

# Customs supervision and closed-loop supply chains

-A search for facilitation –



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## Executive Summary

The role of closed-loop supply chains (CLSCs) in supply chain developments is growing. The amount of product returns raises and possibilities to extract value from rest products is increasing. The scarcity of raw materials, public pressure for 'greener operations' and legislation emphasizes the relevance of analyzing all phases in the lifecycle of a product: from production and consumption to waste management and the market for secondary raw materials. In a linear economic model focus is on forward logistics to distribute the product from producer to end-consumer. In respect to the above more attention should be given to reverse logistics in order to create CLSC's.

The role of Customs in international operating CLSC's is important because it supervises the incoming and outgoing flows of goods on compliance towards legislation. From Customs perspective these CLSCs are more complex as more different parties are involved and more information is needed from different parties. In the European Union (EU), (Customs) legislation is the same for all the member states, however national Customs agencies are responsible for implementation of this legislation.

The way Dutch Customs organizes its supervision is relevant as it can contribute or obstruct the realization of CLSCs. One of the strategic goals of Dutch Customs is to facilitate legitimate business activity. There is however a tension between the control and facilitation ambition as the first can create administrative burden for businesses.

Analyzing the design principles of Dutch Customs supervision instruments could provide insight on how Customs can facilitate cross-border CLSCs. This study tries to fill the gap in research on the relation between Dutch Customs supervision and CLSCs by answering the question: *What are design principles of a portfolio of Dutch customs supervision instruments designed to improve the facilitation of cross-border closed-loop supply chain processes?*

Since the relation between the design principles of Customs supervision instruments and CLSCs has not yet been thoroughly studied, an exploratory research approach is chosen. In order to answer the research question a literature review is presented which addresses the characteristics and design principles of CLSCs as well as of Dutch Customs supervision instruments. After that six expert interviews with Customs officials were conducted. The functional backgrounds of these officials provided a strategic, control and business perspective towards this subject. Furthermore a case study on the offshore back-load process was executed. The emphasis of this case study is on the process of how business in cooperation with Customs arrived at the solution to solve Customs and supply chain issues.

The outcomes and findings of both the expert interviews and case study were confronted with the theory as obtained from the literature review. This discussion leads to the following main conclusions and answer to the research question.

The Customs supervision instruments design principles of 'relationship-oriented', 'in control status' and 'data-sharing' as well as enhancements like 'co-creation' and 'supply chain focus' could facilitate CLSCs, but they were not designed for facilitating CLSCs. In CLSCs it is very important to organize (cross)-sectoral cooperation in order to realize critical mass and form strategic partnerships. The relationship-oriented principle could contribute to this goal as it is based on trust, understanding and transparency. Another precondition for a stable partnership is that each partner is in control of its business. This includes a proper risk management. A supervision strategy which is focused on partners that are in control could therefore stimulate CLSCs. A CLSC has to manage additional uncertainty. The importance of complete and reliable information on products, quality etc. is therefore even more severe. The data-sharing principle could therefore have an important impact on CLSCs.

The co-creation principle could be regarded the next level of the relationship-oriented principle. Especially with the facilitation of CLSCs close cooperation is required between all relevant public and private stakeholders. More understanding, sharing of information and co-creation is needed. It must be noted that the relationship-oriented principle seems under pressure due to the heavy workload of Dutch Customs because of UCC implementation. Shifting focus from supervision toward the supply chain and to the in control status of this chain instead of an individual business could facilitate CLSCs. The concept of 'trusted trade lanes' could be helpful in this respect. At the moment this vision is in the pilot phase due to legal complications.

Important is the required close cooperation between all relevant stakeholders in the supply chain, businesses as well as governments. Customs strives for a good balance between supervision and facilitation. For stimulating CLSCs the concept of facilitation and cooperation with businesses should change. More co-creation is needed and old patterns and roles should be revised.

The increasing importance of CLSCs and the active role of other Dutch and EU governmental agencies calls for an active role for Dutch Customs in this field. Especially when considered that, from supervision perspective, Customs could benefit from a better understanding of the working and set up of a CLSC. Co-creation demands for investments from businesses as well as the Dutch Customs organization. It is recommended for Customs to create a task-force to aim for this.

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# 1. Introduction

## 1.1 Problem definition

In 2050 world population is expected to rise to 9 billion people compared to the 7 billion today. All these people need enough food and water and want to live in prosperity<sup>1</sup>. With the current economic models of take, use and waste of limited resources this seems impossible. The increasing demand and limited supply of resources – of which some critical substances are becoming scarce already – confronts society with the risks of dependency, shortage and increased costs<sup>2</sup>. There is an urgent need for new “circular” models which keep product, components and materials at their highest utility and value at all times<sup>3</sup>. There are various gradations or options for circularity often referred to as the 9 Rs: refuse, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle and recover energy<sup>4</sup>. In the linear economic model focus is on forward logistics to distribute the product from producer to end-consumer. Towards a circular economy emphasis should shift to reverse logistics in order to create closed-loop supply chains (CLSC’s). A closed-loop supply chain recovers and reuses all the materials that are involved in the production process, including the final product itself along with its packaging<sup>5</sup>.

In recent years a lot of initiatives from businesses, often supported by governments, have been executed to use scarce resources more efficiently<sup>6</sup>. Governments also took initiative on different levels to contribute to this enormous challenge. A good example on European level is the Circular Economy Package of 2015, which includes revised legislative proposals on waste, as well as a comprehensive Action Plan that complements the legislative proposals by setting out measures to “close the loop” of the circular economy and tackle all phases in the lifecycle of a product: from production and consumption to waste management and the market for secondary raw materials<sup>7</sup>. The Netherlands have with their Circular Economy Strategy ‘Rijksbrede programma Circulaire Economie’, formulated the ambition of becoming circular in 2050 with a mid-term ambition of 50% in 2030<sup>8</sup>. This can only become reality when all public and private parties work together and cross-sectoral. Several research papers of Sociaal Economische Raad (SER)<sup>9</sup>, Raad voor de leefomgeving en infrastructuur (RLI)<sup>10</sup> and Planbureau voor de leefomgeving (PBL)<sup>11</sup> support this ambition. The Dutch Customs Agency is not playing an active role in this program. This is remarkable when analyzing the role and function of Dutch Customs in the international supply

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<sup>1</sup> Min I&M et. al. (2016).

<sup>2</sup> Buren, van, et. al. (2016).

<sup>3</sup> Ellen MacArthur Foundation, (2015).

<sup>4</sup> Cramer, (2014).

<sup>5</sup> Krikke et al., (2003).

<sup>6</sup> CBSR, (2015).

<sup>7</sup> European Commission, (2015).

<sup>8</sup> Min I&M et.al. (2016).

<sup>9</sup> SER, (2016.)

<sup>10</sup> RLI, (2015).

<sup>11</sup> PBL, (2016).

chain. The way Dutch Customs control and facilitate businesses can contribute to or obstruct the realization of CLSCs.

From Customs perspective CLSCs are complex because different parties are involved and more information is needed from these parties. However it could also provide opportunities as information exchange in the supply chain is a precondition for effective CLSC and perhaps this information could be re-used for Customs purposes.

A lot of literature can be found on the development of CLSCs. See for instance the research of Guide and van Wassenhoven, the evolution of closed-loop supply chain research<sup>12</sup>, or on reverse logistics and closed-loop supply chains<sup>13</sup>. Information can also be found on Dutch Customs supervision. An extensive evaluation report on Dutch horizontal monitoring<sup>14</sup> has been published in 2012 and another example is the study of Hulstijn et.al., towards trusted trade-lanes<sup>15</sup> published in 2016. No study has been found on the relation between Dutch Customs supervision and CLSCs or more specific on the design principles of Dutch Customs supervision instruments in relation to CLSCs. This research tries to fill this gap.

## **1.2 Research Objectives and Research Question**

To address the above mentioned gap in research, an explorative research is appropriate in order to look further into the relation between the principles of Dutch Customs supervision instruments and CLSCs. Therefore the following research question has been formulated:

***What are design principles of a portfolio of Dutch customs supervision instruments designed to improve the facilitation of cross-border closed-loop supply chain processes?***

In order to answer the research question three sub questions have been defined:

***What design principles are necessary to facilitate cross-border closed-loop supply chain processes?***

***Which (Dutch) design principles regarding customs supervision instruments can be identified and how do they impact cross-border closed loop supply chain processes?***

***How could the customs supervision instruments design principles be enhanced to improve facilitation of cross-border closed loop supply chain processes?***

## **1.3 Scientific and Societal Relevance**

This research contributes to a better understanding on how design of customs supervision instruments could affect the development of CLSCs. It may enhance the scientific knowledge base considering this subject. Circular economy and CLSCs are becoming an increasingly important topic. Sustainability is a matter of great concern to many governments as well as citizens. This

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<sup>12</sup> Guide en Van Wassenhoven, (2009).

<sup>13</sup> Govindan et. al. (2014).

<sup>14</sup> Committee Horizontal Monitoring Tax and Customs Administration, (2012).

<sup>15</sup> Hulstijn, et. al. (2016).



multidiscipline research gives another perspective and connects different fields of research. In doing so it could create value for policy makers as well as businesses.

#### **1.4 Research Outline**

The further structure of this master thesis is as follows: Chapter 2 presents the theoretical background. It covers a more in-depth analysis of closed-loop supply chains (CLSCs) and its relation towards circular economy (CE) as well as the development of Customs Supervision in the Netherlands. CLSCs design principles and Horizontal Monitoring principles will be discussed. This chapter ends with a conceptual model. Chapter 3 explains the research methods. First a research design framework will be presented, this consists the research scope, description of data collections, data processing and data evaluating, and limitations of the methods. Chapter 4 presents the findings of the interviews with the Customs experts and Chapter 5 presents the findings of the case study. Chapter 6 discusses the findings and analyses the differences between theory and practice. The limitations of the study will be dealt with here. Chapter 7 draws final conclusions and gives recommendations for further research.

## 2. Theory

### 2.1 Closed-loop Supply Chains

#### 2.1.1 Circular Economy

A circular economy is an economy that is restorative and regenerative by design, and that aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles<sup>16</sup>. In definition this economy needs a complete different way of organizing its supply chain and the traditional value propositions should be revised. Closed-loop supply chains are necessary to achieve circularity.

#### 2.1.2 Defining CLSCs

A closed-loop supply chain recovers and reuses all materials that are involved in the production process, including the final product itself along with its packaging<sup>17</sup>. Closed-loop supply chain management is design, control and operation of a system to maximize value creation over the entire life cycle of a product with dynamic recovery of value from different types and volumes of return over time<sup>18</sup>.

A CLSC consists of two main components: the forward supply chain (FSC) and the reverse supply chain (RSC). The FSC, which encompasses typical functions and steps within the chain (e.g., processing, manufacturing, distribution, and sales), including those at the source of flow of materials and termination of the flow with the end user<sup>19</sup>.

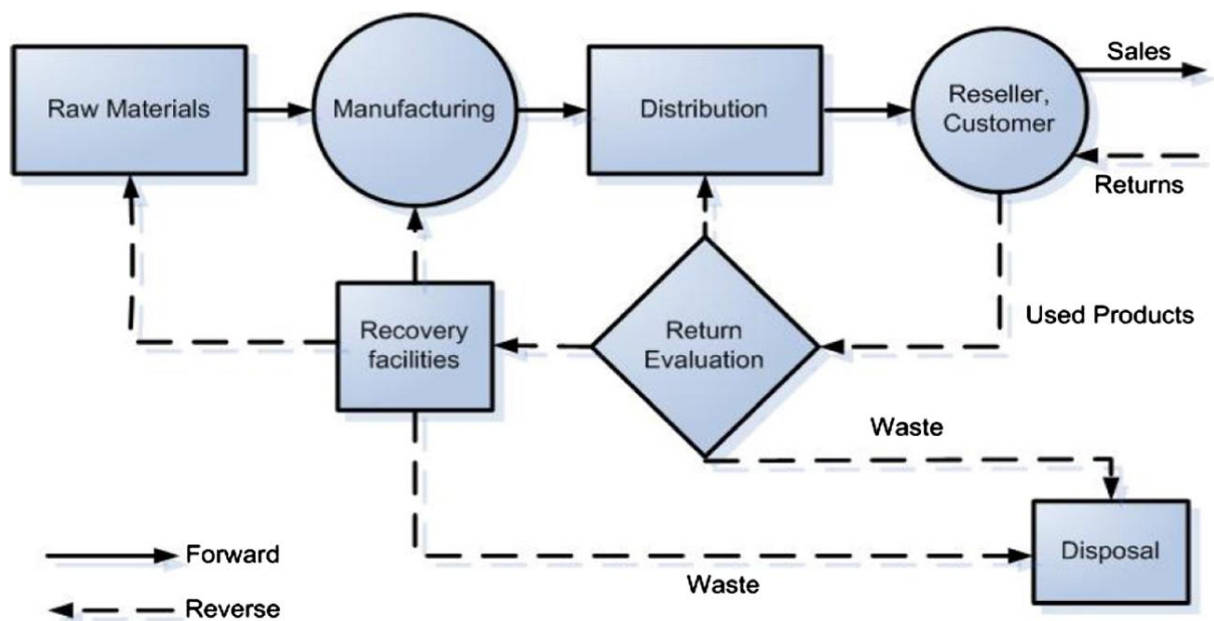


Figure 1: Generic example of CLSC (from Tonanont et. al 2008)

<sup>16</sup> Ellen MacArthur Foundation, (2015).

<sup>17</sup> Krikke et. al., (2003).

<sup>18</sup> Guide and v. Wassenhove, (2009)

<sup>19</sup> Özkır, V., & Başlıgılı, H. (2012).

The RSC is the opposite direction of FSC and can be defined as “The process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal”<sup>20</sup>. In the past FSC and RSC were mainly treated separately, nowadays more attention is given to the connection between them. Krikke pleads for a ‘happy marriage’ between FSC and RSC and sees several different perspectives to analyze: the environment perspective, the customer service perspective, the sourcing perspective and overall (lifecycle) perspective<sup>21</sup>. The above figure 1 shows an example of a CLSC.

When products are returned to the original product manufacturer it is considered a fully closed loop<sup>22</sup>. This however is a more theoretical concept. In practice, most businesses that recognizes the economic potential of product recovery aim for partially closed loops. Partially closed loops arise when the product leaves the domain of the original manufacturer and becomes part of a new loop such as through a third party recycler, or a third party company that recovers the materials for an entirely new purpose<sup>23</sup>. For pragmatic reasons in this research partially closed-loops initiatives are also considered as CLSCs initiatives.

### **2.1.3 Different types of recovery activities and link to CLSCs**

Literature<sup>24</sup> on circular economy makes a distinction between various gradations or options for circularity. These different gradations or options are listed below:

- (1) Refuse: preventing the use of raw materials;
- (2) Reduce: reducing the use of raw materials;
- (3) Reuse: product reuse (second-hand, sharing of products);
- (4) Repair: maintenance and repair;
- (5) Refurbish: refurbishing a product;
- (6) Remanufacture: creating new products from (parts of) old products;
- (7) Repurpose: product reuse for a different purpose;
- (8) Recycle: processing and reuse of materials; and
- (9) Recover energy: incineration of residual flows.

For CLSCs and especially for the RSC number three till nine are most relevant. Number one and two have more to do with efficiency and product design choices within the production process and less with supply chain movements. The most important options with highest impact for the supply chain are Repair, Refurbish, Remanufacture and Recycle. In this research focus will be therefore on these four recovery activities as part of the CLSCs.

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<sup>20</sup> Rogers and Tibben-Lembke, (1998).

<sup>21</sup> Krikke, (2009).

<sup>22</sup> Genovese et. al. (2015).

<sup>23</sup> Wells and Seitz, (2005).

<sup>24</sup> Cramer, (2014).

#### **2.1.4 Drivers and barriers CLSCs**

Different drivers and barriers towards realization of CLSCs can be distinguished, starting with the drivers. First, the economic value of rest products will increase due to scarcity of raw materials. Therefore producers want to initiate return flows. Another driver is a legal aspect. Governments are starting to hold companies more accountable in regard to closing their material loop to ensure proper end-of-life product disposition. Government legislation such as extended producer responsibility (EPR) legislation has been passed to address specific products or sectors such as the Waste of Electronic and Electrical Equipment (WEEE)<sup>25</sup> and End-of-Life Vehicle (ELV)<sup>26</sup> directives. Third, consumers are more aware of environmental issues and demand more sustainable solutions of producers.

There are many different barriers for the development of CLSCs: delayed returns especially for technological and time sensitive products, variation in quantity of product returns, severity and breadth of product defects and unknown product quality due to the lack of information at the consumer or retail level<sup>27</sup>. In addition, more complexity is added as “products and their closed-loop supply chains often differ with respect to a number of critical dimensions including: product acquisition, returns volume, return timing and quality, test, sort and grade, reconditioning, and distribution and selling”<sup>28</sup>.

Considering this it is relevant to analyze which design principles for CLSCs could be distinguished.

#### **2.1.5 Design principles for CLSCs**

Krikke et. al.<sup>29</sup> developed the following list of design principles for CLSCs. The first ten principles were based on ideas regarding traditional logistics, which are in fact FSCs. The latter eight principles were developed specifically for CLSCs. Below the list of principles is presented:

1. Link logistics to corporate strategy: all aspects of logistics operations must be directly linked to the corporate strategic plan.
2. Organize comprehensively: all corporate logistics functions should be unified under a combination of centralized and decentralized management.
3. Use the power of information: successful logistics implementation takes full advantage of information and information-processing technology, not only for data interchange, but also for decision support.
4. Emphasize human resources: logistics excellence flourishes in an environment that recognizes people as the department's most important resource.
5. Form strategic alliances: forming close partnerships with other participants in the product chain or channel can boost logistics operation.

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<sup>25</sup> EPCEU, Directive ELV, (2000).

<sup>26</sup> EPCEU, Directive WEEE, (2012).

<sup>27</sup> Prahinski et. al (2006).

<sup>28</sup> Guide et at., (2003).

<sup>29</sup> Krikke, et. al. (2001).

6. Focus on financial performance: the logistics function should use return on assets, economic value added, cost and operating standards, or similar indicators as measures of performance.
7. Target optimum service levels: companies need to calculate their “optimum” service level and pinpoint the costs associated with sustaining those levels.
8. Manage the details: attention to details can mean real savings.
9. Leverage logistics volumes: successful logistics operations consolidate shipment volumes, inventories and the like to gain operating and financial leverage, whether the logistics function is performed in-house or by an outside contractor.
10. Measure and react to performance: companies must measure their logistics performance and react to the results in an on-going dynamic fashion.

The following design principles are specific for CLSCs:

11. Impose sustainability standards on suppliers: selecting sustainable suppliers requires additional selection criteria.
12. Make use of accounting systems that account for the full life-cycle costing of a product or service, and the environmental impact it creates.
13. Make use of management tools, such as ISO 9000-14000, life cycle analysis, environmental accounting methods, that may help business to identify and select opportunities for improvement.
14. Create new markets: the environment can be at the basis of the creation of new markets or of the reorganization of existing ones for certain (material) flows resulting from the production process.
15. Manage additional uncertainty: in recovery situations only a part of the flow is valuable, but it is hard to say beforehand which part.
16. Match network design with recovery option.
17. Enhance design for recycling.
18. Enhance quality and rate of return.

### **2.1.6 Evaluating design principles for CLSCs**

The above set of design principles generates a wide range of beneficial conditions for CLSCs. Many of these principles focus on organizational design, others focus more on strategic supply chain choices. This study focuses on cooperation in the supply chain. The principle of ‘form strategic alliances’ is therefore relevant. These strategic alliances could lead to ‘create new markets’, for this research this effect is incorporated within the former principle.

Furthermore, in most CLSCs different companies with their own business cases are working together. They need a clear view on the product value. Each party needs to benefit from this cooperation and should ‘focus on financial performance’. Therefore this is a second relevant principle for this study.

From literature became clear that a CLSC can only be realized with critical mass through horizontal and vertical coordination. See in this respect also the Dinalog innovation theme Cross

Chain Control Center (4C) – key idea behind this is to create economies of scale through inter- and intra- supply chain collaboration<sup>30</sup>. The relevant design principle here is ‘leverage logistics volumes’.

Successful cooperation and decision-making depends on reliable information. The principle ‘use the power of information’ is a fourth relevant principle. Other design principles could also, perhaps more indirectly, be relevant for the cooperation in the supply chain but are left out of scope for reasons of focus.

This leads to the following list of CLSC design principles which will be elaborate further:

1. Leverage logistics volumes
2. Focus on financial performance
3. Form strategic alliances
4. Use the power of information

## **2.2 Dutch Customs Supervision**

### **2.2.1 UCC Mission**

Dutch Customs supervision is based on European legislation as laid down in the Union Customs Code (UCC)<sup>31</sup>. The European Union (EU) has articulated in Art 3 UCC its mission for customs authorities:

Customs authorities should be primarily responsible for the supervision of the Union’s international trade, thereby contributing to fair and open trade, to the implementation of the external aspects of the internal market, of the common trade policy and of the other common Union policies having a bearing on trade, and to overall supply chain security. Customs authorities shall put in place measures aimed, in particular, at the following:

- (a) protecting the financial interests of the Union and its Member States;
- (b) protecting the Union from unfair and illegal trade while supporting legitimate business activity;
- (c) ensuring the security and safety of the Union and its residents, and the protection of the environment, where appropriate in close cooperation with other authorities; and
- (d) maintaining a proper balance between customs controls and facilitation of legitimate trade.

This mission sets the scope for Dutch Customs strategy and policy. It defines the role and responsibilities of Dutch Customs.

### **2.2.2 Role Dutch Customs**

Dutch Customs has several tasks and responsibilities in the field of safety, health, economy and environment (abbreviated as 'VGEM'). Besides these ‘control’ tasks, they have the ambition to facilitate (international) businesses as much as possible.

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<sup>30</sup> Dinalog, (2017).

<sup>31</sup> EPCEU (2013), Regulation No 952/2013, UCC.

The core duties are:

- *Stop task*. Dutch Customs makes sure that goods not permitted to enter the country are stopped at the border. Some goods are not allowed free entry into the Netherlands or European market. Dutch Customs therefore takes measures, such as supervising goods movements with scanning equipment or detection gates, whereby Dutch Customs pays particular attention to narcotics, weapons, animals suffering from an infectious disease and counterfeit goods. Dutch Customs also 'stops' the export of certain goods, such as weapons and ammunition. These goods may not be exported, for example, to war zones or to countries subject to international sanctions.

- *Control task*. Dutch Customs controls the correct application of European and national Customs legislation. Goods from countries outside the European Union for which import duties have yet to be paid may be transported, processed and stored in the Netherlands. These are subject to Customs supervision.

- *Levying and collecting*. In conclusion, Dutch Customs levies and collects taxes, namely import taxes, excise duties and consumer taxes.

### 2.2.3 Supervision and facilitation

An important aspect of the UCC mission is maintaining a proper balance between customs controls (supervision) and facilitation of legitimate trade. There is a tension between these elements because supervision causes an administrative burden for businesses.

According to the article 5 (27) UCC **Customs supervision** is the “action taken in general by the customs authorities with a view to ensuring that customs legislation and, where appropriate, other provisions applicable to goods subject to such action are observed”.

**Administrative burden** represents: “the costs to business, citizens and the administration itself of complying with government regulations and procedures”<sup>32</sup>. Administrative burden has to be distinguished from *business as usual costs*, which refers to information that would be collected and processed regardless of the legal obligation to do so. Of course, business prefers business as usual costs above administrative burden. Therefore, it is recommended to try to arrange administrative obligations in a way, that it does not cause unnecessary administrative burden.

In this context **facilitation** is the simplification of administrative obligations which contributes to the speed and predictability of the flow of goods. The effect of this is a lowering of administrative burden for businesses. The concept of Authorized Economic Operator (AEO) is used to operationalize this simplification. In article 38 UCC different types of AEO authorizations are described which lead to different simplifications and facilitation: AEO for Customs simplifications (AEO C) and AEO for security and safety (AEO S).

When an economic operator has both authorizations it is called AEO F (for Full). However this is not a distinct authorization. According to article 24, (1), of the delegated act, an AEO holder should also generally be “subject to fewer physical and document-based controls”.

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<sup>32</sup> Veiga, et. al., (2016).

As is clear from legislation the concept of facilitation is mainly concerned with the lowering of administrative burden for businesses by offering simplifications. This research explores the idea of extending 'normal' facilitation to a higher level called **facilitation plus**. This could be regarded as a concept in which Customs and businesses are actively working together in finding solutions to optimize processes. This transcends the operational level and needs strategic alignment.

#### 2.2.4 Dutch Customs enforcement vision

Dutch Customs have developed an enforcements vision called "*Pushing boundaries*" in which future enforcement is designed by means of data-exchange and creating trusted traders and trusted trade lanes. This vision is visualized in the figure 2<sup>33</sup>.

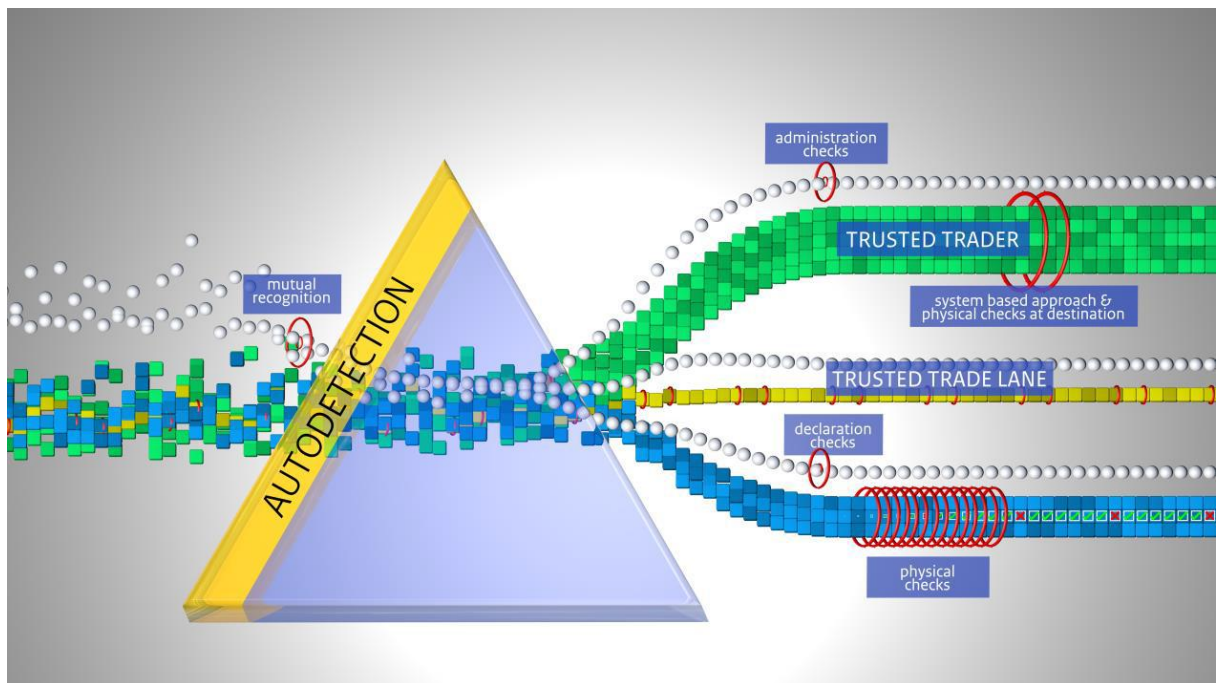


Figure 2: Customs Administration of the Netherlands' vision on regulatory supervision (picture obtained from presentation F. Heijmann during Customs & Supply Chain Compliance lecture).

This figure shows that on the basis of pre-arrival data, the stream of goods is separated into three kinds.

- Blue: unknown trader (traditional). Only origin and goods description are known.
- Green: trusted trader (based on AEO certification as already discussed before).
- Yellow: trusted trade lane (future).

The essential characteristics of a trusted trade-lane are (1) Members are known and individually trustworthy; (2) There is long-term and stable collaboration among members, motivated by a viable business proposition, and coordinated by a governance structure that provides a party who

<sup>33</sup> Customs Administration of the Netherlands (2014).



can act as legal representative; and (3) There is an adequately designed, well implemented and operationally effective system of control measure to ensure (a) physical integrity of the goods and (b) reliable trade data, to be made available to the authorities<sup>34</sup>.

The customs administration uses mixed regulatory methods. For all streams, a combination of administrative checks, physical inspections, and X-ray scanning is used, but the relative proportion of methods depends on the type of trade<sup>35</sup>.

Blue: Mostly physical inspections and additional X-ray scans. Administrative verification for fiscal matters. Note that physical checks are more resource intensive and typically lead to logistics disruptions and delays.

Green: Mostly administrative verifications, with occasional audits or physical inspections to verify reliability.

Yellow: Mostly administrative verification of data from supply chain visibility platforms (data pipeline). Occasional audits or inspections to verify reliability.

This vision is not strictly entitled to The Netherlands but presented on EU/WCO level. It aims for a proper balance between control and facilitation.

### **2.2.5 Horizontal monitoring concept**

The Dutch Tax and Customs Administration introduced 'horizontal monitoring' in 2005, a form of supervision based on the principle that citizens, businesses and institutions should be called to be held more accountable for their personal responsibilities – and Tax and Customs Administration and taxpayers have a mutual interest in the development of a relationship based on trust that avoids an unnecessarily heavy supervisory burden, complex discussions and retrospective adjustments. Today the policies and procedures of Dutch Customs are based on this concept and it fits in the recently developed and above discussed enforcement vision of Dutch Customs.

#### ***Definition and essence***

Dutch Customs' horizontal monitoring has, in consultation with the business community, been formulated as follows: *Inspections of cross-border goods traffic carried out by the Netherlands Customs and other government bodies are based on the proprietary control mechanisms, certification, quality and safety systems within companies, groups of companies, sectors and chains, as a result of which the goods of safe and honorable companies can cross the border without impediments*<sup>36</sup>.

The essence of this concept can be described as follows: "Horizontal monitoring refers to mutual trust between the taxpayer and the Netherlands Tax and Customs Administration, the more

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<sup>34</sup> Hulstijn et. al. (2016)

<sup>35</sup> Hulstijn, et. al (2016)

<sup>36</sup> Committee Horizontal Monitoring Tax and Customs Administration, (2012)

precise specification of each other's responsibilities and options available to enforce the law and the setting out and fulfillment of mutual agreements. In so doing, the mutual relationships and communications between citizens and the government shift towards a more equal position. Horizontal monitoring is also compatible with social developments in which the citizen's personal responsibility is accompanied by the feeling that the enforcement of the law is of great value. In addition, the horizontal monitoring concept also implies that enforcement is feasible in today's complex and rapidly changing society solely when use is made of society's knowledge<sup>37</sup>."

### **Segments**

Important for the concept of horizontal monitoring is the division in the following four segments: Very Large Businesses (VLB), Medium-Sized Businesses (MSB), Small and Medium-Sized Enterprises (SME) and Private Individuals.

The first two segments receive a 'customized' approach which is referred to as 'account management'. The approach adopted for the Small and Medium-Sized Enterprises segment is usually more of a group approach, since the Tax and Customs Administration is of the opinion that the importance of and risks associated with enterprises in this segment are such that account management would not be efficient. The Private Individuals segment is not relevant in this research.

Another division can be found in trusted and non-trusted parties. This classification is based on the Authorized Economic Operator (AEO) status of a company. The impact of this segmentation lies in the different customs supervision treatment and has consequences for customs procedures (simplifications), permits and guarantees.

### **Process**

The horizontal monitoring process differs per segment. For VLB and MSB the following steps have to be taken: Step 0: up-to-date client profile; Step 1: horizontal monitoring meeting; Step 2: compliance scan; Step 3: resolution of pending tax issues; Step 4: compliance agreement; Step 5: analysis and improvement of tax control; Step 6: adjustment of supervision; Step 7: performance of audits<sup>38</sup>.

### **Customs supervision instruments**

Inspections (of Customs & other inspection agencies) are based on the proprietary control mechanisms, certification (AEO), quality and safety systems within companies, groups of companies, sectors and chains (Trusted Trade Lanes). Besides these administrative controls also physical controls like scans are used. Horizontal monitoring is impossible without also using vertical monitoring instruments like physical checks.

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<sup>37</sup> Committee Horizontal Monitoring Tax and Customs Administration, (2012)

<sup>38</sup> Committee Horizontal Monitoring Tax and Customs Administration, (2010)

### **2.2.6 Design principles of horizontal monitoring**

Horizontal monitoring is based on the principle that compliance with tax regulations is promoted by (voluntary) cooperation between taxpayers participating in horizontal monitoring (initially taxpayers in the Very Large Business segment) and the Tax and Customs Administration in a **relationship** based on trust, understanding and transparency. Taxpayers assume their personal responsibility for compliance with tax regulations and the Tax and Customs Administration trust them. The Tax and Customs Administration in return adjusts its supervision in accordance with the degree to which the taxpayer is **in control** (and, consequently, the degree to which the trust is justifiable). The Tax and Customs Administration then relies on the control measures the taxpayer has implemented (the tax control framework) to be **in control** of tax matters and on the internal and external audits conducted to verify control. The combination of these elements should result in more effective supervision (in terms of the taxpayer's improved compliance with the regulations) and more efficient supervision (in terms of the taxpayer's reduced supervisory burden)<sup>39</sup>.

Based on the above the design principles of horizontal monitoring can be formulated as:

1. Relationship-oriented based on trust, understanding and transparency. This principle is mainly established in the design of customs supervision instrument through AEO-certification. In the process towards this certification a clients profile is established and different meetings are organized to establish the relation and create mutual understanding. The status of certified businesses directly affects the level and form of supervision.
2. Based on in control status of businesses. When a relation is established between Customs and business and the latter is in control, the focus of the customs supervision instruments are on the procedures instead of the transactions. For instance an AEO-audit checks the internal control mechanisms and the design, existence and operation of risk mitigation procedures.

In the following when revering to the horizontal monitoring or customs supervision instruments design principles the term relationship-oriented and in control status will be used.

### **2.3 Conceptual model**

This study investigates the relationship between the independent variable or construct 'design principles of a portfolio of Customs supervision instruments', and the dependent variable or construct 'development of CLSCs'. The question is how design principles of a portfolio of Customs supervision instruments can improve the facilitation of the development of CLSCs. Besides that the impact of Customs strategy on the development of the design principles of a portfolio of Customs supervision instruments as well as the impact of design principles of CLSCs on the development of CLSCs will be analyzed. Finally the reciprocal relation between both types of design principles will be discussed. This can further enhance the dependent and independent variables. For this explorative research it is difficult to add measurable attributes to the constructs as both constructs are analyzed on high level.

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<sup>39</sup> Committee Horizontal Monitoring Tax and Customs Administration, (2012).

Figure 3 below visualizes the conceptual model:

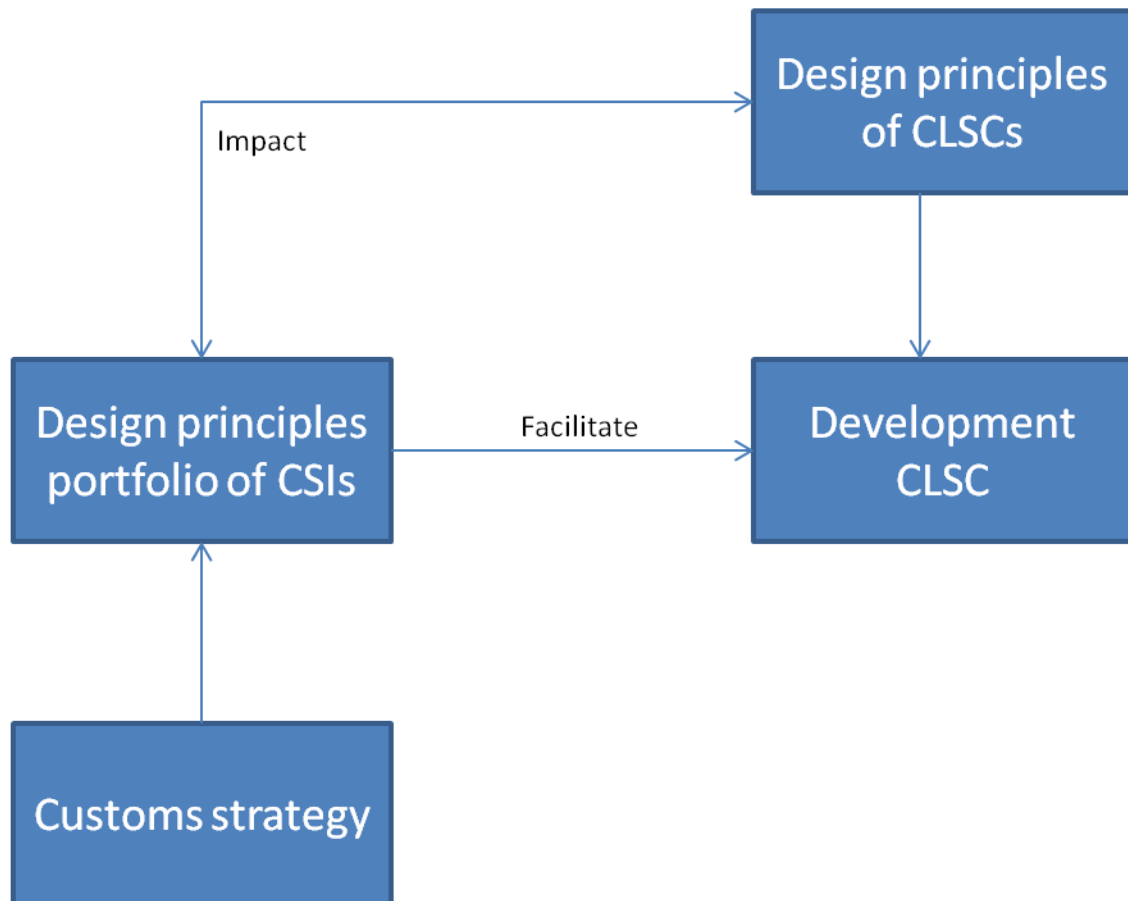


Figure 3: Conceptual model

In paragraph 2.1 and 2.2 the theory and design principles of CLSCs and Dutch Customs supervision have been discussed. In order to investigate the relevance of these design principles towards each other a list of propositions have been developed. As there are two horizontal monitoring and four CLSC principles defined, the following sixteen propositions are developed:

*Relationship-oriented on leverage volumes:*

Proposition 1: Businesses willing to leverage volumes need to find partners to combine flows of goods and generate volume. A relationship oriented focus is therefore very important.

*In control status on leverage volumes:*

Proposition 2: The in control status of a company does not seem to have major impact on leverage volumes.

*Relationship-oriented on focus on financial performance:*

Proposition 3: A relationship oriented focus of a business is not a precondition for better financial performance.

*In control status on focus on financial performance:*

Proposition 4: When a business is in control it will usually perform financially better.

*Relationship-oriented on form strategic alliances:*

Proposition 5: When a business is relationship oriented it has a more outward scope and better insight in the supply chain. This will ease the forming of strategic alliances.

*In control status on form strategic alliances:*

Proposition 6: When a business is in control it has a better focus and idea on relevant partners. They are also willing to cooperate with other also in control partners. An in control status could raise trust in the supply chain and ease the forming of strategic alliances.

*Relationship-oriented on power of information:*

Proposition 7: When a business is more relationship oriented, they are more aware of the (information) needs of other stakeholders and more willing to share information. Information of different stakeholders will increase the quality and power of information.

*In control status on power of information:*

Proposition 8: When a business is in control of its processes usually better information is available, which increases the power of information.

*Leverage volumes on relationship-oriented:*

Proposition 9: Leverage volumes (together with supply chain partners) leads to the need of relation management.

*Leverage volumes on in control status:*

Proposition 10: By leverage volumes and working together with partners the need for in control becomes even more important. However no direct impact is foreseen.

*Focus on financial performance on relationship-oriented:*

Proposition 11: By focusing on financial performance a business could conclude to emphasize more on her relations within the supply chain. However no direct impact is foreseen.

*Focus on financial performance on in control status:*

Proposition 12: By focusing on financial performance a business could conclude that they need to become more in control. However no direct impact is foreseen.

*Form strategic alliances on relationship-oriented:*

Proposition 13: The forming of strategic alliances highly affects the business' relations with other stakeholders.

*Form strategic alliances on in control status:*

Proposition 14: The forming of strategic alliances does not affect the in control status of businesses.

*Power of information on relationship-oriented:*

Proposition 15: Good and relevant information on other stakeholders in the supply chain could enhance relationships. However, this information in itself does not creates sustainable relations.

*Power of information on in control status:*

Proposition 16: Reliable and complete information is crucial for being in control. Therefore the impact of information on the in control status is high.

The above developed propositions have been tested through four interviews from both Customs and business perspective. The results will be discussed in chapter 6. It is relevant to mention that this investigation on the relevance of the different principles upon each other is on high level and can therefore only give a first general impression where these principles can strengthen each other. Also the relative importance and strength is not further investigated.

### 3. Methods

#### 3.1 Research Design

To fill the gap in the knowledge base this research aims to match theory with practice. To answer the research questions a research design is needed. Since this area concerning the relation between the design principles of Customs supervision instruments and CLSCs has not yet been thoroughly studied, an exploratory study is valuable. Figure 4 below gives an overview of the research design process flow.

Research design proces flow

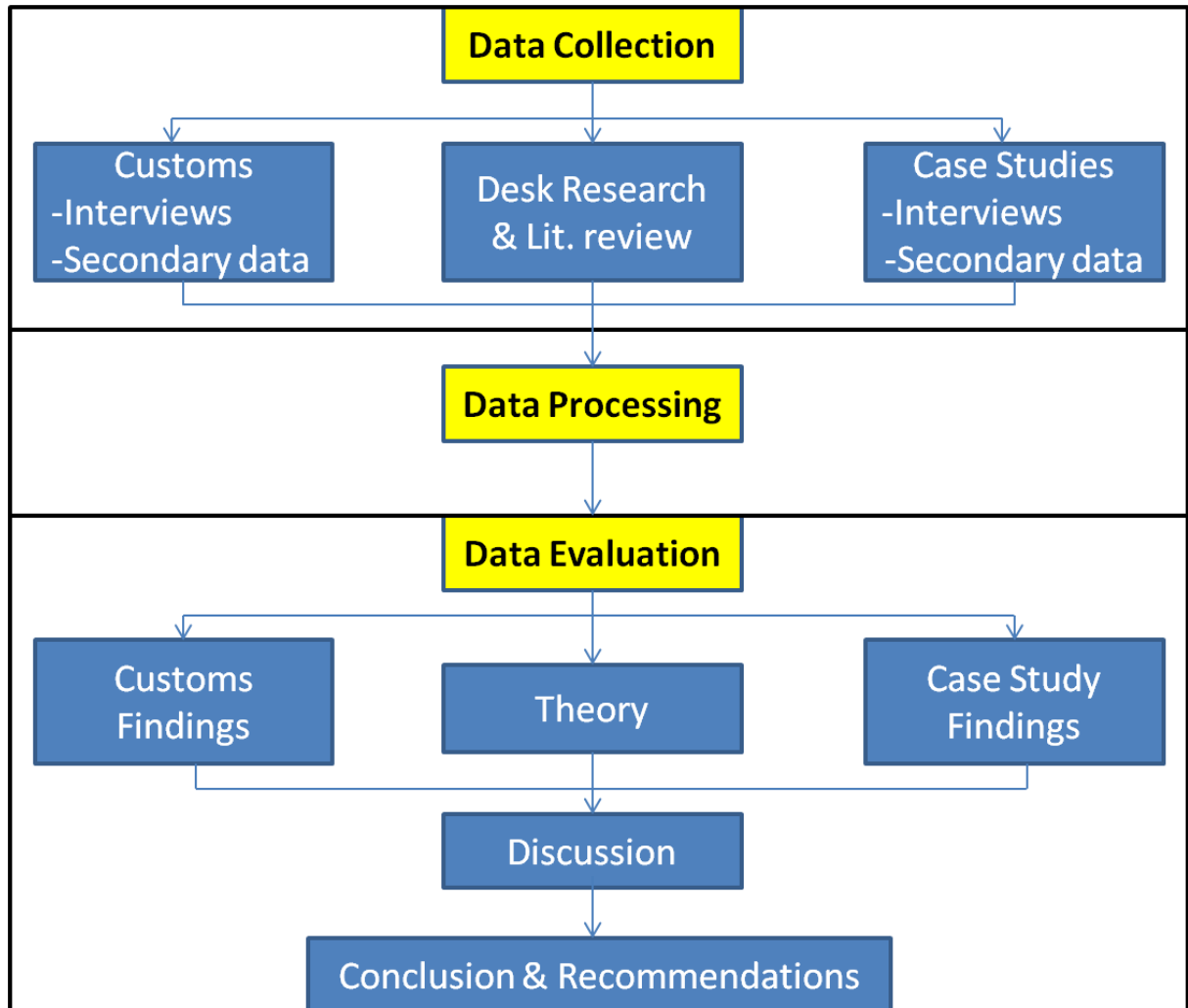


Figure 4: Research design process flow

This research was conducted as an explorative study using several research methods. The main methods were semi-structured interviews and a case study. Below the different steps of the research design process flow will be further elaborated.

### 3.2 Data Collection

In this study, different forms of data collection have been used: desk research and literature review, expert interviews with Customs officials and a case study. Secondary data has also been used.

#### 3.2.1 Desk research and literature review

Desk research was carried out at RSM Erasmus University and online for the development of the theory and background information. Online search engines such as Erasmus University Library and Google Scholar were utilized to gather professional literature and other documentation.

#### 3.2.2 Expert interviews Customs officials

Interviews are critical for collecting accurate and reliable data. In this study, semi-structured interviews were carried out to obtain detailed answers in a defined format. The interview questions were formulated to evoke responses that could be used for input for the case study as well as to determine and test design principles of Customs supervision instruments contributing to the facilitation of CLSCs. The interviews were summarized and returned to the interviewees for approval. In appendix 2 the interview questions were listed.

The expert interviews with Customs officials are relevant for this research because they can test and validate design principles. They have experience with the segments and access to numbers and figures of transactions. Customs have a unique position in the supply chain. They are in the lead due to their legal tasks and responsibilities. Although there are some coordination possibilities in The Netherlands for businesses like 'Overleg Douane Bedrijfsleven (ODB)', businesses have to follow the law and procedures and will therefore adapt to the changes made<sup>40</sup>. It is therefore relevant to explore first the insights of these experts.

For this research, six interviews with Customs officials have been held. To get information from different perspectives, different functional backgrounds have been chosen (manager, auditor and client manager). To overcome bias, of each function two persons have been interviewed.

In table 1 the expected focus of contribution is summarized.

	Manager	Auditor	Client Manager
Perspective:			
Strategic	X		
Control		X	
Business			X

Table 1: Interviewees expected focus

<sup>40</sup> Truel and Maganaris, (2015), p12.



### **3.2.3 Case study**

This explorative research on design principles does not focus on one particular sector or business type. It is meant to enhance knowledge on a more general level. It focuses mainly on the impact of Customs supervision instrument design principles towards the facilitation of CLSCs.

A case study can help explore theoretically ideas in a practical setting. The function of this case study is to test the design principles discovered from literature and from Customs interviews. Furthermore it could add new insights on role and function of Customs in general.

This case study consists of:

- A logistical or Customs problem in the handling of offshore back-load. First the problem will be defined with help of BPMN-tooling.
- A presentation of the final solution.
- A projection of the final solution towards CLSCs.
- The description and analysis of the process of how the different stakeholders came to this solutions. Here the design principles will be tested.

### **3.2.4 Secondary data**

Secondary data includes qualitative and quantitative information such as various documents, brochures, reports as well as other information gathered through the internet and websites.

### **3.3 Data Processing**

The data have been processed by making use of different methods. For the interviews with Customs officials a template has been developed with general and more specific (focus on perspective) questions. This made possible the extraction of the main issues per perspective of the interview reports. For defining the problem the BPMN method have been used. A third method to process the data is process analysis. This is used to organize and present the different steps from problem to solution and implementation in the case study.

### **3.4 Data Evaluation**

The Customs and Case study findings of chapters 4 and 5 will be combined with the theory model of chapter 2. Now a discussion is possible in which theory and practice can be challenged. After that conclusions will drawn and recommendation made.

## **4. Customs Experts Findings**

The Customs experts findings are based on six interviews with Customs officials. To get information from different perspectives, several functional backgrounds have been chosen. In the next paragraphs the control, business and strategic perspectives are elaborated. To overcome bias, two persons of each function have been interviewed. All interviewees agreed with the summary of the interviews as mentioned in appendix 3.

### **4.1 Control perspective**

These findings are based on interview 1 and 4 of appendix 3.

#### ***Customs supervision instruments***

Customs have a layered and risk based approach to supervision. For monitoring Customs uses several instruments which can be classified as administrative or physical supervision. Examples of administrative supervision are CNI (control after import), post audits, initial audits (for certification and authorizations) and AEO field checks. Physical supervision are scans or physical inspection of items. New technological developments like automatic detection are becoming more important as well as the use of open and closed data. Horizontal monitoring uses both administrative as physical supervision as stated in the Commission Stevens report.

#### ***Dutch Customs supervision design principles***

From control perspective in control and relationship-oriented principles of Dutch Customs supervision instruments are very important. The level of transparency also defines the level of facilitation. The relationship-oriented principle represents the willingness of cooperation between businesses and Customs and the in control principle illustrates the ability of businesses. Huge volumes of international trade through the Netherlands makes system-based solutions necessary and these principles relevant. However, also the character of the goods are important to define risks. Together these three elements define the control strategy.

#### ***Customs control gap***

From perspective of Customs and in particular of IT-auditors facilitation of CLSCs is somehow difficult. This has to do with the scope of Customs activities. Customs involvement starts with the entry of non EU goods into the EU (or with an Entry Summary Declaration (ENS)). After import in the EU and release for free circulation the role of Customs and Customs supervision comes to an end.

With the introduction of CLSCs and reuse of products after end of lifecycle, these products can have a second life and send to the original producer. The export of this “waste” is again in scope of Customs supervision. However in the period in between (this can be many years) no Customs involvement is present. In figure 5 below this “Customs Control Gap” is illustrated.

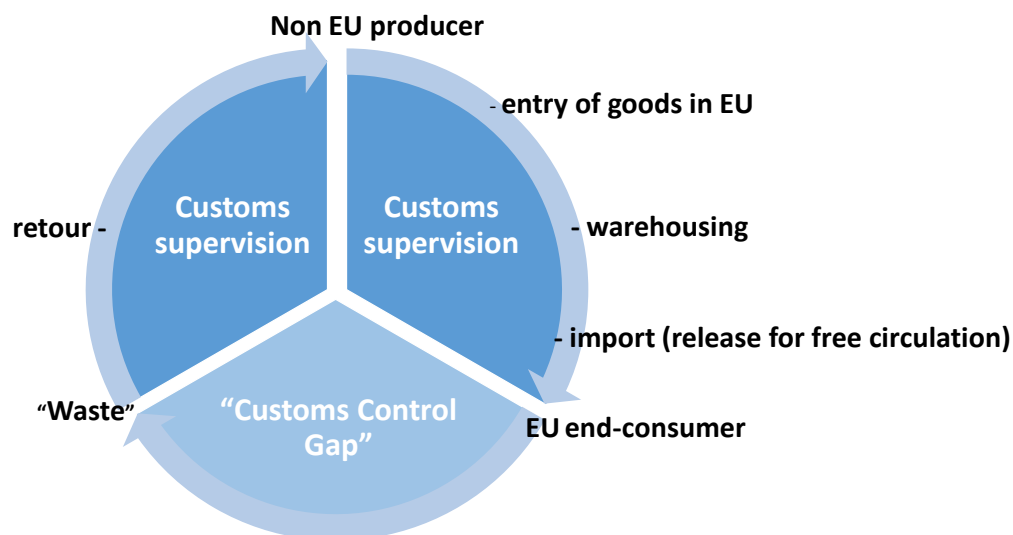


Figure 5: “Customs control gap”

From Customs control perspective this gap is not a real problem, they can manage the incoming and outgoing flows of goods. From business perspective and from a broader sense of Customs facilitation towards businesses, this information gap could become an issue. In order to stimulate CLSCs a business driver could be used of beneficial Customs procedures like outward processing. This procedure is explained below and also related to the Customs supervision gap.

### ***Special procedure outward processing***

Under the outward processing procedure Union goods can be temporarily exported from the customs territory of the Union in order to undergo processing operations. The processed products resulting from those goods can be released for free circulation with total or partial relief from import duty upon application by the holder of the authorization or any other person established in the customs territory of the Union provided that that person has obtained the consent of the holder of the authorization and the conditions of the authorization are fulfilled (art 259 UCC).

This means that an imported product can be temporarily exported and re-imported again under beneficial conditions. Import duties are only applicable on the added value. This procedure is used for processing operations like: repair, upgrade, revisions etc. of imported products. Important is the direct link between the original imported product and the temporarily exported and then re-imported product. Businesses should keep complete records of these products to prove their identity towards Customs. This special procedure is visualized in figure 6.

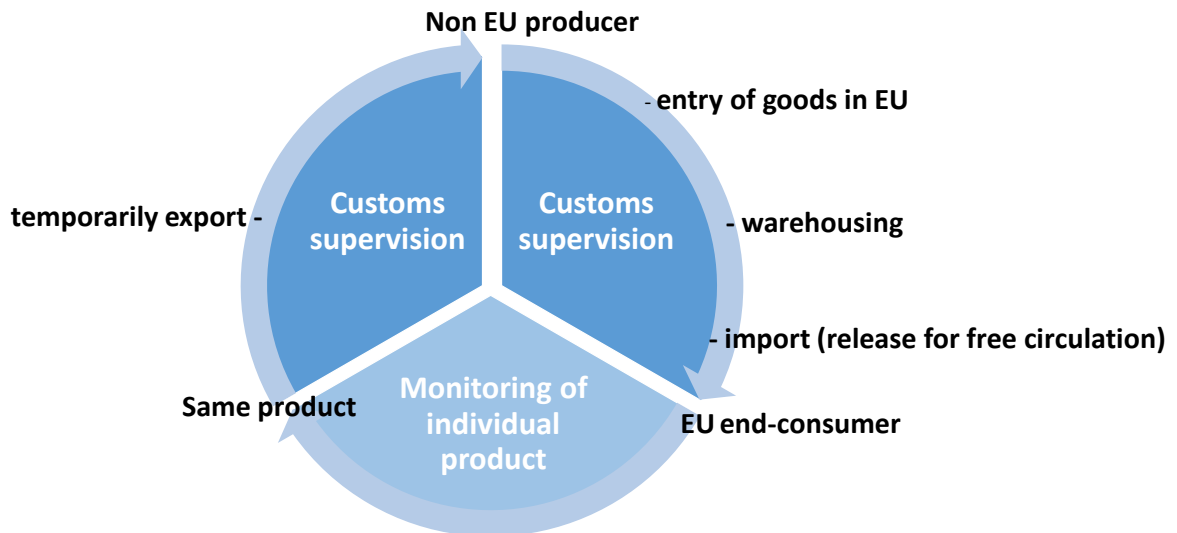


Figure 6: Special procedure outward processing

With respect to CLSCs and the use of outward processing procedure many issues arise. First the time gap between original import and end of lifecycle makes it difficult to keep track of the product. Customs also have no information of this period (see the Customs control gap above). Another issue is that within CLSCs products rarely have the same appearance as the original product. Different parts can be used in different most efficient ways to keep their value at the highest. So the one to one connection is very hard to make and even when this connection can be made it is difficult to prove because of the time lap. Therefore the use of this special procedure in relation to CLSCs is very difficult and not effective. With this analysis in mind it is now interesting to see if a new procedure can be designed to facilitate CLSCs.

***New procedure “circular export”, new design principle***

As stated before businesses are more willing to reuse (parts of) products when a clear business incentive is present. This means that if businesses have an economic benefit of reusing products over using new raw materials they are willing to change old patterns. When Customs provides a special procedure to create such an incentive they can facilitate CLSCs. Now, as seen with the outward processing procedure, the biggest problem was the one to one relation and more specific the information needed to prove this relation. When assumed that this relation is no longer necessary and the focus is no longer on the original imported product but on exported “EU-waste” for circular purposes. This means that if a company exports “EU-waste” which is intended for reuse and re-import back to the EU, it could earn a rebate (in the form of a certificate) for future imports towards the EU. It is not needed to import for example the same television in which certain parts of the exported old television is re-used, this rebate can also be used for another television. For this so-called circular export procedure to work certain conditions are necessary:

- Only “EU-waste” can be used and this origin should be proven. Otherwise unwanted waste streams will appear.
- This “EU-waste” is recognized as a material instead of waste. Waste legislation is no longer an issue here.
- The company that exports this waste should prove the use and end purpose of this waste.
- The value of the exported waste should be determined before export.
- The certificates should be transmissible but only towards AEOs.

Figure 7 shows the working of such a new procedure:

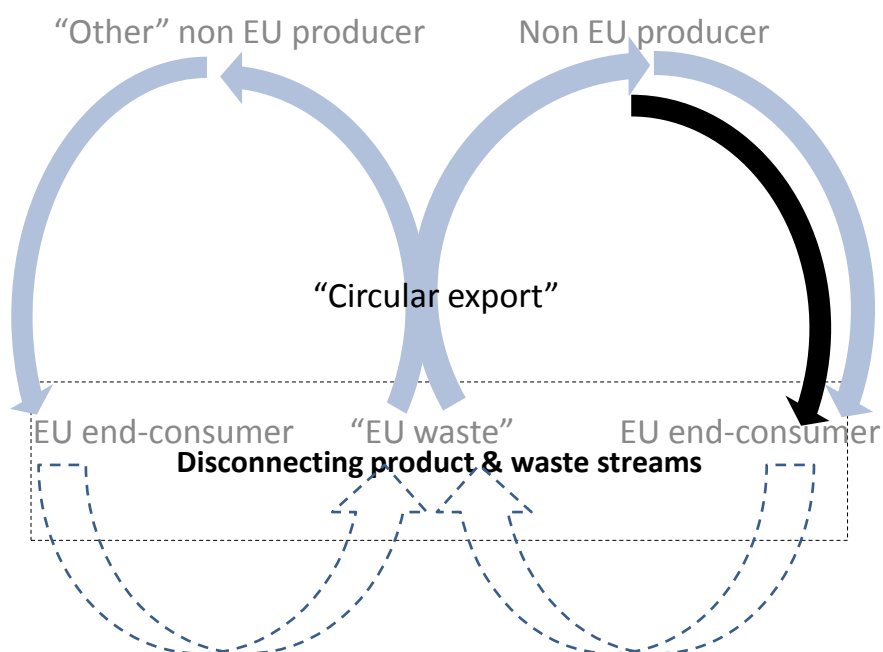


Figure 7: Circular export

With this suggested procedure product and waste streams can be disconnected which eases the information flows and gives an incentive towards CLSCs.

The creation and implementation of such a procedure specific for the facilitation of CLSCs could be an example of close cooperation between relevant public and private stakeholders. It corresponds with the strategic goal of supporting legitimate business activity. However the legal aspect is also relevant. In EU Customs legislation no special attention for facilitating CLSCs can be found<sup>41</sup>. Implementing such procedures could cause amendments to legislation. A possible route could be art. 282 and 283 of UCC which are known as ‘pilot articles’.

<sup>41</sup> EPCEU, (2013), EPCEU, (July 2015) and EPCEU (November 2015).

A cooperation as described above goes beyond the relationship-oriented principle and envisions perhaps a next stage of public-private cooperation. It can be regarded as a higher level of cooperation and is co-creative. Therefore a new or enhanced Customs supervision design principle could be a co-creation principle.

#### **4.2 Business perspective**

These findings are based on two interviews with Customs officials, see appendix 3, interview 2 and 5.

##### **Customs and CLSCs**

No specific relation between Dutch Customs activities and enhancing or facilitating CLSCs is found. Also from businesses no questions asked towards this subject are known.

##### **Relationship-oriented principle under pressure**

The relationship-oriented principle of Customs supervision instruments is best visible in the role of client advisors. They have direct contact with businesses. From the interviews it became clear that nowadays this principle is under pressure. The implementation of UCC causes a huge challenge for the Dutch Customs organization. The tight timelines and deadlines of for example the re-auditing of all authorizations and the limited resources of staff made Dutch Customs to reconsider priorities, at least for the time being. In result of this client advisors are delegated to execute these revisions. They have very little time to invest in relationships with clients and client contact is limited. If businesses need advice, they have to hire expertise themselves. Furthermore the idea of different client approach for different segments has been left. Now, only a generic approach is available instead of an individual (or per segment, based on a weighing system) approach. Although it is not clear if these measures will continue in the long run, at least in the short run it can be concluded that the relationship-oriented principle is under pressure.

##### **Trusted trade-lanes**

From business perspective it is interesting to relate the concept of trusted trade-lanes with CLSCs. This concept as mentioned in the pushing boundaries enforcement vision of Dutch Customs has basically the same characteristics as needed for CLSCs. As already mentioned in paragraph 2.2 these characteristics are: members are known and individually trustworthy; there is long-term and stable collaboration among members and there is an adequately designed, well implemented and operationally effective system of control measures.

Within the Dutch Customs organization (District Rotterdam Rijnmond) referring to this vision and to the relationship-oriented principle, one blue team (for unknown traders) and two green teams (for trusted traders (AEO)) have been established. The client advisors are divided in these teams. At this moment, however no yellow team (for trusted trade-lanes) have been established. In relation to facilitation plus and CLSCs this could be an interesting thought.

### **Relevant principle data-sharing**

The increased importance of data and data-sharing is evident. Businesses for example requested to give Customs permission to look direct into their databases for checks on import dossiers instead of the procedure that they have to hand over those complete files towards Customs for post clearance audits. For mainly legal reasons (who is responsible) this has not yet been realized, however this could be a future direction.

In a pilot with handling offshore back-load, a data pipeline solution is implemented. This data pipeline is organized by a logistic service provider for all the parties involved in this process. It makes (reliable) information sharing more easily and efficient. This efficient and easy sharing of reliable information is also for CLSCs extremely important. With even more stakeholders involved a system based approach is inevitable. In the case study this pilot will be further discussed. A relevant design principle which can enhance CLSCs would therefore be the data-sharing principle

### **4.3 Strategic perspective**

These findings are based on two interviews with Customs officials, see appendix 3, interview 3 and 6.

#### ***Difference vertical and horizontal monitoring***

There are different Customs supervision instruments that can be used for both vertical and horizontal monitoring. With horizontal monitoring the responsibility for in control status lies with businesses and this in control status is based on certain conditions that are fixed in advance. Businesses have to prove this in control status to Customs. In contrary, with vertical monitoring Customs checks the declarations afterwards and businesses have to prove that there declarations are correct. This is a crucial difference. So in respect to supervision instruments it is not correct to call administrative controls horizontal supervision instruments and physical checks vertical supervision instruments.

The vertical monitoring approach is based on risk management and deployment of scarce capacity of Customs resources. With horizontal monitoring (which is also based upon risk management) this capacity is used for monitoring the in control status. This is a more advanced way of supervision based on a relationship between Customs and business and on the in control status of the latter.

#### ***New design principle risk management***

Dutch Customs have chosen the horizontal monitoring approach. Important design principles of this approach are relationship-oriented and in-control status of businesses. A third design principle could be risk analysis or risk management. From European legislation this is the most important

design principle. Risk management within the context of horizontal monitoring is different than with vertical monitoring. With the latter risk management defines which shipment should be checked and with the first it defines the degree of attention towards an individual client.

Risk management not mentioned as principle in Stevens-report, you could say that with horizontal monitoring the relationship and the degree of in control defines the risks you have. This goes for the green and yellow flows but not for the blue flow. For the blue flow risk management is the leading principle.

Important for risk management is the quality of data. Developments like big data, social media and data sharing raises the possibilities of using (better) data for risk profiles and risk assessment.

### ***Control versus facilitation***

The core tasks of Dutch Customs can be defined as ABC-tasks (afdracht, bescherming en concurrentie bevordering). These tasks are mentioned in “Handhavingsplan 2017” of Dutch Customs. Facilitation is not a core task of Customs however they seek for a proper balance between control and facilitation. A form of facilitation is for example the re-use of information. This is an important topic for Customs.

### ***Trusted trade-lanes and CLSCs***

At the moment Dutch Customs have some pilots regarding trusted trade-lanes. The pilots are in the initial stage and not much information is available. The expectation is that these trusted trade-lanes could be relevant for CLSC developments.

### ***Supply chain driven design principle***

For an efficient CLSC in which different parties sharing information a right balance between the parties is essential. In a CLSC with a dominant player a less powerful party is perhaps less willing to share its (business) information to protect its position in the supply chain. Another aspect is the importance of in control status of the strategic alliance as a whole instead of only an individual party. By focusing on the supply chain as a whole instead of individual businesses Customs could contribute towards this issue. A design principle for Customs supervision instruments could therefore be ‘supply chain driven’.



## 5. Case Study Findings

The subject of this case study is the handling of offshore back-load. Back-load means in this sense reverse logistics in the offshore business; returning equipment, goods from oil rigs to the owners. It is based on the research of Molenhuis, Tjoelker and Zandbergen, *Handling offshore back-load: enhancing the supply network*, executed in 2015<sup>42</sup>. This research investigates the issues relating to this process from different perspectives and proposes a solution to solve the issues.

For this study it is more interesting to analyze how the representatives of Customs and businesses arrive at this particular solution. How developed the cooperation between Customs and business and which steps were taken? A process focus will be added to the initial research. Another aspect of interest is the relation between the proposed solution and enhancing CLSCs.

This case study is relevant for at least two reasons. First, it investigates how Customs and business cooperate in finding solutions to optimize business processes. In fact, this can be regarded as an research on the relationship-oriented versus co-creation design principles of Customs supervision instruments. A second reason is that the proposed solution of the research of Molenhuis et.al. in itself is an good example of the data sharing principle and could be useful for CLSCs.

This structure of this case study is as follows: Problem definition; Solution; Solution and CLSCs; and Process. The content of this chapter is validated by the involved representatives of Customs and business.

### 5.1 Problem definition

In order to define the problem it is first relevant to explain the process of offshore back-load. In this case nine offshore operators working together and outsource the logistics of their supplies for the oilrigs and customs formalities towards one fourth party logistics provider (4-PL).

The 4-PL is responsible for the coordination and transport of the goods from approximately two hundred different vendors towards the oilrigs (and back) and the handling of customs formalities. A complicating factor is that the oilrigs of these operators are located on the Continental shelf and for the Netherlands the size of the continental shelf is equal to the Exclusive Economic Zone, see appendix 4. This means that when goods are sent from the Continental shelf they have the Customs status of 'Non-Union goods'. This is the outcome of case law *Aktiebolaget NN v Skatteverket*<sup>43</sup> in which the Court of Justice stated that 'the sovereignty of the coastal state over the exclusive economic zone and the continental shelf is merely functional and, as such, is limited to the right to exercise the activities of exploration and exploitation laid down in Articles 56 and 77 of the Convention on the Law of the Sea'.

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<sup>42</sup> Molenhuis et. al. (2015).

<sup>43</sup> EUCoJ, (2007), Case C-111/05 *Aktiebolaget NN v Skatteverket* at para 59.

Therefore goods coming from the Continental Shelf or Exclusive Economic Zone have the Customs status of 'Non-Union goods' as referred to in article 5(24) UCC. When these goods are brought into the customs territory of the Community they shall, from the time of their entry, be subject to customs supervision for as long as necessary to determine their custom status (article 134 UCC).

The Customs status of the goods complicates the flow of goods. Relief from import duty has been obtained by making use of the exception of returned goods. This means that the exported goods (to the oilrigs) have to be compared with the return goods. However from this case it became clear that the 4-PL did not have all the required information on time to meet Customs demands. As a result this leads to delays in customs clearance and extra supply chain costs.

Furthermore this 4-PL has a permit for simplified declaration and make use of trade documents. From legislation however this simplified declaration should meet a list of requirements<sup>44</sup>. This case study showed that the information used did not meet all the requirements. So it became clear that the 4-PL did not have access to all the required information to fulfill all legal obligations. Below this information issue will be visualized in simplified way for one operator with the use of BPMN modeling. The basic idea is that information flows of the outward and inward flow are not (well) connected and that all the right descriptions are readily available.

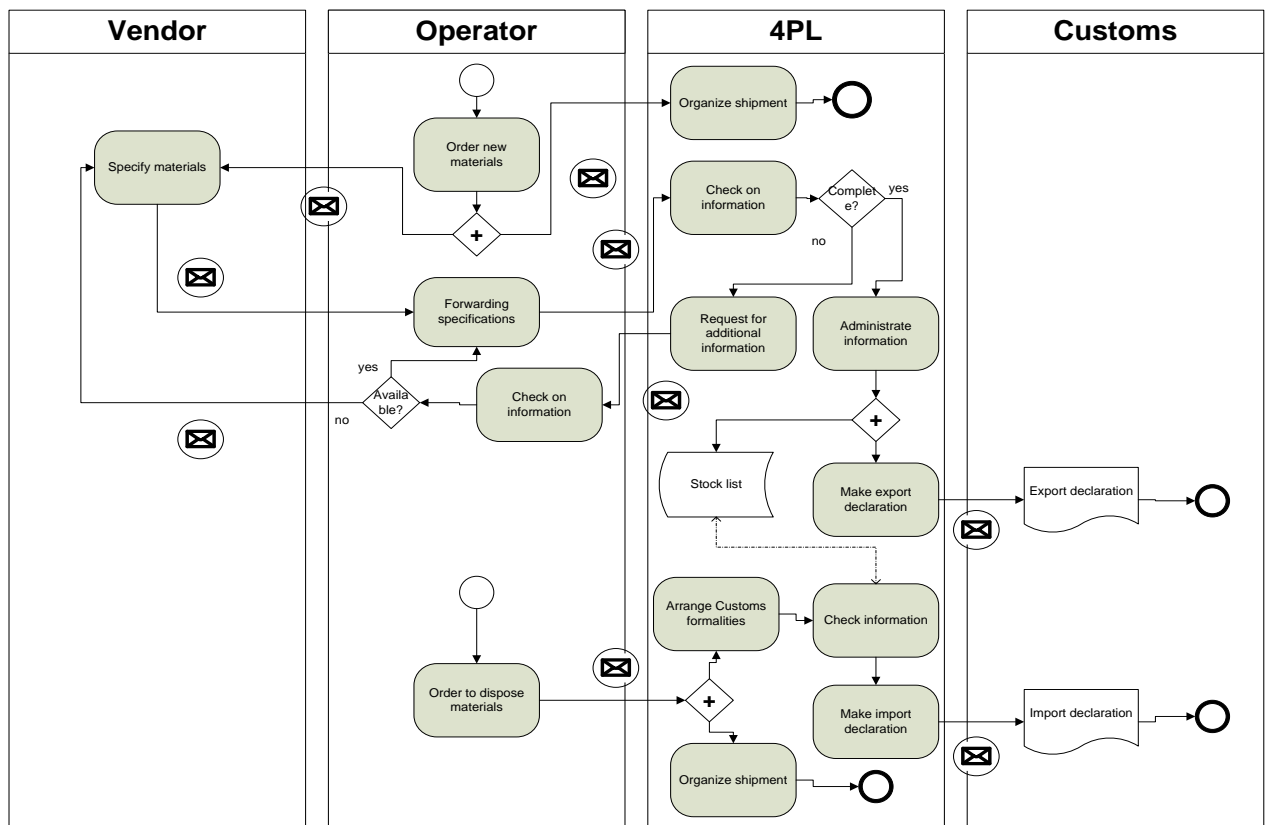


Figure 8: BPMN information issue of one operator

<sup>44</sup> EPCEU, Regulation No 2454/93, CCC, Annex 30A table 7 Requirements for simplified procedures.

In this case the 4PL maintained extensive Excel stock lists for each operator. The 4PL received the information of the vendors through the operators. With these lists it was difficult to track and match the incoming and outgoing materials, with the right descriptions and other manifest criteria. Less standardization was possible and automatic system control did not exist. The quality and integrity of data was more difficult to guarantee.

An extra dimension towards this problem arises with the implementation of the UCC. The option of simplified declaration expired. Key principle of UCC is that all declarations should be electronic (article 6 UCC). This made the used procedure of the 4-PL no longer valid.

## 5.2 Solution

Discussions with the supply chain partners lead to the development of the Transport Request Tool (TRT) by the 4-PL. This tool can be regarded as a data-pipeline solution. It digitizes the outward and inward process flows and can be used by the operators, vendors and 4-PL. Efficiency will improve by eliminating double work and the 4-PL can easily acquire timely and accurate information for the declarations.

Below a picture (figure 9) is presented of the TRT which is obtained from the 4PL<sup>45</sup>. It shows the working of this tool. A key to this system is the connection to material stock database of the different operators. As mentioned, the 4-PL, operators and vendors have access to this tool. Customs have no access to it.

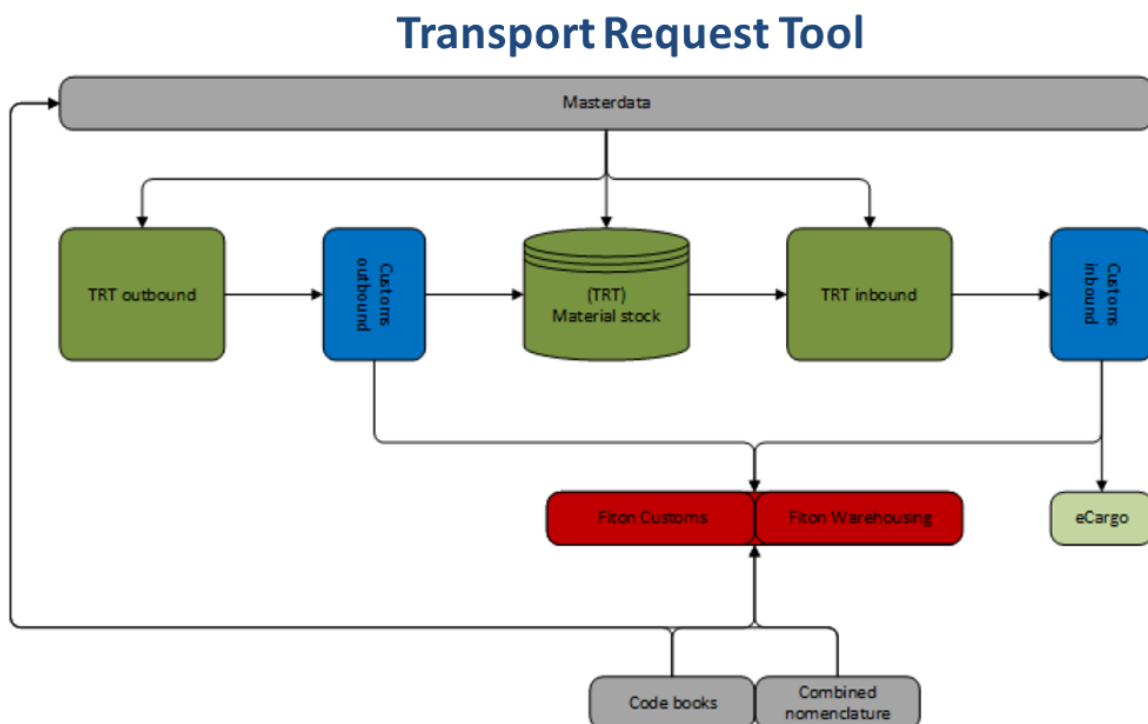


Figure 9 Transport Request Tool

<sup>45</sup> Internal presentation 4PL, (2015)

With the implementation of the TRT the information issue could be solved as well as the issue of electronic declarations.

All vendors agreed to use a fixed Excel format for the description of materials. In this format the relevant manifest information can be filled in. Although vendors do have access to the TRT, they are not allowed to directly put their information into this system. They send the Excel to the operator. Now the operator could easily upload the Excel in TRT. TRT has built in validations, to guarantee completeness of data and data integrity. The 4PL is performing a check by using a filter and if necessary enriches data or adjust it. Then the information is saved in the material stock database, with multiple an unique identifiers, like serial number, Po number, description etc. With the TRT customs functionality the 4PL is able to fulfill the import and export declarations in AGS. The data quality and integrity have been increased and customs formalities can be handled more efficiently.

Concerning the TRT new developments are foreseen. One of the these are that vendors directly put information in TRT (responsibility further back in the chain), which reduces the administrative burden of the operators. This feature is known as virtual loading area (VLA) or vendor portal, which aims to enhance the availability of data, supply chain transparency and minimizes the requirement for double entering of data.

### **5.3 Solution and CLSCs**

The handling of offshore back-load is basically a form of cross-border CLSC. First the goods were sent outward the EU to the oilrigs and later on back inwards to the original (or new) owner for re-use. An important issue concerning this process was the information asymmetry. The TRT proved to be a solution to this issue.

In other CLSCs especially in more complex, cross-sectoral supply chains, this information problem is even more severe. The TRT could also be useful in these chains. The new feature of virtual loading area or vendor portal could even further enhance the availability of data, supply chain transparency and minimizing the requirement for double entering of data. In this way it could enhance CLSCs.

### **5.4 Process**

In the paragraphs above the problem for businesses and Customs, a solution and its possible impact on CLSCs have been described. Different aspects from (changing) legal requirements to information asymmetry between supply chain actors and non-optimal procedures contributed to this problem. For this study however the precise cause or even origin of this problem is not most relevant but how did the different parties come to a workable and acceptable solution. To answer this question the method process analysis will be used. First a short reproduction of the different steps and phases will be presented in a timeline (table 2). Then these different steps will be further analyzed.

### Timeline from problem to implementation:

<b>2012</b>	First signals from Customs towards 4-PL of changing legislation (impact of UCC).
<b>2013</b>	Investigation to different permits at 4PL. Analysis of results by legal department of Customs authorities and the conclusion that the process did not meet the requirements. Also discussions between client managers of Customs and 4-PL on alternatives (use of AGS).
<b>2014 first half</b>	No solution was found which leads to a withdrawal of the permit for simplified declaration by Customs. In response the 4-PL issued an official complaint and escalation towards management level. An escalation meeting resulted in an agreement to work jointly towards a solution.
<b>2014 second half</b>	Investigation by three researchers (all customs employees) to find a solution for the problem. The focus of this research was more on IT-solutions than on simplifications. It concludes that material information was available in the supply chain by different stakeholders. It was suggested that the already planned Transport Request Tool for container transactions should be enhanced with a material level for customs purpose.
<b>2015 Whole year</b>	4PL did detailed analysis and proposed simplifications on procedures, which were turned down by Customs authorities referring to UCC or CCC. In the meantime development of the Transport Request Tool was started.
<b>2015 Aug - Sep</b>	4PL implements TRT and goes live with all 9 clients on container level, however material detail level is required for customs purpose.
<b>2015 October</b>	Manually processing of first declarations of one client to gain experience.
<b>2016 January</b>	Go live of TRT customs functionality to be able to process submitted material detail, including data enrichments, into AGS import.
<b>2016 March</b>	Big bang for offshore industry – all customs formalities are done electronically. Mainly manually, as material details are filled incorrectly.
<b>2016 May</b>	Implementation of UCC (no changes to 4PL).
<b>2016 second half</b>	On behalf of one of the operators (and client of 4PL) a consultancy agency agreed with Customs authorities on simplifications. These were the same simplifications the 4PL asked for and which were turned down.
<b>2016 end</b>	Starting talks between 4PL and Customs authorities on trusted trade-lane.
<b>2017 February</b>	Proposal from Customs authorities on trusted trade-lane. This proposal basically stated that access of Customs authorities to the TRT could reduce the physical inspections, however import and export declarations are still mandatory as required by UCC. For the 4PL and its clients this proposal and its benefits did not lead to a positive business case. No further actions on this subject have been planned.
<b>Future</b>	Perhaps in future by changing legislation it could be possible to use the TRT

	directly for declarations by giving Customs authorities access. Also other sectors like the wind energy parks are interested in this solution.
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Table 2: Timeline of process

***Reflection from business on process***

Observing this process the opinion of business is twofold. First, there is appreciation of the interaction with Customs officials in particular client managers. They offered time to become compliant and adapt to changing legal requirements. The efforts with respect to the research conducted by Customs officials also have been appreciated.

However in the process there was also an escalation regarding the withdrawal of the permit. The strict legal interpretation in this situation where both parties agreed that there are no fiscal, no safety / security or statistical risks did not seem necessary. Another perhaps even more important issue is the situation towards the simplifications. During the process the 4PL repeatedly asked for and proposed simplifications but these were turned down. As a consequence the TRT was programmed and implemented to handle the extensive requirements. By changing the requirements afterwards through agreement on simplification a disinvestment of the 4PL was realized. New investment is needed to adjust the TRT to these simplifications. Another aspect of inconvenience was that this simplification was realized through interaction with a client of the 4PL, initially without participation of the 4PL. The 4PL had to clarify why simplifications were not granted to 4PL, but one operator could get them.

***Reflection from Customs on process***

From perspective of Customs, this process was a good example of cooperation with businesses to solve an issue. The investments of Customs in this process, for instance with the research conducted by Customs officials, proved to be effective to raise mutual understanding and trust. Within the Customs organization however, there are different opinions and perspectives on legal interpretations and to what extent facilitation is possible.

Furthermore it is clear that both Customs and businesses have their own responsibilities and it is a challenge to bring those together. In this case Customs had different conversations with different stakeholders on simplifications. Unfortunately, the timelines of these conversations did not match with the investment and specification decisions of the 4PL regarding the TRT. For Customs the conversations with the 4PL and the representatives of the operator were connected. The eventual outcome and the decision on the simplifications was the same for all the involved parties.

This case proved that cooperation and sharing of data in the supply chain could raise the quality of data and smoothens the handling of customs formalities. More transparency in the supply chain causes a more efficient supply chain.

### ***General observations from research perspective***

By analyzing the above timeline different observations can be made. First, it takes a lot of time. In a network with many stakeholders and different interests it takes time to find common ground and understand and recognize the different perspectives. It is good to be aware that for change commitment is needed and for commitment one needs time. Second, initial focus of the stakeholders is on their own processes and their own perspectives. Both Customs and the 4-PL first look at their own interests and stick to their own domain. This does not lead to a solution of the problem. Third, with a network approach and transparency it became possible to see new options and use the knowledge of the network in a more efficient way. It became for instance clear that other parties (like vendors who rented high value equipment) in this network had not only the needed information but also interest in cooperation. They want to keep track of their equipment. Fourth, investments are needed to create benefit. Parties have to invest in knowledge on the problem and the different perspectives. They need to know the different roles and interests of the stakeholders in the network. This means also an investment in trust and relationship. Fifth, for accelerating the process commitment of a dominant player is crucial. In this case one major player was willing to start implementing the tool and sharing their experiences with the other parties in the network. Sixth, new solutions could create spin-offs. Other parties and networks like the wind energy parks are interested, which could lead to a broader usage of the solution.

### ***Reflection on conceptual model***

From the perspective of Customs, this case study proves to be a next step in cooperation between Customs and business. It became clear that the relationship-oriented approach did not prove to be sufficient to solve this problem. A higher level of facilitation was required. The road towards the solution was a good example of co-creation using the knowledge and commitment of the network to enhance the offshore supply chain. The business perspective on the process and cooperation was different. They believe that this cooperation was unbalanced, especially with respect to the proposed simplifications, through the strict focus of legal implementation by Customs. So for them this case was not an example of co-creation. Perhaps a more integrated approach of Customs and more communication towards business could have helped preventing the escalation. Also from business side more understanding of the position of Customs and more attention towards the requirements could have helped the process. To enhance the relationship-oriented principle towards a co-creation principle in order to facilitate CLSCs is therefore quite a challenge. All the involved parties have to invest in the relation and sometimes broader coalitions have to be organized. It could also be time consuming. This is especially the case when legal adjustments have to be arranged.

Customs strategy to realize trusted trade lanes is a relevant development towards this case. However it became clear that at the moment, this is more a vision than a reality. The discussions between Customs and the 4PL showed no business case for the latter to proceed with this idea. This had to do with the fact that under the UCC, the 4PL is still required to exercise import and

export declarations. Abolition of this requirement could create a business case for the 4PL. Customs on the other hand is very much interested in this concept. All the parties of this supply chain are known and most of them are AEOs. By having access to the TRT and under the right conditions (monitoring of data quality etc.), better data could be acquired which eventually can reduce the amount of physical inspections. An enhancement of the in control status principle to a more supply chain focus could facilitate CLSCs.

The sharing of data within this offshore supply chain is, not only from Customs perspective, beneficial for the relevant stakeholders. They can organize and handle the transactions in a more efficient way. Combining different transports for different operators become more easy, which reduces the supply chains costs as a whole.



## **6. Discussion**

### **6.1 Theory and Practice**

In the previous chapters the theory and practice have been treated separately. This chapter connects both parts.

#### ***Design principles of Customs supervision instruments***

From theory the following two principles could be identified: (1) relationship-oriented and (2) in control status. These principles are extracted from the horizontal monitoring supervision philosophy of Dutch Customs and based on a shift in control responsibility from government towards businesses in exchange for the promise of more efficient handling of goods across the borders. From practice also other principles were mentioned.

The first one is risk management. This is especially important for the blue flow (unknown traders). For the green and yellow flows, it can be said that risk management is integrated in the already mentioned principles as the relation and the degree of in control defines the risk. However this is not the case for the blue flows, therefore this principle should be added.

A second principle is called the data-sharing principle. This emphasizes the importance of reliable information within the supply chain and relates to the relationship-oriented and in control principles. It is also important for risk management as better data improves the quality of risk profiles and risk assessment. When businesses and Customs (for example via single window solutions or in a data pipeline) share more information both could benefit from it.

Also supply chain driven is formulated as a principle. Shifting the focus of supervision toward the supply chain and to the in control status of this chain instead of an individual business could create benefits for both businesses as well as Customs.

Another principle could be called the co-creation principle. This could be regarded as a next level of the relationship-oriented principle. Especially with respect to the facilitation of CLSCs, a close cooperation is required between all relevant public and private stakeholders. New procedures or solutions like the TRT (from case study) can only become reality with the effort and willingness of all relevant parties working intensively together in finding solutions. It takes time and commitment especially when legal adjustments have to be arranged. Besides that it also became clear that the current relationship-oriented principle is under pressure due to capacity constraints. At the moment the implementation of UCC takes a lot of resources and therefore client contact is limited. So it is evident that, at least for the moment, there is a huge gap to bridge to realize co-creation.

#### ***Connection with CLSC***

First it is relevant to mention that from the discussions with Customs officials it became clear that development of CLSCs is at this moment not a topic of importance within the Customs organization. They see it not as an issue for them, see also the 'Customs supervision gap'

discussion in chapter 4. From literature no direct link between design principles of Customs supervision instruments or Customs supervision instruments in itself and CLSCs has been found. From this observation it will be no surprise that the design principles of Customs supervision instruments are not designed for facilitating CLSCs. They do, however, have impact on CLSC processes.

In general, businesses in CLSCs have to deal with the supervision policy of a country and the way this supervision is organized is relevant to them. Also direct impact could be defined. In CLSCs it is very important to organize (cross)-sectoral cooperation and form strategic partnerships. The relationship-oriented principle could contribute to this goal as it is based on trust, understanding and transparency. These values are also very important to create sustainable relations within a strategic alliance. Another precondition for a stable partnership is that each partner is in control of its business. This includes also a proper risk management. A supervision strategy which focused on partners which are in control could therefore stimulate CLSCs. A CLSC have to manage additional uncertainty. The importance of complete and reliable information on products, quality etc. is therefore even more severe. The data-sharing principle could therefore have on important impact on CLSCs.

When comparing design principles of data-sharing and co-creation a lot of similarity could be observed if related to the design principles of CLSCs. The data-sharing could be linked to 'use the power of information' and co-creation in a sense towards 'form strategic alliances'.

For this study sixteen propositions have been developed to investigate the relation between the design principles of CLSCs and Customs supervision instruments. In table 3 these proposition are listed.

1	Businesses willing to leverage volumes need to find partners to combine flows of goods and generate volume. A relationship oriented focus is therefore very important.
2	The in control status of a company does not seem to have major impact on leverage volumes.
3	A relationship oriented focus of a business is not a precondition for better financial performance.
4	When a business is in control it will usually perform financially better.
5	When a business is relationship oriented it has a more outward scope and better insight in the supply chain. This will ease the forming of strategic alliances.
6	When a business is in control it has a better focus and idea on relevant partners. They are also willing to cooperate with other also in control partners. An in control status could raise trust in the supply chain and ease the forming of strategic alliances.
7	When a business is more relationship oriented, they are more aware of the (information) needs of other stakeholders and more willing to share information. Information of different stakeholders will increase the quality and power of information.
8	When a business is in control of its processes usually better information is available, which increases the power of information.
9	Leverage volumes (together with supply chain partners) leads to the need of relation management.
10	By leverage volumes and working together with partners the need for in control becomes even more important. However no direct impact is foreseen.
11	By focusing on financial performance a business could conclude to emphasize more on her relations within the supply chain. However no direct impact is foreseen.
12	By focusing on financial performance a business could conclude that they need to become more in control. However no direct impact is foreseen.

13	The forming of strategic alliances highly affects the business' relations with other stakeholders.
14	The forming of strategic alliances does not affect the in control status of businesses.
15	Good and relevant information on other stakeholders in the supply chain could enhance relationships. However, this information in itself does not creates sustainable relations.
16	Reliable and complete information is crucial for being in control. Therefore the impact of information on the in control status is high.

Table 3: Propositions

These propositions have been tested through four interviews and the results are presented in table 4. Additional information is provided in appendix 1.

Prop.:	Interview 1: C-BP		Interview 2: C-SP		Interview 3: C-CP		Interview 4: B		Relevance	Number
	Agree	Relevance	Agree	Relevance	Agree	Relevance	Agree	Relevance		
1	yes	yes	yes	yes	yes	yes	yes	yes	yes	4
2	yes	no	yes	no	no	yes	yes	no	no	3
3	yes	no	yes	no	yes	no	no	yes	no	3
4	no	no	yes	yes	yes	yes	yes	yes	yes	3
5	yes	yes	yes	yes	yes	yes	yes	yes	yes	4
6	yes	yes	yes	yes	yes	yes	yes	yes	yes	4
7	yes	yes	yes	yes	yes	yes	yes	yes	yes	4
8	yes	yes	yes	yes	yes	yes	yes	yes	yes	4
9	yes	yes	no	no	yes	yes	yes	yes	yes	3
10	yes	no	yes	no	yes	no	no	yes	no	3
11	yes	no	yes	no	yes	no	yes	no	no	4
12	yes	no	yes	no	yes	no	no	yes	no	3
13	yes	yes	yes	yes	yes	yes	yes	yes	yes	4
14	yes	no	no	yes	yes	no	no	yes	yes/no	2
15	yes	no	yes	no	yes	no	yes	no	no	4
16	yes	yes	yes	yes	yes	yes	yes	yes	yes	4

Table 4: Testing proposition results

Table 4 indicates that the four interviewees (from Customs and business) were unanimous on the relevance of the following relations: relationship-oriented on leverage volumes; relationship-oriented on form strategic alliances; in control status on form strategic alliances; relationship-oriented on power of information; in control status on power of information; form strategic alliances on relationship-oriented and power of information on in control status. Furthermore, they were also unanimous on the non-relevance of the following relations: focus on financial performance on relationship-oriented and power of information on relationship-oriented. This gives a good indication of which design principles have or have not an impact on other design principles. The outcome of the other relations as investigated seem less significant.

These preliminary conclusions give a first impression on the possible relevance of these design principles upon each other. Much more research is needed to validate this outcome. Also the relative importance and strength should be further investigated. This is however out of scope of this study.

### ***Case study results in broader perspective***

The subject of the case study is handling of offshore back-load. This can be regarded as a specific CLSC in which equipment and goods from oil rigs returns to the owners. This case study showed that for this CLSC a higher level of facilitation was required to solve Customs issues and enhance offshore supply chain. The way towards the solution was a good example of co-creation using knowledge and commitment of the network to enhance the offshore supply chain. Although the business perspective on this process was different. It proved that cooperation and sharing of data in the supply chain could raise quality of data and smoothes the handling of customs formalities.

Whether or not these outcomes are also applicable for other CLSCs characteristics of this specific CLSC should be analyzed. First, all parties in this CLSC are known and many are AEOs. The latter means that from Customs perspective they are trusted parties. Second, 4PL plays a coordinating role and is able to translate the needs of the nine operators towards Customs. This coordination will simplify the communication between Customs and the CLSC as a whole. Third, as mentioned from both Customs and business perspective, no fiscal, safety/security or statistical risks are involved in this chain. In this case the relevance of control is less significant. Finally the processes in this CLSC are relatively simple which increases the traceability of the goods.

It could be argued that CLSCs with similar characteristics could have the same advantage of a higher level of facilitation and co-creation. In CLSCs that are more complex, having more and unknown parties, less central coordination and more risks the outcome could be different. More transparency and less risks means more facilitation. At the same time less transparency and more risks means more control. So for other CLSCs with other characteristics the balance between control and facilitation is expected to be different.

### ***Facilitation***

From legislation and policy papers it is clear that Dutch Customs strives towards a balance between supervision and facilitation. However the latter is not a core task of Customs. This facilitation is mainly concerned with the lowering of administrative burden for businesses by offering simplifications.

This research however explores the idea of extending 'normal' facilitation to a higher level called facilitation plus and relates with the co-creation principle as such. This could be regarded as a concept in which Customs and businesses are actively working together in finding solutions to optimize processes. This transcends the operational level and needs strategic alignment. It can also be linked to the trusted trade lane concept of Dutch Customs. From the interviews with Customs officials as well as from the case study it became evident that a gap between theory and practice could be observed. Due to legal restrictions this concept is still more a vision than a practical reality. On the other hand, the underlying idea of this concept: the supply chain focus of supervision, use of data from the source etc., are very much relevant.

## **6.2 Limitations**

The relation between the design principles of Customs supervision instruments and CLSCs has not yet been thoroughly studied, therefore an exploratory research approach have been chosen. There are some limitations towards this approach. It is based on qualitative information and the interpretation of the findings could be judgmental. It is aimed to gain first insights. More in-depth and quantitative analyses is needed to draw final conclusions.

Due to time constraints one case study is used in this research. More case studies in perhaps other supply chains could add insights to this research. The fixed format of the interview questions of the Customs officials brought focus to these interviews but perhaps also limitations.

The focus in this study was on the role of Customs towards CLSCs and on cooperation within the supply chain. Other perspectives like a legal focus or consumer focus could also give an interesting view on the development of CLSCs.

This study is on the traditional flow of goods in a CLSC context. Other circular business models like models in which products are sold 'as a service', which mean that the producer retain ownership of the product and consumer get the right to use, are out of scope of this research. It could be interesting to investigate how and to what extent these new business models have impact on Customs procedures and CLSCs.

## 7. Conclusions and Recommendations

### 7.1 Conclusions

It is clear that the subject of CLSCs is becoming increasingly important in supply chain developments. For the same reason the impact of Customs supervision in cross-border CLSCs will increase. This explorative study tries to connect both elements and give answer to the main research question: ***What are design principles of a portfolio of Dutch customs supervision instruments designed to improve the facilitation of cross-border closed-loop supply chain processes?***

In order to answer the main research question, first three sub questions will be answered. Starting with the question:

***What design principles are necessary to facilitate cross-border closed-loop supply chain processes?***

From literature and relating to the scope of this research the following design principles of CLSCs were distinguished: (1) leverage logistics volumes, (2) focus on financial performance, (3) form strategic alliances and (4) use the power of information. CLSCs can only be realized with critical mass through horizontal and vertical coordination. To do this, inter- and intra supply chain collaboration is needed. Forming strategic alliances could help to achieve this collaboration and could also lead to create new markets. Each party in these strategic alliances needs to benefit from this cooperation and should focus on financial performance in order to create an efficient supply chain. Successful cooperation and decision-making depends on reliable information. Use of the power of information is therefore a crucial design principle to facilitate cross-border CLSC processes.

The next sub question to be answered is:

***Which (Dutch) design principles regarding customs supervision instruments can be identified and how do they impact cross-border closed loop supply chain processes?***

From theory two design principles were distinguished; the 'relationship-oriented' principle and the 'in control' principle. During the expert interviews also other design principles like risk management and data-sharing were mentioned. Risk management is especially important for the unknown traders. The data-sharing principle is also relevant for the other mentioned principles as underlying principle.

From the interviews with Customs officials and also from analyzing policy papers it became clear that these principles were not designed for facilitating CLSCs. However, they do have impact on CLSC processes. In general, businesses in CLSCs have to deal with the supervision policy of a country and the way this supervision is organized is relevant to them. Direct impact could also be defined. In CLSCs it is very important to organize (cross)-sectoral cooperation and form strategic

partnerships. The relationship-oriented principle could contribute to this goal as it is based on trust, understanding and transparency. These values are very important to create sustainable relations within a strategic alliance. Another precondition for a stable partnership is that each partner is in control of its business. This includes also a proper risk management. A supervision strategy which focused on partners which are in control could therefore stimulate CLSCs. A CLSC has to manage additional uncertainty. The importance of complete and reliable information on products, quality etc. is therefore even more severe. The data-sharing principle could therefore have an important impact on CLSCs.

The investigation on the mutual impact of the design principles of Customs supervision instruments and CLSCs upon each other showed that in many cases they are relevant. This means that these principles impact the design principles of CLSCs and by doing so, they impact CLSCs.

It should be noted that the relationship-oriented principle seems under pressure due to the heavy workload of Dutch Customs with respect to UCC implementation.

***How could the customs supervision instruments design principles be enhanced to improve facilitation of cross-border closed loop supply chain processes?***

The co-creation principle could be regarded as a next level of the relationship-oriented principle. Especially with respect to the facilitation of CLSCs close cooperation is required between all relevant public and private stakeholders. From Customs perspective, these supply chains are more complex due to the increased number of stakeholders but also with respect to valuation and classification. In some cases (like the offshore back-load case) a relationship-oriented approach does not seem enough to solve the issues. More understanding, sharing of information and co-creation is needed. Perhaps new procedures have to be designed in order to facilitate CLSCs and Customs legislation should be amended. Co-creation could be a valuable instrument.

Shifting focus of supervision toward the supply chain and to the in control status of this chain, instead of an individual business, could facilitate CLSCs. Especially when this 'trusted trade lane' comes with benefits for businesses like less inspections or perhaps the possibility of giving Customs access to their systems in exchange for no longer having the obligation to file declarations. This vision of trusted trade lanes has proven to face some legal obstacles at the moment.

Now the following research question could be answered:

***What are design principles of a portfolio of Dutch customs supervision instruments designed to improve the facilitation of cross-border closed-loop supply chain processes?***

The design principles of 'relationship-oriented', 'in control status' and 'data-sharing' as well as enhancements like 'co-creation' and 'supply chain focus' could facilitate CLSCs. Important is the required close cooperation between all relevant stakeholders in the supply chain, businesses as

well as governments. Customs strives for a right balance between supervision and facilitation. This facilitation through simplifications is focused on minimizing the administrative burden for businesses and optimizing control efforts of Customs. For stimulating CLSCs the concept of facilitation and cooperation with businesses should change. More co-creation is needed and old patterns and roles should be revised. Indeed, the boundaries should be pushed.

## **7.2 Recommendations**

This research made clear that at the moment less attention of Dutch Customs organization for CLSCs and developments considering CLSCs can be noticed. With the current focus on implementation of UCC requirements this is quite understandable. However with the increasing importance of CLSCs and also the active role of other Dutch and EU governmental agencies in this field a more active role for Dutch Customs is advisable. Especially considering that, from supervision perspective, also Customs could benefit from a better understanding of the working and set up of a CLSC.

In paragraph 4.1 a first draft of a new special procedure to facilitate CLSCs is given. This could be a result of a co-creation project. More research is needed to develop this idea further with special attention for the legal consequences of this procedure. Eventually it could lead to amendments on legislation, therefore early participation and commitment of EU legislators is desired. Another important aspect of co-creation is that also businesses themselves could initiate these projects instead of expecting them from Customs. A necessary precondition is the availability of qualitative and quantitative adequate personnel. It is recommended for Customs to create a task-force for this purpose.

The interaction between design principles of Customs supervision instruments and CLSCs are only investigated on high level. Much more research is recommended to define more precise relational impact.

Finally, from this research a strong link between CLSCs and trusted trade-lanes has been observed. The concept of trusted trade lanes is still in pilot phase. When developing this concept further it would be wise to incorporate the concept of CLSCs.



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## Appendix 1: Testing propositions

### Investigation on the following 16 relations between design principles:

1	Relationship-oriented on leverage volumes
2	In control status on leverage volume
3	Relationship-oriented on focus on financial performance
4	In control status on financial performance
5	Relationship-oriented on form strategic alliances
6	In control status on form strategic alliances
7	Relationship-oriented on power of information
8	In control status on power of information
9	Leverage volumes on relationship-oriented
10	Leverage volumes on in control status
11	Focus on financial performance on relationship-oriented
12	Focus on financial performance on in control status
13	Form strategic alliances on relationship-oriented
14	Form strategic alliances on in control status
15	Power of information on relationship-oriented
16	Power of information on in control status

Table 5: Relations between design principles

### Conclusions on relevance of relational impact based on 4 interviews:

Relation nr.	Relevance	Value
1	yes	unanimous
2	no	likely
3	no	likely
4	yes	likely
5	yes	unanimous
6	yes	unanimous
7	yes	unanimous
8	yes	unanimous
9	yes	likely
10	no	likely
11	no	unanimous
12	no	likely
13	yes	unanimous
14	yes/no	questionable
15	no	unanimous
16	yes	unanimous

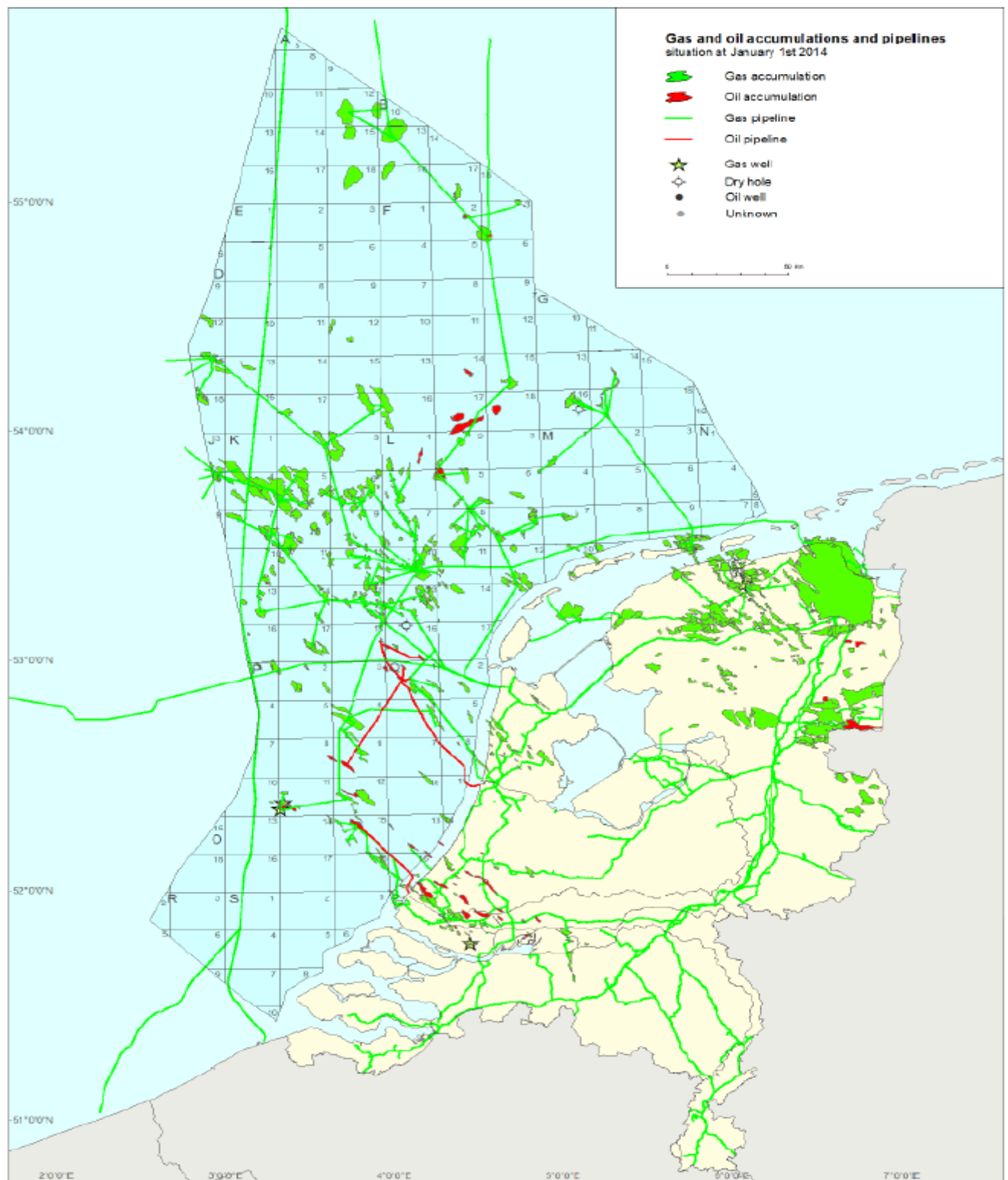
Table 6: Conclusions on relevance of relational impact

**Appendix 2: Concept interview outline Customs experts**

<b>General questions:</b>
<i>What is your name, position and focus?</i>
<i>How would you define the Dutch Customs supervision instruments?</i>
<i>Which design principles for Dutch Customs supervision instruments can you distinguish?</i>
<i>Are you familiar with CLSCs developments in the context of international trade?</i>
<i>Are you familiar with design principles for CLSCs?</i>
<i>Are you familiar with Customs supervision activities which relates to CLSCs developments?</i>
<b>Specific questions from different perspectives:</b>
<i>How do you value from your perspective the design principles of Dutch Customs supervision instruments?</i>
<i>Do you see from your perspective a connection between the design principles of Customs supervision instruments and CLSCs?</i>
<i>Do you see from your perspective new design principles for Customs supervision instruments which can enhance the facilitation of CLSCs?</i>

**Appendix 3: Interview reports Customs experts**

## Appendix 4: Continental shelf and oilrigs



Outline map showing oil and gas accumulations in the Netherlands (as at 1 January 2014). New discoveries are indicated with an asterisk. (Natural resources and geothermal energy in the Netherlands, Ministry of Economic Affairs, May 2014.)