting point for every Maritime Single Window development within the European Union is based on the Directive 2010/65/EU issued by the European Commission. The RFD is considered as the most important *enabler* in realizing a Single Window in the European Union.

The history that precedes the creation and realization of the Directive is being described in this chapter, from the perspective of many developments that helped building the digitization of the inter-organizational information sharing in the Netherlands and the European Union. Both national and European legislation and policy-driven evolution paved the way to be able to share information from business to government, business to business, and government to government. This is to be considered as a *driving* force. The creation of a single entry-point was a huge step, based on the early developments on electronically reporting of vessels. The single-entry point enables the technical development of Single Window.

Nationally, the biggest steps were made by policy decisions that have led to action plans on reduction of administrative burden and cost. By means of new technologies and ICT-infrastructures these accomplishments were established. The technical solution for a single-entry point, first called OTP (Government Transaction Portal) then evolved in the Digipoort, enabled the single submission of individual data for businesses and reuse by government agencies.

The mandatory use of the WCO Datamodel was another very important *barrier* to take in the development of Single Window. At first, a number of organizations were hesitant to use this data model, because they were using or developing another data model for their own purposes. Due to persuasive interventions of the Customs Administration to the Netherlands and the national policy on data models, as the driving force, it became clear that the technical development of Single Window was to be done based on the WCO Datamodel. Both nationally and in the context of the European Union, initiatives were taken to achieve this goal.

The development of the first step of reusing data in the supply chain by both government agencies and businesses proved to be difficult to achieve. The trade facilitation on providing status information could not be realized at that point in time.

The Netherlands have developed and implemented not only a Maritime Single Window to comply with the MSW legislation but used it as a starting point to also incorporate air cargo. The co-operation between government agencies became a success, when the responsible ministry delegated the execution of the development and implementation to both Rijkswaterstaat and Customs. These two government agencies were able to form the necessary CBM before the Single Window development was technically initiated. Also, the co-operation on the business-side was of much use in the development and implementation of the national Single Window solution; the Single Window for Maritime and Air (SWM&A).

To conclude and answer the research sub-question (2): *What are the difficulties occurring in developing and implementing a Single Window?* this research shows that inter-organizational information sharing is possible when all relevant stakeholders are connected and committed. There has to be real understanding of the need to co-operate, standardize where possible and harmonize when needed. The historic overview on the development and implementation of Single Window in the Netherlands in this chapter provided for a real insight in the successes and problems that occur at certain stages in the process. In Chapter 6 there will be given an extensive overview of all barriers, enablers and drivers that are to be

identified during the process of development and implementation of Single Window in the Netherlands. Based on the interviews held with all participating stakeholders in this research.

Chapter 6. To what extent did the Dutch Single Window contribute to CBM and Trade facilitation and what are remaining barriers to be overcome to achieve the benefits?

6.1. Introduction.

This chapter has the goal to analyze the interviews held with experts and stakeholders on Single Window, CBM and trade facilitation. It will be the prelude to answering the main research question: *To what extent does the Dutch national Single Window solution contribute to Coordinated Border Management and trade facilitation, and does it meet the original objectives?* What are their perceptions of these concepts, have they contributed to the reduction of administrative burden and cost, and help to facilitating trade? What kinds of problems have they, as experts and stakeholders, encountered with developing and implementing the concepts? Are there any benefits to describe and which are those? How do the experts and stakeholders think about future developments on Single Window?

The analysis provides for the scientific foundation based on the experiences of experts and stakeholders in practice, in their particular field relating to Single Window, Coordinated Border Management and trade facilitation. With the use of the framework provided in chapter 4 (Yang & Maxwell, Government Information Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011), on the technological, managerial and organizational, and the political and policy factors that are relevant to this research, will help to provide an answer on research sub-question 3: *What are the remaining issues to overcome to reach the objectives of Single Window?*

This chapter provides for a comprehensive overview of which objectives the Dutch Single Window solution was aiming for, by using a table. First, the table will give a view on which objectives that in the Netherlands can be identified. These are handled with in paragraph 6.2. Second, in paragraph 6.3., the table will be extended on which objectives were actually achieved. Finally, the table will be completed on which objectives remain to be issues that are not achieved. This is displayed in paragraph 6.4.

Based on the findings that were drawn out of the qualitative semi-structured interviews with experts and stakeholders, a number of quotes have been inventoried. The quotes are listed in the Annex (II), incorporated in the Appendices of this thesis.

6.2. What are the Single Window objectives in the Netherlands?

In the historical overview, provided in Chapter 5, a number of important objectives of Single Window were described. These objectives were subtracted from literature and other documents and derived from the analysis on the interviews held with numerous interviewees. The table (1, chapter 4.5.) will be used to be able to identify the most commonly known objectives in relation to Single Window in the Netherlands. In the following paragraphs, the table will be filled with, first, the objectives that were achieved. Second, the objectives that have not been achieved and why. Third, which objectives are no longer of interest.

For each objective the analysis will provide a summary on what was achieved, and which key factors were identified that helped enable Single Window, from a *technological*, *managerial and operational*, and *political and policy* perspective. Using the framework with factors based on the research of Yang and Maxwell (Yang & Maxwell, Government Information Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011) and Rukanova (Rukanova, et al., 2020) for this research a limited number of factors (table 1, chapter 4.5.) are being used for this purpose. This will be shown in the table (4) to give a visualization of the achieved successes. The use of the framework and the table can be utilized as a template for other research on objectives and achievements in other countries, for example in cross-country comparison. It might be of interest to apply this on what has been achieved and is still remaining in broader interest in future research in relation to other case studies.

The following objectives have been identified analyzing the interviews:
During the interviews for this research it became irrefutable clear that the *reduction on administrative burden and cost* is one of the most important objectives to achieve. The second objective identified is also a very important one and relates to *harmonization and standardization* of data, data models, processes and procedures in relation to the development and implementation of a Single Window. Two of the five key-elements for identifying a Single Window solution according to UN Rec.No.33 are the *single-entry point* and the *single submission of individual data*. These two elements are very related to each other and therefore joined together as another objective.

The *co-operation between stakeholders* is being recognized as crucial in the realization of Coordinated Border Management, and in the development of a Single Window solution, too. Therefore, the objective how to achieve this will be discussed.

Also, the development of trade facilitation has been mentioned in many interviews as an objective to achieve, in the form of *status information*.

In the Dutch National Maritime Single Window solution, it became clear that the Customs Administration of the Netherlands only would be participating if not only the *maritime* modality would be incorporated, but also the *air cargo* since the mandatory entry (and exit) declaration system does not differentiate between modalities.

Lastly, other modalities were mentioned in the development of Single Window but were eventually not implemented. This objective concerns the *inland shipping, road transport, rail, and pipeline.*

In the table (3) these objectives are listed. The table will be used in this chapter in order to visualize what has been achieved, what has not been achieved for the full extent, and what the remaining issues are that are of interest to further development.

Objectives
Reduction on administrative burden and cost
Single-entry point Single Submission of individual data
Standardization and harmonization
Status Information
Maritime and Air cargo
Co-operation between stakeholders
Inland shipping, road transport, rail, pipeline

Table 4 Objectives of Single Window in the Netherlands

6.3. What was achieved?

This paragraph focuses on what was achieved in the development and implementation of the Single Window concept in the Netherlands. The table identifies which objectives have been achieved. By using the framework on inter-organizational information sharing by Yang and Maxwell (Yang & Maxwell, Government Information Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011), specific factors are being identified (Table 1, Chapter 4.5). Which factor proved to be a barrier, driver or enabler in the process. The subparagraphs that follow structurally build up the achievements from the different described perspectives *technological, managerial and operational*, and *political and policy.* The data is extracted from the interviews that have been conducted in three different phases and with many different experts and stakeholders.

6.3.1. Single-Entry Point and Single Submission of Individual Data.

Technological perspective

Single Window as a concept was introduced in the European Union in order to be able as a business to lodge standardized information related to trade and transport to a single-entry point with the goal to achieve the reduction of administrative burden and cost. In most interviews that have been held, both business as well as government respondents have confirmed that the goal of a single-entry point has been met with. The *IT Capability* factor is being addressed by the installment of the single entry-point since it proved to be a real *enabler* and is being seen as the most significant feature of the Single Window. It is a postbox-like facility, with one point of entry and only made possible when it is arranged perfectly behind the single-entry point in terms of standardization and harmonization. In the Netherlands the development of the so-called Digipoort *enabled* the technical service of Single Window.

The fragmentation of IT-systems, however, is considered to be a *barrier* that had to be overcome, since many stakeholders had chosen their own form of a Single Window solution. Some argue that a Single Window does not exist but is more a collection of diversified landscapes of Single Windows.

Organizational and Managerial perspective
The most important factors that proved to be a *barrier* to overcome in the development of single submission of individual data were related to *organizational boundaries of bureaucracy* and *different origin, values and cultures*. The lack of interaction and of co-operation between government agencies took a lot of effort to overcome. Different cultural backgrounds within national government agencies were a big step to surmount. By the time the Customs Administration of the Netherlands joined, because of their large IT-landscape, the development of Single Window took a new turn and proved to be a *driver* for other agencies to start co-operating and the interaction between different agencies gained momentum. The co-operation between all stakeholders within the development of MSW did also contribute to a more effective and efficient government and *enabled* that government agencies are more aligned in their processes.

Political and Policy perspective
At first, the idea to establish a Single Window originated from the desire to harmonize on the so-called river information service between countries within the EU. On top of this, the harmonization of inland shipping should also definitely be aligned with sea-going maritime affairs and shipping. The factors *legislation and policies*, *partisan dynamics in government agencies* and *public scrutiny and performance evaluation* were important *barriers* to overcome. The introduction of the RFD was the legislative *driver* needed to enhance and proceed the development of Single Window. One respondent argues that the coming about the Directive was even the real *enabler* needed to start Single Window and this is a major achievement relating to the objective.

6.3.2. Standardization and Harmonization.

Technological perspective
In relation to the factors on *Heterogeneous Hardware, Software and Information Systems* and *IT Capabilities*, the mandatory use of the WCO Datamodel proved to be a major *enabler* and, therefore, achievement in the technical development and implementation of Single Window in the Netherlands. At the same time, the choice to use the WCO Datamodel was a huge *barrier* to overcome, too. Many discussions were held by stakeholders, where the main *driver* appeared to be the Masterplan that had been written by the expert group, which had the aim to map the data based on the WCO Datamodel, in the AnNa project. The development of a new Customs import declaration system in the Netherlands can also be considered as an important *enabler* for the use of the WCO Datamodel because the data model was being made mandatory for all new developments in IT. It helped in the process to standardize the use of data models towards the use of one; the WCO Datamodel.

Organizational and managerial perspective
The factors *different operation procedures, control mechanisms and workflows*, *resistance to change, concern of losing valuable assets and completive advantage, concern of losing autonomy* and *competing interests/self-interest* are the main *barriers* to overcome when it

concerns this perspective. The bringing together of stakeholders and procedures are difficult to achieve, and this is not only of technical origin. It is also due to the fact that institutions, agencies, organizations and even persons sometimes have difficulties to work together. This is a *barrier* that stakeholders can only overcome by changing its own organically grown solution(s) or let loose the historically achieved advantages. The co-operation was achieved with the help of the *driver* called Coordinated Border Management (CBM). A Single Window will not be achieved without the real establishment of co-operation between government agencies, and between government agencies and businesses. When there is no need to co-operate, the Single Window will not solve anything. The sharing of data is a characteristic of CBM, but a Single Window is not specifically needed to fulfil sharing between government agencies.

Political and Policy perspective
The tendency to share more information between organizations implicates that standardization is very important in order to keep communicating and the need to translate between different data models is reduced. For this, the factors *legislation and policies* seem to be a *driver* in relation to the achievements on harmonization. The use of many different data models and the differences in explaining certain data elements proved to be a *barrier* to overcome. By using a semantic model, if standardization is not feasible, harmonization can still be achieved and is even considered to be more important. Harmonization can therefore be seen as a *driver* itself, because organizations must align their processes and procedures.

6.3.3. Reduction on Administrative Burden and Cost.

Technological perspective
In relation to the factor on *IT Capabilities* the objective on reducing administrative burden and cost was achieved by overcoming the *barrier* of using many different data models by one Datamodel, the WCO Datamodel. The use of one data model proved to be an *enabler* since the effects of using different data models is considered to be unwanted and undesirable. At the moment that a business is communicating with a government agency, it does not matter that much. But in today's world, everything is connected. So, when businesses are having relations with different government agencies, and they use different standards and data models, it automatically means that this company has to deliver extra effort an aligning all the data. The sharing of more information has been growing steadily, so standardization is much more important in order to keep communicating, and not always have to translate between different data models.

Organizational and Managerial perspective
The factors *organizational boundaries of bureaucracy, different origin, values and cultures, different operation procedures, control mechanisms and workflows* were *barriers* that have been overcome by expanding the scope of MSW to not only maritime but also air cargo Customs declarations. This can be seen as a *driver* which also relates to the factor *concern of losing valuable assets and completive advantage*, because certain parties, like local agents, opposed to the developments afraid of losing their business model. However, the broader scope of the MSW have led to significant reduction of administrative burden and cost for both maritime and air cargo operators. In relation to the factor *lack of experience (don't know the benefits)* the single submission of a message instead of many submissions of that

same message proved to be *barrier* to overcome and gave the Netherlands a much more competitive position in relation to cross-border trade and transport. This is, however, never been measured.

The different cultural backgrounds within the national government agencies and the different businesses were a big step to overcome. To that extent the Single Window development has contributed to help the differences diminish. The co-operation between all stakeholders within the development did also contribute to a more effective and efficient government and better functioning of institutions. Government agencies are more aligned in their processes, proving that the *barrier* on the factor on *different origin, values and cultures* have been overcome.

Political and Policy perspective
In the Netherlands the use of the WCO Datamodel has been made mandatory, addressing the factor *political and policy* that proved to be an *enabler* in terms of using the WCO Datamodel unless it can be explained why it cannot be used. This ensures the uniformity and interoperability throughout any new development in inter-organizational information sharing in the Netherlands. Where data models can be aligned, harmonization comes into play.

6.3.4. Maritime and Air Cargo.

Technological perspective
The development and implementation in the Netherlands of Single Window related to the RFD gained significant momentum when a number of *barriers* related factors *heterogeneous hardware, software, and information systems* were settled. One of the *enabling* factors was the installment of Digipoort, that serves as the electronic postbox between government agencies and businesses. Next to this, the participation of the PCS's, called Portbase for maritime and Cargonaut for air cargo affairs, made it possible to use a so-called Graphical User Interface (GUI), in order to make visible the interaction of messages between government and businesses. The development of the Message Implementation Guide (MIG) based on the WCO Datamodel was another major innovative contributor and *enabled* the standardization and harmonization in information systems.

Organizational and Managerial perspective
Relating to the factor *concerns of the quality of information received* the *barrier* was overcome in relation to the submission of information by, for example, shipping companies. The Single Window *enables* to push the information towards the correct government agency, based on the standardized data model. The factor *leadership* is addressed due to the fact that the government in the Netherlands took the lead, stating that the primary of the design is of government interest. By appointing a centralized leading government agency (Rijkswaterstaat) and the Customs administration of the Netherlands as executive organization, proved to be the *enabler* that have led to the development of the Single Window for maritime and air.

Political and Policy perspective
For the Customs administration of the Netherlands no differences in modality exist in relation to the used declaration system and serves therefore as a *driver* in the development

of the Single Window solution that became the Single Window for maritime and air. In that way, the factor *legislation and policies* were addressed.

6.3.5. Co-operation between Stakeholders.

Technological perspective

On the subject of co-operation between stakeholders, the factor *heterogeneous hardware, software, and information systems* proved to be one of the biggest *barriers* to overcome. It is needed to harmonize data, which is mainly technical issue. The co-operation between government agencies and businesses, like software developers, encounter difficulties in practice, because of differences in software packages and interaction toward government agencies. Differences on interpretation and different data element formats, which can lead to conversions from one standard to another one. Changing something effects everything. The Single Window for maritime and air proved to be an *enabler* because this did not incorporate everything. It allowed to find a balance between a Single Window for all purposes and just a Single Window for Customs declarations.

Organizational and Managerial perspective

If there is no harmonization and standardization on data, data models, and laws and regulations, and how to co-operate between government agencies and businesses, the development of a Single Window will not meet the expectations. The Single Window is also seen as vulnerable and somewhat rigid and not so much flexible, when it comes to sharing information. It depends on the co-operation between government agencies, too. The exchange of information takes place serving to pleasure the government agencies at once. It is needed to have an unambiguous conceptual framework in place, harmonization of data elements, and speaking the same language on data. These *barriers* had to be overcome and relate to factors *different origin, values and cultures, competing interests/self-interest* and *organizational boundaries of bureaucracy*. It has been partly successful that the co-operation between stakeholders as an objective has been achieved. The development of Coordinated Border Management is seen as a one of the *drivers* in co-operation and is a ground prerequisite. But only between government agencies themselves and not so much between government agencies and businesses. CBM should be an integrated process between different government agencies, where the agreement is made at what point the government interferes in the supply chain to perform inspections and physical checks.

Political and Policy perspective

The factor *information as power and authority* is both a *barrier* and a *driver* since at the one hand stakeholders might be afraid to lose their position of power due to the sharing of information. And on the other hand, stakeholders are also dependent on sharing of information to be able to gain a better information position. For example, to be able to perform risk analysis or plan their supply chain activities. The Single Window *enables* to achieve this objective by being a source of its own.

6.4. What are the remaining issues?

This paragraph focuses on the remaining issues in the development and implementation of the Single Window concept in the Netherlands. The table identifies which objectives still are desirable and remain to be achieved. By using the framework on inter-organizational information sharing by Yang and Maxwell (Yang & Maxwell, Government Information

Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011) and Rukanova (Rukanova, et al., 2020) specific factors are being identified (Table 1, Chapter 4.5.). Which factor proved to be a barrier, driver or enabler in the process. The subparagraphs that follow structurally build up these objectives from the different described perspectives *technology, managerial and operational*, and *political and policy.* The data is extracted from the interviews that have been conducted in the three different phases and with many different experts and stakeholders.

6.4.1. Reduction on Administrative Burden and Cost.

Technological perspective

For this perspective there are no remaining issues to discuss in relation to the objective.

Operational and Managerial perspective

In the air cargo modality, the objective has not been achieved since huge investments had to be made, and before the Single Window in the Netherlands was developed and implemented those costs did not occur. The factor *different operation procedures, control mechanisms and workflows* seem to be the *barrier* that was not fully overcome since there was no real necessity to inform more government agencies besides Customs, Phyto sanitary or veterinarian. For these agencies one single-entry point already existed, the Single Window solution did not provide for the objective to reduce on administrative burden and cost, some respondent's plea.

Related to the factor *organizational boundaries of bureaucracy* there is a common opinion that on the organizational part of the Single Window development should have been done more. The argument behind this opinion is that before a Single Window has to be developed and implemented, the CBM must be completely in order. Business stakeholders do not care for more than one Single Window solution, certainly in relation to reduction of administrative burden and cost. The problem that has been identified in this context is that there is no synchronicity between several Directorate Generals in the EU.

Political and Policy perspective

The Single Window in the European Union and the reduction on administrative burden and cost did suffer from the effectuation of the European Commission issued RFD, which delegated the development and implementation of a national MSW, towards the Member States. This relates to the factor *legislation and policies* and proved to be *barrier* that can only be overcome when there will be EU legislation about the harmonization legislation and every national legislation should provide for a common ground on harmonization, and there will be no contradictions. The installment of Single Window did not particularly contribute to less administrative burden and cost, since the Port Community Service (PCS) provider already existed, handling all notifications, and diverted these to all government agencies. The factor *Information as power and authority* relates to this last *barrier* suggesting that the objective of reduction have not been achieved as foreseen.

The development and implementation of Single Window did suffer of huge investments that some respondents claim to be higher than the benefits it should deliver. The benefit of the Single Window should have been the clarity and uniformity from the government to

business, this has not been achieved, yet. Because regulations are not completely aligned to each other. This makes it harder to submit a clear data set, and do not contribute to harmonization. The importance of harmonization and standardization with, for example, the use of one data model, can only be achieved with enforcement through new regulation, respondents argue.

6.4.2. Status Information.

Technological perspective

In relation to status information no technological developments have been made.

Organizational and Managerial perspective

In terms of *leadership* the development of status information in the Single Window proved to be a *barrier*. It is important to know what the real need for businesses is. To solve problems, and enhance in such a way, that it will be beneficial for all. The first step is to identify what should be aimed for, the second step is to investigate what is needed to achieve this goal, the third step is to know what is already developed and what can be re-used, and the fourth step is to know how to fill in the blanks. The trade facilitation Supply Chain Data Exchange (Supd@x) was developed by the government on request by businesses. This development took a certain amount of time, at the same time businesses did develop the facility themselves. The initial solution became obsolete, it was investigated whether change could bring new life, but since the trade community had solved the problems themselves the initiative got stopped.

Political and Policy perspective

Status information is considered something that goes beyond the Single Window. A clear distinction must be made between making available information based on regulatory requirements and decisions based on certain events that take place in the supply chain. A good example, that to this date still has not been developed, is the Container Release Message (CVB). Providing for a message that a shipment is released for further transport is an example of required information. The CVB is status information of an event and is to be seen as an upgrade to the required information. The factor *legislation and policies* proved to be a *barrier* that has not been overcome and therefore the objective has not been achieved.

6.4.3. Inland Shipping, Road Transport, Rail and Pipeline.

The development of the Single Window in relation to modalities inland shipping, road transport, rail, and pipeline are no longer of interest, probably due to the generic nature. The mapping of the modalities proved to be too difficult. During the interviews it became clear that these modalities have no priority at present nor the near future. Therefore, there is no need to further elaborate on these items in this research.

6.5. Contemplation on objectives.

The objectives of the Dutch Single Window solution were extracted from literature, documents and interviews. These objectives were most commonly named or described and therefore interesting to investigate whether they were achieved. Table (4) builds on the table (3) and also displays quotes that have been uttered during the interviews. It provides for a visualization on the objectives that are achieved, or to some extent. Which objectives are still desirable to achieve in full? And which objective is no longer of interest on the short

term. The objectives that were achieved are displayed with the symbol ☺. Some objectives were achieved to some extent and therefore displayed with the symbol ~. Objectives that were not achieved are displayed with the symbol ☹. The 'X' marks the objectives as still to accomplish, or not.

In the table (4) there are some quotes listed that have been proved to be the most significant statement uttered by one respondent, representing also other quotes that were somewhat similar and stated by other respondents. For further elaboration, please explore the Annex (II) in the Appendices.

Objectives	Achieved	Desirable to achieve	No longer of interest	Quotes
Reduction on administrative burden and cost	~	X		*"The management of several data models was to my opinion much more costly, in comparison to what is now one data model for all"*
Single-entry point Single Submission of individual data	☺			*"Single Window is at the one side an IT-solution, with the installment of a single-entry point, or postbox-like facility. On the other side, it is really a system of mutual agreements, and where parties are bound to co-operate"*
Standardization and harmonization	☺			*"Through standardization and harmonization the administrative burden and cost for trade will reduce"*
Status Information	☹	X		*"Things like returning status information is something that goes beyond the SW"*
Maritime and Air cargo	☺			*"The Dutch situation, with establishment of the SWM&A have accomplished just that"*
Co-operation between stakeholders	☺			*"Before you think about a SW, you must work on real co-operation between agencies and other stakeholders"*
Inland shipping, road transport, rail, pipeline	☹		X	*"The hinterland approach we did not proceed any further, since the mapping of inland shipping on the basis of the WCO Datamodel proved to be a bridge too far"*

Table 5 Single Window Objectives in the Netherlands

6.6. Conclusion.

This chapter answers the last research sub-question: *What are the remaining issues to overcome to reach the objectives of Single Window?* Based on the findings abstracted from the interviews with many experts and stakeholders the following conclusions can be drawn.

Harmonization and standardization are the two biggest issues to cope with when realizing a Single Window solution. These two concepts are both relevant on the side of co-operation between stakeholders and government agencies, and on the technical side when it comes to developing the IT-solution in relation to the Single Window; which data model is going to be used. This will have great influence on the expectations of stakeholders and on the willingness to co-operate. The Single Window concept is still being seen as a single entry-point to enter harmonized and standardized data to, where all government agencies can pull out their relevant information suited for their needs.

Not all respondents acknowledge that the aim of the RFD is being achieved. The objective of administrative burden and cost was not reduced as foreseen, although it is recognized that the single-entry point is of great value. The investments that had to be done were high, in some cases higher than the predicted cost reduction due to the implementation of Single Window, and few or no benefits are identified by some respondents. A distinction must be made between the opinions of government agencies and stakeholders and those of the business-side. Due to different perspectives on the achieved objectives, the opinions of success differ on certain points.

Single Window is still being considered as a one-way submission of information or data, after being used by government agencies, the feedback should also have the possibility to be resent by those agencies to the particular stakeholder(s) that have interest in the supply chain. The expectations of some respondents on Single Window are that the concept will evolve towards exchanging information on co-operating data platforms. The further development of this will enhance status information and therefore trade facilitation.

In relation to CBM it is recognized by some respondents that this should be the starting point of any development towards co-operation on the level of Single Window, based on the concepts described by the UN and WCO. The established level of co-operation in the CBM should also encompass the risk management and risk analysis of the government agencies, aiming for one-stop-shop in relation to performing (physical) inspections and controls. In the Netherlands, the co-operation between government agencies and Ministries proved to be an objective of great magnitude. Without this, the development and implementation of Single Window would not have been successful.

On trade facilitation the main conclusion to be drawn is that no respondent has mentioned it specifically as an item when interviewed. The suggestion is that when harmonization and standardization is achieved, CBM is established and, eventually, a Single Window is developed and implemented, the facilitation of trade will be accomplished accordingly.

The objective to achieve a Single Window for all modalities has not been realized, yet.

Chapter 7 Lessons Learned.

7.1. Introduction.

As in every major new development, introduction, or project there are always lessons that prove to be educative. The development and implementation of Single Window in the Netherlands is, of course, no exception to the rule. In this chapter, these lessons that have been learned are being discussed in the following subparagraphs. First, some contemplation on which important decisions and developments paved the way to a successful development of Single Window. Second, how to generalize this research and use it as a template for other countries analyzing their Single Window solution. And to finalize, a short summary.

7.2. Contributions.

The following contributions have been of value in the development of Single Window in the Netherlands and are being based on learned lessons during the process. It can be of help to use the concept of the Golden Circle[32] provided by Simon Sinek. This concept uses three questions, *why*, *what*, and *how*. Based on the understanding that everybody knows 'what' he or she is doing, and everybody knows 'how' to do that. But the starting point is to ask 'why', because you really should start something by asking why something is needed to realize. In the subparagraphs that follow the 'why' is being answered to help understanding what lessons have been learned.

7.2.1. Co-operation between government agencies and Ministries.

Make a solid stakeholder analysis.

It has been of great value to learn, especially during the interviews, that the establishment of real and solid-based co-operation between all government stakeholders is of utmost importance. It is, therefore, very important to investigate which parties are involved in the development and implementation of Single Window. For example, in this research, the case of the Netherlands showed that it was necessary to have all government agencies and Ministries that are involved in cross-border trade and transport, join the development. The importance of this level of co-operation and commitment lies in the fact that the goal of less administrative burden and cost can only be achieved when it is understood which stakeholder does what in the supply chain. For example, when stakeholders are identified, e.g. the Customs administration, Phyto-sanitarian or veterinarian agency, border control and or coast guard, it can be analyzed what particular role they play. This is necessary to understand what kind of procedures might overlap, can be aligned, or must remain distinct. This analysis makes it possible to pursue joined physical inspections, so that a company is only be checked once, *the one-stop-shop concept*, and therefore decrease the administrative burden and cost that is related to the inspection.

Map all interrelated interaction (laws and regulations, processes and procedures, IT, etcetera) between government stakeholders.

The next step, and important lesson learned is to map all interrelated interaction between government stakeholders. So, it forces stakeholders to really understand each other's laws and regulations, and, processes and particular procedures. This makes it possible to align risk

[32] https://simonsinek.com/product/share-the-golden-circle-presenter-slides-and-notes/

management between the different government stakeholders. For example, in the Netherlands the NVWA uses the risk management tool of Dutch Customs in order to perform their risk analysis. For this, analysis was needed of the architectural landscape of the organizations. A number of government officials underwrite this during the interviews that had been conducted and add to this that in the early beginnings of the development it proved to be a big hurdle to take. Different cultural backgrounds within national government agencies were a big step to overcome. That has also to do with (basic) differences between agencies and ministries. Some agencies were already co-operating on an operational level, because of some interfaces they have in processes and procedures. It is, however, different to the level of co-operation that is needed in co-operation when Single Window has to be developed. For this, the co-operation must be aligned on strategic level, too. Because on the strategic level major decisions on policy can be made that help develop and implement the Single Window. Examples of such major strategic decisions are, the use of the WCO Datamodel is the only data model, and, the executive leading authority in the development and implementation should be the Customs administration, because of its centralized role in the international trade and transport of goods.

Organize the governance of the development and implementation.
Before the development of Single Window there were forms of co-operation between different government agencies. For example, between Dutch Customs and the NVWA, when it comes on goods of Phyto-sanitary or veterinarian origin. The same goes for the co-operation of Dutch Customs and border control and immigration. This was mainly on issues of safety and security, like passengers carrying illicit drugs across the (EU) border. But the government is only in the position to facilitate trade, not before the level of co-operation is established where laws and regulations and policies alike are altered in such a way that it is possible to establish a Single Window. This level of harmonization provides for the same language to speak for all government stakeholders, making it possible to begin to think about the development and implementation of a Single Window solution. In the literature, such as the policy documents of the UN Recommendations (No.33, etcetera), it has been advised that one strong partner should be the coordinator and facilitator of the joined co-operation between the stakeholders. The situation in the Netherlands has learned that the teaming-up of the Ministry of Infrastructure and Water Management, the executive branch Rijkswaterstaat and the Customs Administration of the Netherlands proved to be the *driving* force that have led to the successful development and implementation of the national MSW. In particular, at the one side the leading role of Rijkswaterstaat in relation to policy, and on the other side the leading role of Dutch Customs in the execution of the development and implementation of the Directive that have led to SWM&A.

7.2.2. Why is the development necessary?

Start with asking why something should be developed.
The development of anything starts with asking the question ‘why is this necessary?’, or ‘which problem are we going to solve, and for whom?’. The lesson learned in the development of the Single Window in the Netherlands, is that the initial thought came out of the recommendation that a Single Window should be seen as a tool for trade facilitation. On top of Coordinated Border Management, government agencies provide for one entry-point to submit mandatory information by trade on which different government agencies can base their respectively inspections or other means of control. In some countries, the

developments on Single Window proved to be another aim: to enhance the sharing of information between government agencies themselves rather than facilitate trade. In other words, improving and securing their own internal procedures.

Listen to what the business community needs
It is important to listen to the business community in order to learn what their needs are. During the interviews it became clear that on the on hand the government often thinks what is best for the business community. The government, by means of eager policy-making civil servants, wants to make things better and simpler for businesses. The fact is, however, that civil servants do not run those businesses themselves. It would be more prudent to acknowledge that the government wants to improve their own processes and procedures and be more efficient. The essence of the Single Window can be best described as the enhancement of government processes. The lesson learned is to be clear from the start why the development is necessary and communicate this necessity. On the other hand, the business community does not always speak with the same mouth when it comes to why something should be changed. This is often due to different commercial interests and positions. For example, a logistic service provider, or, local agent, might not have very much interest in a smooth operating supply chain, because its business model is based upon the service provided.

Evaluate and measure if objectives are being achieved.
Another indication that the objective of Single Window is difficult to achieve is the fact that it has never been quantitively measured whether the initial goals have been achieved. Did the development and implementation of Single Window in the Netherlands reduce the administrative burden and cost from a qualitative perspective? The claim that one interviewee stated, that Single Window did not help to reduce the administrative burden and cost but rather cost besides a huge investment also yearly recurring costs, has never been scientifically investigated. This research did investigate qualitatively in which way the objectives of Single Window might have been achieved, or not. By interviewing many different experts, both from government and businesses in the development and implementation of Single Window, it was established in which way the objectives were qualitatively achieved. The lesson learned is that this should be done quantitively too to produce a solid scientific basis for analyzing whether the original objectives have been achieved.

Be transparent in the objectives to achieve.
In the beginning of the development and implementation of the national Maritime Single Window in the Netherlands, which in the end evolved into the Single Window for Maritime and Air, it was communicated from the government side to the business community that this SW solution would provide for the reduction of administrative burden and cost. During the process until almost the end this message was uttered towards all business's stakeholders. It was until about the end of the development and implementation that this claim proved to be difficult to achieve. Next to this, the Directive that the European Commission issued proved not to be the best solution to have common understanding amongst the stakeholders what had to be exactly achieved, and how. This has consequences for harmonizing processes and procedures. Some interviewees stated that clarity and uniformity from the government side to the business community was not (always) been achieved.

Regulations are not completely aligned and therefore the harmonization cannot be achieved in full. Some interviewees state that the only way harmonization will be achieved is, when it will be enforced by a Regulation. The lesson learned in this particular area is that the transparency must be achieved by clear laws and regulation, and derived policies, to achieve the objectives. But also make effort to communicate between government and businesses, by means of information sessions, seminars and webinars, leaflets and publications on websites of the different government agencies, stating the same information. It can even be seen as part of the governance that have to be set-up from the beginning. And lastly, do not promise anything that is absolutely achievable beforehand. Businesses will understand that something is not as achievable as expected, or realized on time, but be as transparent as possible and cautious overstating what has to be achieved.

7.2.3. The use of the WCO Datamodel.

Use one mandatory data model in order to standardize.

During the whole process of developing and implementing Single Window in the Netherlands, it has been one of the biggest achievements: the use of one data model. In the beginning of the development, it proved to be very difficult to align between government agencies at the one side. Dutch Customs had stated that it would only participate when the WCO Datamodel as the only standard was going to be used. The Ministry of Infrastructure and Water Management (and Rijkswaterstaat) was not of that opinion at that time. As it was the same for border control and immigration. These agencies were using different data models. This led to many discussions in the early stages of the process, what also can be seen as establishing the first stage of Coordinated Border Management.

And on the other side to convince business stakeholders to invest in the use of a data model that they previously did not use. For example, certain stakeholders were using data models of the International Standardization Organization (ISO), or International Maritime Organization (IMO). The question arose *why* the change was necessary. The objection of many was that the investment was very high and no certainty that it would be possible to earn it back. The effect is, depending on the data model you would use, that certain IT-systems are based on different data models. At the moment that business is communicating with a government agency, it does not matter that much. But in today's world, everything is connected, so, when businesses are having relations with different government agencies, and they use different standards and data models, it automatically means that this company has to deliver extra effort on aligning all the data. This means harmonization and the so-called mapping of the data models, which is a very costly effort to pursue. We tend to share more information, so standardization is much more important in order to keep communicating, and not always have to translate between those different data models. In the Netherlands the use of the WCO Datamodel was a lesson to be learned that also relates to the co-operation between government agencies and Ministries. The lesson was that one data model should be made mandatory by law, and that all stakeholders should build their respective IT based on that data model. In this way, not only the much-needed standardization will be achieved (one data model), also the harmonization (of procedures and processes) and interoperability between stakeholders will be achieved.

Make use of a template like the Message Implementation Guide (MIG).

Building on the lesson learned concerning the use of one mandatory data model, it proved to be of great value to standardize the way data elements should be structured and build-up

logically. In the Single Window for maritime and air (SWM&A), as the national Maritime Single Window solution in the Netherlands, all involved government agencies built their particular IT according the developed Message Implementation Guide that is based on the WCO Datamodel. This MIG is a structured guideline that exactly prescribes how an application should be logically build-up in relation to the use of the data elements. It has been developed by Dutch Customs data model experts that are in close collaboration with experts of the WCO, the UN/CEFACT and the European Commission.

7.3. Generalization of this research.

This qualitative research on the development and implementation of Single Window in the Netherlands was based on the methodologies of a single case study approach, with the use of desk research and literature study, and qualitative semi-structured interviews. This research design can be used as a template for other research in different situations with the same objectives. The following possibilities to negotiate a research can be given.

The use of a research framework provided by Yang and Maxwell, on information-sharing in public organizations (Yang & Maxwell, Government Information Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011) and used in the paper '*A Framework for Voluntary Business-Government Information Sharing*' (Rukanova, et al., 2020), proved to be of great value to investigate what was needed. In Chapter 4 it was described what the framework is used for investigated how to apply the framework, in Chapters 5 and 6 and Annex II it has been extensively written out how the development and implementation of the SWM&A came about in the Netherlands.

First, start with a solid research design and theoretical framework on the subject and its objectives. During the research and interviews with stakeholders it became clear that a number of mutual commonalities were identified. These mutual commonalities were being used in the framework to identify what *barriers* have to be overcome, what was considered a *driving* force in the process of the development, and which *enabler*(s) can be described that really made a difference in the development and implementation of Single Window in the Netherlands. Meaning that without that particular driver or enabler, the objective would never be achieved. Or had a certain barrier not have been overcome, the result of the development and implementation would probably not have been the same as the achieved SWM&A.

The historical overview in Chapter 5 on how the development of Single Window in the Netherlands came about, provides for a clear understanding on milestones, which stakeholders were identified in the process of developing and implementing, and did those items meet the expectations on identifying what is necessary in the development and implementation of a Single Window in the Netherlands. In other words, are the five key elements of Single Window visible during the process?

During the research it became clear that no other Single Window solution had been developed by other Dutch government agencies. This is logical, in the sense that the Dutch Customs organization is in the center of the border-crossing of goods and most other Dutch

agencies tend to initiate their actions not before the goods arrived in the EU. Often with the help of Customs, limiting the generalizability of this research to Customs organizations.

All EU Member States had to comply with the RFD (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010) and in the near future comply with the new Directive European Maritime Single Window environment (EMWSe)[33]. It would be interesting for other countries to use this set-up as a template, in order to evaluate their own development and implementation on the concept of Single Window. The RFD is at the one hand a legislative *driver* that enhanced the development of Single Window. On the other hand, it is also an *enabler*, because it made it mandatory for all Member States to pursue the development and implementation of Single Window. The WCO Datamodel as the single data model to be used in the development and implementation proved to be a major strategic decision that had been made, and therefore, a *driving* force in the development of the Dutch Single Window solution. The fact that Dutch Customs persisted on the mandatory use of it, and, that Dutch Customs only would participate when Customs declarations on goods were incorporated in the scope of the development and implementation. This also led to the extension of the original objectives of the RFD. In the legislation, only the messages of arrival of a ship was foreseen. In the Dutch Single Window for Maritime and Air (SWM&A), this was extended with Customs declarations concerning the goods and those relating to messages the arrival of airplanes and the air cargo Customs declarations for the goods. This was enforced by Dutch Customs because the declaration system does not distinguish between modalities. In the pre research phase to this research, it became clear that other Member States have walked another path in the development and implementation of their particular Single Window. In some developments, the Customs agency was not the leading authority but, for example, the National Coast Guard. In other developments, the legislative objective of the RFD was followed exactly, so no Customs declaration on the goods were incorporated. Therefore, it might be of assistance to use this research as a template for other countries when initiating an investigation or evaluation of the development and implementation of the National Single Window solution.

7.4. Summary of the lessons learned.

There are a few key lessons learned that have been identified in this research. The first is that importance of solid co-operation between government agencies and other stakeholders is evident. Without this, the development of a Single Window will not succeed. Secondly, it is important to listen carefully to the need and necessity of the trade partners. Do not make the mistake to try to make life better without knowing what the problem really is. The third lesson relates to the importance of choosing one standard data model to build the development of a Single Window. If this is too hard to achieve, make effort in harmonizing different standards used. But this relates also to the first lesson; if co-operation is established, standardizing and harmonizing will follow suit.

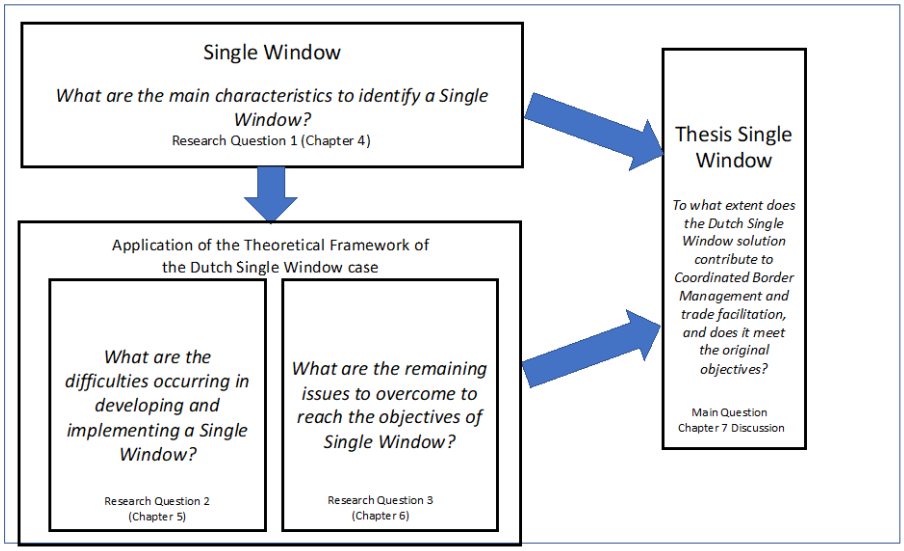
[33] https://eur-lex.europa.eu/resource.html?uri=cellar:ca8b13b0-59cd-11e8-ab41-01aa75ed71a1.0001.02/DOC_3&format=PDF

Chapter 8 Discussion.

In this thesis the subject of Single Window has been investigated. As a trade facilitation instrument the aim of this concept is to reduce administrative burden and cost for both trade and government. Single Window has made its formal entry in the Netherlands, and the EU, due to the introduction of the Reporting Formalities Directive (RFD), also known as Maritime Single Window 2010/65/EU. By means of three research sub-questions this investigation has provided for an answer for the main research question:

To what extent does the Dutch national Single Window solution contribute to Coordinated Border Management and trade facilitation, and does it meet the original objectives?

Figure 3 Conceptual Framework and Visualization on the Research Design Single Window



In Chapter 4 it is explained what the theoretical views on the concepts of Single Window, Coordinated Border Management and trade facilitation, are, based on definitions prescribed by IGO's, such as the UN, WTO and WTO. In this way, the research sub-question (1): *What are the main characteristics to identify a Single Window?* has been answered. The United Nations have issued a number of Trade Facilitation Recommendations, of which Number 33 specifically describes what a Single Window should consist of. The **five key elements** drawn out of the definition must be identified when developing and implementing a National Single Window solution. Any other solution, lacking one of the five key elements, are not to be considered as Single Window but are best described as Other Collaborative Systems (OCS). For traders it is important to have a **single-entry point** to submit their data to authorities to fulfil regulatory requirements and the information should be **re-used by all government agencies**, and it must be resubmitted via the single-entry point in return to the trader. The WCO focuses on the trade facilitation factor a Single Window provides for, based on a standardized dataset to exchange information. Coordinated Border Management is to be seen as the foundation on which trade facilitation can be built on, with the help of an instrument called Single Window.

In Chapter 5 the aim was to provide for an answer on which difficulties have been met during the development and implementation of the Single Window concept in the Netherlands. To answer the research sub-question (2): *What are the difficulties occurring in developing and implementing a Single Window?* this research shows that inter-organizational information sharing is possible when all relevant stakeholders are connected and committed. The starting point for every Maritime Single Window development within the European Union is based on the Reporting Formalities Directive 2010/65/EU issued by the European Commission.

The use of a research framework provided by Yang and Maxwell, on information-sharing in public organizations (Yang & Maxwell, Government Information Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011) and used in the paper '*A Framework for Voluntary Business-Government Information Sharing*' (Rukanova, et al., 2020), also apply to this chapter, discussing the findings in this research. In Chapter 4 it was described what the framework is used for and investigated how to apply the framework to structure the research. In Chapters 5 and 6 and Annex II it has been extensively written out how the development and implementation of the SWM&A came about in the Netherlands.

The RFD (Commission, Directive 2010/65/EU of the European Parlaiment and of the council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC, 2010) is considered as the **most important enabler** in realizing a Single Window in the European Union. The history that precedes the creation and realization of the Directive is being described in this chapter, from the perspective of many developments that helped building the digitization of the inter-organizational information sharing in the Netherlands and the European Union. Both national and European legislation and policy-driven evolution paved the way to be able to share information from business to government, business to business, and government to government. This is to be considered as a **driving force**. The creation of a single entry-point was a huge step, based on the early developments on electronically reporting of vessels. The single-entry point enables the technical development of Single Window. Nationally, the biggest steps were made by policy decisions that have led to action plans on reduction of administrative burden and cost. By means of new technologies and ICT-infrastructures these accomplishments were established. The technical solution for a single-entry point enabled the single submission of individual data for businesses and reuse by government agencies. The mandatory use of the WCO Datamodel was another very important **barrier** to take in the development of Single Window. At first, a number of organizations were hesitant to use this data model, because they were using or developing another data model for their own purposes. Due to persuasive interventions of the Customs Administration to the Netherlands and the national policy on data models, as the driving force, it became clear that the technical development of Single Window was to be done based on the WCO Datamodel. Both nationally and in the context of the European Union, initiatives were taken to achieve this goal. The development of the first step of reusing data in the supply chain by both government agencies and businesses proved to be difficult to achieve. The co-operation between government agencies became a success, when the responsible ministry delegated the execution of the development and implementation to both Rijkswaterstaat and Customs. These two government agencies were able to form the necessary CBM before the

Single Window development was technically initiated. Also, the co-operation on the business-side was of much use in the development and implementation of the national Single Window solution; the Single Window for Maritime and Air (SWM&A).

In Chapter 6 the last research sub-question: *What are the remaining issues to overcome to reach the objectives of Single Window?* has been answered. Harmonization and standardization are the **two biggest issues** to cope with when realizing a Single Window solution. These two concepts are both relevant on the side of co-operation between stakeholders and government agencies, and on the technical side when it comes to developing the IT-solution in relation to the Single Window; which data model is going to be used. This will have great influence on the expectations of stakeholders and on the willingness to co-operate.

The Single Window concept is still being seen as a single entry-point to enter harmonized and standardized data to, where all government agencies can pull out their relevant information suited for their needs. Not all respondents acknowledge that the full objective of the RFD has been achieved. The objective of administrative burden and cost was not reduced as foreseen, although it is recognized that the single-entry point is of great value. Because most stakeholders are of the opinion that sending data once to the single-entry point makes communicating more efficient and effective. The investments, however, that had to be done were high, in some cases higher than the predicted cost reduction due to the implementation of Single Window, and few or no benefits are identified by some respondents.

A distinction must be made between the opinions of government agencies and stakeholders and those of the business-side. Due to different perspectives on the achieved objectives, the opinions of success differ on certain points. On the side of the government the overall judgment on the development and implementation of Single Window is rather positive. Dutch Customs, NVWA, Border Control and the Ministry of Infrastructure and Water Management are positive about the implementation of the Single Window for Maritime and Air, because it complies with the RFD, it made the processes and procedures of the individual organizations more effective and efficient due to the single submission of individual data by companies. The Single Window provides for the distribution of the information to the authority that has interest. The expansion of the RFD with maritime and air cargo Customs declarations did, for example, contribute to the realization of the reduction on administrative burden and cost for maritime and air cargo operators. The diminishing of cultural backgrounds within the different government stakeholders is seen as important, because it have led to better understanding each other's processes and procedures. In this way, it became easier to co-operate in general, and in particular in the development and implementation of the SWM&A.

But, on the other hand Single Window is still being considered by some business stakeholders as a one-way submission of information or data. After being used by government agencies, the feedback should also have the possibility to be resent by those agencies to the particular stakeholder(s) that have interest in the supply chain. For example, providing status information on the goods. This can be something like the mentioned Container Release Message (CVB), that still has to be enrolled by Dutch Customs. There is

also some reluctancy in being positive about the development and implementation of the SWM&A, because the two PCS's, for maritime and air, already existed and provided for the service of handling notifications for businesses that are involved in the cross-border trade and transport of goods, and diverted these to all government agencies that had interest in particular notifications. To be more specific, the PCS for the air cargo stated very firmly that, since the RFD was specifically written to develop and implement a Maritime Single Window, the PCS was persuaded to participate in the development and implementation. But they did not have any reduction of administrative burden and cost. They had to invest strongly to comply with the development and implementation of the SWM&A. And for air cargo there was no real necessity to inform more government agencies besides Dutch Customs and the NVWA, they already provided for a single-entry point and using the same data elements.

During the interviews some respondents mention that Single Window in the present form, best described as an 'electronic post-box facility', will evolve into a new innovative form of data exchange facility, called platforms. A Single Window is a facility whereby data is being pushed from businesses towards government and the single-entry point makes this technically possible. The innovation on which the idea of a platform is being based, is that data (and information) is not being pushed rather being pulled from a company by any government agency that has interest in particular data, at any time. This company publishes its data on the particular platform and any stakeholder that has interest can subscribe to be allowed to pull the data.

The further development of this will enhance status information and therefore trade facilitation. In relation to CBM it is recognized by some respondents that this should be the starting point of any development towards co-operation on the level of Single Window, based on the concepts described by the UN and WCO. The established level of co-operation in the CBM should also encompass the risk management and risk analysis of the government agencies, aiming for one-stop-shop in relation to performing (physical) inspections and controls. In the Netherlands, the co-operation between government agencies and Ministries proved to be an **objective of great magnitude**. This means that from the moment that those parties were able to really communicate and co-operate with each other, the development and implementation of Single Window in the Netherlands came to life. The necessity to establish a sound CBM has been proven in this way. Without this, the development and implementation of Single Window would not have been successful. On trade facilitation the main conclusion to be drawn is that no respondent has mentioned it specifically as an item when interviewed. The suggestion is that when harmonization and standardization is achieved, CBM is established and, eventually, a Single Window is developed and implemented, the facilitation of trade will be accomplished accordingly. The objective to achieve a Single Window for all modalities has not been realized, yet.

Accordingly, the main research question:

"To what extent does the Dutch national Single Window solution contribute to Coordinated Border Management and trade facilitation, and does it meet the original objectives"?

First, it can be answered in the way that the Dutch national Single Window is an instrument for trade facilitation, by making information exchange between businesses and government

simpler. This has been achieved by *standardization and modernization of information, documents, processes and procedures*. Especially the installment of the *single-entry* point did contribute to this goal, making it possible to the *single submission of individual data* and information. The *fulfilment of regulatory requirements* was achieved by the adoption of the mandatory RFD issued by the European Commission, drawn-up by the Directorate General MOVE. In this way, the original objectives of the Single Window have been met, in accordance with the UN Recommendation No.33, the five key elements to identify a Single Window.

Next, the Single Window development and implementation in the Netherlands was also established by means of accomplishing a solid CBM, which is based on the co-operation between a number of Ministries. To name a few are the Dutch Ministry of Infrastructure and Water Management, and the Dutch Ministry of Finance. The first ministry contributed in the development and implementation by making policy on the issued RFD by the European Commission, since it was the national responsible ministry. The Dutch Ministry of Finance is the ministry in which the Customs Administration of the Netherlands resides. In this way, the ministry is responsible for issuing the executive power for Dutch Customs to participate in the development and implementation of the RFD. That allows Dutch Customs to become the leading organization in the development and implementation, as prescribed by the UN and WCO on how to approach the Single Window concept. Also, a number of other executive departments and agencies did contribute to this CBM. Rijkswaterstaat was the executive policy department, residing in the Ministry of Infrastructure and Water Management, that was in charge of writing the policy and coordinate and delegate what has to be done to other stakeholders. The Dutch Border Control and Harbor Police contributed to the development and implementation of Single Window in relation to immigration.

For the most part, the original objectives have been achieved. Some issues remain to exist, like the fact that not all modalities are incorporated in the Single Window solution. Besides the obliged regulatory replies from government side to the business side of the Single Window, real status information has not yet been achieved. Harmonization and standardization in the broadest sense, meaning besides using one standard data model also the processes and procedures, remain to be an issue to be overcome. To use one standard data model is key for the success of the development and implementation. Harmonization on the level of mapping data models is important when standardization proves to be difficult. Harmonization of (legal) processes and procedures can only be achieved when politics and policies are aligned between all stakeholders. The reduction of administrative burden and cost remains to be an objective undecided, some stakeholders have stated in the interviews that Single Window proved to be an enormous investment without any benefits. One respondent even calculated that the Single Window for Maritime and Air costs, besides the huge investment that had to be made, extra every year only to be able to submit data. Those costs did not exist prior the Single Window, if it relates to the reporting formalities he already was required to fulfil. Also, some stakeholders do not see any real difference with the situation before the Single Window, and the present situation. The PCS did already exist in the Netherlands, handling all notifications. For other stakeholders, Single Window proved to be an instrument of great value in the effectiveness and efficiency of exchanging information between border crossing trade and transport and government agencies. The management of several data models, in pre-SW era, proved to be much more costly, in

comparison to what is now achieved using one data model for all. And the claim that is posed that stakeholders have to cope with many different Member States where they submit data to, handle slightly different standards. The experiences from the beginning were that mainly parties who were making a living on this, and they are opposed to developments that will take away this business model. Think of local agents. In the Netherlands it was decided to expand the MSW scope with other maritime Customs declarations and air cargo Customs declarations. Therefore, in the end it proved to be able to realize a significant reduction of administrative burden and cost for maritime and air cargo operators.

Chapter 9. Contributions and limitations.

9.1. Contribution for research

There are two ways how this thesis contributes to research. First, the research contributes in the field of evaluating qualitative research by providing for a systemic historical overview of the coming about of the development and implementation of Single Window in the Netherlands. This historic overview adds to research by means of explaining what difficulties arise during the process. Study learned that this had not been done before in this way. The second contribution to research, besides the literature study on the concepts of Single Window, CBM and Trade Facilitation, the coming about provides for a first step that creates for a single-case study template. The second step was achieved by using the framework on Information-sharing in Public Organizations (Yang & Maxwell, Government Information Quarterly 28 (2011) 164–175, Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, 2011) and Rukanova (Rukanova, et al., 2020), and build on these researches, by adding specific knowledge investigated in the single-case study. In chapter 4 the framework has been researched on its applicability for this thesis. In the chapter 5 till 8 the framework is being used, providing analysis on what blockages had to be overcome, what proved to be a driving force in the development and implementation, and what enabled the breakthroughs necessary to be successful.

9.2. Contribution for practice

This thesis contributes to practice by providing lessons learned during the process of development and implementation of the Single Window solution in the Netherlands. The lessons learned are the basis for a template to use by other EU Member States and third countries, in order to investigate their own Single Window solution and the coming about. The template should consist of the notion of the preferable use one data model as standard. Also, a thorough stakeholder analysis is very important, because it will help on the one side to identify all key government stakeholders that must participate in the Single Window solution. On the other side, it identifies the same for the business community. The stakeholder analysis will contribute to initiate the needed CBM, before a Single Window should be developed and implemented. The Single Window can be considered as a form of Inter-organizational information sharing and this thesis shows that besides the known literature, (national) policy and laws and regulations, the need to first establish Coordinated Border Management. Only than the development and implementation of a Single Window solution can be achieved and be able to facilitate trade. By using this thesis as a template, it can be of assistance in conducting such a research and compare theory to practice.

9.3. Limitations and further research

This research is limited to the situation in the Netherlands and conducted on the foundation of three methodologies. Those were, first, to get a clear understanding of what the concepts and definitions of Single Window, Coordinated Border Management and Trade Facilitation comprise of. Secondly, it was important to provide for a clear understanding about the coming about of Single Window in the Netherlands. This understanding was based on the outcome of the held interviews with 25 experts and stakeholders. The validation of this research is established with the qualitative semi-structured interviews. The respondents are

all experts in their specific field and in relation to Single Window, CBM, and, or, trade facilitation. Thirdly, with the help of a framework to identify barriers, drivers and enablers the development of the Dutch Single Window was investigated, to comply with the single case-study requirements. The conclusions of this research are applicable to the situation in the Netherlands. It should be possible to expand this research to other Customs agencies within the EU. Those other Member States have the same laws and legislation to comply with. Dependent on the national situation in other Member States, the conclusions drawn in this research are perhaps generalizable to the context of others. Additional research might be necessary to investigate this generalizability.

This thesis is only based on qualitative gathered data and literature study. The method and methodology used did not provide for quantitative data. It can be advised in future study to measure items, such as, for example, the actual reduction of cost, or administrative burden.

Chapter 10. List of References

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Chapter 11. Appendices

Annex I Activity Overview.

Table 6: Overview on Activities of Data Collection

Activity	
Submitting Final Research Proposal; 1 December 2019	Prof. dr. Yao-hua Tan, Dr. Boriana Rukanova. According to the thesis manual of the RSM, the Final Research Proposal was signed by the researcher, the internal supervisors, and the academic supervisors, and submitted digitally on Canvas and via e-mail.
Conference call; 6 December 2019	In order to exchange views on the approach of researching and next steps, a conference call was held between researcher and prof.dr. Tan.
Meeting with former Customs Liaison in Singapore; 9 December 2019	This thesis investigates the topic of Single Window and the Singaporean variant is subject to this research. This meeting was to initiate first contact with the former Customs liaison in Singapore, in order to explain the purpose of this research, and to ask how to approach the Singaporean Customs to participate in the research.
Meeting Customs Liaison Singapore via FaceTime; 13 January 2020	A follow-up conference call, together with the former and the new Customs liaison in Singapore, in order to get a clear understanding what the purpose is of the participation of the Singaporean Customs authority, and their possible co-operation in an interview and/or questionnaire.
Phase 1 Single Window	
Interview with Single Window expert; 22 January 2020	The first interview in phase 1 on Single Window was conducted with an expert of the Port Community Service (PCS) Portbase in Rotterdam, responsible for handling of 99,8% of all manifests in the Netherlands.
Meeting with internal supervisors; 23 January 2020	Progress interview with the two internal supervisors, in order to exchange views on the approach and the progression so far.
Interview with Single Window expert, 23 January 2020	Second interview in phase 1, held with a senior policy advisor of the Ministry of Infrastructure and Water Management.
Telephone call with expert on Single Window of the UN/CEFACT, 24 January 2020	The telephone call was being held in order to make an appointment in which way the expert could participate in the research. It was agreed he would participate by filling the sent questionnaire.
Interview with Single Window expert, 27 January 2020	Third interview in phase 1 on Single Window was conducted with an expert from the national Air Cargo handler association ACN.
Interview with Single Window expert, 31 January 2020	Fourth interview in phase 1 on Single Window was conducted with an expert from the Port Community Service (PCS) Cargonaut, on Schiphol Airport in relation to air cargo.

Interview with Single Window expert, 3 February 2020	Fifth interview in phase 1 on Single Window was conducted with the former project manager on the National Single Window solution, based on the EU Directive of DG MOVE 2010/65/EU, on behalf of the Customs Administration of the Netherlands.
Interview with Single Window expert, 4 February 2020	Sixth interview in phase 1 on Single Window was conducted with an external hired expert on Single Window, participating in the development and implementation of the National Single Window. This interview has not been written out. The expert has again been interviewed in the second phase. That interview has been written out.
Interview with Single Window expert, 5 February 2020	Seventh interview in phase 1 on Single Window was conducted with the Domain Architect of the Customs Administration of The Netherlands.
Interview with Single Window expert, 6 February 2020	Eighth interview in phase 1 on Single Window was conducted with the program manager on Single Window Trade and Transport, of which the National Single Window was an underlying project, on behalf of the Customs Administration of the Netherlands.
Interview with Single Window expert, 10 February 2020	Ninth interview in phase 1 on Single Window was conducted with a stakeholder, the director of the Association of Rotterdam Shipbrokers and Agents, and the Association of Dutch Shipbrokers and Agents, and Chairman of the ECASBA, the European Community Association of Ship Brokers and Agents.
Interview with Single Window expert, 11 February 2020	Tenth interview in phase 1 on Single Window was conducted with an expert and senior policy advisor of the Customs Administration of the Netherlands, department of Information Management.
Interview with Single Window expert, 11 February 2020	Eleventh interview in phase 1 on Single Window was conducted with a policy advisor on IT of the Customs Administration of the Netherlands.
Interview with Single Window expert, 14 February 2020	Twelfth interview in phase 1 on Single Window was conducted with a senior policy advisor of the Ministry of Finance, the World Customs Organization, the European Commission (TAXUD), and the United Nations/CEFACT.
Interview with Single Window expert, 18 February 2020	Thirteenth interview in phase 1 on Single Window was conducted with a senior policy advisor of the department of Information Management, member of the expert team on Data Models, specifically on the WCO Data Model.
Interview with Single Window expert, 18 February 2020	Fourteenth interview in phase 1 on Single Window was conducted with an IT and Information Management advisor of the Customs Administration of the Netherlands.
Meeting with internal supervisor, 18 February 2020	This meeting was set up in order to give insights on the progress of the research and to evaluate the scoping of the research.
Submission of the mid-term version of the thesis	The mid-term version was submitted via Canvas and via e-mail towards the academic supervisors.
Interview with Single Window expert, 26 February 2020	Fifteenth interview in phase 1 on Single Window was conducted with a Business Analyst of the

	department of Information Management of the Customs Administration of the Netherlands.
Phase 2 Data Models	
Meeting with internal supervisor, 3 March 2020	The purpose of this meeting was to investigate what the next steps in the research should be, based on the first analysis on the outcome of the held interviews and literature study on Single Window.
Meeting with internal supervisors, 10 March 2020	This meeting was held in order to discuss the scoping towards Data Models, the new interview with experts, and the questions to be asked.
Conference call with academic supervisor and internal supervisors, 11 March 2020	After submitting the mid-term version, a further scoping of the research had been initiated. This has led to a new phase on interviewing Data Model experts. Also, the current state of the research has been discussed.
Interview with Data Model expert, 12 March 2020	First interview in phase 2 on Data Models was conducted with an expert as a representative of the Software Developers, who is also a member of the Council of Consultation between Government and Businesses (ODB).
Interview with Data Model expert, 16 March 2020	Second interview in phase 2 on Data Models was conducted with an expert from the Netherlands Organization for Applied Scientific Research (TNO), with many years of experience in the field of Data Models.
Interview with Data Model expert, 16 March 2020	Third interview in phase 2 on Data Models was conducted with an expert from the Swedish Maritime Administration, and member of the International Maritime Organization (IMO).
Interview with Data Model expert, 17 March 2020	Fourth interview in phase 2 on Data Models was conducted with an expert and senior policy advisor of the Customs Administration of the Netherlands.
Interview with Data Model expert, 17 March 2020	Fifth interview in phase 2 on Data Models was conducted with an expert and senior IT specialist of the Customs Administration of the Netherlands.
Interview with Data Model expert, 17 March 2020	Sixth interview in phase 2 on Data Models was conducted with an external hired expert on Data Models, participating in the new Regulation on the European Maritime Single Window environment (EMSWe) of DG MOVE.
Interview with Data Model expert, 18 March 2020	Seventh interview in phase 2 on Data Models was conducted with an expert of the Netherlands Food and Consumer Products Safety Authority (NVWA).
Conference call with internal supervisors, 19 March 2020	This conference call was held with the purpose to discuss the progress of the research and the interviews that had been conducted in relation to Data Models.
Phase 3 Dutch National Single Window Solution	
Interview with Head of Trade Relations of the Customs Administration of the Netherlands, 23 June 2020	First interview in phase 3 was held in order to investigate the historical coming about of the development and implementation of the Single Window concept in the Netherlands.
Interview with senior policy advisor of the Ministry of Finance in the Netherlands, 24 June 2020.	Second interview in phase 3 was held in order to investigate the historical coming about of the

	development and implementation of the Single Window concept in the Netherlands.
Interview with senior policy advisor of the Ministry of Infrastructure and Water Management in the Netherlands, 24 June 2020.	First interview in phase 3 was held in order to investigate the historical coming about of the development and implementation of the Single Window concept in the Netherlands.

Annex II Quotes drawn out of the qualitative semi-structured interviews.

Explanation.

The interviewees that have been interviewed are experts and stakeholders on the subject of Single Window, Coordinated Border Management and Trade Facilitation. They have made many statements that are of significance for this research, because it made very clear what successes have been achieved, what difficulties had to be overcome, and how exactly what made the development and implementation of Single Window in the Netherlands to a success. Those statements are being summarized in this Annex (II) to provide for an overview of quotes. In Chapter 6 it is referred to this annex in order to validate the outcomes of this research.

The interviewees have been anonymized to comply with the GPDR (2017/679) and numbered, in order to be able to refer to the quotes. The table (7) provides for an overview of the interviewees, their function, position, or role in their respective organizations, and the specific expertise.

Table 7 Overview of respondents to the interviews

Interviewee	Function/Position/Role in Organization	Field of Expertise
1	Business Consultant at Port Community Service Portbase	Strategy and Innovation, Single Window
2	Program Manager	Maritime Single Window development and implementation
3	Director of Innovations and Compliance, Air Cargo Netherlands (ACN)	Air Single Window development and implementation
4	Product Owner at Port Community Service Cargonaut	Communication with government agencies, Air Single Window
5	Project Manager Maritime Single Window, Customs Administration of the Netherlands	General project management
6	Domain Architect at the Customs Administration of the Netherlands	Development of communication portals for government purposes
7	Program Manager Single Window Trade and Transport	Development and implementation of Single Window
8	Managing Director Association of Shipbrokers and Agents	Development and Implementation of Maritime Single Window
9	Senior Policy Advisor Information Management, Customs Administration of the Netherlands	Data model expert, WCO Datamodel and EU Customs Data Model
10	Strategic Policy Advisor, Customs Administration of the Netherlands	Strategic advice on the development and implementation of Single Window
11	Senior Policy Advisor, Ministry of Finance of the Netherlands	Law, expert on Coordinated Border Management, Trade Facilitation and Single Window, NL, EU, WCO
12	Senior Policy Advisor IT, Customs Administration of the Netherlands	Information Management, IT development and Single Window
13	Business Analyst, Customs Administration of the Netherlands	IT Architectural expert in Single Window developments

14	IT and Information Management Advisor, Customs Administration of the Netherlands	Information Management, IT development and Single Window
15	Secretary to the UN/CEFACT, OiC UNECE TFS	Expert on the development and implementation of Recommendations of UNECE, No.33, 34, 35, 36
16	Software Consultant, Customs Software Alliance	Software development between Customs organizations and trade, Single Window
17	Senior Scientific Researcher, Organization for Applied Scientific Research (TNO)	Expert Data Science, Data Sharing
18	Senior IT Advisor, Customs Administration of the Netherlands	Single Window, CBM, and sharing of information
19	Senior Policy Advisor, Customs Administration of the Netherlands	Legal expertise, Single Window, European Union
20	IT and Policy Consultant	Translation of laws and regulations into policy on Single Window developments
21	Senior IT advisor, Netherlands Food and Consumer Product Safety Authority (NVWA)	Manager, public-private co-operation, Single Window
22	Head of Trade Relations, Customs Administration of the Netherlands	Single Window, Trade Facilitation
23	Senior Policy Advisor, Ministry of Finance of the Netherlands	First program manager Single Window Trade and Transport. Policy
24	Senior Policy Advisor, Ministry of Infrastructure and Water Management	Single Window
25	Senior Advisor, Swedish Maritime Administration	IT strategy and architecture, expert Single Window

Quotes.

The following quotes have been stated.

Interviews on Single Window in general:

Most respondents characterize a Single Window as *"the principle of a single delivery, or submission, of data, and a multiple use (and re-use) of it by government agencies"*, stated by respondent 10. Whereby the single-entry point is seen as the most significant feature of the Single Window and, according to respondent 2: *"instead of a tangle of information flows, coming from very many different parties, a business submits its information or data to the government on a single basis".* Next to this, respondent 1 finds it important to note that *"the responsibility is on the government side, it should be an independent party"* whereby *"the harmonization of all agencies behind the Single Window should be evident"*. A characteristic indicating a close connection towards CBM.

"The Single Window is at the one side an IT-solution, with the installment of a single-entry point, or postbox-like facility. On the other side. It is really a system of mutual agreements, and where parties are bound to co-operate" respondent 13 argued, while respondent 8 adds that *"it should be single, one. One point of entry. But only made possible when it is arranged perfectly behind the single-entry point in terms of standardization and harmonization, and co-operation between government agencies".* The Single Window is also considered by respondent 3 to be *"vulnerable, it is somewhat rigid and not so much flexible, when it comes to sharing information".*

Another characteristic of a Single Window described by respondent 4 is *"where all information exchanges take place, serving to pleasure one government. Meaning that behind the single-entry point several agencies are being served at once"*, added by respondent 5 with the comment that *"there should be an unambiguous conceptual framework in place, harmonization of data elements and speaking the same language on data".*

Respondent 6 emphasizes that *"what I have observed is that many stakeholders choose their own form of a Single Window solution. In my view, therefore, a Single Window does not exist, rather than a collection of diversified landscapes of Single Windows."* This observation is being acknowledged by respondent 11, recalling examples of parties that they *"claim that if all border control agencies and affiliates do not work together, we are going to solve this with the installment of a Single Window. The only thing that happens, is that you will transform an inefficient and dysfunctional situation into a somewhat automated version thereof".*

The difficulties occurring in the development and implementation of Single Window are of a variance of origin. To give some examples the lack of co-operation between government agencies, the harmonization and standardization of data elements and procedures, and the sharing of data (or information) are to name a few. And after the development and implementation of the national Single Window, the biggest issue is that the reduction of administrative burden and cost have not been met with.

To give a practical example of what the costs are, respondent 8 has calculated specific additional costs related for the electronic reporting formalities on maritime messages. Since the development and implementation of the national Single Window in the Netherlands, the respondent is charged for costs that were before free of charge in relation to the reporting formalities. The calculation is an indication and provides for a rough insight. It relates to the reporting formalities for maritime affairs, where: "*a crew change is charged for €3,24 per call and IMOFAL 3 ship supplies for €3,03. In the port of Rotterdam around 29000 ships annually call port, which total the additional costs annually up to between €180,000 - €185,000 in relation to respondents' interests. This atop on the total investment of €1,500,000 to be able to connect to the PCS based on the WCO data model standard*".

Respondent 10 concurs with the statement that Single Window did cost an investment, but *"the management of several data models, in pre-SW era, was to my opinion much more costly, in comparison to what is now one data model for all".* And *"I do not agree with the claim they pose that they have to cope with many different Member States where they submit data to, handle slightly different standards".* This opinion was backed by respondent 2 who stated: "*The experiences I have had in the beginning were mainly with parties who were making a living on this, and they are opposed to developments that will take away this business model. Think of local agents. In the Netherlands we decided to expand our MSW scope with other maritime Customs declarations and air cargo Customs declarations. Therefore, in the end we were able to realize a significant reduction of administrative burden and cost for maritime and air cargo operators".*

The Single Window in the European Union and the reduction on administrative burden and cost did suffer from the effectuation of the European Commission issued Directive

2010/65/EU, which delegated the development and implementation of a national Maritime Single Window towards the Member States. Respondent 1 argued that "*it would be of great assistance if there will be legislation about the harmonization legislation, every national legislation should provide for a common ground on harmonization, and no contradictions".* The respondent also stated that *"it should be recognized that businesses see no real difference with the past situation, before Single Window".* Suggesting the installment of Single Window did not particularly contribute to less administrative burden, since *"the PCS already existed, handling all notifications, and diverted these to all government agencies".*

"The benefit of the Single Window should have been the clarity and uniformity from government to business, I cannot state this has already been achieved" respondent 13 replied to the question whether Single Window contributes to the purpose it was originally designed for. Adding to the argument that *"Regulations are not completely aligned to each other. This makes it harder to submit a clear data set, and do not contribute to harmonization".* For which respondent 7 makes a link towards *"the importance of harmonization and standardization with, for example, the use of the EU Customs Data Model"* and *"the only way to achieve uniformity is to enforce it with a new Regulation".*

A strong plea was made by respondent 8, arguing *"that through standardization and harmonization the administrative burden and cost for trade will reduce. There is no harmonization in Europe, and for shipping agents the administrative burden has risen instead of reduced. The objectives of the Directive, on less administrative burden and cost, are not met and a captain of a ship must file his information in each port in a different way, every port has its own procedures."* This respondent also added that *"for me it is utmost important that data harmonization will be achieved".*

The opinion of respondent 4 summarizes it in one sentence: *"We did not have any reduction of administrative burden or costs, other than we had before Single Window".* Adding to his plea *"huge costs have been made, and in the situation before Single Window, we did not have those costs. For air cargo there was no necessity to be involved, it was a maritime oriented Directive. There is also no necessity in air cargo to inform more government agencies rather than Customs and Phyto sanitarian or veterinarian ones, because for 'us' there has always been one single entry point using the same data elements".*

Another opinion of respondent 5 tries to meet both worlds when stating: *"Different cultural backgrounds within national government agencies were a big step to overcome. This is also within businesses, by the way. The Single Window development has contributed to help the differences diminish. The administrative burden and more specific the reduction on cost have, in my opinion, not led to success".* Whereas *"the co-operation between all stakeholders within the project (on the development of the MSW), did also contribute to a more effective and efficient government. This has led to better functioning institutions on national and regional level. A major plus is that governments are more aligned in their processes".* These statements suggest that the development and implementation started with the immediate thinking about how to develop and implement a Single Window instead of thinking about realizing first the border management in a coordinated manner.

Respondent 12 stated that *"we could have done more on the organizational part of our Single Window development. It connects to the opinion of some businesses who claim it did not meet with expectations like reduction of administrative burden and cost".* This statement seems to the underwrite the thinking of respondent 11 who states that *"the argument has always been, before you think about a development and implementation of a Single Window, the CBM must first be in order".* This respondent adds *"business stakeholders claim they do not care for any other version than one Single Window, it does not meet any expectations of less administrative burden and reducing costs. But the problem is that there should be an idea of what we all should accomplish on EU-level. There is no synchronicity between several Directorate Generals".*

Some respondents, of both government and business side, stated that Single Window in its present concept, form and implementation is being seen as somewhat obsolete. *"The pushing of data has become obsolete. If I must answer the question why several developments in the EU still have to objection to accomplish a SW solution, I can only say that in my opinion the EU is losing ground and lagging behind"* respondent 10 states. Respondent 9 adds that *"in reality, there has not been many implementations that can be used. Thus, must all developments still be called Single Window? Because the concept is obsolete, and people tend to think about it in terms of also obsolete techniques. Single Window is still very much seen as sending information, using it and sending it in as return information".*

In contrary to this, respondent 1 finds: *"The Dutch situation, with the establishment of the Single Window for maritime and air, have accomplished just that. The combination with the PCS and the SWMA can be seen as a single-entry point. It must be distinguished, however, where the actual point of contact is situated, and, where the businesses can enter their notifications and declarations".*

This thinking is supported by several respondents in terms that the sharing of data should be achieved by an innovative development, like the publish and subscribe principle. *"Data is published somewhere and pulled out whenever it is needed by subscription of selected stakeholders",* respondent 10 states. Respondent 9 agrees: *"Single Window is still very much seen as sending information, using it and sending in return information. Nowadays there are many talks about block chain techniques, API usage, platforms, etcetera".*

Some visions were being shared on how future developments on the concept of Single Window could be developed. *"I do not think Single Window will be relevant at the long term. I think the concept will evolve towards something new. The technical developments also contribute to new directions for Single Window as a concept. Maybe it will be going to cloud computing? Or the data pipeline concept? Pull data directly from the source".*

On Coordinated Border Management (CBM) a number of respondents specifically state that it is the starting point on which Single Window eventually should be built on. Respondent 11 strongly states: "*I must emphasize that, from a WCO point of view, I would really react to your research question. Here you ask, if SW does contribute to CBM? The argument has always been, before you think about a development and implementation of a SW, the CBM must first be in order".* Adding to the argument: *"Before you think about a SW, what in my*

mind is like a more specific co-operation at the border, you must work on real co-operation between agencies and other stakeholders. When there is still a situation that there is no need to co-operate, a SW will not solve anything". "SW is a specific outcome of CBM, and it is the basis for further development. I think that the sharing of data is also characteristic for CBM, you do not specifically need a SW to share data between agencies".
Respondent 9 agrees with the importance of the development of CBM, before thinking about a SW. *"I share the same view as is shared in another interview, that it all starts with the development of a sound Coordinated Border Management in a country".*

"The concept of CBM could in my opinion relate to one-stop-shop, where different authorities, based on shared data, perform their inspections at the same time. Thus, resulting in less 'inspection-burden' for the industry", a view given by respondent 2 who adds a practical touch to the concept. *"When more data is shared between authorities, the more chances there are for CBM"* he states to emphasize the of sharing of data is important in relation to CBM.

Respondent 13 thinks there is more than one way to think about what CBM is and what it consists of: *"The thinking that it all starts with CBM before you can think about a SW development depends on what you understand by CBM in the first place. When it is about the organizational part, I think it is true. I experienced this in the first phase of the development of the Maritime Single Window, where it was clear that co-operation is key".* He also advocates the perception to develop CBM as broad as it possible can: *"This is not only on operational level, also if it comes to exchange of information".* Pointing out the sometimes-difficult development of co-operation: *"At the time the Maritime Single Window was in development, it became clear there was different point of views on how CBM should be installed and where it should consist of. And even on how the SW could contribute to this".* Closing his arguments with: *"Coordinated Border Management is a ground prerequisite".*

Respondent 14 thinks the development should be dealt with as a process: *"CBM is an example for this. What I do hear in meetings is the fact that many parties state that the Netherlands have approached it quite well, though. The single-entry point is highly valued by businesses, what can be considered as a success. But the way all should work behind the SW, is not yet fully developed, let alone implemented".* This statement is a hint that the development of SW in the Netherlands is considered to be a success, but it did not start with the development of a solid CBM before the SW. Respondent 14 also has the opinion that CBM *"is a step beyond the one-stop-shop. An integrated process between different government agencies. Meaning, you agree with each other at what point you as government interfere in the supply chain to perform inspections and physical checks. Can we combine or integrate our risk management protocols? So, coordination on risk management, and coordination on inspections, without the stringent need to do this always together, or perform it for one another".*

"In my opinion, CBM goes further, and supervision is also coordinated. Acting as one government. At the one side there is exchange of information, the other side is about working together also in supervision and inspection", respondent 12 sums it up how CBM and Single Window should relate to each other. Where respondent 6 adds: *"I think the backside is more interesting in relation to co-operation between government agencies. This is*

important when it comes to the matter of in which way a single government sends back any message to a business partner. What will Customs do, or not do, is there another agency that wants to perform an inspection on goods, etcetera. This has also impact on the way agencies perform risk selection". Adding the argument with: *"I observe how many times we ask information of one container in different Customs processes, like entry, temporary storage, import, transit, and so on, it seems odd to me that we are not able to re-use information ourselves. The processes and systems are not interconnected at all".*

Respondent 4 does not quite realize that he at the one hand claims: *"We have no involvement in relation to CBM or trade facilitation. I cannot think of any way we have something to do on those areas".* And on the other hand, at the same time, claims: *"The big success is definitely that we have achieved the development and implementation of Single Window with also a good co-operation between all involved partners and stakeholders".* These contradictions suggest that not all stakeholders fully understand the significance and importance of the concept of CBM, and the relation towards the development and implementation of Single Window.

On the subject of trade facilitation most respondents did not have particular views or opinions on what this concept specifically should comprise of or have stated what trade facilitation is to them. Almost all respondents answered, when interviewed to the question on what is important in relation to the development and implementation of SW, that the harmonization and standardization of information exchange, data (models), legislation and risk management is very important. These statements, in fact, underwrite the definitions given by international organizations and economic areas. This analysis shows that, in contrary to SW and CBM, the concept of trade facilitation was not mentioned using exact examples, rather with examples hidden between the lines spoken by interviewees.

"You are, as government, only in the position to facilitate trade, not before you have the o-operation installed. We emphasize always that countries and governments must alter their laws and regulations to make it possible to do so", respondent 9 states. Adding to this: *"The next step is the harmonization, meaning that all government agencies speak the same (data) language, only then it is possible to start to talk about the development and implementation of a SW".*

Respondent 9 thinks the following will help facilitate trade: *"When you also turn this thinking the other way around, that one message coming from government agencies can also be used by different parties or stakeholders on the trade side, I think this is a matter of legal professionals. Some parties in the logistical flow suggested such. Because, is every type of information suited for every single stakeholder or should this be restricted. Still, I think that such a service would be of use as facilitation of trade".* This opinion is backed by respondent 10: *"I think the sending of status information back to not only who had submitted the data, but also to other interested parties could work. It is however legally an issue, because of security reasons. Outcome of risk selection is rather confidential. And I think businesses should really do this themselves".*

Respondent 13 specifically connects trade facilitation to legislation. *"At the time the Maritime Single Window (in the Netherlands) was in development, it became very clear there*

were different points of views on how coordinated border management should be installed and where it should consist of. And even on how the Single Window could contribute to this. But, when you read the Directive (2010/65/EU) closely, there must be a trade facilitation component. Make it possible that trade can submit their data at a single-entry point. My view on this first phase is, that certain parties were involved in the MSW development to get more information, a better information position, with the help of the SW as a source. The facilitation of trade was to them of no importance, and further co-operation between agencies was not interesting whatsoever". Later on, adding to his statement: *"If you look at the side of trade facilitation, is it really needed to have a full functioning co-operation between all government agencies, in relation to the single submission of data, I doubt that".*

A practical approach on what trade facilitation should contain is being given by respondent 3: *"The risk analysis should be done before the goods are being loaded onboard, and government agencies are at present bound to ask information of parties that do not have the information. If you consider this in relation to a SW concept, this issue is easily forgotten".*

There are two reoccurring very important items that were pronounced by every single interviewee: harmonization and standardization. This holds true for the development and implementation of a SW solution, in the field of legislation, and even in relation to co-operation between national and international organizations. All respondents emphasized that if there is no harmonization and standardization on data, data models, laws and regulations, and how to co-operate between government agencies and businesses, the development of a Single Window will not meet the expectations. Because these items were specifically mentioned by the respondents, this paragraph describes what is being stated. It runs like a thread through all interviews on Single Window.

"The co-operation between many different stakeholders is the biggest challenge to overcome. You have to harmonize data, that is mainly a technical issue. Therefore, it is really a shame that, despite all our efforts to co-operate on all matters and within relevant modalities, the new Regulation EMSWe (successive to the Directive) does not foresee any role for the ENS message, and therefore also not the air cargo to be included. This will result in two or even more Single Windows, and that contradicts entirely to the concept of 'Single', I believe", respondent 10 stated. The same respondent adds: *"For real CBM, I think you should take a step further in harmonization. Then you should also harmonize the risk selection process with other agencies".*

"It is all about a single-entry point, which is for trade very important and therefore the most significant feature. So, trade does not have to go to several different entities in order to submit something of a data element, and also not have to deal with different standards.", respondent 9 adds, making a note of the importance of standards in data elements. *"I think it is impossible to have so many Single Window solutions, as long they 'talk the same language'. What you can observe is that there has not been any obligation from TAXUD or MOVE, to develop it only based on the standardized data elements. And therefore, also no harmonization can be realized".* This observation is shared by respondent 2: *"This realization has not come to light in Europe, but unfortunately, with the Regulation on EMSWe the ENS has been cut of out of the text. I do not quite understand this, because, when we evaluated all this, the Commission was very much impressed with the Dutch achievements. The adding*

of more Customs information was of real value in the MSW. I think this is due to a lack of ability to (co) operate as one in the Commission, and different politics within the institutions, like DG MOVE and DG TAXUD for example".

Respondent 1 connects his view on harmonization as follows: *"We were able to base it all on the WCO Data Model, which made it possible to harmonize messages. This is real added value. Harmonization is key. When I consider we have to deal with in cargo shipments, four to five different standards for messages are being used, and, depended on the different parties which are sending those messages, also different specializations occur."* On harmonization of procedures, he adds: *"To my opinion a SW is specifically being developed for one business to have one and the same entry point towards government agencies. Atop of this, the harmonization of all agencies behind the SW. All information should be distributed to the right agencies in a right manner. This should also be in the other direction: when agencies want to inspect or check something, that is also be done in a coordinated manner. The harmonization must also contain the legislation".*

"The standardization and harmonization are very difficult to achieve. A standard can help to harmonize, is what I think is important. If you are able to make standards, like it has been done by the WCO with its data model, you can harmonize to develop things the same way", giving some clearance on how these two concepts relate to each other, by respondent 13.

Some commonly expressed views have been given by a number of respondents; they are the following:

- Different standards between systems exist, harmonization of data fields is quite an issue.
- Every single stakeholder looks from its own point of view but never oversees the whole chain. It should be able to oversee the whole lot. This is very difficult. A data pipeline could be an instrument to help with this overview.
- At the moment, the different legislations within the European Union are not aligned.
- Harmonization is very important, so it will be possible to exchange on a large-scale data.
- It still remains important to harmonize and standardize, regardless the techniques that are being used.
- More need for sharing data on an integrated manner, instead of what a SW does. As a concept it might even be obsolete.
- The direction is moving towards a more decentralized way of sharing of data, with the development of platforms.

<u>Interview on data models:</u>
The effects of using different data models is considered by most respondents as unwanted, or undesirable. Respondent 18 argues: *"The effect is, depending on the data model you would use, that certain IT-systems are based on the data models. At the moment that business is communicating with a government agency, it does not matter that much. But in today's world, everything is connected, so, when businesses are having relations with different government agencies, and they use different standards and data models, it automatically means that this company has to deliver extra effort on aligning all the data. We tend to share more information, so standardization is much more important in order to*

keep communicating, and not always have to translate between those different data models".

Respondent 25 states: *"IHO (International Hydrographic Organization)[34], UN/CEFACT, WCO, ISO, and EUCDM are considered the main ones (data models) in maritime. The WCO and UN/CEFACT are not that far apart or different. They use both a core trade data dictionary"*, claiming that semantic base is similar. But: *"If I'll have to use a diversity on data models and everyone explains a data element in a different way, it is very difficult for software developers"*, respondent 16 argues the importance of 'speaking the same data language'. *"For most humans it is quite easy, for example: in this situation an 'exporter' means this, in another situation it means that. But when this should be automated IT-wise, it is very difficult."*

Contrary to that statement, respondent 19 argues: *"It will still be the case that data can be asked in different ways. Harmonization is more important than standardization. Though, from a political point of view, it might also be that it is decided that only one data model is going to be used. In the Netherlands the WCO DM is being used, which can be considered like a mechanism called: apply or explain. If you ask data in relation to the transport of goods, you must apply the WCO DM, unless you can explain why this is not to be used. Uniformity and interoperability will be the better choice. Where data models can be aligned, harmonize".*

Respondent 17 is a strong advocate *"to not sink into the marshes of data models. But to use all standardized data and disconnect these entirely from logistical terms. What we foresee in future is that we take all what has been defined in the area of standardization, the core components in the broadest sense including all lists of codes. We are going to use these, saying it is a technical model and we attach it with a more semantic model. In this semantic model it will be clear that a certain thing is about a load, or lading. It does not really matter whether this is being exchanged with a WCO DM message, or XSD, or UN/CEFACT, it just has to fit."*

And respondent 20 states: *"Co-operation is always possible in relation to exchange of information, we are able to connect one standard to another standard by using some fusion material. If you choose to use purely from a standard point of view, you must go deeper in the lower levels of data elements, and if they have the same meanings and formats. If an element has the same name but is used in a different context, this is rather tricky. It should be clear that if you want to use a data element of, for example, 70 positions, it consists of an alphanumeric structure, and you can also use every character available, this is also true in other data models."*
Respondent 21 is short in his view on using different data models: *"The big advantage using one data model is that no further tuning is necessary".*

As earlier claimed in this thesis, the harmonization and standardization in relation to Single Window are twofold. On the one side it is about the technical issues to cope with. The other side is about bringing together all stakeholders, aligning laws and regulations and

[34] https://iho.int

procedures. The respondents on the interviews on data models underwrite this, too, with their answers.

A number of respondents more or less state the same. The following statements explain: Respondent 18: *"One of the ways to achieve this is with the help of a semantic tool or ontology, but I think there is more to it. The challenge is to investigate how different meanings of a certain data element relate. I believe that if you stick to the translation of technical data models, it will remain difficult to harmonize. Another way could be that you see the data models of WCO, UN/CEFACT, ISO and IMO as purely technical. The question is; do you want to achieve harmonization on a technical level, or do you recognize that on the legal level sometimes things are defined in a different way, sometimes the same definition but a different name or label. Is it necessary to harmonize on this level?"*

Respondent 25: *"Yes, it is difficult, but it implies that you have a higher semantic model which you can refer to for translation between data models. For a computer it is different, than it is black or white, it does not recognize those kinds of subtle differences. This is one of the big issues, why there is still no real harmonization. Standardization has been done, and harmonization not. As long as you can understand the language behind it, based on a certain ontology or semantic, that is the key."*

Respondent 17: *"We can agree on the fact that standardization and harmonization is not that easy to accomplish, but this is not so much a technical issue rather than one of institutions and persons sometimes have difficulties to work together. What is missing is really a good dictionary, a semantic model".*

Respondent 21: *"It is almost always a semantic discussion; it is difficult because most of the time something has grown organically and after a while you detect or experience some negatives of this. The wish to harmonize comes in play, but it is very difficult to do in practice. A stakeholder must change its own organically grown solution, or let loose of the historically achieved advantages, not everybody is willing to give up something".*

Respondent 20: *"I think stakeholders, like software developers, encounter difficulties in practice, because of differences in software packages and interaction toward government agencies, differences on interpretation and different data element formats, which can lead to conversions from one standard to another one. If you change something, it has effect on everything. You can choose another scope that is more manageable, for example, the Single Window for maritime and air, it did not incorporate everything in it."*, respondent 20 reacts, building on the thinking that *"it is about finding a balance between 'I want a Single Window for all purposes', which might not be always feasible or reasonable, and for another one might be saying 'I want a Single Window that covers all Customs declarations'. Choose wisely on what is feasible and logical to do".*
"If we are able to harmonize on the legal level, and we know what we mean, we are also able to map all to any kind of model, because it has been drawn up in a law or regulation what is meant", respondent 18 relates to the other side of harmonization other than the technical one. Adding: *"The main difficulty here is that lawmakers in different areas of policy are not able to harmonize. Every entity develops something for their own purpose, but they do not*

co-operate with others. I really think if the alignment starts within lawmaking, this will have very positive effects on harmonization. Interoperability on legislation, so to say".

Respondent 17 thinks that harmonizing is difficult because: *"you could endlessly try to harmonize, the only thing you could do is to give insights on how to do things differently. In the end, everything and everyone is able to co-operate. But within the UN and WCO they are not easily persuaded. And the European Commission could say that this is the way forward, still DG MOVE and DG TAXUD must co-operate with each other".* And adding to this: *"It should also be made clear what you, as a lawmaker, would like to have to be reported in a Single Window".*

Respondent 21 states: *"What the Commission is doing on IT-level is to determine how do to things, I would rather see that the Commission makes an effort on incorporating in the law or regulation which data model is to be used".*

Between the mentioned data models some differences exist. That is often a reason why mapping one to the other is difficult to achieve. Mapping is another word for harmonization. Some of those differences are characteristic. This investigation tries to pin-point what these differences are and why it is so difficult to align. In the interview some comments were made by respondents.

Respondent 18 gives *'advice to look for similarities between different data models. A data model is the carrier of information, that should be mapped in relation to what it means in the real world and in the law".*

Respondent 16 shortly states: *"What is different is the technical structure, where one uses numeric elements, another one uses alpha-numeric".*

"The differences between the UN/CEFACT multi-modal transport model and the WCO DM are really of details. Comparing both models with the EUCDM, the differences are on the level on what is called 'nesting'. Meaning those levels that are being used to identify consignments, for example. They all use core components in their models, based on UN Recommendations, as well as code lists. The use of EDIFACT or XSD's can differ per model, and therefore lacking compatibility", respondent 17 explains. Adding to the statement that: *"Data must have some kind of structure, a standard format, so you know what it is and be able to read in your data in the model. Here, the ontology can be of use. You must have a sort of fundament on which you can build this ontology, with the core components and concepts in logistics".*

To respondent 20 a data model *"can best be compared as an entity relation diagram. A relation between classes and objects that also could hold some information. Considering data models, this is more the classic way to look to what it is. This entity relation diagram can be normalized, with logical data models (containing logical buildup of information), technical data models (databases), and if you reason this through into the WCO DM then you will see it is about the structure of messages. This is not really the same as an entity relation diagram".*

<u>Interviews on Single Window in the Netherlands:</u>

Respondent 22 explains whether the Netherlands achieved the realization of the concept of Single Window, based on the five key-elements: *"Yes, I think our Single Window solution provides for all five key-elements. Even the last element on Single Submission of Individual Data. I think for both the Maritime Single Window and Air Single Window (SWM&A) this is true. Shipping companies only have to submit once their information in the MSW/ASW, whereby after submission the Single Window pushes the data towards the correct government agency.*
Also: *"In the Netherlands we chose to use the WCO Datamodel, to implement the European Directive. Following this, we have had many difficult discussions with our national representatives of shipping line agents. The claimed that they had to invest hugely to comply with the WCO standard, asking why they should do this".*
On the reduction of administrative burden and cost: *"The cost are reduced, by means of the single submission of information in regard of submission of many times the same information to many different parties, So yes the Single Window in the Netherlands did contribute to the purpose it was originally designed to ".*

Respondent 23 states: *"The reason, I think, that not all modes of transport have been developed into a Single Window, is due to the generic aspect of it. When talking about Single Window starts, everybody finds this truly interesting. But immediately the questions arise, what does this mean, exactly, what does it produce, and what do I have to do, and what is in it for me"?*
"Something is needed to accelerate things, whereby everybody thinks: now we all have to do something. This was also the case when the Maritime Single Window became true. At that moment, everybody involved was forced to think more structured, to think about what is needed to realize this, and what deadlines can be laid down. This was in relation to the Directive 2010/65/EU. It was a driving force to enhance things and give the development more body and substance".
"The 5 key-elements of a Single Window, drawn up by the UN you almost cannot ignore. It all starts with the question: what is the purpose of a Single Window"? Adding to this: *"If I look at the Dutch Single Window solution, this is true, we comply with all five elements. Even the last element: single submission of individual data. I see this as integral status information, provided by the government".*
"Single Window in its current state of development has not yet been marked as delivering the promised full decrease of administrative burden and reduction of cost. At the same time, it has never been measured".
"Step one is to identify what should be aimed for, step two is to investigate what is needed to achieve this goal, and step three is to know what is already developed and what can we reuse, step 4 will be how do we fill in the blanks"?
"In the end, you might conclude this is true, the development of Single Window did contribute, because there is now one portal to submit once and behind the portal coordinated management can take place. And in return, businesses receive one integral message".

Respondent 24 puts some things in perspective: *"At that moment, the idea was formulated to establish a Single Window for inland shipping, originating in 2008. That idea was introduced to the European Commission, by our Ministry of Infrastructure and Water*

Management, in legislation, which was being prepared at the time, based on the Customs legislation, where reporting formalities towards Customs was regulated".
"To the surprise of many, this Directive was approved by the Council of the European Union. Then it became somewhat difficult, because now it has to be implemented".
"Besides the incorporation of the WCO Datamodel and data-elements, we have managed to describe leading principles with the technical specifications and functional requirements, in March of 2013. This was essential, because this was for many Member States the starting point to base their own national design on".
"The choice to use the WCO Datamodel and the mapping are the two most strategic and fundamental choices we have managed to realize. The Hinterland approach we did not proceed any further, since the mapping of inland shipping on the basis of the WCO Datamodel proved to be a bridge too far. Knowing this, the value of the Single Window could therefore be debated. What is a Single Window in the end"?
"All those so-called 'broker functions' help to oblige the Single Window approach, as defined by the UNECE in their Recommendations. That are, to my opinion, far too stretched".
"But if you look closely, at the moment it is nothing more than a technical solution, to exchange data from point A to B. The discussion over the fact that it is nothing more than a technical solution was a hard nut to crack".
"One of the main reasons that things were not achieved is due to the so-called silo thinking of Directorates in the EU and amongst modalities".
"Another large problem in relation to digitization and digitalization is due to the fact that there is still very little knowledge amongst policy-makers to estimate what can and cannot be done".
"The problem remains that the purpose was to simplify things for businesses, and to this day it is not clear whether this goal has been achieved. I believe that this systemic fail is due to the fact that it was not decided on which data model should be chosen, and that there was a total lack of understanding on how to harmonize data interoperability. This should have been dealt with before you can implement such things as a Single Window".
"The essence, therefore, is to enhance your own government processes".

Annex III Interviews.

Interview Protocol I

Institution:

Interviewee (Title and Name): name is known to interviewer (GDPR, 2017/679).

Interviewer: Martijn van Kruining

Opening statement

- First of all, I would like to thank you for supporting me in my Thesis project of the Executive Master Program, Customs and Supply Chain Compliance, at the Rotterdam School of Management.
- Subject of the Thesis project: *Single Window*, *to what extent does a Single Window solution help to facilitate trade, enhance compliance, and suits Customs agencies in order to be able to stimulate Coordinated Border Management?*
- I am aiming to interview the following stakeholders: Customs Administrations of the Netherlands, Spain, Estonia, and Italy, the Netherlands Food and Consumer product Safety Authority (NVWA), Port Community Service provider Portbase, expert(s) with the World Customs Organization and the European Union, at the level of EU DG TAXUD/MOVE. Experts of the Netherlands Shipping Agents (VNC) council and, if possible, the European Shipping Council (ESC).
- I have selected you, with the help of a stakeholder analysis, for this interview, based upon your involvement in one, or more, subjects, handled with in this thesis.
- Your answers will have no impact on the supervision by the enforcement authorities.
- Your privacy will be safeguarded, the outcome of the interview data will be analyzed, no names will be included in the text or appendices.
- I have planned this interview to last no longer than one and a half hour. During this time, I have several broad-sensed and in-depth questions that I would like to cover.

Introduction

The research question is: "*Single Window*, *to what extent does a Single Window solution help to facilitate trade, enhance compliance, and suits Customs agencies in order to be able to stimulate Coordinated Border Management?"*

The theme of the thesis project is the development and implementation of a Single Window environment in the Dutch Customs administration, in comparison to others in the EU and world. During the research phase, it will be determined whether it will be feasible to conduct the comparison, and, analysis between the Dutch Single Window solution and of those of other Member States and even worldwide solutions.

The problem can be described as the way the Single Window theory is transcribed into regulations and laws, and then is developed and implemented in sovereign states. Do these different versions contribute to a better working logistical flow of goods, smoother operating governmental agencies, facilitate trade, and possible higher compliance in a certain supply chain?

Since the development of the Single Window theory, many different versions, laws, regulations and implementations have been established. This has led to a situation that the Customs Administration of The Netherlands sees itself in a various landscape of Single Window environments.

Main questions:

1. What is a Single Window?

2. What is the definition of Coordinated Border Management?
3. Why is Coordinated Border Management important?
4. Who are the stakeholders involved in the Single Window environment?
5. What is Trade Facilitation?
6. In which way does a Single Window solution contribute to trade facilitation, compliance and Coordinated Border Management?

Questionnaire:

A. Interviewee Background of the interviewee

1. What is your current function, position, or role in the organization?

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2. Can you please describe your daily proceedings?

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3. What is your involvement in the field of Single Window development and in which way does your involvement contribute to the development of Single Window?

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4. Do you also have involvement in any field to Trade Facilitation and or Coordinated Border Management, and, if yes, in which way?

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5. What is your view on the concepts of Single Window, CBM and Trade Facilitation?

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6. What are the successes of difficulties of these concepts in your opinion?

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7. Do you consider Single Window a step forward relating to the work of Customs in the world, and for your organization, and why do you think this?

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B. General questions for all interviewees

8. What is a Single Window to you, what are the specific characteristics?

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9. What are the main difficulties to cope with, when a Single Window is being designed? Are these technical, or, practical and organizational, of origin, or both?

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10. How does legislation contribute to the development and implementation of the Single Window solution?

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11. Do you think these laws and regulations have been successfully developed in relation to the original concept of Single Window, why is that, or why not?

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12. Is there a standard base form in order to describe, develop and implement a Single Window, or, if not why is that not feasible?

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13. What is needed to be successful in the development and implementation of the Single Window, and have those requirements been met in your opinion?

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14. When the paradigm 'submit data once, and use the data for many governmental purposes at the same time' has to be met, what is in your opinion important to organize or develop?

15. In which way does a Single Window contribute to the purpose it was originally designed to do, in your opinion?

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16. What is, to your opinion, the definition of Coordinated Border Management (CBM)?

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17. How does CBM relate to Single Window?

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18. Which characteristics of CBM are of the most importance, when success in cooperation is the goal?

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19. Could there be a standard procedure to develop CBM, and how would this look like, from your perspective? Or, if not, why not?

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20. Imagine that both Single Window and CBM are being implemented in your organization, or country, does this pave the way for Trade Facilitation, and how does this look like to you?

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21. In what way does Trade Facilitation help the enforcement of Customs, and other governmental agencies, in your country to your opinion?

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22. Looking back at the past years of developing and implementing Single Window, CBM and Trade Facilitation, can you explain how these concepts have been contributing to your organization?

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23. What should in your view be done to enhance the possibilities of these concepts, in order to have a worldwide seamless flow of goods, for importers and exporters which are considered to be trustworthy?

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24. In your opinion, what is your general idea to these concepts and developments the past few years, and what is your advice for the future?

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Interview Protocol II

Institution:

Interviewee (Title and Name): name is known to interviewer (GDPR, 2017/679).

Interviewer: Martijn van Kruining

Opening statement

- First of all, I would like to thank you for supporting me in my Thesis project of the Executive Master Program, Customs and Supply Chain Compliance, at the Rotterdam School of Management.
- Subject of the Thesis project: *Single Window*, *to what extent does a Single Window solution help to facilitate trade, enhance compliance, and suits Customs agencies in order to be able to stimulate Coordinated Border Management?*
- I am aiming to receive information stakeholders in the field of Coordinated Border Management and Single Window: Customs Administrations of the Netherlands, Spain, Belgium, and Italy, expert(s) with the World Customs Organization and the European Union, at the level of EU DG TAXUD/MOVE), and the Singaporean Customs Administration.
- I have selected you, with the help of a stakeholder analysis, for this interview, based upon your involvement in one, or more, subjects, handled with in this thesis.
- Your answers will have no impact on the supervision by the enforcement authorities.
- Your privacy will be safeguarded, the outcome of the interview data will be analyzed, no names will be included in the text or appendices if there is any objection to do so.

Introduction

The research question is: "*Single Window*, *to what extent does a Single Window solution help to facilitate trade, enhance compliance, and suits Customs agencies in order to be able to stimulate Coordinated Border Management?"*

The theme of the thesis project is the development and implementation of a Single Window environment in the Dutch Customs administration, in comparison to others in the EU and world. During the research phase, it will be determined whether it will be feasible to conduct the comparison, and, analysis between the Dutch Single Window solution and of those of other Member States and even worldwide solutions.

The problem can be described as the way the Single Window theory is transcribed into regulations and laws, and then is developed and implemented in sovereign states. Do these different versions contribute to a better working logistical flow of goods, smoother operating governmental agencies, facilitate trade, and possible higher compliance in a certain supply chain?

Since the development of the Single Window theory, many different versions, laws, regulations and implementations have been established. This has led to a situation that the Customs Administration of The Netherlands sees itself in a various landscape of Single Window environments. I would like to investigate whether this situation also holds true in other customs administrations of Member States and Singapore. What are the main benefits, successes, difficulties and other problems encountering the development and implementation of a Single Window?

Main questions:

1. What is a Single Window?
2. What is the definition of Coordinated Border Management?
3. Why is Coordinated Border Management important?
4. Who are the stakeholders involved in the Single Window environment?

5. What is Trade Facilitation?
6. In which way does a Single Window solution contribute to trade facilitation, compliance and Coordinated Border Management?

Questionnaire:

A. Background of the interviewee

1. What is your current function, position, or role in the organization?

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2. Can you please describe your daily proceedings?

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3. What is your involvement in the field of Single Window development and in which way does your involvement contribute to the development of Single Window?

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4. Do you also have involvement in any field to Trade Facilitation and or Coordinated Border Management, and, if yes, in which way?

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B. In-depth questions for all interviewees

5. What is Coordinated Border Management to you?

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6. How does CBM relate to Single Window?

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7. What is a Single Window to you, what are the specific characteristics?

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8. What is your view on the concepts of Single Window, CBM and Trade Facilitation?

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9. What are the successes of difficulties of these concepts in your opinion?

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10. Do you consider Single Window a step forward relating to the work of Customs in the world, and for your organization, and why do you think this?

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11. What are the main difficulties to cope with, when a Single Window is being designed? Are these technical, or, practical and organizational, of origin, or both?

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12. How does legislation contribute to the development and implementation of the Single Window solution?

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13. Do you think these laws and regulations have been successfully developed in relation to the original concept of Single Window, why is that, or why not?

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14. Is there a standard base form in order to describe, develop and implement a Single Window, or, if not why is that not feasible?

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15. What is needed to be successful in the development and implementation of the Single Window, and have those requirements been met in your opinion?

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16. When the paradigm 'submit data once, and use the data for many governmental purposes at the same time' has to be met, what is in your opinion important to organize or develop?

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17. In which way does a Single Window contribute to the purpose it was originally designed to do, in your opinion?

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18. Looking back at the past years of developing and implementing Single Window, CBM and Trade Facilitation, can you explain how these concepts have been contributing to your organization?

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19. What should in your view be done to enhance the possibilities of these concepts, in order to have a worldwide seamless flow of goods, for importers and exporters which are considered to be trustworthy?

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20. What will future developments on Single Window look like?

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21. In your opinion, what is your general opinion to these concepts and developments the past few years, and what is your advice for the future?

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Interview Protocol III

Institution: Customs Administration of the Netherlands.

Interviewee (Title and Name): name is known to interviewer (GDPR, 2017/679).

Interviewer: Martijn van Kruining.

Opening statement

- First of all, I would like to thank you for supporting me in my Thesis project of the Executive Master Program, Customs and Supply Chain Compliance, at the Rotterdam School of Management.
- Subject of the Thesis project, *Single Window*.
- I am aiming to receive information of stakeholders in the field of Coordinated Border Management Single Window and trade facilitation.
- I have selected you, with the help of a stakeholder analysis, for this interview, based upon your involvement in one, or more, subjects, handled with in this thesis.
- Your privacy will be safeguarded, the outcome of the interview data will be analyzed, no names will be included in the text or appendices if there is any objection to do so.
- The interview will be recorded to be able to analyze it thoroughly. The recording will not be disclosed.

Introduction

The main research question is: Subject of the Thesis project: *To what extent does the Dutch national Single Window solution contribute to Coordinated Border Management and trade facilitation, and does it meet the original objectives?*

The theme of the thesis project is the development and implementation of a Single Window environment in the Dutch Customs administration.

The problem can be described as the way the Single Window theory is transcribed into regulations and laws, and then is developed and implemented in sovereign states, specifically the Netherlands. Does it contribute to a better working logistical flow of goods, smoother operating governmental agencies, facilitate trade, and possible higher compliance in a certain supply chain?

Since the development of the Single Window theory, many different versions, laws, regulations and implementations have been established. This has led to a situation that the Customs Administration of The Netherlands sees itself in a various landscape of Single Window environments. What are the main benefits, successes, difficulties and other problems encountering the development and implementation of a Single Window?

Research questions:

1. What are the main characteristics to identify a Single Window?
2. What are the difficulties occurring in developing and implementing a Single Window?
3. What are the remaining issues to overcome to reach the objectives of Single Window?

Key questions:

1. What is your current function, position, or role in the organization?

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2. What is your involvement in the field of Single Window development in the Netherlands and in which way does your involvement contribute to the development of Single Window?

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3. What were the key steps in the development of Single Window in The Netherlands? Please, describe the development process in your experience as clear as possible.

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4. For each of the steps, which organization was in the lead, what were the key drivers for SW development, what were key enablers. What blocked SW developments? How were these blockages overcome?

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5. What were other strategic decisions that were made (e.g. to use the WCO data model for all agencies), and what were the instruments used in order to influence developments at EU level?

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6. Were there any legal developments that influenced the course of the SW development in NL? Which were they?

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7. Do you consider the Dutch Single Window to comply with the 5 key elements the UN has defined? (Parties involved in trade and transport, standardized information and documents, single-entry point, fulfilling regulatory requirements, and, single submission of individual data)

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8. What is needed to be successful in the development and implementation of the Single Window, and have those requirements been met in your opinion?

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9. In which way does the Single Window in the Netherlands contribute to the purpose it was originally designed to do, in your opinion?

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10. What will future developments on Single Window look like?

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11. Do you also have involvement in any field to Trade Facilitation and or Coordinated Border Management in the Netherlands, and, if yes, in which way? What is the impact of Single Window on Trade Facilitation and Coordinated Border Management on the Netherlands?

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