The customs-oriented value chain

How customs-oriented collaboration across the value chain supports value creation in the customs operations of a multinational manufacturing organization

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Executive Summary

This thesis places customs operations in the context of competitiveness and value creation within large multinational manufacturing entities. The empirical research within the subject of research, the Swiss-Swedish multinational EIMR, zooms in on the analysis of how the structural collaboration between customs and non-customs stakeholders in the value chain contributes to the value creation and competitiveness of a multinational manufacturing enterprise. The main finding is that a consistent and qualitative contribution by non-customs stakeholders is a critical pre-condition for the efficient and effective execution of the customs clearance process. The effective collaboration between customs and non-customs stakeholders in the value chain supports the value creation and competitiveness of the organization in two ways. A structural collaboration improves the flow of customs related data and documentation and ensures that certain commercial aspects, such as the selection of incoterms, are well aligned with the customs requirements and vice versa. This reduces the risk of irregularities in the customs process. A flawless customs clearance process enables the shortest possible operational timelines and helps to avoid delays in transportation and other associated cost, such as increased broker fees, customs warehousing cost, customer penalties and fines for non-compliance. Increasingly, a fast, stable and reliable delivery of goods is perceived as value enhancing and it plays an important role in customer satisfaction. Additionally, an un-hindered clearance process reduces the capacity need of the customs operations department. Ad hoc resolution of gaps in the flow of customs related data and documentation is very time consuming at the time of clearance and regularly has an additional administrative impact thereafter. A conservative estimate in the environment of study indicates that an average of 3-4 % of the shipments can create around 15-20% of the workload of the customs operations team due to firefighting and issue resolution. On occasion, the workload can even be higher, as less frequent cases and extreme cases have been left out of the equation. Also other associated cost, such as an increased workload elsewhere in the internal value chain, customs warehousing cost, increased brokerage fees, customer penalties for delays and fines for compliance violations have not been estimated. Based on anecdotal evidence they are deemed to be substantial.

Through the creation of a customs-oriented value chain model, this thesis aims to further the common understanding about who the relevant non-customs stakeholders are, what their respective contributions should be and how the performance of their contribution can be tracked. The customs-oriented value chain model is first and foremost a tool, which can be used for the review and management of the end-to-end customs process flow which runs throughout the entire internal value chain. The insights which are developed during such reviews within individual companies can furthermore be used as critical input for the build-up and maintenance of essential customs related capabilities, such as a system-based customs

management system and customs related competencies in non-customs departments. This thesis demonstrates such capability development by constructing a custom related competency table. As simple as such a tool may sound, it can be viewed as low hanging fruit. The adequate customs related expertise across the value chain supports the effective collaboration and communication and forms the foundation of development other capabilities. Particularly in the environment of the research subject, it makes a sense to complement the organizations` existing competency management materials with a customs-oriented focus.

The main academic contribution of this thesis is the development of a custom-oriented value chain model, which serves as a first step in the scientific analysis and substantiation of customs operations as a contributing factor in the competitiveness of an organization. So far, this domain seems under-exposed and within the existing body of academic work, only very few authors have focused their attention on the essential collaboration along the internal value chain.

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Preface

As I am concluding the work on my master thesis, I would like to spend a few words on this incredible three-year journey of my Master`s course in Customs and Supply chain Compliance.

Already shortly after I took my first careful steps in the functional domain of global trade, I learned that it was possible and highly needed to take the topic out of the `compliance-only` box. I often thought about how to substantiate and communicate that message, but I was seeking pieces of a puzzle without finding them. In hindsight, this makes sense to me. The domain is still very much in development and there is a lot, which has yet to be explored. The selection of the research topic therefore did not require a lot of thinking.

Unlike the ease I experienced in finding the topic of my research, the development of a comprehensive thesis report took some concerted effort. Now, after completing this final research project, I feel that I managed to contribute one tiny piece of the puzzle. It would be interesting to take it to a next level. Not sure, whether I am ready for that. I thoroughly enjoyed the analytical challenge, but I must admit that on more than just one nice sunny day, I had wished for other things.

As this thesis also is my last step in this part of the journey, I would like to take the opportunity to express my gratitude to several persons. Firstly, I would like to thank all the teachers at RSM. Each in their own inspiring way, they have laid the groundwork for many of my professional achievements in these last three years. Time and again, it amazes me how often I would return to the office after a week in Rotterdam and find that I could immediately put into practice what I had just learned. I am particularly thankful for the substantive feedback and guidance which I have received from Prof. Dr. Albert Veenstra during the writing of this thesis. His feedback has enabled me to bring this work to a successful conclusion. Furthermore, I would like to thank my co-reader Dr. Joris Hulstijn, who has provided me such inspirational feedback. And of course, my fellow students, who brought so many sparks of joy. One by one, you are all amazing.

A very (very!) big thank you to all those (former) colleagues, without their support and cooperation none of the research would have happened. With special thanks to Dirk, Sander, John, Johnathan, Christopher, Andrea, Christoph, Micaela, all participating CTCO`s and particularly also Mike and the wonderful ladies Yolanda, Ajada, Relesha.

And last, but certainly not least, my partner Lisette, who has been so very patient with me. Thank you for letting me do my thing. Let`s celebrate, my dear.

Introduction

Within large manufacturing multinationals, such as EIMR, the role and contribution of customs operations to a firm`s competitiveness does not seem immediately obvious to many people. As department and as activity, customs operations themselves are generally not seen as value creating. Aside from tariffs and duty spent, only limited management attention is given to customs operations. Problems in customs operations are mostly viewed from a compliance perspective and from that angle, the focus is on whether (significant) fines are incurred. When this is not the case, then there is little incentive to work on improving processes.

In this thesis, the customs domain is placed within the context of competitiveness. The research elaborates on the consideration that the improvement of customs operations processes can contribute directly, as well as indirectly to the value creation of a firm. A direct contribution can be established through efficiency gains in customs operations itself, whereas the indirect contribution can be established through transportation. The improvement of such contribution, however, is dependent on an effective collaboration between customs and non-customs departments. Through the development of a customs-oriented value chain model, this study aims to further the understanding of how a strong alignment and cooperation between customs operations teams and other non-customs departments in a firm`s value chain may directly and indirectly contribute to creating a sustainable competitive advantage in a global industrial business environment.

Within the overall domain of supply chain, transportation is also not typically regarded as a value adding activity, but as pointed out by Mangan & Lalwani (2016), transportation plays an important role in ensuring that supply chains operate efficiently and effectively. Increasingly, companies experience that responsiveness and particularly also predictability and reliability of delivery time are considered as strategic and value adding aspects of transportation, as it enables a stronger control over total cost of ownership (Chopra and Meindl, 2016). To contribute to the competitiveness of the organization, customs operations processes should support a smooth and uninterrupted transport process.

In the day-to-day operations, hundreds of shipments cross national borders daily. Many of them pass customs with relatively minimal trouble, though every so often there are consignments, which run into certain delays and on occasion such delays can be extensive. When problems occur in customs operations, then this potentially or effectively interrupts the transportation process and negatively impacts the performance of a company. Customs operations staff therefore are often quick to respond to irregularities and they apply a variety of firefighting tactics to solve issues and prevent delays. Such interventions can easily take up around 15-20 percent of their overall capacity, on occasion this is even exceeded.

Whilst customs operations staff react to problems that have already arisen, a more comprehensive solution would be to prevent such issues in the first place. Especially for often reoccurring problems this seems possible, provided that the root cause is well understood. The perception of many outside of the customs department is that this domain is pretty much a black box over which the firm has no control. However, for many of the reoccurring problems, the answer lies earlier in the internal value chain, outside of the scope of work and influence of the customs departments.

A comprehensive overview of the essential contribution of non-customs departments to the customs process is missing. Through the analysis of one specific area of customs operations in EIMR, this thesis aims to create a customs-oriented value chain model. This is an instrument, which can be used by companies to support the review and analysis of their cross-department collaboration. Moreover, the model provides initial KPI suggestions, which could serve the active management of the customs-oriented collaboration going forward.

Achieving (near-)permanent resolution of the most common customs-related issues may require the adequate buildup of specific capabilities, including process excellence, a customs-oriented systems infrastructure, guidance materials for day-to-day operations, as well as basic or advanced competencies in identified departments and job-roles. In the final section of this thesis, it is demonstrated how the customs-oriented value chain model can be used as a basis for the development of such capabilities. By translating the identified operational requirements into a practical competence management tool, the theoretical contribution can be directly applied in the actual business environment to support the continuous improvement efforts of a company.

The first chapter of this thesis provides an elaborate description of the problem statement, the methodology and the scope of this research. This is followed by a high-level introduction of EIMR in the chapter 2. Chapter 3 provides an overview of the literature, which was used for this thesis, in the areas of transportation, customs, value chain modelling and competence management. Chapter 4 elaborates on the relevance of transportation and customs in the context of creating customer value and highlights the most common problems in customs operations. The identification of the specific customs requirements and the categorization of customs related problems forms the basis of the next chapter. Chapter 5 provides the main academic contribution. Using a two-step approach, the concept of a customs-oriented value chain model is explored and constructed. Chapter 6 discusses the competence management aspect. The thesis finishes with a conclusion, practical recommendations for business and suggestions for further research in chapter 7.

Chapter 1 – Problem statement and methodology

1.1 Problem statement and research question

Companies seeking a sustainable competitive advantage spend much effort carefully designing their supply chain structure and aim to optimize all individual elements thereof. For large international corporations, such as EIMR, it is important to improve their performance in cross-border transportation, because stable and efficient transportation lowers cost and increases customer value. This contributes to their overall competitiveness. Important metrics in transportation management are on-time-delivery and transportation lead-time, which are critical indicators of stability and predictability of delivery and cost effectiveness.

Up to this day, the role of customs operations in transportation performance remains rather underexposed in the literature. However, when discussing the impact of customs issues on transportation with professionals in the transportation and logistics domain in EIMR, it becomes clear that it regularly influences performance. The fulfillment of customs requirements during cross-border shipments often encounters issues, which cause delays and impact a company`s transport lead-time and on-time-delivery. For example, goods may need to be temporarily stored in a customs warehouse at the border awaiting clearance confirmation, because the invoice does not provide an accurate product classification or product description. Visibility of the issues and their impact is often limited. The transport indicators on-time-delivery and transportation lead-time can be influenced by multiple factors and can therefore not be used to adequately measure impact (or improvements). Furthermore, customs related issues themselves are not structurally reported and adequate measurement standards are missing.

Transportation and logistics staff and customs professionals regularly apply ad hoc solutions (`firefighting`) to solve the problems and where possible avoid delays. Such measures, however, may lead to additional cost themselves. For instance, higher costs may be incurred on an ad hoc or even structural basis to mitigate expected customs related delays, by choosing a different and more expensive mode of transport. Or, costly external expert service suppliers are deployed on an ongoing basis, to swiftly follow up on potential gaps in data and documentation. Customs operations also becomes more expensive due to an increase in required resource capacity.

Many of the problems in customs operations revolve around incorrect, or incomplete data and documentation. Generally, the required input needs to either come from stakeholders elsewhere in the importing or exporting organization, or from stakeholders outside the organization with whom contact is handled by different departments (i.e. the customs department is not directly managing their performance or relationship). A certain level of integration and/or collaboration between customs and non-customs stakeholders within the

organization is required, but the exact nature of that collaboration is often not clearly defined. Customs operations staff typically do not have the authority, the capacity or even enough insight in the pre-customs business processes to drive structural resolution of issues. Similarly, stakeholders in other domains in the value chain often lack the visibility and/or understanding of the impact of their work on the fulfillment of customs requirements and how this ties-in with overall strategic performance of the company.

For further strengthening of competitiveness through optimization of performance in transportation and customs operations, it is critical for an organization to incorporate customs related requirements earlier in the end-to-end business process. Furthermore, the different functional areas of the company need to have the right capabilities to collaborate effectively. At the time of writing this thesis, there is only limited insight in the literature, which management practitioners can use to analyze their organization and identify gaps.

This study seeks to contribute to the understanding about who the relevant non-customs stakeholders are, what their respective contributions should be and how such insights can be used to support the build-up and maintenance of critical capabilities, such as customs related competencies in non-customs departments. This thesis is therefore structured around the following research question: How does the structural collaboration between custom and non-customs stakeholders in the value chain contribute to the value creation and competitiveness of a multinational manufacturing enterprise?

1.2 Research goal and questions

The main aim of this research is to identify and structure the essential contributions of non-customs departments to the customs operations` domain. The first part of this thesis places customs operations in the framework of competitiveness and focuses on constructing a generic customs-oriented value chain model, which reflects the essential activities across the value chain. This tool should provide managers with clear insight in the requirements and enable them to analyze their organizations` approach to customs operations. The overview also suggests potential measurement standards or KPI`s, that can be used to track performance of the activities. By implementing the respective KPI`s, collaboration with customs operations can become better visible and can be managed as an integral element of company`s overall competitive strategy.

The second part of this thesis aims to demonstrate how insight in the essential contributions can be used as a basis to develop capabilities in support of further streamlining the customs operations. The customs-oriented value chain model is used as a basis for the construction of a generic competence table and a customized competence table specifically for one of the procurement departments in EIMR.

The presentation of the work is structured along the following questions:

1. How are customs and transportation related in the context of competitiveness and competitive strategies?
2. What are the root causes and relevant stakeholders in the internal value chain in relation to the most common issues in customs operations?
3. What should a customs-oriented value chain model look like?
4. How can the customs-oriented value chain model be used to create a competency table?
5. Can gaps in competencies be linked to the identified problems the customs operations domain?

1.3 Scope of research

General

This thesis combines different fields of study, to know customs legislation, supply chain management, knowledge and competency management and, although very limited, information technology. The research focuses on global engineering companies in the domain of power and automation. There are multiple large companies in this industry and the business of those organizations may consist of product business, project business and service business. The data collection for the empirical research in this thesis is limited to data sources inside of EIMR and with a specific focus on EIMR`s product business. This does not exclude that experience of individuals in project and/or service business may have been incorporated occasionally. Where this is known, it is expressly identified.

Customs operations

The trade domain covers different elements. It will be difficult to find a single set of all-encompassing definitions. Depending on the author, one may find alternative terms and definitions, but roughly the trade domain covers the following:

- Trade compliance, which concerns the interpretation of - and compliance with regulatory requirements and incorporates also elements of oversight and internal control and handling the relationship with the relevant authorities. This can be sub-divided in export control and sanctions, and customs compliance;
- Strategic trade, which mainly concerns the use of free trade agreements and duty management;
- Customs operations, which concerns the effective organization and efficient execution of the day-to-day customs clearance activities of an organization;
- Trade management, which focuses on building the capabilities in the end-to-end process and throughout the entire organization to facilitate effective management of the previous three.

The focus of this thesis is mainly on customs operations and trade management within the context of competitiveness and transport management. Although conceptually it may be possible to make a distinction between these four trade related areas, in practice there is a lot of overlap between them. The contributions of non-customs departments to `trade compliance` and `strategic trade` would likely overlap significantly with what is defined in the customs-oriented model, but few key aspects of the customs process (e.g. archiving) have been left out of the research because they are more relevant within the context of trade compliance. Further research would be needed to ensure the appropriate analysis and completeness. For ease of understanding typically only uses the terminology of customs operations and customs (clearance) processes. The model is therefore also called a `customs-oriented value chain model` (as opposed to e.g. `trade-oriented`, or `trade compliance oriented`).

Customs-oriented value chain model

The construction of the customs-oriented value chain model is largely based on the value chain model, as developed by Michael Porter. Porter`s original model divides a generic manufacturing company into nine distinct departments. The activities of these departments are considered either primary or secondary (or support) activities[1] depending on the nature of their contribution to value creation. Although the definition and the identification of primary and secondary activities is somewhat altered in the customs-oriented value chain model, the concept of the nine departments remains intact.

Due to a general limitation in time and scope, the construction of the customs-oriented value chain model is only partial. In this thesis, the model does not cover all nine departments of the entire internal value chain. Instead, it is centered around the departments, which are known to most strongly impact the execution of the transactional processes in the EIMR environment. These are mostly (but not only) activities, that are considered primary activities[2]. Other departments have been left unaddressed, such as HR, legal, or audit[3]. More research is needed to integrate also the activities of the remaining departments to complete the customs-oriented value chain.

[1] Further explanation on the meaning of primary and secondary activities in Porter`s value chain model is provided in chapter 3 (literature review).

[2] Further explanation on the meaning of primary and secondary activities in the customs-oriented value chain model is provided in chapter 5 (Building up the customs oriented value chain model).

[3] HR could e.g. support the correct approach to competency management and/or training; legal could e.g. ensure timely information sharing with the customs department about changes in the legal set up of the organization; audit could e.g. support with performing trade and/or customs compliance audits

Customs-oriented competency table

The construction of the high-level competency table is based on the content of the customs-oriented value chain model. Since that model covers only a selection of the departments and their activities, the competency table is automatically also limited to those departments. To demonstrate the use of the table, a small section thereof is worked out in further detail and integrated into an existing EIMR competence table for procurement.

1.4 Methodological approach

The research combines desk research and qualitative empirical research. The main reason to select empirical research has been to contribute to the still limited amount of available structure- and theory building research in the area of customs operations. The aim is to provide a holistic, but structured overview of the customs operations' domain[4] and its touchpoints with other parts of the organization. Such overview can serve as a basis for further development of the theoretical framework and the execution of targeted quantitative studies into individual elements of the domain. The intention has been to structure the customs relevant collaboration using the well-known value chain model of Michael Porter, an approach that has already been explored once before in a research project into product classification at the Rotterdam School of Management (RSM)[5]. Although the general concept of the value chain is maintained, some adaptation was needed to compensate some of the shortcomings of the Porter`s original value chain model and to facilitate a more consistent conceptual framework. The selected adjustments should also facilitate easier communication regarding the goal and criticality of certain linkages between non-customs and customs stakeholders.

A combination of different data collection methods has been used, including a literature review, a case system review, several in-depth interviews, two workshops and follow up validation sessions and a qualitative survey. The main aspects thereof are discussed individually hereafter.

Desk research

The desk research covers a literature review, a case-system review (internal EIMR database), as well as a review of proprietary EIMR working documents.

Literature review

The literature which is used for this thesis covers multiple scientific articles and few academic books, which are included in the reference list. The main topics for which a literature review

[4] Customs operations and trade management (ref. scope of the research)

[5] Project paper ` POWER, Classification within a multinational`. This integration project took place within the scope of RSM`s master-program `Customs and Supply Chain Compliance`.

is conducted include transportation management within the context of competitive strategies, customs requirements and the most common issues in this domain, value chain modelling and finally knowledge and competency management. A review of the literature is provided in chapter 3. The main database used for the literature search is the ABI/Inform Complete database[6], to which access was provided by the RSM. Additional online and offline material was used as a complementary source, including websites and publications of the World Trade Organization, the World Bank, the OECD and consulting reports of renowned global consulting firms. In the initial exploratory phase, also online searches through different public search engines and google scholar were used. Aside from reports and papers found on websites of intergovernmental institutions and large consulting firms, none of the materials found during that phase were actively considered during the remainder of the research.

Case system review (EIMR internal-database)

EIMR maintains a database, which can be viewed as a quality improvement-tool. It is used to register and escalate operational issues and to track the resolution of those issues, the involved stakeholders and potential support documentation. The case search was performed using a given time period and relevant search terms. The time frame, which was selected for the review of cases in the database covered the period from 2016 until the first quarter of 2020. This timeframe was selected to ensure that information collected was sufficiently recent and because during this time, there has been increased effort by the then-global supply chain department to improve transportation and customs operations. Those activities have triggered an increase in attention for transport management and therefore the likelihood of having cases registered in the database[7]. In total, 19 cases were pulled out of the system for closer analysis. Overall, the volume and quality of the registrations was not enough to draw any solid conclusions. The identified cases did mirror the issues which were raised during the extensive workshop (described further below) and as such provided a source of complementary information. Limitations to the use of the database as reliable source of information include: non-structural use of database by employees (not many people seem to be aware of the existence of the tool, or are not able or willing to use it); language limitations (not all cases are documented in English); inconsistent and/or unclear use of terminology by users of the database; incomplete filling of data fields; incomplete upload of evidentiary documentation (emails etc.); follow up on older cases not feasible, due to persons no longer being available for questions (people having left the organization).

[6] A detailed overview of search terms is included in Annex II

[7] A detailed overview of search terms is included in Annex II

Review of proprietary EIMR work documents

In addition to literature and cases, also several proprietary internal EIMR documents have been reviewed. The most relevant ones include:

- Template documentation of global trade processes (see figure 1, below). This documentation consists of a visual and descriptive overview of all individual steps, which need to be taken to ensure a complete and compliant customs clearance process. The documentation has been compiled during a series of extensive workshops with diverse stakeholders from local EIMR businesses and represents best known practice in EIMR (sales, procurement, order handling, etc.). Individual steps in the processes are divided over three `generic` groups, to know local business, transportation management (including customs operations) and external (e.g. broker, freight forwarder, etc.).
- A time-limited issue/escalation-reports from external service providers, that are supporting one US-based EIMR business in the domain of customs operations.
- Several HR related documents, such as a job structure and profile manual and a functional competency guideline; and a recently updated and detailed skills and competencies-table for procurement and logistics in EIMR. This documentation was reviewed to perform an AS-IS analysis regarding the inclusion of customs-related competencies in EIMR`s internal competency management set up.

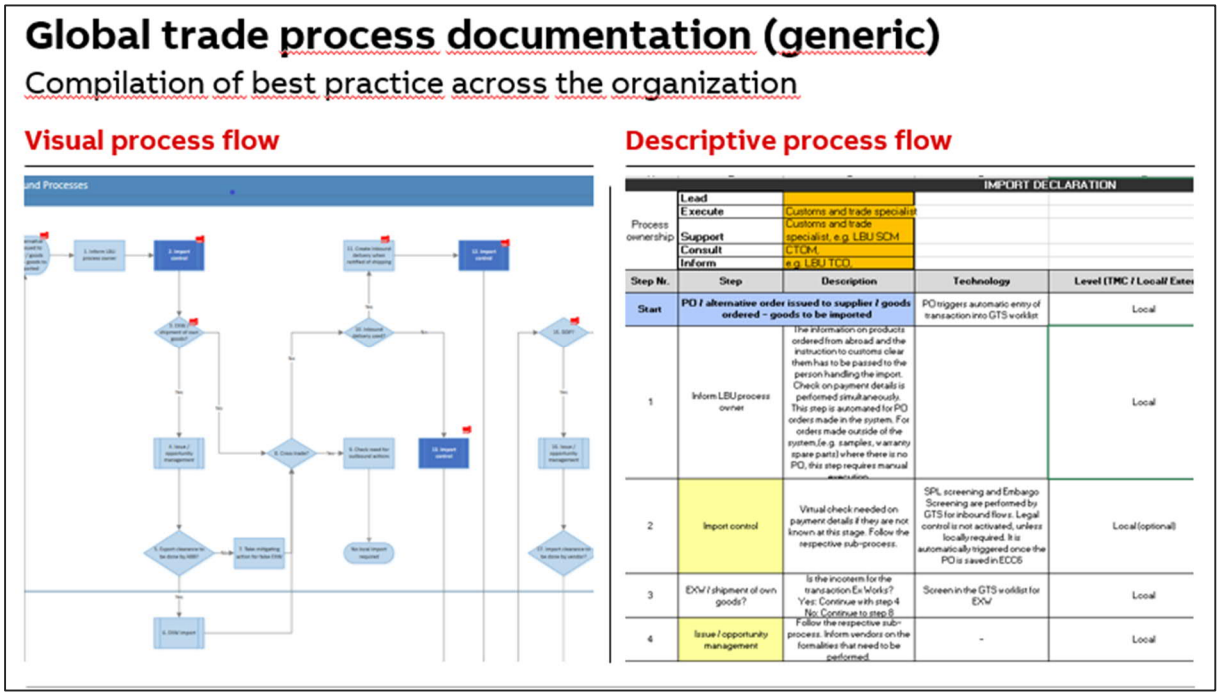

FIGURE 1 - DETAILED TRADE PROCESS DOCUMENTATION (GLOBAL TEMPLATES)

Qualitative empirical research

The empirical research covers in-depth interviews, workshops and validation sessions, as well as a qualitative survey.

Interviews

In total, seven in-depth interviews were held. Five of these interviews were held with senior managers in Transportation and Logistics, four of which are operating on a global basis and one in Italy. These were interviewed against to support the analysis of the role and impact of customs operations within transportation management and the relevance of transportation (incl. customs operations) regarding overall competitiveness. One other interviewee is a senior trade compliance leader, who has provided input to the analysis of custom relevant expertise among non-customs stakeholders and the effect thereof on the collaboration with stakeholders in the customs domain. The last interviewee is a leader in competency management services and has provided theoretical- as well as practice-oriented input regarding competency management in general, as well overall guidance in the conversion of the customs-oriented value chain model to a competence table. These last two interviewees are both also operating in a global role.

Workshops and validation sessions

Data was furthermore collected during two workshops. One multi-day workshop was attended by 19 participants, consisting of customs operations staff from EIMR in the US, as well as a diverse group of trade compliance managers (local US business, US and Canadian country level, regional and global). The workshop focused on the review of trade process template documentation (described above). Key discussion points (in relation to this research) include the AS-IS process and main gaps (AS-IS versus template), root causes and associated delays, as well as required guidance documentation for local businesses. The output of the workshop was validated once more during few validation calls with limited selection of workshop participants. Critical selection criterium for this workshop and these participants, is the extensive experience of the customs operations staff with a `full instruction model`. The operational model ensures that brokers receive full information. Whilst systematic registration of issues is missing, the staff have very good understanding of gaps in the process and the root causes. To compensate for the strong US orientation of the workshop, the key findings were compared with feedback collected from a manager of a similar team in Italy (interview) and the other sources from the desk research.

Another workshop was held to review the draft competency tables, together with competency management leader and an experienced trade compliance operations manager. The workshop aimed to collect reflections on the draft competency tables and on the process of how the tables were created.

Qualitative survey

As a final source of information, a qualitative survey was held among 10 experienced trade compliance managers in 10 different countries (BR, CA, CH (2x), FI, FR, NL, UAE, UK, ZA). The individuals all operate at country level and interact with local business, brokers and customs authorities on a daily basis. This survey consisted of three parts and was used as structured method to collect information from key trade compliance staff in EIMR about their view on required customs related skills and skill levels, as well as on the link between gaps in customs operations and gaps in required competencies. To compensate for some ambiguities in the third part of the survey and to gain a deeper understanding of the link between gaps in competencies and gaps in operations, the survey was complemented by an in-depth interview with two of the trade compliance managers. The survey questions are included in annex iii.

Chapter 2 - EIMR

EIMR is a large, multinational engineering company, with factories, sales representation and general business offices in 100+ countries. The organization employs around 110`000 employees and consists of four distinct Business Areas: Electrification, Industrial Automation, Motion, as well as Robotics and Discrete Automation[8]. Each Business Area in turn consist of several Divisions (18 in total). EIMR has a strong business-to-business profile and serves customers in a wide variety of industries, ranging from raw materials processing (e.g. mining, metals, oil and gas) to consumer industries (e.g. automotive, food and beverage). The company offers an extensive range of products (standard, as well made-to-order), systems and software solutions.

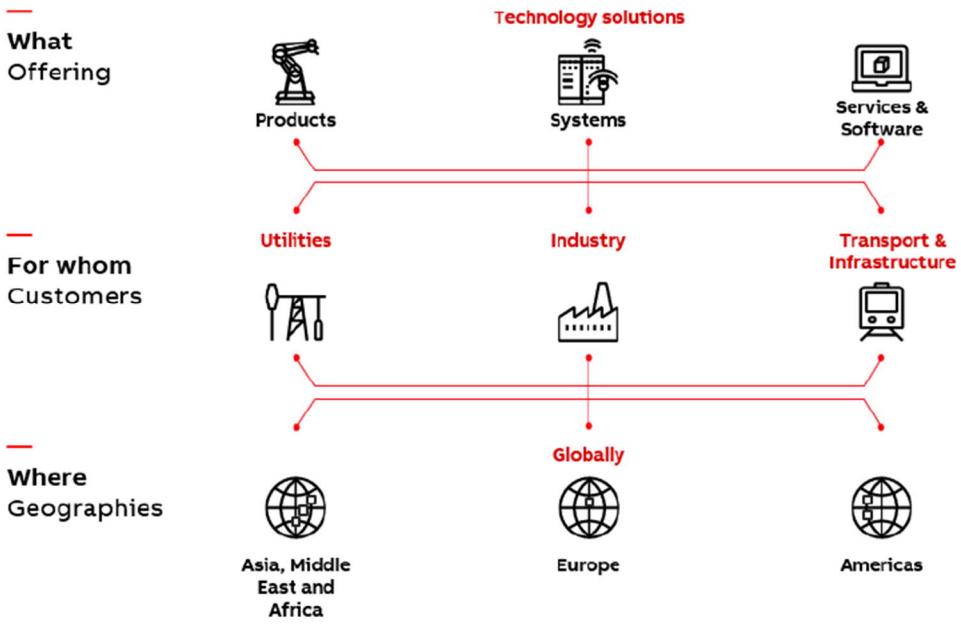

FIGURE 2 - GENERAL COMPANY PROFILE

border procurement and sales transactions, including many instances of cross-trade/triangulation. Transactions include business with external business partners, as well as with internal stakeholders, such as supplying units and so-called feeder factories, as well as central warehouse- and distribution centers.

Individual Divisions within EIMR typically tend to focus either on product sales, on (large) projects or on service delivery, although they may also hold a combination of offerings,

[8] At the time of writing this report, a fifth and large Business Area, Power Grids, is subject to a divestment process and ownership will be transferred as per 1.7.2020. Information in this paper about EIMR excludes

depending on the identified need in the market. The process and overall capability requirements can differ significantly between the three types of business, also in the domain of transportation and trade. This paper focusses mainly on EIMR`s product business and leaves project and service business out of scope. Where relevant, reference to the other business types is added to highlight the different needs.

2.1 EIMR operating model

Over the course of 2019 and the first half of 2020, EIMR`s operating model has undergone a significant transformation. As publicly announced at the end of 2018, the original matrix model has been turned into a so-called Business-led model and previous global functional departments have been removed from the organization. Functional roles still exist, but they are integrated in the individual sub-organizations. The breakdown of the matrix model has been paired with a further decentralization within each Business Area, shifting higher levels of autonomy and accountability to the Divisions. The re-organization creates great opportunities for better alignment of functional activities with the business strategies of the Divisions throughout the value chain. The integration of functions within the business environment enables a faster and more agile way of working. Furthermore, the increased autonomy is intended to support a stronger sense of business ownership for processes, continuous improvement and issue resolution. The changes, however, also increase the need for each Business Area and individual Division to develop and maintain essential capabilities and skill sets within their own organizations. Certain operational activities, critical expertise and governance activities are no longer provided by specialized central departments. Individual EIMR businesses will have to be (or become) continuously learning and self-developing organizations. Previously, functional maturity development was driven by central functions. Now, businesses themselves must ensure that their capabilities fit with market demands and customer requirements, short-, mid- and long term.

2.2 EIMR`s competitiveness and transportation

EIMR has been able to set itself apart with highly innovative and qualitative products for a long time. Whilst its product features are still highly business critical, also for EIMR it no longer suffices to `merely` focus on product excellence and advanced technology. Competition in the global market is fierce and for many of EIMR`s products, there are multiple suppliers in the market, which provide the same or similar products, or offer acceptable alternatives. Additional effort must therefore be made to create the value which entices customers to prefer EIMR as supplier over other companies. This is where, amongst many other aspects of the value chain, transportation management plays a role.

Especially in EIMR`s product business, transportation plays an important role both on the inbound side (EIMR acting as customer), as well as on the outbound side (EIMR acting as supplier). As a customer, EIMR sources globally. Ensuring fast and stable transportation supports low cost sourcing and short production lead time, whilst maintaining consistent production cycles and lowest possible inventory and warehousing cost. Similarly, as a supplier of goods, EIMR`s customers are located all over the world and for many of the products, the requested delivery times are short.

During all interviews, which were held for this thesis, it was indicated that short delivery times are increasingly important, but above anything else, EIMR`s customers value stability and reliability of delivery.

2.3 EIMR customs operations

The organizational approach and the maturity in customs operations within EIMR is rather dispersed.

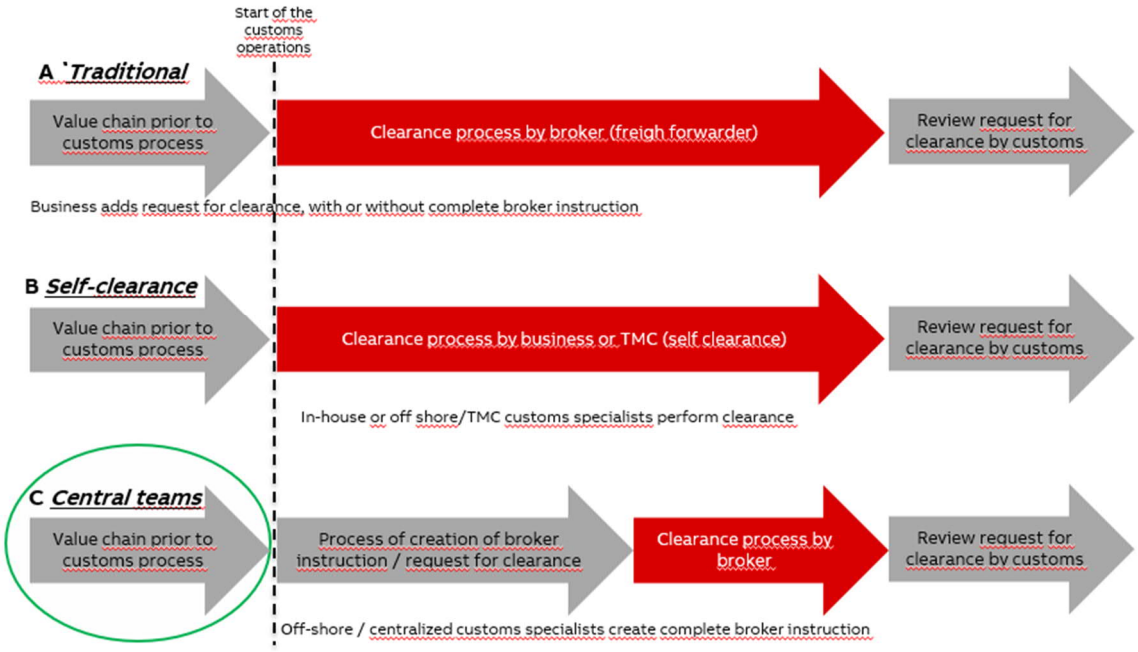

FIGURE 3 - MOST COMMON CUSTOMS OPERATIONS SET UP & FOCUS OF STUDY

Still a relatively large number of units are handling this activity in a more traditional way i.e. mostly leaving this up to the broker, with or without specific broker instructions (A). A very limited number of other units have effectively implemented a system-based approach and are self-filing directly with the customs authorities (B). A significant number of units have been part of extensive centralization efforts in previous years, whereby the customs operations activities were embedded in transport management centers under the management of the global supply chain department (C). The customs operations specialists in those teams are

enabled by system-based exchange of data and documentation with the business and provide full instructions to EIMR`s customs brokers, where available through an electronic data interface. It is especially for those units, where the reorganization could and for certain units already has a large impact. Unless they accept to go back to their old way of working, they will have to work on establishing the right capabilities in-house. Finally, a handful of other units have an in-between solution and use brokers in a mostly traditional way, but they are supported by an external expert service provider, which executes active broker management and the expedited resolution of issues encountered by brokers (e.g. when missing critical data). At the time of writing, this is not a very common model in EIMR.

The research underpinning this report centers mainly around the approach to customs operations of the last category (C). Such central teams are present in multiple geographic locations, but the teams in the US and Italy have been selected as the main source of information. There likely are limitations to the extent that results can be generalized for the entire organization, however, the underlying assumption is that the most common challenges in customs operations in EIMR are largely the same across all customs operations models (though perhaps to a different extent, depending on the maturity levels of the involved business organizations). A critical consideration for the selection of a central team under model C relates to visibility levels. As the centralized internal customs teams are providing full instructions to the brokers, they have gained a lot of insight in the issues which previously were encountered by external brokers. The physical and the organizational distance between the centralized customs operations and the individual business units has further contributed to the visibility of those challenges, because it increases the complexity and thus cost of firefighting efforts. In the few units, where customs operations are supported by the use of external expert service provider, the most common issues are even better documented, however, the customs-relevant maturity levels of those few units are typically a bit higher than elsewhere in the EIMR organization and therefore provide less insight into crucial domains of collaboration. Data collected from one of these US-based units, however, is used to complement and compare findings.

The work of the selected teams is predominantly focused on the transactions of EIMR`s product businesses. The nature of the product business typically creates higher volumes of smaller shipments, in comparison to project business with fewer higher value shipments. Furthermore, the contribution to EIMR`s project business is less extensive, because project transactions regularly require specialized transport. Project managers may give preference to working directly with the respective freight forwarders (who also act as customs broker) for such transactions.

The next chapter provides an overview of the theoretical contributions, which form the basis of the research underpinning this thesis.

Chapter 3 – Literature review

The previous chapters described the research problem, objective and scope of this thesis, as well as the organization, which served as subject of research. This chapter provides an overview of the literature, which gives the scientific context and serves as a basis for this research. In line with the structure of this thesis, the literature review covers transportation management within the context of competitive strategies, customs requirements and the most common issues in this domain, value chain modelling and finally knowledge and competency management.

3.1 Transportation and customs operations the context of competitive strategies

For already several decades, it is a generally accepted notion that companies must have a competitive advantage, which sets the firms` value proposition apart from the offering of its competitors and ensures sustainable longer-term success. Much of the extensive body of literature around competitive strategies and tools to implement those strategies is based on the well-known work of Michael Porter, who first introduced the concept of competitive advantage in 1980`s. His extensive theoretical contributions cover, amongst many other things, basic competitive strategies and a value chain model (Porter, 1998[9]). Although the overarching concept of competitive advantage is still firmly acknowledged and applied in modern business strategy, under influence of technological advancement, extensive globalization and global market fragmentation, scholars and practitioners have developed new types of competitive approaches and strategic tools (Barber, 2008; Busbin, Johnson and DeConinck, 2008; Kaplan and Norton, 1992; McPhee and Wheeler, 2006 and Webb and Gile, 2001)[10].

The literature which places both transportation and customs operations in the context of competitive strategies is very limited. For transportation only there is more available, though much of the literature on transportation focusses on one of multiple factors that influence costing models and do not immediately tie this in with competitive strategy. Key considerations in the domain of transportation management as a factor of competitiveness have been found through publications of Chopra and Meindl (2016); Mangan and Lalwani (2016) and Bhatnagar and Teo (2009).

Within the overall concept of supply chain and logistics, transportation is typically regarded as a non-value adding activity, but it plays an important role in ensuring that supply chains

[9] This work is a republication of Michael Porter`s original book, published in 1985.

[10] A further discussion of this literature is provided under the value chain section.

operate efficiently and effectively (Mangan & Lalwani, 2016). In addition to making sure that orders arrive with the customer at all, stable and fast transport capabilities can help lower a customer`s total cost of ownership, particularly those cost that are associated with inventory, warehousing and production cycle time (Chopra and Meindl, 2016). As pointed out by Bhatnagar and Teo (2009) as one of the four logistics-drivers behind supply chain performance, transportation can serve as an enabler for companies to maintain economies of scale in parallel to time-based competition to enhance responsiveness to customer needs.

The need for short lead times can be so strong that it may even trigger a company to make a trade-off and pay a premium price for more expensive modes of transport in exchange for shorter lead times and reliable delivery. Chopra & Meindl (2016) make specific reference to transport options and transport management capabilities in the fourth decision making phase of their framework for supply chain network design decisions, during which a company`s location decisions are made.

Transport lead time

Neither of these two concepts is consistently defined in the literature. The common denominator found for transport lead time (LT), simply enough, is duration of transportation. I.e. the length of time needed to transport a product from its point of departure, to the agreed destination. Though time is a critical defining element, feedback from EIMR transportation management teaches, that the associated cost per unit of time should be read together with this performance indicator, because EIMR businesses often choose to incur extra cost to keep delays to a minimum (e.g. by using a different mode of transport, an alternative transport provider or alternative route). A complicating factor, when considering this KPI as impact criterium for customs operations, are certain incoterms in a contract or purchase order, as these generally determine which party performs the customs clearance. As soon as EIMR is no longer the party that controls the clearance, or the transportation, the visibility of the impact on end-to-end transportation disappears entirely. This does not mean, though, that there are no problems with the clearance of the goods, which might originate from within EIMR and which may delay the overall transport and affect customer value and satisfaction.

On-time delivery

Contrary to transport lead time (linked to duration), on-time-delivery (OTD) is linked to the exact moment of delivery, i.e. a single point in time. OTD measures whether a company has physically supplied the goods against the contractually agreed date and time of delivery. More than transport lead times, good OTD performance enhances the reliability of EIMR as supplier. Bad performance in OTD can strongly influences customer satisfaction, as it means that goods

are consistently not delivered against agreement[11]. Here too, certain incoterms form a complicating factor for the use of OTD as a criterium for estimating the impact of customs operations. If the contractually defined point of delivery (upon outbound) is determined to be before any or only part of the customs formalities have been completed, then it is difficult to maintain visibility of any impact of customs operations. Evaluating the performance of a company in transportation requires insight in both On-Time-Delivery and Transport lead time, as this will provide insight in the level of efficiency in transportation, as well as the level of reliability (adds customer value). Although the inconsistent application of both KPI`s within EIMR renders these two criteria less reliable and less effective to be of direct use, for lack of a better alternative they will loosely serve to evaluate of the impact of custom operations on transportation.

Where firms already have to make a significant effort to establish stable and efficient inbound and outbound transportation, the process becomes additionally complex and harder to manage due to customs clearance formalities. Transportation leaders in EIMR have indicated that the clearance process can be swift, provided that all parties involved in the supply chain fulfill their administrative obligations and all required data and documentation is available. Under sub-optimal circumstances, however, the import and export procedures are hindered, and this can greatly affect the efficiency in transportation, it can lead to additional cost and it may negatively impact customer satisfaction. No literature was found, where customs-related issues are addressed against the within the context of transportation and competitive strategies.

In addition to interrupting transportation, the cost of the customs process itself can affect the competitiveness of companies. When insight in these costs is limited, then the impact of issues remains hidden and then likely also underestimated. Grainger, Huiden, Rukanova and Tan (2018) have established an extensive overview of all the categories of direct and indirect cost of customs and have placed this within a wider framework of trade cost. Such insight can support the formulation of key performance indicators and help to reduce cost.

Out of all customs-related aspects, the impact of tariffs is likely to be of greater impact and more straightforward to identify as cost-category. Tariffs and other tax incentives are also the only category to have been explicitly included as a separate element in the framework for supply chain network design decisions (Chopra and Meindl, 2016).

[11] OTD should not be mixed up with ROTD, which is the measurement of the delivery against the delivery date as requested by the customer. ROTD serves as a measurement of the general expectations of the customer and is commercially relevant, as it expresses competitive position of other players in the market.

3.2 Customs formalities and issue categorization

The customs clearance process is highly data driven. Overly simplified, the customs process of a normal cross-border transaction (inbound and outbound) entails not much more than an exporter or importer providing some information to the customs authorities to declare what it wishes to export and/or import. The customs authorities subsequently review that data to determine whether the transaction is in order and provide confirmation of clearance and in case of import indicate how much duty needs to be paid. From time to time, this is accompanied by a physical inspection. As explained by Hesketh (2010), however, the international supply chain has grown in complexity and the identification and management of data involves collaboration between a blend of different parties and coordination of parallel processes across different geographical locations and jurisdictions.

Based on findings in the literature and few non-academic sources, problems with import and export processes can be divided into three categories:

- *Authority related issues*, i.e. problems which reside mainly at the side of the customs authorities, such as resource limitations and subsequent congestion at the border, accessibility of the customs office and/or ease of administrative processing of the declaration.
- *Supply chain related issues*, i.e. problems which typically relate to the process flows in the wider supply chain network. These include issues, such as delays in document handover; timely sharing of information and documentation.
- *Internal value chain related issues*, i.e. problems which typically relate to the unavailability or untimely provision of required data and documentation, which is needed to perform a clearance, to either the internal customs operations teams and/or the external broker.

Overall, far more material can be found on the first two categories (authority- and supply chain network-related issues) than on the last one (internal value chain related issues). The available studies in the customs domain seem to either focus on the macro-economic impact of border requirements, or on the role of customs in integrated global supply chain management.

Authority related issues

Many of the customs-oriented studies have been performed to support regulatory developments and improved policy making (Grainger, 2018). These include macro-economic studies, which aim to identify benefits derived from trade facilitation-measures, as implemented by governments. Or, such studies aim to identify border processes which form trade barriers and consequently hamper a country`s economic development (Nordas et al, 2006). Grainger (2016) specifically refers to the time release studies of individual countries

and a database of the World Bank[12], which `records the time and cost (excluding tariffs) associated with the logistical process of exporting and importing goods, including documentary compliance, border compliance and domestic transport`. The authorities of the respective countries recognize that `although tariffs still play an important role, their relative importance has declined, and trade related transaction cost have taken precedence`[13]. Especially intergovernmental institutions, which deal with international trade and trade liberalization, have an interest in gaining insight in the impact of non-tariff measures. The World Bank, for instance, defines the transaction cost as to include `logistics and freight expenses`, `customs administrative fees` and `border cost`[14]. In a trade policy working paper from 2006, the OECD `analyses the relation between time for exports and imports, logistics services and international trade`. The study subscribes to the increase in time-sensitive product ranges and the necessity for the authorities to enable shorter lead times. An example of a country-specific study is one as performed by Taylor, Robideaux and Jackson (2004), which `examines the levels of trade and transportation on the U.S.-Canadian border, and the cost impacts that border and bilateral trade policies impose on that trade`. The article subscribes to the relevance of an efficient border process to avoid delays in transportation and to enable company strategies like just-in-time delivery. The study focuses on the functioning of the customs authorities and ultimately concludes with pointing out the necessity for the government to invest in institutional improvements and staffing.

Although from the perspective of governments and trade barriers, these studies confirm that lead time and time reliability are important competitive factors for companies.

Supply chain related issues

Given the clear recognition of the relevance of customs processes, as highlighted above, it could perhaps be expected that at least some of the literature within the domain of supply chain- and / or transportation management would address this topic. Yet, key academic books in these domains offer very little on the link between transportation and customs. For example, the framework for supply chain network design decisions, as developed by Chopra and Meindl (2016), lists transport, inventory and coordination as main elements of logistics cost, but fails to address customs as a separate item. Similarly, in their book on logistics and transportation, Mangan and Lalwani (2016) point out several factors which impact the efficiency of transport services, but without going into detail on customs requirements.

[12] https://www.doingbusiness.org/en/data/exploretopics/trading-across-borders/why-matters

[13] Although recent years have shown forceful geo-political developments, such as the China -U.S. trade war, which have once again demonstrated the highly impactful nature of tariffs.

[14] World Bank owned website `Doing Business`: https://www.doingbusiness.org/

Instead they just broadly refer to `regulatory requirements` (environmental, security) as something of relevance.

The available studies on the integration of global supply chains which take a specific focus on customs processes, generally address the various aspects of trade related cooperation between different stakeholders along the supply chain. They evolve around improvement of the cooperation between different commercial stakeholders, or on the streamlining of the interaction between commercial parties and governmental stakeholders, particularly on the topic of data visibility and data sharing. Aiming to design a framework for collaborative governance, Zhang and Preece (2011), for instance, explore shared objectives between business and customs, as well as complexities which arise when implementing the concept of `Customs-Business-Partnerships` or CBP`s. The authors note that, besides the general wish from businesses to remove unnecessary administrative requirements and regulatory interventions, the main interest of businesses lies with reducing transport times and improving certainty and stability in the clearance process. Taking a wider angle and building further on the well-known SCOR model for supply chain management, Hammadi et al (2018) propose a process design model for mapping the customs supply chain network and demonstrate the multitude of operators and operations in the global `customs supply chain`. With any cross-border operation typically involving a multitude of stakeholders working together, generally still with an outdated paper trail, it is very difficult to assess the true and total cost, whether expressed in monetary terms, time-cost, or both. Rarely, if ever, does any of the stakeholders have full visibility of the entire chain of operations. Hesketh (2009 and 2010) highlights this problem and argues that the lack of data visibility, combined with the legal construct of limitations in carrier liability, hinders effective management of processes and the performance of transport and brokerage service suppliers and drives up the cost. Hesketh (2010) argues for the establishment of a multilateral legal framework with enforceable jurisdiction. The framework should address the legal discrepancy between those who are responsible for making a customs declaration and those who need to provide all the relevant information. A stronger emphasis should thereby be placed on the starting point of international movements of goods to ensure reliability of the information. Hesketh furthermore presents a data pipeline concept, which should facilitate the data integrity and visibility across the supply chain. Between 2011 and 2014, this concept of a data pipeline to address supply chain visibility has been extensively piloted during a multi-year EU project called `Cassandra`, which aimed to address `visibility needs of both business and government in the international flow of containerized cargo`.

Finally, as already referred to in the previous paragraph, Grainger, Huiden, Rukanova and Tan (2018) aim to contribute to the discussion about and development of a comprehensive overview of border cost of customs requirements. Their extensive discussion of different cost

categories and the interdependencies of certain categories demonstrate the complexity of assessing the border cost of customs requirements.

With the work on the data pipeline concept, Hesketh (2009 and 2010) and others propose innovative ways of sharing data and documentation, which could indeed address some of the key problems, which are hindering the customs operations and processes today. The effective configuration of digital solutions can contribute to data completeness and data reliability. Digital tools, however, do not address the critical problems, which occur within the firms` internal value chain. A tool is just a tool and will only be (fully) effective, if the processes and activities which these instruments aim to support, are properly aligned and managed.

Firm value chain related issues

The third and last category appears underrepresented in the literature, which seems to reflect the reality in operational practice. It concerns problems that stem from the organizational dynamics around customs operations as functional domain within companies (as opposed to between stakeholders in the industry supply chain). `Relationships with external parties need to be coordinated internally to be successful` (Biemans, 1991 in Hillebrand and Biemans, 2003) and this is exactly where attention seems to be missing in relation to customs operations.

The limited attention for this domain at management level (inside and outside of the logistics department) was already pointed out in a publication from 1999, in which Thomchick, Young and Grenoble discuss the perceived influences on downsizing import activities. The authors point out the lack of recognition by management of the vital role of customs operations for a company and the relative ease with which downsizing is often considered. The study reports on then-relevant management considerations, which were perceived to support a decision to downsize (most notably the availability of third-party providers and automation opportunities through EDI), and those which were perceived to support a decision to refrain from downsizing (most notably compliance considerations). They found limited support for downsizing (e.g. through outsourcing) having a positive contribution to improved logistics performance provided that the transition was paired with appropriate quality management and process re-engineering. Though the latter is not the strongest conclusion of the research, it offers a seemingly relevant clue for the relevance of outlining the required contributions of non-customs departments in the value chain.

In a dissertation paper on information processing within supply chain management, Rosado Feger (2009) addresses the complexities regarding internal supply chain integration and information processing. To highlight the existence of an internal `operational divide`, the paper reports on managers indicating that it is easier for procurement and logistics department to integrate with suppliers, respectively customers, than that it is for these groups to integrate within the firm. The work furthermore focuses on testing factors for their effect on collaboration, respectively the strategic consensus between the purchasing, manufacturing

and logistics departments. Strongest support for a positive effect on internal supply chain integration include management support, communication and integrative information technology (Rosado Feger, 2009).

In a qualitative study on the role of the trade manager in international companies, Grainger (2016) confirms the limitations of the existing literature by observing that critical drivers of customs oriented studies are largely `at macroeconomic global or country level, or occasionally at the aggregated company level` and that `no concern has been made for the functional level`. Furthermore, the author mentions that customs management within companies is traditionally the domain of only a small group of specialists (lawyers, brokers and practitioners) that concern themselves with the technical details of customs laws and procedures. This is another clue regarding the apparent disconnect between other departments in a firm and the customs domain.

Grainger (2016) provides few examples of where and how customs managers typically support the logistics department to ensure efficient and undisrupted clearance – both from a preventive approach, as well as on ad hoc basis with fire-fighting activities. In his introduction it is indicated that `the transaction cost between businesses and the border agencies are known to inhibit efficient logistics and supply chain management operations`. This is followed by the overall observation that customs managers typically have three main, interdependent areas of activity, to know 1) logistics support, 2) supply chain management and 3) regulatory compliance.

Concluding from the findings reflected above, the available literature seems to confirm that there are problems with the collaboration between customs and non-customs stakeholders, but little is available on the nature of the gaps. Neither on a topical basis, nor on an overall conceptual level does the literature provide much guidance on how to identify gaps and improve the necessary alignment. Companies would be served with a conceptual framework which represents and reflects on the different areas of critical cooperation and which can be used as an instrument for a structured, stepwise gap identification. This will be elaborately discussed in chapters 4 and 5. The value chain model of Michael Porter is used in chapter 5 to structure the findings and develop the conceptual framework.

3.3 Value chain model

This section briefly elaborates on the value chain model as developed by Michael Porter and few developments that have shaped the evolution of value chain thinking.

Michael Porter published his well-known work about competitive strategies and value chain modelling in 1985 (Porter, 1998 (a re-publication)). Porter`s value chain model (see figure 4, below) is based on a manufacturing organization that buys raw materials, turns them into physical products and sells those products. The model basically divides a standard business

organization into separate functional departments, each of which performs a specific set of activities. The model assumes that each segment performs mutually exclusive activities and the combination of all these activities together ultimately create value for the customer. This traditional value chain concept serves as a tool, which can be used to perform a cost-benefit analysis of the individual departments and activities in the firms` value chain. By applying the model to a real-life company and by breaking that organization down into smaller segments, a company can identify in a structured manner which activities create (most) value and which activities do not, or insufficiently add value. By targeting departments and/or activities which do not (sufficiently) contribute to the overall value, a firm can improve its profit margin and/or increase the value created for the customers. The valuation method is based on traditional cost-accounting methods.

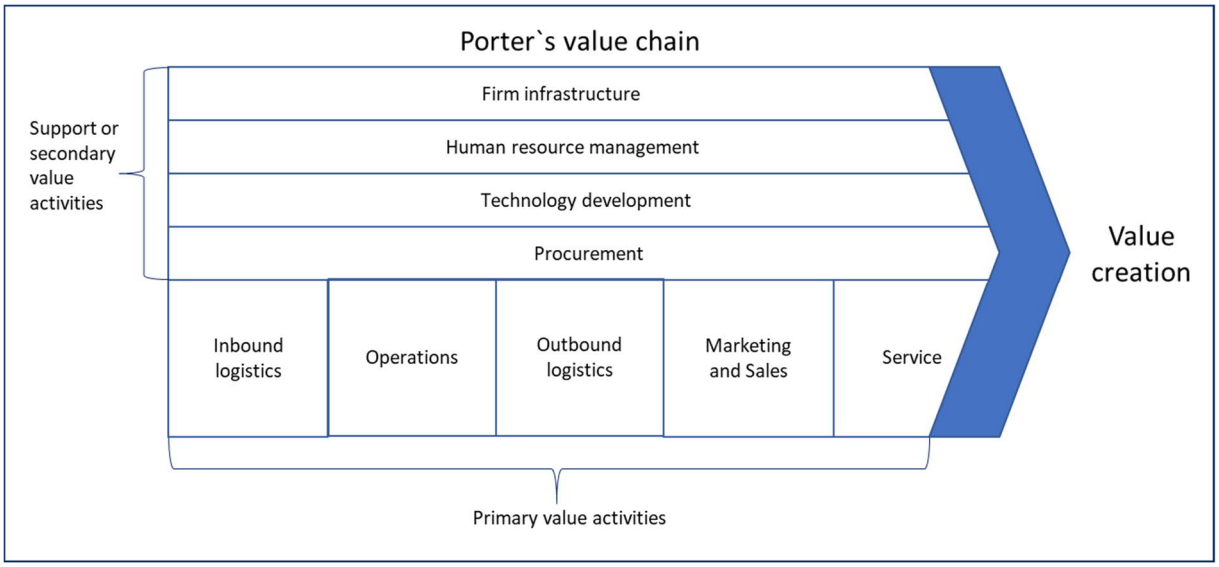

FIGURE 4 - MICHAEL PORTER`S VALUE CHAIN MODEL

The model distinguishes between primary value activities, secondary (or support) value activities and the linkages between both. Primary activities are the activities that are essential for the creation of value and includes activities that are directly linked to the physical creation, sale, maintenance and support of a product or service. The involved functions include inbound logistics, operations, outbound logistics, marketing & sales and service. Companies can build and strengthen a competitive advantage around any one of the five activities in the value chain. Secondary or support value activities are intended to support the primary activities, making them more effective and efficient. The involved functions include infrastructure, technology development, human resource management and procurement.

The value chain concept forms a useful basis for the analysis of a manufacturing organization, because the model not only addresses those departments, which are directly relevant in the

production process of a firm. Instead, it captures the complete combination of segments, which jointly make up the entire organization.

Over time, many other academics have analyzed the value chain concept, as initially developed by Porter, and have used it as a basis for further development of competitive thinking and value chain modeling. Developments were (and are) driven by developments in the global market, as well as in response to certain shortcomings of the original model. Practical sources for cross-referencing and basic understanding of the evolution of the value chain concept are the literature review written by Ricciotti (2019) and a scientific paper drafted by Durisova (2010).

Within the context of this thesis, the most notable developments in the evolution of value chain modeling and performance management have been found in the work of Barber (2008); Busbin, Johnson and DeConinck (2008)[15]; Kaplan and Norton (1992); McPhee and Wheeler (2006) and Webb and Gile (2001).

Kaplan and Norton (1992, 1996) introduced the concept of the Balanced Scorecard (BSC), which translates the mission and strategy of an organization `into a comprehensive set of performance measures that provide the framework for a strategic measurement and management system`. According to the authors, not all activities and contributions, which are valued by the customer can also be captured in standard accounting terms. The balanced scorecard allows for different performance measurement, combining financial and non-financial measurement standards.

Barber (2008) further elaborates on the work of Kaplan and Norton and develops a BSC-based framework that incorporates a wider scope of tangible and intangible areas of the value chain into the approach of measuring value. The author stresses that `value is added most successfully with collaborative partnerships that recognize all contributing areas, including processes, procedures, information and financial linkages, management of knowledge innovation strategies, change and relationships`.

Webb and Gile (2001) looked beyond the concept of core competencies and only adding high-value-added-internal activities as a starting point for value creation. Partially in response to technological advances, they propose a `*reversed value chain*` which takes the customers` needs as a starting point and use those needs to reevaluate the value of the contribution of core competencies and outsource functions.

McPhee and Wheeler (2006) have developed an `added value chain model`, which includes an expanded set of business activities, as well as a revised definition of value. The primary

[15] Not discussed in this thesis.

functions are expanded with supply chain management, product use and end-of-primary use. The functions listed under support activities are expanded with external networks.

Porter`s value chain model, the balanced scorecard, the reversed value chain and the added value chain are critical foundational concepts, which are used for the development of the customs-oriented value chain model in chapter 5.

3.4 Competence management

In the cross-functional domains of competency management and/or knowledge management and customs operations, no specific academic publications came up. This section will therefore address findings of a more general nature.

The critical review of the science and practice of competency modelling, written by Stevens (2012) is used as a practical initial source of information. It supported the basic understanding of the concept of competency management. The review addressed the definition of competency and competency modelling, the best practices in competency identification and competency structuring. Most striking finding is the observed lack of true consensus among experts about the definition of competency, although there seems a general agreement among scientists and practitioners that the concept of competency encompasses knowledge, skills, abilities and other characteristics, as well as behavioral capabilities. Similarly, the act of competency modelling is defined in many ways, but most authors would agree that it entails `an attribute-based form of work analysis`. Stevens also iterates the importance of explicitly considering the purpose and goals of competency modelling, as well as the context in which the exercise takes place. For example, a competency model in a highly centralized organization with strong functions should look different from a more decentralized organization. This is an important observation given the often-occurring reorganizations in large multinationals, such as EIMR. Typical use cases for the practice of competency modelling include employee development, career development, leadership development and managing of organizational change.

Kayakutlu and Büyüközkan (2010) place the concept of competency management in the context of supply chain competitiveness and create awareness of the dynamics of knowledge- and competency management for companies which are in need to improve their supply chain performance. They identify the three most important competence attributes to improve supply chain competitiveness, to know individual competence in continuous learning, networking and innovativeness of the team.

Marca and Zhao (2019) outline a customized procedure for improving the knowledge flow across the firm`s internal value chain. Their paper describes a four-step approach, which can facilitate the knowledge flow in an organization, through a) the identification of the process executed to manage knowledge, the actors and their role of transferring and managing

knowledge, and b) the classification of the information and identification of the knowledge that is (or should be) used by the departments of the internal value chain. In this thesis, the focus is on the latter (i.e. b) and addresses the knowledge and skills specifically in the customs domain.

Summarizing, it can be stated that continuous learning is essential for the effective and efficient functioning of the supply chain and the overall competitiveness of a firm. It is, however, important to clearly identify and map the critical competencies per department. This is consideration is critical for the further buildup of the competency tables in chapter 6.

Before putting these learnings into practice, the next chapters first bring the discussion back to the domain of transportation and customs and how the collaboration between customs and non-customs stakeholders along the value chain should look.

Chapter 4 – Customs requirements and common issues in the internal value chain

The fulfilment of customs requirements is very much a data driven process, aimed at facilitating the customs authorities with critical information about a given cross-border shipment of goods. Within an internationally operating manufacturing organization it requires a well aligned end-to-end processes to ensure that all data and documentary evidence is available by the time customs clearance is to be performed. As will be demonstrated in this chapter, inefficiencies and delays in the customs operations process are generally triggered by a lack of key required data and documentation. The following paragraphs provide an overview of identified gaps in the flow of data and documentation and categorizes them based on key customs-relevant aspects. For an organization to effectively close gaps, it must also be clear where the gaps originate. This is discussed in more detail in chapter 5, which develops a customs-oriented value chain model and provides an overview of the structural interaction between the customs department and other non-customs departments that need to contribute to the customs process.

4.1 Collecting insight in the interruption of the data flow

Anecdotal evidence indicates that customs-related issues occur on a regular basis, but exact data is not available. Under none of the three most common operational models for customs operations are issues structurally tracked and data collected from brokers and freight forwarders is often of insufficient quality (not detailed enough, incompatible reason codes, in contradiction with one another). To gain more insight, data must therefore be collected through alternative channels.

During a customs-oriented workshop early 2020 at one of the EIMR locations in the US, newly compiled templates for the end-to-end inbound and outbound customs processes were reviewed for training and re-validation purposes. The audience of the workshop consisted of US-based trade compliance leaders and several members of a central EIMR customs operations team, which has been performing the inbound clearance for all the US-based business units and manufacturing locations over the last few years. During the multi-day workshop also key areas of interruptions of the clearance process were identified and captured. During three follow up calls, the documented feedback from the workshop was validated and complemented with further details on the estimated impact on the efficiency of the customs operations and transportation process.

Questions during the workshop and the calls covered: which issues were at stake, how long it takes to solve such issues whether the issues lead to actual delays or whether they can usually be solved within the timeframe of scheduled transport, whether there is a direct cost impact and/or compliance risk. Similar questions were asked during two consecutive interviews with

the manager of a transport management center in Italy, which has a customs operations team that operates in a comparable set up as the team in the US. The feedback from the customs operations team was furthermore compared with output from a brokerage-report from another unit that is working with an external expert service provider. Both alternative sources of information showed similar results in terms of the types of issues encountered. Frequency levels could not be compared, because of differences in volume of shipments and differences in the nature of the business.

4.2 Key customs requirements and related issues

The following paragraph provides an overview of the collected feedback. The findings are mostly structured around the essential data requirements, which need to be complied with against the background of customs clearance formalities. With few exceptions[16], the HS classification, origin and customs value jointly form the basis of customs control and are particularly relevant for the calculation of duty. Export control classification and licensing form the basis for Export Control. The most relevant data elements for the fulfilment of customs requirements therefore include:

- HS Classification
- Origin (non-preferential; preferential)
- Customs Valuation
- ECCN Classification and license information

Based on the findings from the research, two other aspects will also be addressed, to know:

- Incoterms
- Non-customs regulations enforced by (or via) the customs authorities

These are not truly customs requirements, but are added to the overview, because they can and often do have an (indirect) impact on the customs processes and often require follow up and cooperation with non-customs departments.

Product classification

Product classification basically entails the identification of a product in the formal language of the relevant authorities. There are two types of product classification, classification for customs control purposes and classification for export control purposes. Both types of classification require the availability of qualitative product information.

[16] E.g. Switzerland, where duty is still tied in with the weight of goods

Product classification for customs purpose is the process of assigning a numerical code (HS or HTS number) to an article and is the starting point for tariff and non-fiscal matters, such as product prohibitions and quantitative import restrictions. The basis for classification is the global Harmonized System, but further developments of the classification system and the interpretation of the classification tables stem from different national and international sources. Besides new tariff measures at the WCO, as well as at national and regional level, also interpretations by national customs authorities and national and regional legal courts can lead to the application of specific classification codes. The rules for classifying goods have been stable for a long time, however, applying these rules in practice has proven to be complex.

Product classification for export control purpose is the process of assigning a numerical code (ECN or ECCN) to an article, which is a controlled good, such as military or dual use[17] items. Export products, which are controlled will need an export license. Such licenses can be requested upon transactional level, or for a given period or amount of goods. Operationally critical for controlled products is the timely classification of the product, as the processing of a license request typically requires time and this process can rarely be expedited.

Classification related	Estimated impact	Occurrence
Missing HS classification and/or missing product information.	Time loss to finalize clearance is typically 1-2 days, up to a week. High risk of delay in case of urgent inbound shipments and/or express shipments. Low risk for regular inbound shipments (ocean freight), also because customs operations deploy strong fire-fighting tactics (e.g. self-classification)	Daily, performance differences per site.
License / license data for associated ECCN code missing	6 weeks delay in case of license application	3-4 x per year

TABLE 1 - PRODUCT CLASSIFICATION RELATED ISSUES

[17] `Dual use` means that an item suitable for use for civilian, as well as military purposes.

Throughout most interviews, the workshop and validation sessions, as well as following a review of the data from the `broker exception requests`, missing HTS classification was indicated as the most common issue, causing interruption of the transport process and deployment of resources for problem resolution (internal customs operations team, as well as external agent supporting the resolution of issues and/or the broker). During the in-depth validation sessions, the customs operations team furthermore reported on missing and/or bad quality product descriptions, which serve as critical input for the identification of the (missing) HTS code.

Based on a conservative 1-week scenario (see annex vi), it is estimated that within the team of 4 persons, about 0.15 FTE is spent on self-classification and/or follow up with local business to ensure completion or correction of product classification required for customs clearance on inbound.

Origin

The data requirement of `origin` consists of two different types of origin. Non-preferential origin, which deals with the economic nationality of goods, and preferential origin, which deals with the preferential treatment of goods (potential for duty reduction).

Non-preferential rules of Origin `determine the economic nationality of a product` and `shall be defined as those laws, regulations and administrative determinations of general application applied by any Member to determine the country of origin of goods (Article 1.1)`.

Preferential Rules of Origin `shall be defined as those laws, regulations and administrative determinations of general application applied by any Member to determine whether goods qualify for preferential treatment under contractual or autonomous trade regimes leading to granting of tariff preferences (…)[18]`. In more simple terms, the rules of origin enable agreements about preferential treatment to be implemented.

Depending on the country of destination and/or the licenses of a company, certificates of origin may have to be obtained from the competent authorities. The request for such licenses requires documentary evidence and product calculations, which prove compliance with applicable regulations and/or free trade agreements.

[18] `… going beyond the application of paragraph a of Article 1 of GATT 1994 (Annex II, Paragraph 1)`

Origin related	Estimated impact	Occurrence
Non-preferential origin data not available or incorrect	On average 2 - 7 days delay in transportation (if detected).	Daily for non-preferential origin. Difficult to detect.
Preferential origin data and/or origin certification not available	2-3 days loss of time to finalize clearance. Typically, no delay, because preferential treatment will usually be waived to avoid material impact on transportation.	Depending on the unit. Some units 1x day, others 1x month, again others rarely.

TABLE 2 - ORIGIN RELATED ISSUES (PREFERENTIAL & NON-PREFERENTIAL ORIGIN)

Based on a conservative 1-week scenario (see annex VI), it is estimated that within the team of 4 persons, about 0.11 FTE is spent on follow up with local business to ensure correction of origin data and/or obtaining origin documentation required for customs clearance on inbound.

Customs valuation

On its website[19], the WTO describes customs valuation as `a customs procedure applied to determine the customs value of imported goods. If the rate of the duty is ad valorem, the customs value is essential to determine the duty paid`. Nearly all of the WTO members determine the value of goods based on the provisions of the WTO agreement on Customs Valuation (1994). In few cases, customs duties are designated in another way (specific or mixed approach) and customs valuation is then not required. The rules regarding the applicability of the commercial price on the invoice as a basis for the calculation of the customs value are strict. Furthermore, additional cost elements may have to be subtracted from and/or

[19] www.wto.org/english/tratop_e/cusval_info_e.htm, 20 April 2020

added to the commercial price to determine the customs value (e.g. transport cost). Such elements need to be underpinned with documentary evidence. A complex set of methods applies when the commercial value cannot be used. It may take specific expertise and potentially an inquiry with the customs authorities to identify the right method and appropriate documentary evidence.

Valuation related	Estimated impact	Occurrence
Quality of invoices, e.g. missing pricing information (return items, spare parts under warranty) or language issues.	Impact is mixed, depending on the nature of issue and whether sufficient information can be deducted from the invoice to identify the relevant business location that needs to provide additional information.	Regularly (more precise estimate not available).
Missing value-related data, such as transport cost (e.g. rated Bill of Lading) & assists.	Rarely leading to direct delays, more likely to be contested during audit. When detected by customs, then cases are difficult to solve, and disputes can lead to increased inspections.	Very often, but rarely during transport.

TABLE 3 - CUSTOMS VALUATION RELATED ISSUES

Based on a conservative 1-week scenario (see annex VIII), it is estimated that within the team of 4 persons, about 0.05 FTE is spent on follow up with local business to ensure correction of valuation data and/or obtaining necessary documentation required for customs clearance on inbound.

Incoterms

Incoterms are standardized terms for the sale of goods, issued under trademark of the International Chamber of Commerce. They are mainly addressing the division of cost and management responsibilities between buyer and seller for transportation, insurance (during transport) and customs clearance. Incoterms are included in a contract of sale and therefore

in first instance agreed upon by persons in sales and procurement. Generally, in case of cross-trade – relevance of back-to-back contractual terms of trade & transfer of all the relevant information. Incoterms are reported to be linked to problems in relation to customs valuation, taxation and inability to anticipate on required customs clearance.

Incoterms and general customs process related	Estimated impact	Occurrence
Potential impact of incoterms selection on the documentary requirements in relation to customs valuation. Depending on the country, cost of transport may be dutiable up to the border. When delivery is not on the border, then a division of transport cost must be made, for which a rated Bill of Lading is required. When a rated BOL is not available, customs operations aim to collect the required documentation retro-actively to avoid unnecessary duty payment.	Potential of 1 – 2 weeks loss of time, before clearance can be finalized. Typically, no delay, because reduction of cost will usually be waived to avoid material impact on the transport.	Regularly (more precise estimate not available).
Potential impact of incoterms selection on failure to receive timely arrival notification (pre-alert), when transport is organized by supplier.	Can lead to delay of 1 day up to 3-4 weeks. Demurrage and/or warehousing cost can be substantial.	Up to 2-3 per month for some sites.
Potential impact of incoterms selection on last minute clearance requirements in relation to taxation (e.g. US Wayfair tax). Selection of incorrect incoterms (EXW/DDP, while performance of clearance is required).	Mainly affects resource planning and ability to solve other issues in a timely manner.	Up to 4-5 per week.
Potential impact on last minute clearance requirements in relation to incorrect configuration of incoterms in the ERP system. Information not transferred to the customs management system.	Mainly affects resource planning and ability to solve other issues in a timely manner.	Rarely.
Unclear indication of buyer (importer of record) on invoice / shipping documentation.	In case of express shipments, delays can often be kept limited, due to self-	2-3 per day.

	maintained data by customs operations team. Similarly, when a P.O. is available the issue can be solved relatively quickly. Without P.O. information, solving the problem may take 1-2 days, or even up to a week.	
Unclear indication of selected broker.	30 min up to 1,5 hours, in case of additional document handover problems	Few times a week.
Problems with document handover between FF/carrier and (separate) broker.	Delays can run from 1 day up to 3-4 weeks. This may also incur very high storage cost (up to few thousand dollar).	2-3 per month for some locations, others hardly ever.

TABLE 4 - INCOTERMS AND GENERAL CUSTOMS PROCESS RELATED ISSUES

Based on a conservative 1-week scenario (see annex IX), it is estimated that within the team of 4 persons, about 0.19 FTE is spent on follow up with local business to facilitate distribution of critical data, adjust course of action, etc. required for customs clearance on inbound.

Non-customs regulations maintained by (or via) customs authorities

In addition to customs clearance, additional requirements may have to be complied with upon export and (most often) import. These include nationally determined requirements in relation to national security, public health and food safety, and environmental protection. Such regulations are not directly related to customs rules, but they are often enforced at national level by (or via) the customs authorities and can be linked to HS classification codes.

Non-customs related	Estimated impact	Occurrence
Missing self-declaration needed for import of chemicals (list of accepted chemicals), or similar requirement.	Depends on the response time of the local business. Typically, 1 or 2 days delay.	1 or 2 a week.
Non-compliance with regulations tied to transport packaging, particularly lack of fumigation of materials (or the evidence to prove fumigation).	Can lead to one- or two-day delay, depending on the exact nature of the issue.	Once per week or two weeks.

TABLE 5 - OTHER CROSS-BORDER RELATED ISSUES (OFTEN ASSOCIATED WITH CUSTOMS)

Based on a conservative 1-week scenario (see annex X), it is estimated that within the team of 4 persons, about 0.08 FTE is spent on follow up with local business to facilitate distribution of critical data, adjust course of action, etc. required for customs clearance on inbound.

Generally, the feedback from the workshop indicates that there are a lot of inefficiencies in the end-to-end processing of data and documentation, from the initial moment of procurement and/or sale of goods, all the way down to the moment(s) of customs clearance. Typically, the effects of those inefficiencies are most strongly felt within customs operations, where missing information and documentation carry direct consequences. An aggregate estimate is provided further below (Figure 5 - Estimated aggregate impact). In most cases, problems cannot be solved without involvement of non-customs departments, but the respective non-customs departments themselves are typically not directly hindered by the gaps and therefore do not automatically have an awareness that they exist, nor do they have an incentive to change their way of working.

According to the customs operations team, true delays in transportation can often be avoided through firefighting and cost/delay trade-offs. As confirmed also by other sources in EIMR, when delays do occur, they can be significant and typically lead to additional cost. Cost may include demurrage and/or customs warehousing, or penalties from the customer for late delivery. In the given US location, it is the customs team that works on issue resolution, but in other countries many units work in a more traditional way. In such cases, the brokers are confronted with these gaps. A senior leader in transport sourcing indicated, that if such issues occur regularly, then the brokers will claim higher rates for their services.

Limitations to generalizability of the information captured:

- The US-based team is an experienced team, that is familiar with the issues and potential solutions. They know how to solve certain things quickly, but also which potential opportunities are best forfeited, because they are practically unattainable (i.e. no time is wasted on those). For businesses, that are not working with experienced staff (e.g. when double hatting a role), seeking solutions is likely much more time consuming.
- The scenarios and actual issues depend a lot on the trade-profile of the local businesses (size, type of business (product/project, service), performance level of the freight forwarders and brokers, supplier quality, etc..
- Strong focus on inbound shipments

Especially with ocean freight, there is often enough time available for effective issue resolution. With air freight and/or express consignments, the risk of delay increases significantly, simply because transport lead times are shorter. To avoid time-consuming firefighting, duty-reducing opportunities may be renounced (depending on the amount saved), or higher-than-necessary compliance risk accepted (uncertainties around customs valuation; last minute product classification; unconfirmed questions around origin). This suggests that without improvement of processes, transport lead times cannot be shortened without sacrificing on-time-delivery performance. Additionally, the likelihood of a cost/delay trade-off would rise.

The next chapter will take a closer look at where inefficiencies in the flow of data and documentation originate. The focus thereby goes out to the third category of customs related issues, the `firm value chain related issues`, as discussed above. By applying a customized approach to the classic value chain model, the chapter furthermore aims to create a conceptual tool, which can be used to map the structural interaction between customs operations and other departments. By mapping out which departments have role to play, it is which stakeholders need to contribute to the resolution of issues. In chapter 6, this will be complemented with a mapping of the customs-oriented competencies which the respective stakeholders need to enable optimal performance.

Based on a compilation of the 1-week scenarios, it is estimated that within the team of 4 persons, about 0.57 FTE is spent on firefighting of issues and attempting to avoid delays. In addition, the total time for around 25 shipments is 16-17 days and another 11-12 days could be avoided with additional effort.

In comparison to the total number of shipments, an estimated 4-5% of the shipments together make up around 14-15% of the total workload of the team. For several reasons, it can be assumed that in practice these percentages are higher. Likely the numbers are closer to be around 5-6% of the shipments causing around 20%, and on occasion even 25% of workload of the operational customs team.

- *The scenarios do not reflect exceptional and extreme cases of goods that are stuck at the border for several weeks or even months. Or even more extreme cases, where goods are sent back to their origin or are destroyed. Before such cases are closed, an extensive amount of time goes into their (attempted) resolution.*
- *Issue resolution often requires additional (and more expensive) hours, due to involvement of senior trade compliance managers and persons from other functions, as matters may be complex and/or political (internal organizational disputes). Any duplication of time (e.g. two or three persons on the same call) is left out of the calculation.*
- *No specific consideration is given to compliance needs, time dealing with requirements of trade opportunities (AEO, CTPAT, special customs regimes, etc.) and the effect of issues on efficiencies elsewhere (e.g. handling of freight payments is extra burdensome when importer of record is registered incorrectly).*
- *Also not incorporated in these numbers are hours of local business staff and internal business abroad and/or hours of persons at the broker/freight forwarder/supplier and (less often) customer.*

On a general business level, delays in shipments are also likely to cause delay in payment. For multinational enterprises, the late collection of receivables can have a substantial financial impact. Such calculations are outside of the scope of this thesis, but this would be an interesting angle for further research and one that is likely to draw management attention.

FIGURE 5 - ESTIMATED AGGREGATE IMPACT

Chapter 5 - Non-customs` contribution to customs operations

The previous chapters placed transport and customs operations in the context of competitive advantages and customer value creation. Aditionally, the customs operations process of one of EIMR`s central customs operations teams was analyzed in detail to more clearly identify whether there is a structural impact of customs operations on the transportation process. The findings are twofold. On the one hand, if the customs clearance process can be handled without any irregularities, than the impact on the transportation process is minor, almost negligeable. On the other hand, often there are issues with the flow of data and documentation. These issues trigger considerable inefficiencies in the customs clearance process and carry a significant risk of negatively affecting transport lead time and/or on-time-delivery, along with an increase in other cost (e.g. cost of warehousing, or brokerage fees).

The issues identified in chapter 4 are in many cases either data related (e.g. missing, incomplete or incorrect data), or related to a lack of coordination of activities between different parties in the supply chain. Customs operations departments are the last stakeholder in the end-to-end process. When faced with problems that originate from earlier in the value chain, they are dependent on others to provide the essential input. The identified gaps suggest a certain breakdown of the internal cooperation within the company and a potential lack of custums-oriented consideration in non-customs departments. This chapter shows the development of a customs oriented value chain model, which is an instrument that reflects and structures the activities and output of non-customs departments to contribute to effective, efficient and above all stable and reliable customs operations.

On a more abstract level, this includes that:

1. Much of the required data generally needs to be obtained from external partners in the supply chain (suppliers), or from internal parties that are managing the transaction with the supplier.
2. Another significant part of the data needs to come from internal parties that are managing either the company`s product or the transaction with the customer.
3. The coordination of the data and document flow and/or other cross-border requirements among the diferent parties in the supply chain is largely handled by the inbound / outbound logistics and transportation teams (who instruct the freight forwarders and carriers), by procurement (who need to give clear instructions to the supplier), or by sales (who agree with the customer on e.g. incoterms and preferential origin).

These three categories are insufficiently specific. When issues need to be addressed by management, their insight is often not detailed enough to identify and solve the underlying problems. Management would be served with a tool that helps them to identify what needs to be executed. Irrespective of how an organization wishes to structure its activities and tackle

challenges, it must first be clear, what exactly is required and how different activities are related. This chapter aims to facilitate the creation of such a conceptual model. The approach will be structured using Porters` value chain model as a basis, but the resulting model will look slightly different to enable a better fit for purpose and to overcome few shortcomings in the traditional model.

5.1 From Porters` value chain to a customs-oriented value chain model

As mentioned in the literature review, Porter`s value chain model is a useful model for global manufacturing firms such as EIMR, because it captures the complete combination of segments, which jointly make up the entire organization. Against the background of the use of this model for the review of the value chain for customs purposes, however, a few complications need to be overcome. A key drawback of Porter`s original value chain concept is its initial design as a strategic cost management tool. The analysis of the value chain based on Porter`s theory is based on cost accounting data and focuses on past performance Porter, 1998). The analysis in this chapter aims to identify collaborative activities that enhance the overall value proposition of the EIMR business (i.e. its products and systems), as well as contribute to customer value. Some of the value can be captured in standard accounting terms, such as labor cost of the customs department, cost of customs duties and penalties. Other factors are more difficult to capture with standard cost accounting methods, such as the value that customers attach to stable and timely delivery. Also quantifying the impact of delays is difficult, as it varies per customer, per country (in case of penalties), per freight forwarder (for cost of warehousing), etc. and may also swiftly change over time.

A further complicating factor follows from the break-down of the end-to-end process (Porter`s primary and secondary activities). On a general level, Porter acknowledges the need to manage process linkages, but ultimately the model is focused on the optimization of the performance individual department. This oftentimes leads to a trade-off between integration and differentiation, as addressed by Rosado Feger (2009). Indeed, also in the domain of customs, none of the non-customs departments is likely to be rewarded for their contribution to the customs domain.

While Porter was the first to develop a value-chain approach, many scholars thereafter have developed consecutive value-oriented concepts and support instruments. These include, amongst others, the concepts of balanced scorecard (Kaplan and Norton, 1992) and the reversed value chain (Webb and Gile, 2001), as well as the added value chain (McPhee and Wheeler, 2006). By drawing parallels with and/or applying few specific elements from those alternative concepts to Porters` value chain concept, it is possible to create a practical customs-oriented value chain model.

Reversed value chain – Porter`s model focuses on value creation for the company. Similar to the reversed value chain concept, the focus of the model is adjusted. To enable a clear focus, the customs-oriented value chain analysis will focus on those activities which contribute to an efficient, reliable and thus cost-effective fulfillment of customs requirement, instead of focusing on direct value creation. Value creation is assumed to be direct (cost saving in customs operations) and indirect (contribute to customer value), but not (not only) measured in cost-accounting terms.

Balanced Scorecard - With a focus on the flawless and reliable handling of customs formalities as the main value proposition, the customs-oriented value chain model will have to provide an alternative set of KPI`s and measurement standards to enable the evaluation of the contribution of non-customs departments to the customs process.

Added value chain – Porter`s model has divided a company in 9 standard functional departments and assigns the activities to be primary or secondary activities. When applying adjustments similar to the reversed value chain and the balanced scorecard, the division between primary and secondary activities also requires slight alteration. In the customs-oriented value chain model, primary activities will not consist of value creating activities, but activities which

- influence the data needs and/or the coordination with other parties in the supply chain (such as incoterm selection),

and/or which

- generate data that is relevant for customs clearance purposes and which needs to be made available to customs operations staff or brokers.

Secondary activities are those activies, which support the execution of the primary activities. This can be, for example, through building and maintaining the right system infrastructure, master data governance, competence management, compliance instructions, etc. This adjustment of the concept of primary and secondary activities means that within the customs oriented value chain model `procurement`, which in Porter`s model is reflected as a secondary activity, has become a primary activity. The latter, because procurement is one of the most important sources of customs required data. Similar to the added value chain model, the customs-oriented requires an adjustment of the composition of the functions under the primary and secondary activities.

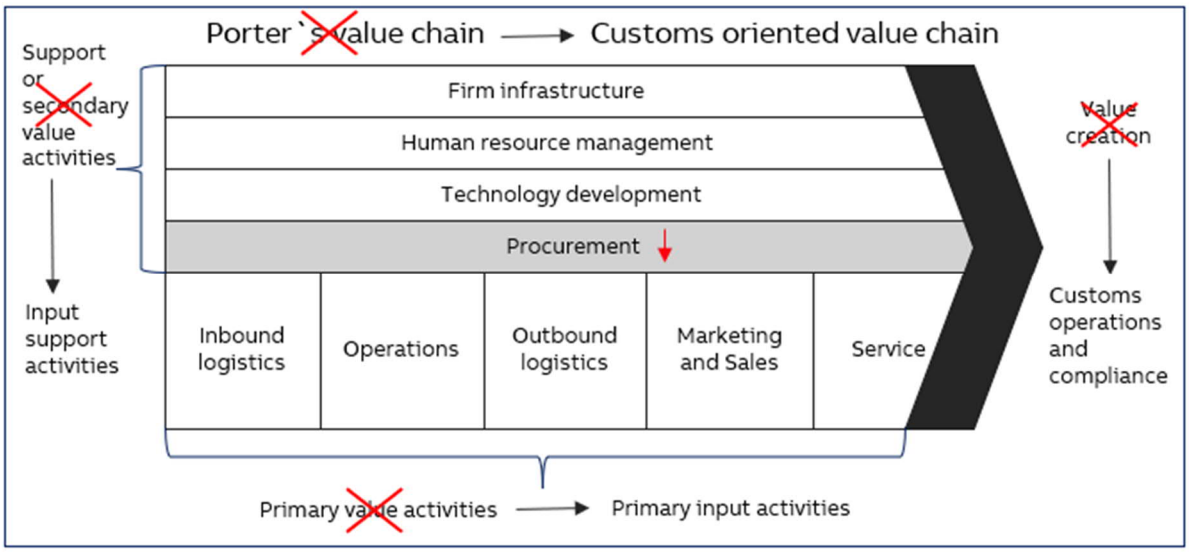

FIGURE 6 - ADAPTATION OF MICHAEL PORTER`S VALUE CHAIN MODEL

The visual representation of the adjusted model therefore looks as follows:

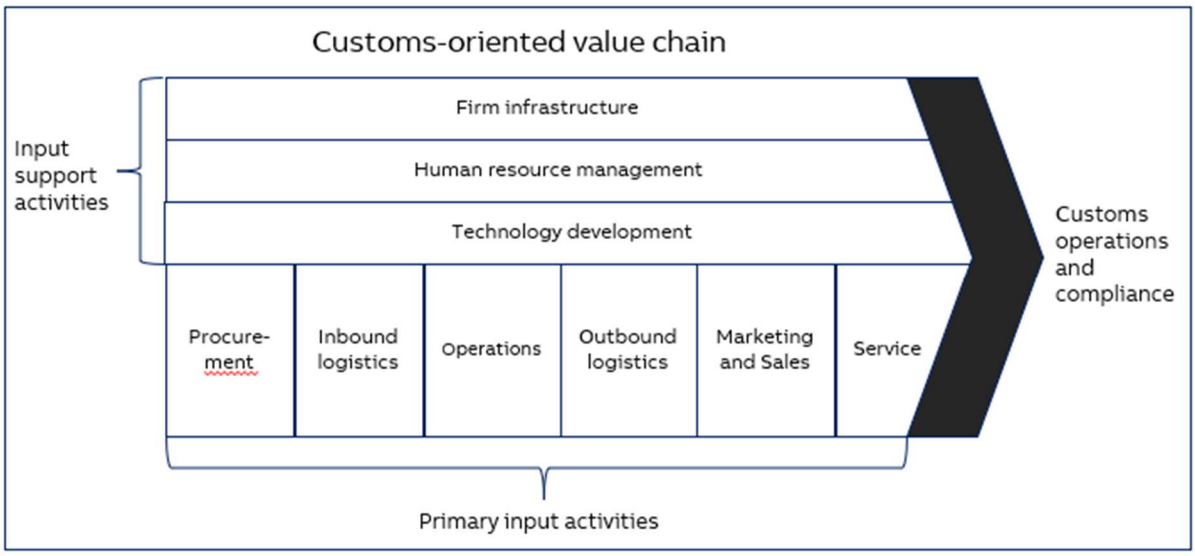

FIGURE 7 - CUSTOMS-ORIENTED VALUE CHAIN MODEL

By adjusting Porter`s classic value chain model with above listed adjustments, it is possible to create a customized value chain model, which reflects the most customs relevant linkages in the organization and which explicitly lists the required contributions of non-customs departments to the customs process. This standard overview can be used as a tool for the structural review of existing operational practices and supports the identification of critical gaps. By identifying the critical links and gaps in the interaction, concrete measures can be taken to improve the collaboration and integration, and indirectly and indirectly contribute to

the optimization of the value creation across the organization. Improvements in the collaborations can be achieved through a variety of measures, such as the innovation and/or enhancement of processes, the implementation of support systems and tools, the creation of guidance documentation and other job-aids, etc. Chapter 6 discusses this in more detail and explains why within EIMR it currently makes sense to focus on competency development.

5.2 Building the customs oriented value chain model (activity tables)

The following paragraphs aim to further the identification of the essential internal cooperation between customs and non-customs along the internal customs-oriented value chain.

The construction of the activity tables of the customs-oriented value chain model will follow a two-step approach:

1. Identification of where non-customs stakeholders need to collaborate with and contribute to customs operations, per main customs requirement
2. Grouping of the contribution per non-customs stakeholder in the customs-oriented value chain model

The scope of this thesis does not allow for an exhaustive mapping of all possible collaborations between customs and non-customs departments. It is therefore limited to only those interactions, which are linked to the problem areas identified in chapter two and to those functional business areas, which have a critical role in the resolution of those problems. The latter group includes inbound logistics, outbound logistics, procurement, sales and technology development. It is important to stress that the there are also linkages with the other functional domains (company infrastructure, human resources, operations, and service). Those contibutions can be scope of further research.

Step 1 - Issue-based identification of required collaboration between non-customs and customs operations

The first step entails a re-visit of the issues, which were identified in chapter two. For each of the issues listed, two aspects need to be added, to know the root cause and the non-customs departments, that should be involved is resolving the problem. E.g.:

Classification related	Root cause indication	Departments involved
xxx	xxx	xxx

TABLE 6 - EXEMPLARY TABLE FOR THE IDENTIFICATION OF COLLABORATION

The information needed for this step in the research has been aggregated by looking into the customs process templates (see Figure 1 - Detailed trade process documentation (global templates), page 16) and by collecting feedback from the customs operations team and local trade compliance managers (during and after the workshop in a US-based transport management center, as described in chapter 1 and 4). Key questions raised during and after the workshop included the indication of the most common root cause(s) and the specific identification of departments which should be involved in the problem resolution. Further feedback and validation of those findings has been collected during interviews with the head of one of the other EIMR`s transport management centers. Within that center, another customs operations team is engaged with the customs operations of the local EIMR Divisions in Italy.

In the following table, only a selection of the issues (product classification and origin related issued) will be shown below to demonstrate the first step of the construction of the activity tables of the customs-oriented value chain model. A table with the full overview of issues, root causes and non-customs departments can be found in annex iv.

Step 1 - Issue-based identification of required collaboration between non-customs and customs operations for product classification and origin:

Classification-issues	Root cause indication	Departments involved
Missing HS classification and/or missing product information: • Product classification on supplier invoice seemingly incorrect and/or inconsistent with other imports (import). • Product description insufficiently clear to check code and/or classify the product (import). • Customs classification code not available in p.o., GTS or SAP ERP master data (import / export). • Part number on the invoice is not the same as the one in the system (e.g. supplier does not use EIMR part number). • Individual parts not separately classified.	• Qualitative product description and initial classification not requested from supplier via purchase order (p.o. quality). • Insufficient vendor management, no follow up with supplier upon failure to deliver complete and qualitative data. • No resource availability for quality check on classification and/or classification upload in the system. • Inconsistent use of material and product registration in the ERP	Procurement Product management Engineering Technology development / R&D IT Master data

	system(s) by product management and/or engineering. • Insufficient governance over data availability (completeness, validity, consistency, correctness). • Lack of appropriate support system (central data repository) (not applicable for US). • Classification requirements unknown by relevant stakeholders (product mgt, engineering / Product Classification Engineers). • In case of projects, project mgt and/or order handling insufficiently aware of the need for product code.	
License / license data for associated ECCN code missing • No export license obtained	• Product has not been classified for export control on time. • Local business was unaware of the need for license.	Order handling
Origin issues	Root cause indication	Departments involved
Non-preferential origin data not available or incorrect: • Information not available, or clearly incorrect on invoice	• P.O. quality insufficient. • Insufficient instructions to supplier and/or insufficient follow up with supplier (vendor management).	Procurement IT department Master data
Preferential origin data and/or origin certification not available • Information not available, or clearly incorrect on invoice • Origin certificate not available	• P.O. quality insufficient • Insufficient instructions to supplier and/or insufficient follow up with supplier (vendor management).	Procurement IT department Master data

TABLE 7 - PRODUCT CLASSIFICATION RELATED COLLABORATION

Step 2 – Grouping of the contribution per stakeholder in the customs oriented value hain model

The second step entails the creation of the customs oriented value chain model, by means of grouping activities and input per individual functional domain.

It is relevant to identify and group the linkages and contributions per department, because this enables the involved stakeholders to gain proper understanding of their required contribution in one single overview. Such grouping also enables the creation of targeted support tools, including for example:

- Organizational review and gap-analysis tools
- RASCI charts and process documentation
- Policies, instructions, guidance documents, templates and checklists
- KPI development and performance reporting
- Competence modeling and targeted training

Similar to Porter`s value chain model, the activities of each department can be divided in sub-activities: direct, indirect and quality assurance.

- Direct: decisions to be made and/or data, which needs to be shared with customs operations (for the primary activities: per transaction);
- Indirect: preparatory activities, which enable the handling of the direct activities in a smooth and efficient way;
- Quality assurance: activities, which ensure that the direct and indirect activities meet the necessary standards.

The main aim in this thesis is to provide the description of relevant activities. Where feasible, also suggestions for KPI`s are mentioned by way of example.

5.3 Customization of the customs-oriented value chain model

The organizational structure of EIMR does not provide for a 100% match with the generic customs oriented value chain (as will be the case with other companies). Where the generic customs-oriented model (coinciding with Porter`s model) has 9 functional categories (6 primary activities and 3 secondary activities), EIMR has 21 different functional categories identified in the organisation`s career guide. This implies that the application of the model to the organization requires a certain conversion effort, which raises the question whether the model cannot be further detailed from the outset. The complexity of the overall company structure of EIMR and the continuous organizational development, however, do not allow a

permanent and/or exhaustive mapping at the level of the 21 functional domains[20]. The company structure of other companies at such detailed level is likely to look different for each individual company and would thus create a different model. Despite required conversion effort, this demonstrates the relevance of creating a standardized model of a more generic and higher level nature (similar to Porter`s approach).

The tables below reflect the generic functional categories of the customs-oriented value chain model, as well as the EIMR-specific functional areas. This way, it is demonstrated how the generic model and the activity tables can be customized to an individual organization. At the same time, it anticipates on the further processing of the results into an EIMR oriented support tool. For this reason, also relevant job-roles (based on the company`s career guide) are added to the tables. A detailed overview of how the mapping is constructed can be found in annex v.

5.4 Primary activities

Procurement

This category refers to the functional activities related to the purchasing of the inputs used in the firm's value chain. It includes the sourcing of raw materials, machinery, building etc. In this domain, the following activities are linked to efficient customs procedures:

Functional area(s) in EIMR	Logistics & Procurement
Examples of EIMR roles within identified functional areas	Procurement & logistics managers, Sourcing managers; Buyers; Category specialists; Purchase order & contract administrators; Supplier qualification specialist.
Attention areas	• Product classification • Customs valuation • Product classification • Origin
Direct activities	• Pre-check product regulations for import from dedicated countries, particularly import control and (special) tariff. Check at time of quotation, contracting, prior to delivery. • Requests full product information from supplier, prior to shipment, to enable (verification of) product description, classification, origin and customs valuation.

[20] At the time of writing, the available materials from the global HR department are not yet brought in line with the new operational model of the organization. Although the functional areas are expected to remain the same, it is not unlikely, that under the new structure, the HR materials of the individual Business Areas and Divisions may differ from one another at job level (i.e. different role-titles and descriptions).

	• Request origin confirmation and certification from supplier (where applicable). • Instruct supplier regarding format and and quality of mandatory data, documentation (especially the invoice), packaging requirements and associated regulatory obligations (e.g. fumigation) and transport handling (if required by supplier under incoterm). • Ensure complete flow of customs relevant data and documentation to customs operations/broker. Follow up with supplier, where needed.
Indirect activities	• Maintain workforce with insight into customs requirements and inform workforce about about listed direct activities. • Include customs relevant aspects in the standard supplier qualification process (i.e. prior to placing any purchases order) and in the frame agreements, where applicable. • Maintain customs relevant KPI`s for long term suppliers.
Quality assurance activities	• Actively manage vendors in case of non-compliance with requested quality, completeness, correctness and timely delivery of data and documentation. • Maintain detailed SOP with customs operations for main types of transactions, standard incoterms and agree on the approach to handling brokerage for urgent and/or express shipments. • Seek early confirmation from customs operations regarding documentary needs, in case of alternative transactions. • Regularly perform post entry-checks on the documentation and executed clearance.
Potential KPI	• Number of times data/documentation from supplier and/or procurement was incomplete. • Number of times where data from supplier and/or procurement was incorrect. • Number of times pre-alerts and arrival notifications were not received in timely manner. • Number and cause of non-regular delays at the border due to data and/or documentary issues.

TABLE 8 - PRIMARY ACTIVITIES: PROCUREMENT

Inbound logistics

Inbound logistics consist of activities associated with receiving, storing, and disseminating inputs to obtained products, such as material handling, warehousing, inventory control,

vehicle scheduling and return to suppliers. In this domain, the following activities are linked to efficient customs procedures:

Functional areas in EIMR	Logistics & Trade – inbound (within overall Procurement & Logistics)
EIMR roles within identified functional areas (examples)	Transport administrator; transport and trade specialist; transport management center manager; shipping specialist, head of shipping.
Attention areas	• Customs valuation • Incoterms in relation to customs operations • Non-customs regulations (but enforced via customs), mainly in relation to transport packaging
Direct activities	• Ensure complete flow of customs-relevant transport information and documentation. • Provide timely pre-alert and arrival notification to customs operations staff (or broker). • Ensure clear division of responsibilities between freight forwarder/carrier and broker (in case parties are different). • Align with and/or issue clear instruction to relevant parties regarding regulations around packaging (e.g. weights, materials, licenses, fumigation, etc.) • Establish clear instruction to freightforwarders and carriers which party serves as broker and ensure contact details are available and up to date at all times. • Ensure readily available documentary evidence for customs operations to share with authorities, in case of need.
Indirect activities	• Maintain workforce with sufficient understanding of customs requirements. • Prior to any transaction, establish clear agreement with freightforwarders and carriers on customs related documentary requirements per incoterm (e.g. rated BoL), via contract and/or SOP.
Quality assurance activities	• Request confirmation of appropriate document delivery for each transport booking, especially in case transaction diverts from SOP. • Align documentary needs with the customs operations specialist and/or independent external broker for all incoterms/shipping scenarios.

	• Maintain KPI`s and performance standards and ensure regular follow up with freight forwarder/carrier in case of non-compliance.
Potential KPI	• Number of times data/documentation was incomplete • Number of times where data provided was incorrect • Number of times pre-alert and arrival notification are not provided (or too late) • Number and cause of non-regular delays at the border

TABLE 9 - PRIMARY ACTIVITIES: INBOUND LOGISTICS

Outbound logistics

Outbound logistics entails activities associated with collecting, storing and physically distributing the product to buyers, such as finished goods warehousing, material handling, delivery vehicle operation, order processing and scheduling. In this domain, the following activities are linked to efficient customs procedures:

Functional areas in EIMR	Logistics & Trade - outbound (within overall Procurement & Logistics)
EIMR roles within identified functional areas (examples)	Transport administrator; transport and trade specialist; transport management center manager; shipping specialist, head of shipping; warehouse manager;
Attention areas	• Customs valuation • Incoterms in relation to customs operations
Direct activities	• Ensure complete flow of customs-relevant transport information and documentation (e.g. vessel information, transport cost) • Provide timely confirmation of departure to customs operations staff (or broker). • Ensure clear division of responsibilities between freight forwarder/carrier and broker (in case parties are different). • Ensure readily available documentary evidence for customs operations to share with authorities, in case of need.
Indirect activities	• Maintain workforce with insight into customs requirements • Agree with business and customs operations/broker regarding cut-off times and emergency processes

Quality assurance activities	• Request confirmation of appropriate document delivery for each transport booking, especially in case transaction diverts from SOP. • Align documentary needs with the customs operations specialist and/or independent external broker for all incoterms/shipping scenarios. • Maintain KPI`s and performance standards and ensure regular follow up with freight forwarder/carrier in case of non-compliance.
Potential KPI	• Number of times data/documentation was incomplete • Number of times where data provided was incorrect • Number of times cut-off times were not maintained and emergency clearance effort was needed • Number and cause of non-regular delays at the border

TABLE 10 - PRIMARY ACTIVITIES: OUTBOUND LOGISTICS

Marketing & sales

This category entails activities associated with providing a means by which buyers can purchase the product and inducing them to do so, such as advertising, promotion, sales force, quoting, channel selection, channel relations, and pricing. In this domain, the following activities are linked to efficient customs procedures:

Functional areas in EIMR	Marketing, Sales and Product management
EIMR roles within identified functional areas (examples)	Sales manager; order handling; product management
Attention areas	• Product classification • Customs valuation • Export control (license requirements) • Import control and other relevant local regulations (e.g. tax) at customer end
Direct activities	• Inform customs operations about pricing structure and incoterms, as agreed with customer. • Ensure complete and timely flow of customs-relevant transactional information to customs operations, incl. product- and (end)customer information, valuation elements (e.g. assists, royalties), classification, origin, incoterms, export regime. • Ensure that product classification of a sold product is available for the customs operations/broker in timely manner.

Indirect activities	• Maintain workforce with insight into customs requirements. • Define appropriate data for product and/or product-combinations, as sold to customer, incl. customs description and classification. • Prior to any transaction or need for transport, align on cut-off time for clearance request and delivery of complete documentation. • Align standard customs handling-processes per incoterm and type of transaction (direct shipment, cross trade, temporary export, etc.). • Pre-check product regulations for export to and import from dedicated countries, particularly export control (at time of creation of Bill of Material, quotation, contracting, prior to delivery).
Quality assurance activities	• Perform timely walk-through of the sales set up with customs specialist and document standard process in SOP
Potential KPI	• Number of times data/documentation was incomplete • Number of times where data provided was incorrect • Number of times where cut-off times were not met

TABLE 11 - PRIMARY ACTIVITIES: MARKETING, SALES & PRODUCT MANAGEMENT

Functional areas in EIMR	Research and Development; Engineering
EIMR roles within identified functional areas (examples)	• Researcher, product developer, engineer, product classification engineer
Attention areas	• Product classification (customs, export control) • Export control (license requirements)
Direct activities	• Create/maintain product description with sufficient quality and ensure accessibility of information. • Perform and/or ensure product classification (customs & export control). • Maintain availability for product questions at time of shipment.
Indirect activities	• Maintain workforce with insight into customs requirements en expertise in product classification. • Pre-check product regulations for export to and import from dedicated countries, particularly export control.
Quality assurance activities	• Ensure active checks and governance over product classification (completeness, consistency, correctness).

	• Ensure governance over product license management.
Potential KPI	• Incomplete product classification data • Inconsistent product classification • Number of compliance issues due to mis-classification

TABLE 12 – PRIMARY ACTIVITIES: RESEARCH & DEVELOPMENT, ENGINEERING

5.5 Support activities

Technology development

This category entails all value activities, which embody technology, be it know-how, procedures, or technology embodied in process equipment. In this domain, the following activities are linked to efficient customs procedures:

Functional areas in EIMR	Information Systems; Master Data
EIMR roles within identified functional areas (examples)	IS domain architect; IS application specialist; master data domain manager (product & material domain)
Attention areas	• Export control • Product Classification • Origin • Customs processes
Direct activities	• Build and maintain systems infrastructure to optimize completeness and consistency of product information. • Develop master data structure and match system configuration in such a way, as to facilitate maintenance and governance of product classification for customs and export control purposes (incl. multi-sourcing options). • Support selection, implementation and maintenance of appropriate customs management system and efficiency of data flows from other source-systems. • Provide training to system users (product registration / customs management system interface). • Provide direct system-support in case of technical issues.
Indirect activities	• Support customs dashboard development and maintenance. • Where applicable, maintain contracts with external service providors to ensure continuous support function and/or content providers (e.g. HS-lists). • Governance of application implementation and compatibility.

Quality assurance activities	• Regular system testing, with a applicable range of test-scenarios.
Potential KPI	• Master data completeness and consistency • Number of system-support requests • System user-training completion rate

TABLE 13 - SECONDARY OR SUPPORT ACTIVITIES: TECHNOLOGY DEVELOPMENT

With a complete overview of activities and a conversion of the generic categories of the customs-oriented value chain model to their own organizational design, companies like EIMR will be able to review their internal collaborations and identify the relevant areas for improvement. The next chapter will briefly highlight some of next steps, which could be taken up to support further improvements in customs operations. One such activity, to know the construction of a competence model in the domain of procurement, is used to demonstrate how the customs-oriented value chain model can serve as a steppingstone for the build-up of essential customs-oriented capabilities.

5.6 Limitations of the model

The overview in tables 8 - 13 provides insight into key areas of collaboration between customs operations and non-customs. The content is structured around mandatory customs requirements, which apply to all cross-border transactions. The content will therefore apply for a very large part to all internationally operating manufacturing organization in the same industry. However, the compiled output is aggregated based on best practice developed within EIMR, as well as from identified problem areas in the same organization. Since companies differ in terms of operations, best practice and most common issues, the content may not necessarily reflect the complete spectrum of collaborative efforts. Also, existing collaborations, which are running effortlessly are easily overlooked because they do not require a lot of conscious attention. An extensive validation exercise in cooperation with relevant departments in different companies would provide the model stronger rigor and potentially also more complete.

Furthermore, the tables do not address the full array of linkages and contributions in the customs operations` domain. Activities in customs operations, which in first instance are mainly performed to ensure compliance (e.g. archiving) have been excluded from the review. Similarly, linkages between customs operations and the remaining functional domains (company infrastructure, human resources, operations, and service) are not addressed in this model. The creation of a comprehensive customs-oriented value chain model requires further research across the entire spectrum of customs operations and the other functional areas to identify and validate all essential and/or potential collaborations and contributions.

Finally, the model could be further completed with a further specification and categorization of the data needs, checklists with documentary requirements, as well as a discussion of the relevant KPI`s and alternative ways of capturing such data in an efficient way. An interesting starting point for further empirical research could be a comparison between and evaluation of the different customs management systems available in the market, as such systems are likely to reflect best practices and demands from the market.

The next chapter demonstrates how the customs-oriented value chain model can be used as basis for the further development of essential organizational capabilities, which can be developed to further facilitate good collaboration across the value chain. The focus is on one particular capability, to know competency management.

Chapter 6 - Competency modelling across the customs-oriented value chain

The previous chapters have provided an in-depth analysis of the required collaboration of non-customs stakeholders in the customs operations process. This chapter deals with how such collaboration can be facilitated and especially which competencies are required for the effective execution of the identified activities.

6.1 Customs-oriented capability development

For companies experiencing difficulties or (suspected) inefficiencies in the domain of customs operations, the buildup of critical capabilities and essential collaboration throughout the organization requires efforts at multiple levels. During several of the interviews with trade compliance managers and senior managers in transportation and logistics, it was pointed out that not one single approach is likely to be the silver bullet that will solve all problems. In the academic literature, as well as in more practice oriented papers and on-line, much guidance can be found on improving operational capabilities and general collaboration. Some of the recommended approaches are very conceptual in nature, whereas others are highly practice oriented. Typically a combination of different approaches is recommended, though priority might be given to one or the other approach depending on the expertise and the personal preference of the author (Rosado Feger, 2009).

Without trying to put together an exhaustive list, some practical improvement efforts and capability developments include:

- Development of comprehensive process documentation (SOP`s) and responsibility tables (RACI)
- Customs management system implementation (automation)
- Issuing policies, instructions, guidance documents, templates and checklists
- KPI development and performance reporting
- Development of a comprehensive customs oriented communication platform (e.g. a customs and trade-portal on the organizations intranet)
- Competence modeling and targeted training

As a first step, a fully defined customs-oriented value chain model could serve as useful tool to facilitate an organizational review and to identify gaps and opportunities for improvement of collaboration. It will depend on the specifics of an organization which steps are best taken thereafter. Considering the general limitation in available resources, not every option can and/or should be pursued. Each organization will have its own unique combination of considerations behind the selection for one or the other approach. Relevant aspects to

consider may include the organizational structure, the business model, operational maturity levels and the availability of best-practice examples in the organization.

From a wider set of potential options, this thesis discusses only competency management more in-depth. Within EIMR specifically, the further development of competency management tools seems a sensible first step to take. Development, as mentioned here, must be understood as the updating of existing competency management materials in terms of inclusion of customs-oriented skills and/or technical expertise. A review of the most relevant proprietary documentation with job- and competency descriptions has shown that the customs-oriented competence requirements are significantly under-represented.

A first consideration for this step is that it will support individuals, who are expected to perform certain activities, to know which skills are required to perform those tasks. A competency table is a simple tool that can help to communicate the required skill set.

Another more critical consideration, which has become very relevant in recent times, is the reorganization of the company and more specifically the removal of the matrix organization and by extension the associated global functional departments, such as global supply chain management. As a result of the reorganization, the individual businesses have become responsible for the build-up and maintenance of critical capabilities in support of the efficient handling of customs operations. Against the background of an already scattered landscape (prior to the reorganization) in terms of maturity levels, systems availability and appropriate staffing, this creates a significant challenge (though certainly more for some business than for others)[21].

In the current circumstances, there is a dependency on limited resources that possess the required expertise. This shortage of staff with specific customs-oriented skills is likely to influence chances of success with the pursuit of any of the other suggestions listed above:

Organizational review and gap-analysis, with subsequent local or country level	Improvement efforts are less likely to be initiated, as staff may not even be aware that there could be solutions (customs is considered complex, a `black box`).

[21] For example, certain units have withdrawn from using the services of the transport management centers, which are mentioned in chapter 2. Respective businesses therefore no longer have access to the experienced operational staff in the central customs operation's teams. Since these units do not typically have own staff with comparable levels of maturity in customs operations[21], they revert to the operational model for customs clearance, which they applied before they started using the shared customs services. This entails heavy reliance on external brokers and a move away from the use of certain system-based customs operations processes.

process improvement	In case of an organizational review with help of external expertise (consulting), local staff might be less inclined to adopt newly defined processes. In any case, without accompanying skill and competence development, they will be less able to properly adjust their actions to variations in commercial practice and/or to changing circumstances (e.g. in case of changes in the regulatory environment).
Responsibility charts and process documentation	In case of externally designed process documentation: without parallel skill and competency development, documentation is likely to become `dead paper` quickly and/or persons may hesitate to consult the documentation.
Customs management system development	Without the right skill and competence, there is an elevated risk of inconsistent and/or incomplete build-up of a systems infrastructure across the organization (especially in an already dispersed systems landscape).
Policies, instructions, guidance documents, templates and checklists	With a limitation in capacity and capability, it may be difficult for any unit to develop required support documentation and/or adjust to newly issued central policy instructions.
KPI development and performance reporting	The development of the right KPI`s requires an understanding of the domain and individuals who will trigger and maintain such initiatives in a sustainable and useful way.

TABLE 14 - POTENTIAL FOR CAPABILITY DEVELOPMENT

These objections do not mean that competency modeling and training alone would solve all issues and/or that training efforts automatically lead to improvements in efficiency and effectiveness in customs operations. As indicated in the literature and also highlighted by one of EIMR`s competence managers, competency development is not a quick fix. Rather, a certain level of competency serves as the foundation that enables the successful development and/or deployment of other capabilities, tools and instruments.

6.2 Customs-oriented competency development

6.2.1 Generic competency table

The following paragraph elaborates on the construction of a customs-oriented competency table. Since competency management and/or competency are rather broadly defined in the literature, it is decided for the purpose of this thesis, to align the use of the terminology with how it is used within EIMR. This means that competency is defined to be the combination of soft skills and technical skills (expertise). Since the main aim is to create higher maturity levels in customs operations overall and to facilitate a better understanding of the needs of customs departments, the focus of competency modelling in this chapter is on customs specific skills and/or expertise, not behavioral competences.

The scope of the table is furthermore limited to the identification of skills per general functional level or department (i.e. not defined on job level). A key consideration in this regard aligns with the argumentation to limit the customs-oriented value chain model to the nine standard departments as listed by Porter, to know that a further detailing of the competency table will make it more complex to customize the table. Moreover, as also confirmed during several interviews, individual jobs and/or roles are continuously under development and a detailed competency table is thus likely to become outdated very soon. Also against the background of EIMR`s reorganization and its decentral and business-led operating model, it makes sense to focus more on defining competencies at department-level rather than on specifying job-roles. Each Division will decide for itself, which roles and/or combination of activities it will want to embed in its business. Despite efforts of human resources to maintain a certain level of harmonization, there will likely be a continuously developing myriad of roles. Finally, it may be necessary to ensure that competencies of certain departments are improved, but that does not immediately mean that it is necessary to train every individual of a given team or department.

The data for this exercise has been collected through two different channels. Firstly, the data has been directly and indirectly collected through the workshop in the U.S., which has already been mentioned in the methodology section. The `direct` information refers to the remarks, which were made by the participants in the workshop about what skills people should have (or rather, which they are currently missing). The `indirect` information refers to the topical connection of different departments and the identified customs-oriented activities, which are reflected in the model. The general assumption is that if someone performs a certain task, then in principle this person should also have the right expertise to perform the task. The information in the initial draft table has been confirmed and further complemented with data collected through a survey among (and limited follow-up discussions with) 11 experienced trade compliance managers from different countries. The respective individuals were provided with an introductory presentation about customs-oriented value chain model and

the identified role of non-customs departments, after which they were invited to fill out a questionnaire. There was a common alignment as regards the content of the customs-oriented value chain model, but some difference of opinion about the need for certain skills and/or the skill level. The outcome has been captured in the table further below.

The customs-oriented competency table (table 15- Customs-oriented competency table, below) aligns the need for competency modeling with the considerations of context and purpose. It is a high-level table, which reflects the competencies of each department, aiming to:

- Structurally embed basic awareness and understanding of the data needs in customs operations, in relation to the specific departments
- enable the development of capabilities, which will support an enhanced collaboration and data flow to customs operations
- enable flexible and efficient handling of ad hoc customs related issues
- enable anticipation and of adaptation to internal and external changes (e.g. in the market, organization, etc.)

Generic categories (Porter)	ABB categories	Customs processes	Classification HS	Classification ECN / ECCN	Export control	Origin	Valuation	Incoterm	Other regulations with cross border relevance
Procurement	Procurement	B	B	B	A	A	B	E	A
Inbound logistics	Logistics (inbound)	A	B/A	A	A	B/A	B	E	E
Marketing & sales	Sales	B	B	B	A	B	B	A	B
Marketing & sales	Product Management	AO/B	B/A	A	A	B/A	B	B	A
Marketing & sales	Research & Development; Engineering	AO	A	B/A	B	AO/B	AO	AO	AO
Outbound logistics	Logistics (outbound)	A	B/A	A	A	B/A	B	E	E
Technology development	IS and Master data (material MD)	AO	B	B	B	B	AO	B	B

AO = awareness only / B = basic / A = advanced / E = expert

TABLE 15 - CUSTOMS-ORIENTED COMPETENCY TABLE

There are a few limitations, which need to be taken into account. Firstly, the table cannot be deployed as a `directly` applicable competency table. Similar to the need for customization of

the value chain model, there is also a need for customization of the competence model. Alignment with existing competence table. Use of only the procurement layer of the generic competence table. The table does not need to be converted for a whole company or a business, but it can be converted for an individual department or even for a single role only. To ensure clear understanding of why certain competencies are included in the model for certain departments, it is necessary to present the model together with the information in the customs-oriented value chain model. As previously already stated, not all roles in a given department will actually deal with part or all of the customs -oriented activities.

6.2.2 Customized and detailed competency table

In combination with the customs-oriented value chain, the generic competence table may support the creation of general awareness and understanding. However, with an eye on actual application in practice, as well as with the aim of promoting career development and self-learning, a high-level table only will not suffice. It makes sense for each department by themselves to also develop a competence table, which is more detailed and specifically links each distinct skill to individual jobs and/or roles in a given department (Figure 8 - Detailed competency table (adjustment), below), provides a visual representation of how the generic table is used to update a recently developed competence overview for procurement and logistics roles (P&L) within a business service organization of EIMR.

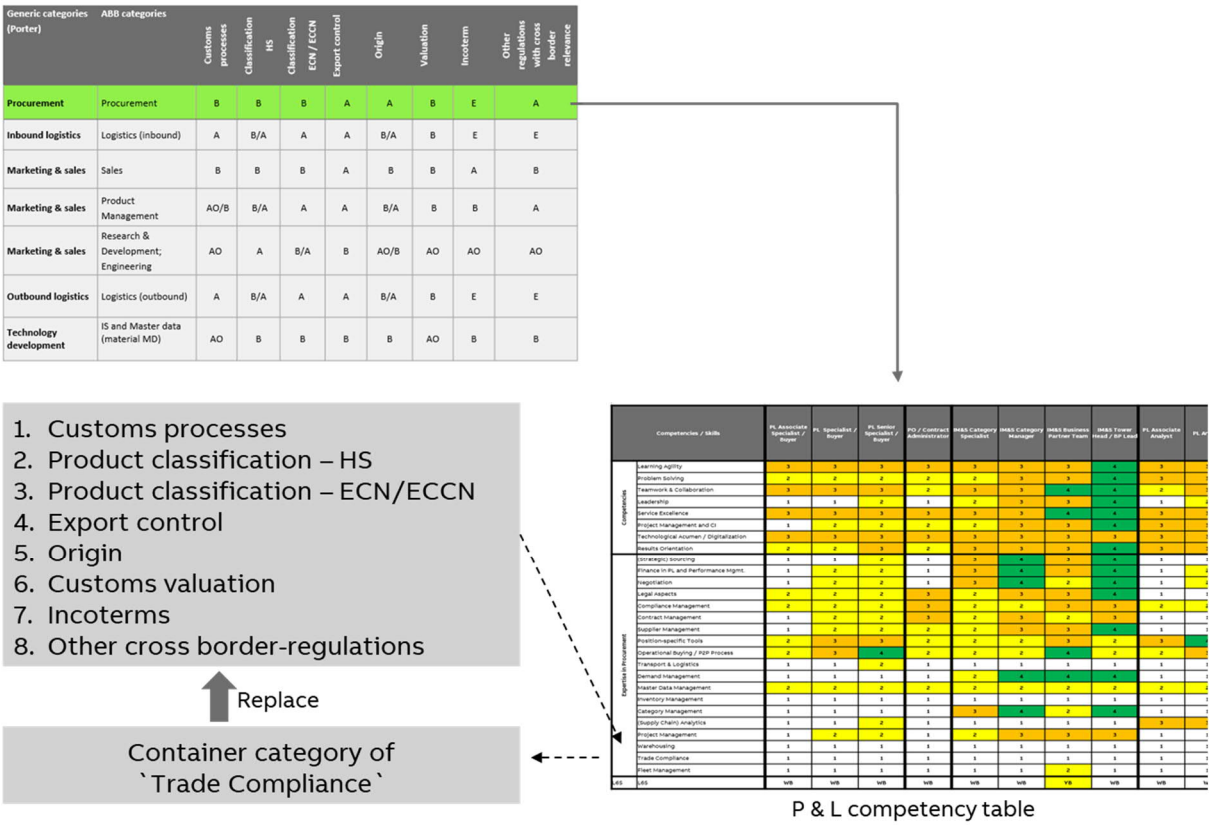

FIGURE 8 - DETAILED COMPETENCY TABLE (ADJUSTMENT)

The top row of the P&L competence table lists specific job-titles and the left column lists 8 soft skills and 19 technical skills (expertise), including `trade compliance`, as single container concept for everything that relates to customs operations, trade compliance and (strategic) trade management. To adjust this table, `trade compliance` as single category is replaced with the 8 listed competencies in the generic customs-oriented table. The updated P&L competency table therefore holds 8 soft skills and 26 technical skills (expertise). For each of the roles, the exact level of expertise needs to be assigned. Since the respective department head(s) or team manager(s) will know best what a certain role entails or at least should entail, their participation and validation of the such detailed tables is essential. The customs-oriented value chain model and activity tables can be used by the competency manager and a customs operations expert to explain the background of the proposed competency table.

The process of constructing the generic customs-oriented competency table, as well as the detailed table has been discussed with the EIMR competency manager (in P&L). A draft version of the table (with expertise levels already assigned) has been provided to the competency manager to facilitate a final validation (which needs to be re-done on a regular basis, e.g. annually). The approach as such was deemed to provide solid background information and material to serve as input during a validation session, to ensure clear understanding of why

certain competencies are included in the model for certain departments. As previously already stated, not all roles in each department will deal with part of, or all the identified customs-oriented activities. There are a few limitations in working with a detailed competency model. Aside from initial validation, such detailed table requires re-validation by the management of a department on a regular basis (for example annually), because individual jobs evolve over time and the focus of roles may shift to other dimensions of the respective functional departments. Similarly, certain jobs may disappear and new roles may be defined, depending on the need of the organization.

6.3 Gaps in competencies and the effect on the efficiency in customs operations

During the initial workshop and validation rounds, the US-based customs operations team shared their views on the need for customs-oriented competencies. Those reflections are included as `attention areas` in the tables 1 - 5. As described in the previous paragraphs, the need for such competencies was completed and validated through a qualitative survey among trade compliance managers and incorporated in the customs-oriented competency table.

Additionally, during the initial workshop and the subsequent conversations with the customs operations team, references were made to the link between gaps in the process and presumed gaps in customs specific competencies among non-customs departments. In their view, the lack of competencies often forms the underlying trigger of incomplete or incorrect input. The inverse reasoning would imply that adequate competency levels should lead to a reduction of issues in the customs domain. As confirmed by several of the interviewees, it is not realistic to imply that the identified problems can all be solved through competency development and/or training. Competency and knowledge development should rather be viewed as a pre-condition to avoid the most common problems and as a critical enabler of daily operational alignment and interdepartmental communication. One of the transport- and logistics managers expressed that there is a `need for improvement of the culture`, i.e. the customs domain must be treated as an integral part of the end-to-end process and less as an after-thought. Competency management and training could facilitate such a culture change. This remark is especially relevant when considering customs operations as one of multiple contributors to a company`s competitiveness. If the customs domain is seen as an integral part of the end-to-end process, then it is also more likely to managed as such. When the essential contributions and data flow are understood along the internal value chain, then this likely increases the willingness to further develop basic capabilities, such as the review and documentation of processes and/or the management of quality and performance through the use of KPI`s and other management instruments. Similarly, more in-depth investments, such as the build-up of system-based customs operations and systems interfaces are more likely to gain acceptance with an eye on the further streamlining of activities.

By virtue of their job-roles, the insight of persons in customs operations in actual competency levels elsewhere in the value chain is limited and possibly skewed. Their interaction with non-customs departments mainly evolves around solving the problems and therefore less of their attention goes out to what goes well. An in-depth interview was held with two senior trade compliance managers to establish deeper insight into whether and how gaps in knowledge are a trigger for the problems in the customs operations process. The interview took the format of a semi-open conversation around the question: `Does a lack of customs related competencies have a (causal) link with operational issues? ` . This question was asked for each of the listed competencies. The following paragraph reflects few key remarks and examples from that interview, as well as some complementary insights from other interviews.

On a more general level it was underlined that problems do not only occur due to lack of competencies. Customs related issues are also, if not largely, triggered by organizational complexities that are inherent to the functioning of large multinational organizations. As a result of re-organizations, acquisitions and divestments, firms such as EIMR become owner of a variety of legacy processes and systems and without sustained effort to integrate and harmonize, the complexities will remain. Against that background, it was also stressed that problems can therefore not all and/or not only be solved through competency development and/or training of persons in operational roles such as procurement, sales, in- and outbound logistics. Truly sustainable improvements require competency development to go together with development of other capabilities.

Direct and indirect involvement

In terms of direct impact on the execution of individual transactions, a distinction can be made between departments that are directly involved with transactions and departments that are only indirectly involved. When stakeholders are directly involved (e.g. procurement in case of inbound transactions), then lack of knowledge more often leads to issues, than when it concerns only indirect involvement (e.g. information systems). This observation aligns with the distinction between primary and secondary activities in the customs-oriented value chain model.

Roles and responsibilities

Many issues evolve around (lack of) clarity on roles and responsibilities of individuals, as well as the division of responsibilities between departments. Where clarity is missing on the responsibility for certain steps in the overall process, technical knowledge on customs-related topics (e.g. origin) alone will not help to solve the issue. In addition to knowing what something is about, individuals need to take ownership over an activity. A lack of clarity on responsibilities may be a consequence of, for example, a high turn-over of staff in a local department (e.g. transport and logistics), or the result of a re-organization where the division of tasks has been insufficiently re-aligned. This implies that it does not come down to the

competency development of individuals in transactional roles only. The management of individual teams, as well as senior business management need to have an adequate understanding of customs requirements to ensure that clarity on responsibilities and critical alignment between departments (and potential external service providers) is not overlooked.

The combination of a lack of competencies and a lack of ownership is likely to be most problematic in functional areas where the impact of errors is not reflected upon the department itself (e.g. procurement covering certain actions in relation to export control) and/or where specific actions are not required for the execution of every single transaction. For example,

- If in the outbound process a license is required, which is triggered by the ECN and/or ECCN of a procured product, then the person in procurement who is handling the inbound transaction will a) need to inform sales and/or order handling that a certain product has such a code[22] and b) the respective individual needs to ask the supplier for a supplier declaration. If individuals in procurement do not understand what an export control code is and what it is used for, then they will also not immediately ask for a supplier declaration, which later may lead to delays upon export. In case such information is not even shared internally at all, then there is furthermore a risk of non-compliance upon outbound.
- In a project-business related one-off case of cross trade, it turned out that the respective procurement department ordered materials in country A, whilst the goods were ultimately destined for a customer in a country B, that had sanctions in place against the country of origin (country A). In such cases, there is a potential requirement for two departments. The department handling the outbound transaction should inform procurement about the nature of the transaction. Additionally, procurement should always request information about the nature of a transaction, determine the limitations of the transaction and adjust their activities accordingly.

The impact of errors will furthermore be higher, when the general execution time is long, but because involved individuals are not unfamiliar with them, they are not initiated in a timely manner.

- Examples of such are cases where a classified item has an associated license requirement and there is a need for an end-user certificate. If the department, which covers the outbound transaction does not understand the requirement than it will not have requested the end-user certificate on time, which will lead to a delay in the license-request process.

[22] Depending on how certain things are organized, it may be the product manager, who needs to handle this.

Non-harmonization of processes and systems

The lack of harmonized processes and a single comprehensive ERP system and integrated customs management system was mentioned as a source of inefficiencies, errors and consequent delays. At the same time, such circumstances require a higher level of competency among a broader group of stakeholders. Manual workload increases and will have a higher level of variation when processes are divers and not consistently captured in an ERP system that is integrated with a customs management application. Higher manual workload also carries a higher risk of error (or absence of action) and often demand a certain level of pro-activeness to contact a wide array of people when information is missing. Overall, such circumstances demand a wider and stronger set of professional skills, as well as a higher level of expertise of an individual.

One of the trade compliance managers took the reasoning on this point one step further and suggested that the need for customs specific expertise in relevant non-customs roles could go down again, provided that:

1. customs (data) requirements are adequately addressed in the overall design of the end-to-end process and the related (system-based) capabilities,
2. there are high levels of harmonization and standardization across the different businesses, and
3. individuals in non-customs departments know very well when and where to obtain expert input.

Although this may be true in principle, there are some objections and limitations[23] to this idea in the day-to-day practice of large multinationals, such as EIMR.

Straightforward impact on delays and capacity

From the previous sections, it becomes clear, that in many cases it is a combination of a lack in competencies and (partial) absence of other capabilities, which creates problems. There are, however, also several issues whereby the link between a gap in competencies or expertise and a gap in in the process is much more straightforward.

- For the import of certain chemicals substances, a business may need to provide a self-declaration indicating the nature and categorization of the chemicals. Such statement

[23] The build-up of the suggested level of maturity and harmonization in capabilities demands an initial maturity and a significant drive to get to that level. The size of multinationals and the continuous need to adapt their business models, operational routines and locations to serve the market makes them unlikely candidates for such a sustained effort. Considering that such a `fixed` set up might not serve a company well from a competitiveness point of view, perhaps pursuing an in-between state would be more opportune. This could, for example, be achieved through a targeted approach on one specific topic, for example product classification, whereby a limited number of operational models are worked out in more detail and combined with dedicated competency tables.

is not dependent on any outside party, but it is very often overlooked and not included in the documentation. When the customs operations request the form, it may still take one or two days before the statement is ultimately provided.

Particularly in large multinational manufacturing enterprises, the failure to submit certain information and/or documentation can relate to many different topics and there may be a need for customs operations to reach out to multiple different stakeholders. This increases the need for capacity and organizational skills with a customs team. A centralized custom set up exacerbates this, due to a multiplication of business locations. At the same time, though, it also makes such issues better visible.

Concluding the findings, it seems clear that a lack of customs specific competencies certainly influences the performance and/or contribution of non-customs stakeholders in the value chain. Nevertheless, it would be too bold to state that a lack of competencies is the only reason for such problems. It is not unlikely that the strongest impact is generated by a lack of customs specific competencies among medior and senior management, in combination with a lack of visibility of the issues and the associated cost.

Chapter 7 – Conclusion

This chapter provides a summary of the research findings and answers to the main research question and sub-questions. The chapter will conclude with several recommendations for business and suggestions for further research.

7.1 Summary and answers

This thesis is structured around the research question in chapter 1: `How does the structural collaboration between custom and non-customs stakeholders in the value chain contribute to the value creation and competitiveness of a multinational manufacturing enterprise? `. The research has been addressed through sub-questions 1-5. These are subsequently answered in the chapters 4-6. Sub-questions 1 and 2 are reflected in chapter 4. Sub-question 3, the most essential step, is answered in chapter 5. The last two sub-questions are reflected in chapter 6.

Firstly, the relationship between customs and transportation is placed in the context of value creation, competitiveness and competitive strategies (sub-question 1). The main finding is two-fold. Customs operations can provide a direct contribution to value creation through efficiency gains, and an indirect contribution to value creation by enabling a stable and reliable transportation process, devoid of customs-related disruptions. There are still other contributions in global trade, most notably the use of free trade agreements, but these have been left out of scope for this research.

Secondly, the analysis of the essential customs requirements and the most common issues (sub-question 2) provides critical input for step 3 and enables a conservative estimation of the improvement potential in the customs operations department, which was used as subject of study for this thesis. The main observation here is the pivotal role of other, non-customs departments as enabler of value creation in customs operations. A complete and qualitative flow of customs related data and documentation throughout the end-to-end transaction process is a critical pre-condition for an un-interrupted customs clearance process.

Thirdly, the issues from the previous chapter are categorized and structured in a customs-oriented value chain model (sub-question 3). The model is based on Porter`s value chain model, which has been specifically modified to serve the purpose of customs operations and compliance. The model supports the identification and structuring of the essential contributions of non-customs departments to the customs operations` domain and suggests KPI`s which can be used for the continuous and effective management of the contributions.

The effective and efficient flow of data and documentation can be supported and optimized through the buildup of key capabilities, such as clear identification of roles and responsibilities (RACI-charts), process- and guidance documentation, a system-based infrastructure for

customs management, as well as competency management and training. Chapter 5 complements the customs-oriented value chain model with a customs-oriented competency table (sub-question 4). This also demonstrates how the value chain model can be used as support instrument for the buildup of other capabilities. The selection of competency management for this demonstration relates to the link between gaps in competencies and the identified problems (sub-question 5) in chapter 4. Customs related competencies, especially technical expertise, facilities a better collaboration and communication between customs and non-customs stakeholders. This requirement is not only limited to persons engaged in the execution of transactional activities. The need for adequate customs competencies extends to middle and higher management, as these have a critical role to play in the management of the quality of execution, as well as in the re-distribution and re-assignment of tasks and responsibilities during times of change (e.g. in case of employee turnover, when off-shoring or outsourcing specific activities and/or at times of a re-organization). Finally, adequate competencies are an important foundation for the buildup of other structural capabilities.

Resulting from the research into the main research question, it emerges that the structural collaboration between customs and non-customs stakeholders reduces the risk of irregularities in the customs process. A consistent and qualitative contribution by non-customs stakeholders is a pre-condition for the efficient and effective execution of the customs clearance process. The essential contributions are reflected in the customs-oriented value chain model. A flawless customs clearance process enables the shortest possible timelines and helps to avoid delays in transportation and other associated cost, such as increased broker fees, customs warehousing cost, customer penalties and fines for non-compliance. An un-hindered clearance process furthermore reduces the capacity need of the customs operations. Efficiency gains, as well as stability and reliability of delivery against shortest possible lead times contribute to the value creation and competitiveness of multinational manufacturing organizations. The critical identification and assignment of tasks and responsibilities should be complemented with the development of competencies and other capabilities to further optimize the collaboration and communication between customs and non-customs stakeholders in the value chain.

The main academic contribution of this thesis is the development of a custom-oriented value chain model, which serves as a first step in the scientific analysis and substantiation of customs operations as a contributing factor in the competitiveness of an organization.

7.2 Recommendations for business

From an overall business perspective, customs operations may not be the largest contributing factor in terms of an organization`s competitiveness, but if the process is not managed well than the negative impact can still be significant, especially on a transactional level. The following list provides recommendations for multinational manufacturing companies that

want to improve their performance in transportation and their efficiency in customs operations.

1. Business entities may address the most common issues in customs operations by working backwards through their end-to-end transactional processes and establishing clarity regarding the roles and responsibilities of non-customs departments in the internal value chain. The custom-oriented value chain model can serve as input for this review. Priority is best given to issues that most frequently lead to direct and impactful delays. Second to be addressed are the commonly re-occurring issues for which true delays are avoided with the deployment of additional resources and/or the waiver of (duty related) advantages.
2. When reviewing customs operations, it makes sense for businesses to not only give attention to the customs process at a high abstract level, but that particularly classification, origin, customs valuation, export control, export control classification, incoterms and other applicable non-customs cross border regulations are addressed individually and in-depth. Prioritization of topics can be based on an impact assessment. In case of limited internal visibility of impact, then the recommendation is to start with incoterms, product classification (HS) and origin.
3. Businesses are advised to not only focus on re-alignment of activities on an ad hoc basis, but rather that they manage the internal cooperation between customs and non-customs on an ongoing basis. Such management effort can be supported through the implementation of KPI`s, which measure the quality of the contributions of non-customs departments (completeness, correctness, timeliness).
4. Businesses are advised to implement KPI`s to record delays, avoided delays, direct customs-related cost factors (e.g. warehousing) and improve overall visibility of time spent on firefighting and other inefficiencies. Preferably in combination with the use of the transport KPI`s (transport lead-time and on-time-delivery, if maintained with a consistent definition). This will serve as critical input when contemplating in-depth investments, for example, for the implementation of a customs management system.
5. Businesses are recommended to ensure that local business management has an adequate understanding of customs requirements and the activities listed in the customs-oriented value chain model. Such awareness should raise visibility of the needs of customs operations and support the resolution of bottlenecks. Such understanding could, for instance, be achieved through basic training and the facilitation of best practice sharing sessions.
6. Businesses can use a customized custom-oriented value chain model as instrument for a targeted review of individual local businesses. In addition, it is recommended that the localized model is used as a basis for creation of communication, competency and training

material. This may support raising general awareness around the contribution of non-customs teams to the customs operations process.

7. Finally, in relation to competency management, businesses are advised to construction and implement localized and detailed competency tables. The construction thereof shall be supported through evaluation rounds with business leaders in charge of the respective departments. Such validation shall raise the essential awareness, enforce the quality of the tools and increase acceptance levels.

When efforts have been made to build up certain levels of competencies, then it is in the interest of a company to keep such skills within the organization and to facilitate natural transfer thereof to other departments. Businesses could consider the following:

- Development of a career path for custom operations staff into medior and senior roles in trade management or other types of functions to facilitate the transfer of relevant knowledge to other departments in the organization.
- Develop harmonized guidance notes and instruction materials for non-customs departments to support the efficient handling of customs related activities and support development of awareness and understanding
- customize the customs-oriented competency table for the complete organization and include job-relevant competencies in the overall HR competency materials (e.g. career guides, etc.)
- Include the customs department in the scheme for job rotations (e.g. for new staff in procurement and order handling) and/or internship rotation schedules for general business interns.

7.3 Suggestions for further research

The research for this thesis is empirical and based on data of one global manufacturing firm only. This affects the generalizability of the study. A further quantitative study of the impact of customs related issues on transport lead time and on-time delivery across two or more firms could provide additional and more solid insights. Moreover, such study could perhaps enable a calculated impact on the cost of customs and trade for an organization. A further conceptualization and development of KPI`s for the measurement of avoided delays and other inefficiencies would support such quantitative study.

As indicated earlier, due to limitations in the scope of this thesis, the tables with the listed activities of the customs-oriented value chain model in this thesis are mostly centered around the activities directly focused at (compliant) customs clearance, which may impact transport performance. Further research would be required to complete and incorporate a full view on every aspect of customs operations, such as:

- trade compliance and strategic trade

- the role and contribution of other functional departments in the model, which are not discussed in this thesis (infrastructure, HR, operations, service).

Completion of the model would require:

- Additional elaborate research into secondary value chain activities.
- Inclusion of insights from non-customs department in relation to their view on the assigned contributions, as well as their view on the reversed direction of the integration with customs operations: what should a customs department know about their work as non-customs and where could customs operations support and/or enable them in the execution of customs related tasks.

Additional research in relation to customs-oriented competencies could include:

- Research into which other competencies (non-expertise) should be part of an extended customs-oriented competency table? For example, interpersonal skills, conflict management, functional leadership, etc.
- Research into the best ways to maintain critical customs related competencies (expertise) within the organization.
- Research into what customs teams should know and/or understand about the main activities of other departments in the organization.

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Annexes

ANNEX I - OVERVIEW OF INTERVIEWEES & WORKSHOP PARTICIPANTS

Interviewees and function	Date of interview
• Sander van den Berg – Senior Logistics and Trade manager	8 October 2019
• Jonathan Vaisbrot – Regional Head Transport Sourcing	10 October 2019
• Andrea Locatelli – Head of Transport Management Center	11 & 13 March 2020
• John Muncey – Global Head Transport Sourcing	2 August 2020
• Michaela Saeftel - • Christoph Holtmann – Global Trade Compliance operations	10 August 2020
• Joerg Przybyla – Country Trade compliance Manager (CH) • Christoph Holtmann – Global Trade Compliance operations	6 & 13 August 2020

Workshop participants	Date of workshop
Initial workshop <u>Global & regional Trade Management / Trade Compliance</u> Iris Amptmeijer, Christoph Holtmann, Sander van den Berg, Tanya Kadah <u>Country Trade Compliance Management</u> Michael Mulcahy (US), Paul Shersand (US), Jonathan Wood (US), Rod Burgess (US), Makis Trigonakis (CA), Christophe Beauregard-Blachford (CA), Gabriela Martinez (MX), <u>Country Trade Compliance support organization</u> Manuel da Silva (US) – Trade Compliance Specialist Jeff Banes (US) - Product Classification Specialist, Chris Moody (US) – Local Business Trade Compliance manager <u>Customs operations</u> Ajada Bernard, Yolanda Ross, Maria Cherry, Relesha Williams, Kathy Kamlet	4-7 February 2020
Follow up calls & validation Ajada Bernard, Relesha Williams, Yolanda Ross, Michael Mulcahy	5 & 11 March 2020 31 August 2020

Working locations survey participants	Date of survey
Brazil, Canada, France, The Netherlands, South Africa, Switzerland, United Kingdom	3 Augustus 2020

ANNEX II - SEARCH CONCEPTS USED FOR LITERATURE SEARCH

Literature review

- Competitive strategies
- Competitiveness and supply chain (management)
- On-Time-Delivery (OTD)
- Lead-Time (LT); Transport Lead-Time (TLT)
- Customs regulations and requirements (in relation to OTD & LT)
- Value Chain Analysis (Porter)
- Value Chain Analysis in relation to key customs concepts, such as customs declaration, origin, valuation, (product) classification, etc.
- Competency management (as stand-alone concept, and in relation to supply chain, value chain, customs operations, trade compliance)
- Knowledge management (-systems) (as stand-alone concept, and in relation to supply chain, value chain, customs operations, trade compliance)
- Organizational Learning & knowledge transfer

Case-system review

To search for relevant cases in the EIMR proprietary database, the following search terms were used:

- Customs
- Customs clearance; clearance
- HS classification
- Supplier declaration
- Customs valuation; valuation
- Origin; Origin declaration
- TMC; Transport Management Center
- Import; Export
- Incoterms

ANNEX III - CUSTOMS COMPETENCIES QUESTIONNAIRES I & II

Customs competencies - Questionnaire I

1. In support of the efficient and effective handling of customs clearance (inbound / outbound), the following departments should possess at least some basic capabilities and/or understanding of customs operations processes in general:

2. In support of the efficient and effective handling of customs clearance (inbound / outbound), the following departments should possess at least some capabilities and/or basic understanding of product classification for customs purposes (HS / HTS)

3. In support of the efficient and effective handling of customs clearance (inbound / outbound), the following departments should have at least a basic understanding of origin (preferential / non-preferential):

4. In support of the efficient and effective handling of customs clearance (inbound / outbound), the following departments should have at least a basic understanding of customs valuation:

5. In support of the efficient and effective handling of customs clearance (inbound / outbound), the following departments should have at least a basic understanding of export control:

6. In support of the efficient and effective handling of customs clearance (inbound / outbound), the following departments should have at least a basic understanding of product classification for export control purposes (ECN / ECCN):

7. In support of the efficient and effective handling of customs clearance (inbound / outbound), the following departments should have at least a basic understanding of incoterms and the effect of incoterm selection on customs purposes:

8. In support of the efficient and effective handling of customs clearance (inbound / outbound), the following departments should have at least a basic understanding of other non-customs regulations with cross-border relevance (e.g. HSE):

Selection options for all questions:

- Procurement
- Transportation Management
- Logistics (incl. warehouse mgt)
- IS and Master Data
- Human Resources
- Corporate Infrastructure
- Operations/Manufacturing
- Marketing and Sales (incl. Order handling & product management)
- R&D and Engineering

Customs competencies - Questionnaire II

For each of the following departments:

- Procurement
- Transportation Management
- Logistics (incl. warehouse mgt)
- IS and Master Data
- Marketing and Sales (incl. Order handling & product management)
- R&D and Engineering

Participants were requested to rate the required level of awareness and understanding:

- Customs processes
- Product classification (HS)
- Origin
- Customs valuation
- Product classification (ECN/ECCN)
- Incoterms and other non-customs regulations with cross-border impact (e.g. HSE)

The selection options for all listed competencies included:

- Awareness only (AO)
- Basic (B)
- Advanced (A)
- Expert (E)
- Not required

Example:

1. Employees active in procurement require awareness and understanding of the following customs related aspects: *

	Awareness only	Basic	Advanced	Expert	Not required
Customs operations processes	○	○	○	○	○
Product classification - HS/HTS	○	○	○	○	○
Origin	○	○	○	○	○
Customs valuation	○	○	○	○	○
Export Control	○	○	○	○	○
Product classification - ECN/ECCN	○	○	○	○	○
INCOTERMS and other non-customs regulation with cross border impact (e.g. HSE)	○	○	○	○	○

ANNEX IV - EXTENDED OVERVIEW OF ISSUES, ROOT CAUSES AND INVOLVED DEPARTMENTS

Classification related issues	Root cause indication	Departments involved
Missing HS classification and/or missing product information: • Product classification on supplier invoice seemingly incorrect and/or inconsistent with other imports (import). • Product description insufficiently clear to check code and/or classify the product (import). • Customs classification code not available in p.o., GTS or SAP ERP master data (import / export). • Part number on the invoice is not the same as the one in the system (e.g. supplier does not use EIMR part number). • Individual parts not separately classified.	• Qualitative product description and initial classification not requested from supplier via purchase order (p.o. quality). • Insufficient vendor management, no follow up with supplier upon failure to deliver qualitative data. • No resource availability for quality check on classification and/or classification upload in the system. • Inconsistent use of material and product registration in the ERP system(s) by product management and/or engineering. • Insufficient governance over data availability (completeness, validity, consistency, correctness). • Lack of appropriate support system (central data repository) (not applicable for US). • Classification requirements unknown by relevant stakeholders (product mgt, engineering / Product Classification Engineers). • In case of projects, project mgt and/or order handling are insufficiently aware of the need for product code.	Procurement Product management Engineering Technology development / R&D IT Master data

License / license data for associated ECCN code missing. No export license obtained.	• Product has not been classified for export control on time. • Local business was unaware of the need for license.	Order handling
Origin related issues	Root cause indication	Departments involved
Non-preferential origin data not available or incorrect: • Information not available, or clearly incorrect on invoice.	• P.O. quality insufficient • Insufficient instructions to supplier and/or insufficient follow up with supplier (vendor management).	Procurement IT department Master data
Preferential origin data and/or origin certification not available. • Information not available, or clearly incorrect on invoice • Origin certificate not available.	• P.O. quality insufficient • Insufficient instructions to supplier and/or insufficient follow up with supplier (vendor management).	Procurement IT department Master data
Valuation related issues	Root cause indication	Departments involved
Quality of invoices, e.g. missing pricing information (return items, spare parts under warranty) or language issues.	• Supplier invoice insufficiently specified, insufficient instructions in the purchase order. • Lack of in-house understanding regarding valuation elements.	Procurement Sales Order handling
Missing value-related data, such as transport cost (e.g. rated Bill of Lading) and/or assists.	• Freight forwarders not willing to provide rated Bill of Lading to the broker, for fear of sharing competitive information and/or violating anti-trust regulations. • Lack of in-house understanding regarding valuation elements.	Inbound logistics / transportation Procurement Project management
Incoterms, general contractual / transactional information	Root cause indication	Departments involved

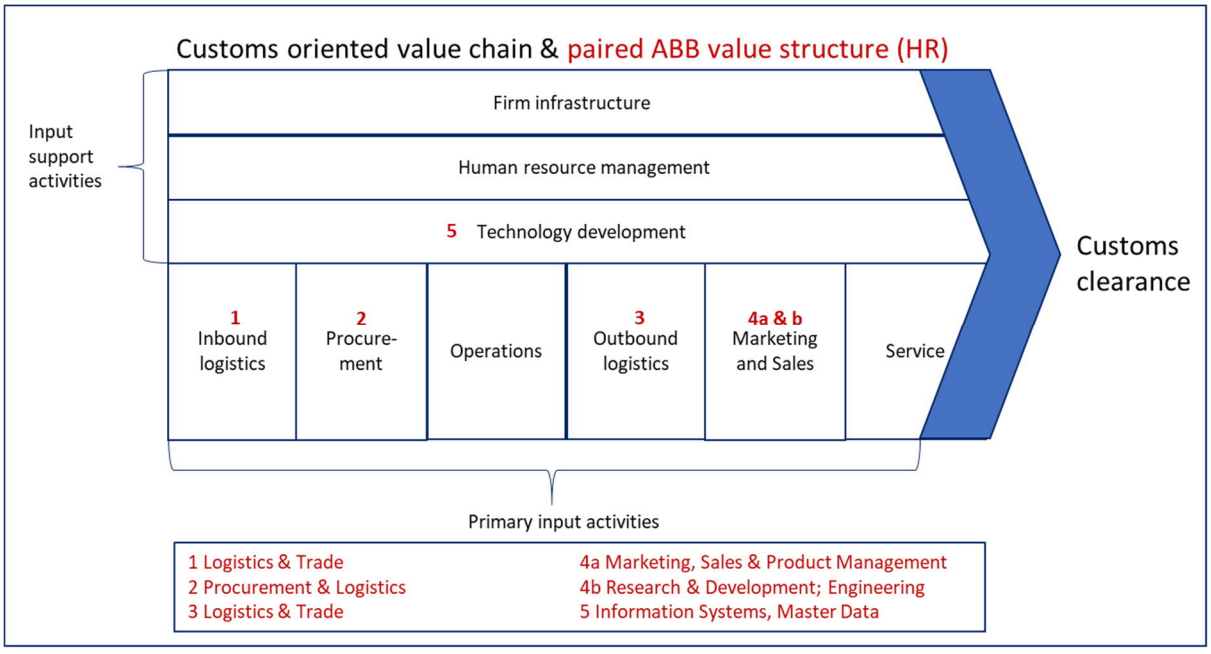
Impact of incoterm selection on the documentary requirements • Original (rated) Bill of Lading not available.	• Project management / procurement not aware of need for document for customs operations/broker.	Sales Procurement Inbound logistics / transportation
Impact of incoterm selection on transport arrangement by supplier • Freight forwarder fails to send timely arrival notification (pre-alert), or arrival notification not extended to customs operations / independent broker.	• Supplier not sufficiently instructed to ensure timely notification. • Transportation management not aligning with customs operations in case of delivery at border.	Procurement Inbound logistics / transportation
Impact of incoterm selection on determination of formal importer / exporter of record.	• Last minute clearance requirements in relation to taxation (e.g. US Wayfair tax). • Selection of incorrect incoterms (EXW/DDP, while performance of clearance is required).	Sales Order handling Procurement
Potential impact on last minute clearance requirements in relation to incorrect configuration in the ERP system.	• Sales department using old(-er) incoterms. • Information not transferred to the customs management system.	Sales IT department
Information on invoice unclear • Unclear indication of buyer (importer of record) on invoice / shipping documentation. • Unclear indication of selected broker.	• Insufficient instruction to the supplier. • Insufficient instructions to the freight forwarder. • Direct order placement with carrier instead of freight forwarder (often ordered by supplier).	Procurement Inbound logistics / transportation
Problems with document handover between FF/carrier and (separate) broker.	• Insufficient instruction to the supplier. • Insufficient instructions to the freight forwarder.	• Inbound logistics / transportation • Procurement • Sales (non-US based sales department)

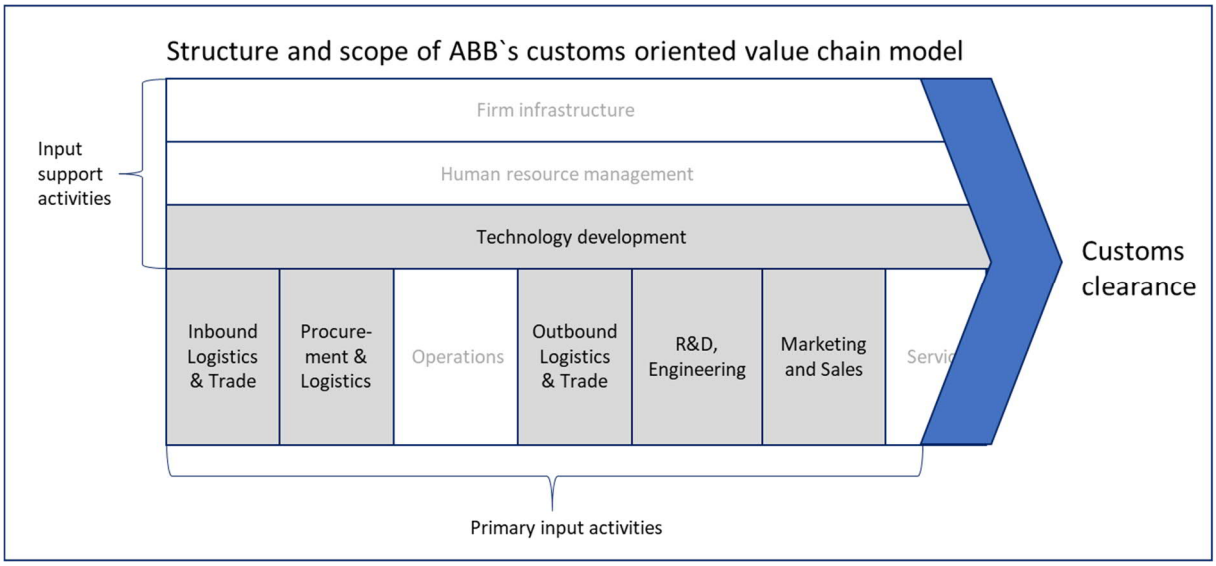
	• Insufficient or late instructions to the broker due to last minute changes in the purchase order, or last-minute request for clearance by sales.	
Non-customs related issues	Root cause indication	Departments involved
Non-compliance with non-customs regulations.	• lack of fumigation of transport packaging (or evidence thereof). • Missing licenses for the import of specific substances.	Procurement Inbound logistics / transportation

ANNEX V - EIMR CUSTOMS-ORIENTED VALUE CHAIN

Porter`s value chain model has 9 functional categories (6 primary activities and 3 secondary activities), EIMR has 21 different functional categories identified in the organisation`s career guide. In anticipation of further processing of the results into an EIMR oriented support tool, the EIMR structure is paired with the generic model. Two categories in the table, to know research and development, and engineering, are not present in the generic customs-oriented value chain (nor in Porters` model). Both are, however, relevant stakeholders for customs operations in EIMR and thus need to be included. The two functional domains have been paired with marketing and sales, because they too are involved with determining what kind of goods (and in which composition) will ultimately be exported / imported. A pairing with technology development (as secondary activity) would not make sense within this context, as they are data creators and not support departments.

	Customs-oriented value chain model	EIMR value structure (partial reflection)
1	Inbound logistics	Logistics & Trade
2	Outbound logistics	Logistics & Trade
3a	Marketing and sales	Marketing, Sales & Product Management
3b	Marketing and sales	Research & Development; Engineering
4	Procurement	Procurement & Logistics
5	Technology development	Information Systems, Master Data




Structure and scope of ABB`s customs oriented value chain model
Input support activities
Firm infrastructure
Human resource management
Technology development
Inbound Logistics & Trade
Procure-ment & Logistics
Operations
Outbound Logistics & Trade
R&D, Engineering
Marketing and Sales
Servi
Customs clearance
Primary input activities

ANNEX VI - ISSUES IN CUSTOMS OPERATIONS RELATED TO PRODUCT CLASSIFICATION (HS) (SCENARIO)

Current practice:

In case of missing classification data for individual transactions, the custom operations staff regularly self-perform the classification for `simple products`. The team also supports the file upload for larger classification batches in the customs management system (central repository), when the unit does not know how to do this. For some units, it occurs that daily lists with new product codes are sent to the central team for upload. These lists are sometimes incomplete or hold mistakes, which requires correction.

According to a 2013-report from a US-based customs Law firm[24], the average classification time per line item is between 5 and 10 minutes. However, classification of individual items can also be far more complex and can in certain cases take up to 4 hours to classify. Often additional time will be spent searching and waiting for product information. E.g. because additional product information needs to be requested from the supplier.

The following 1-week event registration is a scenario based on general feedback provided about similar cases and does not represent actual cases. The overview is deemed a conservative scenario.

Monetary cost (customs warehousing, increased broker fees, customer penalty, etc.) are excluded from the estimation.

Day 1:

For a single shipment, 10 line-items require self-classification by a team member, limited search-time for material info, as well as little time for archiving and communication to the business. Otherwise an uninterrupted clearance process. Completion before cut-off time, so no delay.

Day 2:

5 line-items require self-classification by a team member, info search takes bit longer, because business needs to be contacted and has response time of 2 hours. Little time spent on archiving & communication to the business. It is an urgent shipment, but work is finalized just before cut-off time so delay could be avoided.

[24] Key Performance Indicators for HTS Classification. Understanding Time per Classification, 2013 Update. Zisser Customs Law Group, PC, 2013

Day 3:

2 shipments, 3 line-items need to be classified by two different businesses, requiring calls and emails. Response time of 1 hour, resp. 4 hours. 1 item not done before cut-off time and leads to one day delay, because goods are already at the border. The others can be handled before cut-off time.

Day 4:

1 line-item needs to be classified by the business, which requires calls and Emails. The business also requires more information/explanation. Response time adds 1+ day, because the contact person is out of office and returns the next day. Goods are already at the border and need to be kept in customs warehouse (storage cost still included in the standard rate).

Day 5:

No classification incidents, but an upload of a classification list is requested. The list seems incomplete, or with few mistakes. Some minor back and forth communication is required (45 minutes).

Classification issues (HS) (scenario)	# shipments / issues	Total items	Self - classification or follow up effort	Info search	Archiving	time spent (min)	(hrs)	FTE	Delay (days)	Avoided delay (days)
Day 1	1	10	75	50	5	130	2.2	0.05	0.0	1.0
Day 2	1	5	38	30	5	73	1.2	0.03	0.0	1.0
Day 3	2	3	30	0	0	30	0.5	0.01	1.0	1.0
Day 4	1	1	60	0	0	60	1.0	0.03	1.5	0.0
Day 5	0	0	0	0	45	45	0.8	0.02	0.0	0.0
Total	5	19.0	202.5	80.0	55.0	337.5	5.63	0.14	2.5	3

Cont.	Increased compliance risk	Missed cost saving opportunity
Day 1	yes	possibly
Day 2	yes	possibly
Day 3	yes	possibly
Day 4	yes	possibly
Day 5	yes	possibly

- FTE = consumption of team capacity
- Delay = impact on the agreed delivery time and/or transport lead time
- Avoided delay = when impact on transport lead time / delivery time is avoided due to rapid response from team
- Missed cost saving opportunity = opportunity of cost saving or cost avoidance

ANNEX VII - ISSUES IN CUSTOMS OPERATIONS RELATED TO ORIGIN (SCENARIO)

Current practice:

Issues with preferential origin occur regularly, with volume of cases highly varying per local business. Some units have problems in this domain 1x day, other units 1x month, again other units hardly ever. Preferential treatment may be forfeited (business decision), if time is deemed more essential than obtaining lower duties (e.g. when penalties for late delivery costs more). If not obtained, then shipment will be pushed through customs and normal duty levels apply. In more exceptional cases, value of preferential treatment may be so high, that a decision is made to first solve the problem and obtain the necessary documentation. It usually takes about 2-3 days to obtain the required documentation for preferential origin (if available).

For non-preferential origin, missing/incorrect data occurs daily (usually for returned items). Often data is incorrect due to a mix-up of country of departure and non-preferential origin. This is not always detectable for persons in customs operations (they are reliant on what is on the invoice) and is more likely to be detected during inspection or customs audit.

The following 1-week event registration is a compilation based on general feedback provided about similar cases and does not represent actual cases. The overview is deemed a conservative scenario. Monetary cost (forfeited duty reductions, customs warehousing, increased broker fees, customer penalty, etc.) are excluded from the estimation.

Day 1:

Non-preferential origin seems incorrect (identified based on experience). Follow up with procurement required, to contact the supplier. Time is spent calling and emailing to get confirmation of correct origin, which arrives with delay of 1 day.

Day 2:

Non-preferential origin seems incorrect, but it remains un-detected. No time spent and no delay, but there is a compliance risk.

Day 3:

Preferential origin is requested, but certificate of origin is missing. Time is spent on calls, emails and follow up. Customs specialist supports business in call with supplier. Response time 3 days, while goods are waiting at the border.

Day 4:

Preferential origin seems justified for particular transaction, but certificate is missing. Documentation appears to have already been sent by supplier, but not forwarded to customs operations. 30 min spent on follow up, but still during transportation.

Day 5:

Non-preferential origin seems incorrect and remains un-detected. No delay, no time spent, compliance risk and associated cost. Also, non-preferential origin is requested, but certificate is not available. After 1 hour follow up, option to apply for preferential treatment is waived in favor of timely delivery. Origin certificate could take several days, delivery unsure

Origin issues (scenario)	# shipments / issues	Follow up effort (min)	Hours	FTE	Delay (days)	Avoided delay (days)	Heightened compliance risk	Missed cost saving opportunity
Day 1	1	60.0	1	0.03	1.0	0.0	yes	no
Day 2	1	0.0	0	0.00	0.0	0.0	yes	no
Day 3	1	120.0	2	0.05	3.0	0.0	no	no
Day 4	1	30.0	0.5	0.01	0.0	0.0	No	no
Day 5	2	60.0	1	0.03	0.0	2.0	No	Yes
Total	6.0	270.0	4.5	0.11	4	2		

- FTE = consumption of team capacity
- Delay = impact on the agreed delivery time and/or transport lead time
- Avoided delay = when impact on transport lead time / delivery time is avoided due to rapid response from the customs operations team
- Missed cost saving opportunity = opportunity of cost saving or cost avoidance

ANNEX VIII - ISSUES IN CUSTOMS OPERATIONS RELATED TO CUSTOMS VALUATION (SCENARIO)

Current practice:

Most common issues in relation to customs valuation evolve around the Bill of Lading (BoL) and a potential for duty reduction in relation to transport cost. Very often (no further specification available) the transport documentation does not specify the transport cost. With active follow up, it may take between 1 and 2 weeks to receive the required documentation (rated BoL). If necessary, duty reduction can be forfeited without compliance problems. In most cases, the shipment will be customs cleared without reduction of the transport cost from the customs value and relevant duty levels are applied on transport cost. In cases where this happens, time is often deemed more essential than obtaining lower duties, because penalties for late delivery are likely to be higher. Only in rare cases, value of duty on transport cost may be so high that a decision is made to first address the issue and obtain the necessary documentation.

On few occasions (1x per month), customs clearance cannot immediately be executed, because the original Bill of Lading is missing. This may occur when individuals in the local business have received the documentation, but do not pass it on to the customs team (they have forgotten it or are unaware of the need of the documentation for clearance purposes). Tracing the documentation can be very time consuming.

Potential non-compliance cases in relation to the indicated value of the goods are deemed rare (e.g. value on the BoL is different from P.O.). If caught on time, it will usually take 2-3 days to solve and likely to lead to delays. If not spotted, then there is a chance of this being captured by customs at the time of clearance, or (more likely) during a customs audit.

The following 1-week event registration is a compilation based on general feedback provided about similar cases and does not represent actual cases. The overview is deemed a conservative scenario. Monetary cost (customs warehousing, increased broker fees, customer penalty, etc.) are excluded from the estimation.

Day 1:

No irregularities registered.

Day 2:

The rated BoL is missing. The local business is known and contacted to (jointly follow up with supplier / freight forwarder to receive required transport cost details). Time spent on follow up by customs operations is around 1 hour in total. In the end, details are not obtained before arrival of shipment. To avoid delays, clearance is executed. No compliance risk, but over-payment of duties.

Day 3:

No irregularities registered.

Day 4:

The rated BoL is missing. The local business is known and contacted to (jointly follow up with supplier / freight forwarder to receive required transport cost details). Time spent on follow up by customs operations is around 1 hour in total. Details are obtained before arrival of shipment.

Day 5

No irregularities registered.

Valuation issues (scenario)	# shipments / issues	Follow up effort (min)	Hours	FTE	Delay (days)	Avoided delay (days)	Heightened compliance risk	Missed cost saving opportunity
Day 1	0	0	0	0.00	0.0	0.0	No	No
Day 2	1	60	1	0.03	0.0	1.5	No	Yes
Day 3	0	0	0	0.00	0.0	0.0	No	No
Day 4	1	60	1	0.03	0.0	0.0	No	No
Day 5	0	0	0	0.00	0.0	0.0	No	No
Total	2.0	120.0	2.0	0.05	0.0	1.5		

- FTE = consumption of team capacity
- Delay = impact on the agreed delivery time and/or transport lead time
- Avoided delay = when impact on transport lead time / delivery time is avoided due to rapid response from team
- Missed cost saving opportunity = opportunity of cost saving or cost avoidance

ANNEX IX - ISSUES IN CUSTOMS OPERATIONS RELATED TO INCOTERMS AND GENERAL CUSTOMS PROCESSES (SCENARIO)

Current practice:

The most prevalent issues in this domain relate to the incorrect selection of incoterms, uncertainty as regards selected broker, incorrect declaration of importer of record (e.g. old address & former business name), lack of pre-alert and arrival notifications from freight forwarders, document hand-over between freight forwarder/carrier and broker, communication around last minute changes in purchase orders (P.O.) and transport administration requirements in relation to the selection of specific customs regimes. It must be noted that one of these issues is very US-specific (in relation to incorrect selection of incoterms): agreed incoterms may not require customs clearance by the US customs team, but business has changed their minds last minute and desires EIMR as importer of record after all. This often occurs in relation to certain specific US-tax requirements.

The following 1-week event registration is a compilation based on general feedback provided about similar cases and does not represent actual cases. The overview is deemed a conservative scenario. Monetary cost (customs warehousing, increased broker fees, customer penalty, etc.) are excluded from the estimation.

Day 1:

A freight forwarder does not have clarity on the selected broker, but they are able to contact the customs team and receive appropriate instructions and contact details. Still some issues with document hand-over to the broker arise and follow up is required to solve the issue the same day. Total time spent is 1,5 hours and delay of one day is avoided.

In addition, another freight forwarder has not provided a pre-alert and therefore the broker-instruction for import has not yet been sent out. The shipment is already at the port and has been available for clearance for two days (high storage cost!). The customs team makes minor over-time to limit further delay. Additional time, in comparison to regular clearance 30 min.

Day 2:

Procurement has made some last-minute changes to the purchase order, which do not show up in the customs management system. Follow up with local business is required to ensure the correct details are entered into the broker instruction. One day delay, because the supplier needs time to adjust documentation. Additional time spent: 45 min.

Day 3:

Last minute request for import clearance by the business (incorrect selection of incoterms). Customs team needs extra time to double check the request, collect the correct documentation and create broker instruction (60 min.). Due to late instructions, additional time needs to be spent on coordinating the document handover between freight forwarder and broker (30 minutes). Delay can be avoided.

Additionally, for one express shipment a request for information comes in as the importer of record is incorrectly indicated on the shipping documentation. As a result of experience with these issues, the team can solve this within about 15 min.

Day 4:

Another last-minute request for clearance (incorrect selection of incoterms). The customs team needs extra time to collect the correct documentation and create broker instruction (60 min.). Due to late instructions, additional time needs to be spent on coordinating the document handover between freight forwarder and broker (30 minutes). Despite efforts, this has led to 2 days of delay (due to need for corrected documents), but a third day is avoided.

Furthermore, another express shipment with a request for information comes in as the importer of record is incorrectly indicated on the shipping documentation. As a result of experience with these issues, the team can solve this within about 15 min.

Day 5

Problems with document handover between freight forwarder and broker. Customs teams needs to intervene and follow up with calls and emails (60 min). Contact person at the business is not immediately available and responds late next day.

Additionally, for another shipment the importer of record is incorrectly indicated on the shipping documentation. It takes about 3 hours to determine the correct location and receive all the required documentation and information.

Finally, and again for one express shipment a request for information comes in as the importer of record is incorrectly indicated on the shipping documentation. As a result of experience with these issues, the team can solve this within about 15 min.

Incoterms & customs processes	# shipments / issues	Follow up effort (min)	Hours	FTE	Delay (days)	Avoided delay (days)	Heightened compliance risk	Missed cost saving opportunity
Day 1	2	120	2	0.05	2.0	1.0	No	yes
Day 2	1	45	0.75	0.02	1.0	0.0	No	No
Day 3	2	105	1.75	0.04	0.0	1.0	No	No
Day 4	2	105	1.75	0.04	2.0	1.0	No	No
Day 5	2	75	1.25	0.03	1.0	1.0	No	Yes
Total	9	450.0	7.5	0.19	6.0	4.0		

- FTE = consumption of team capacity
- Delay = impact on the agreed delivery time and/or transport lead time
- Avoided delay = when impact on transport lead time / delivery time is avoided due to rapid response from team
- Missed cost saving opportunity = opportunity of cost saving or cost avoidance

ANNEX X - ISSUES IN CUSTOMS OPERATIONS RELATED TO NON-CUSTOMS REQUIREMENTS (SCENARIO)

Current practice:

Non-customs requirements typically refers to legal requirements, which follow from non-customs regulations, such as `health safety and environment`-regulations (HSE) and tax regulations. Often (but not in each country), such regulations are enforced at the border either by another agency or via the customs authorities. As enforcement takes place at the border, people outside the customs domain typically associate these regulations with customs regulations.

The following 1-week event registration is a scenario based on general feedback provided about similar cases and does not represent actual cases. The overview is deemed a conservative scenario. Monetary cost (customs warehousing, increased broker fees, customer penalty, etc.) are excluded from the estimation.

Day 1:

For a single imbound shipment of chemicals, a self-declaration for (list of accepted chemicals) is required. Customs team needs to follow up with business (15 min). One day delay due to response time of business.

Day 2:

A shipment with goods on wooden pallets arrives at the border. Goods are stopped at the border by customs, because the shipping documentation does not provide a certificate of fumigation. The customs team gets contacted by the broker and follows up with the local business (the buyer of the goods). The goods were not fumigated and this therefore needs to be arranged. Follow up requires around 2 hours and clearance of the shipment is delayed for 2 days. Additional time is spent on supporting the re-claiming of associated cost from the supplier (30 min).

Day 3:

No irregularities observed.

Day 4:

Once again, a self-declaration is needed for the import of chemicals (list of accepted chemicals). Follow up takes about 15 min, but a response time by the business of 2 days.

Day 5:

No irregularities observed.

Non-customs requirements (scenario)	# shipments / Issues	Follow up effort (min)	hrs	FTE	Delay (days)	Avoided delay (days)	Heightened compliance risk	Missed cost saving opportunity
Day 1	1	15	0.25	0.01	1.0	0.0	n/a	n/a
Day 2	1	150	2.5	0.06	1.0	1.0	yes	n/a
Day 3	0	0	0	0.00	0.0	0.0	n/a	n/a
Day 4	1	15	0.25	0.01	2.0	0.0	n/a	n/a
Day 5	0	0	0	0.00	0.0	0.0	n/a	n/a
Total	3.0	180.0	3.0	0.08	4.0	1.0		

- FTE = consumption of team capacity
- Delay = impact on the agreed delivery time and/or transport lead time
- Avoided delay = when impact on transport lead time / delivery time is avoided due to rapid response from team
- Missed cost saving opportunity = opportunity of cost saving or cost avoidance