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Digital Transformation of Small- and Medium Sized Ports:

A Case Study of the NON-STOP Project

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Abstract

In this thesis, we present a qualitative case study of the NON-STOP project, with the aim of investigating how small- and medium sized ports (SMPs) can access the possible benefits of becoming more digitalised. The data constituting this study is collected through nine semi-structured interviews with port managers at the different participating ports as well as external actors with relevance for the SMPs and within the port industry in general. Additionally, participation in a webinar contributes to the primary data of this study. The data have been coded, interpreted, and presented through an analysis with a theoretical lens consisting of the theoretical framework of *Organisational responses to identity threats* (Ravasi & Schultz, 2006) as a foundation. This framework is furthermore complemented with the theory of sensemaking and the concept of dynamic capabilities, which altogether forms the theoretical basis of this thesis. The discussion pulls together threads from the port managers, stakeholders, and relevant literature from the field of strategy and organisational identity.

Based on the findings and the discussion, this study reveals that the SMPs are facing four external challenges moving the port industry towards an extensive digital transformation that poses a threat to their previous role and identity. It is found that SMPs as of now are lacking a collective understanding of their identity, which prevents them from finding the needed capabilities and strategising in a way that helps them access the possible benefits of becoming more digitalised. This study further outlines the implications this has for the SMPs and provides them with four recommendations on how the SMPs could sense and seize the capabilities that are essential to sustain a digital transformation, and thereby strategise to transform their identity substantially. Lastly, this study outlines possibilities for future research.

Keywords: Digital Transformation, Dynamic Capabilities, Identity, NON-STOP Project, Strategy, Small- and Medium Sized Ports

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Abbreviations

ERDF - European Regional Development Funds

EU - European Union

ICT - Information and Communication Technology

IT - Information Technology

NON-STOP - New smart digital Operations Needed for a Sustainable Transition of Ports

NSR - North-Sea Region

PM - Port Manager

PCS - Port-Community System

SMP – Small- and Medium Sized Ports

STS - Sociotechnical System

TOS - Terminal Operation System

VAL - Value-Adding Logistics

1. Introduction

1.1 Background

Technology has always helped industries to develop business in achieving more efficient workflows, minimizing production costs, and more recently to reach a more sustainable behavior (Ross, Beath & Sebastian, 2017). The perhaps most important technological advancement that currently influences the conduct of many companies is the digitalisation of previous analogue processes and actions (Bharadwaj et al., 2013). As new market developments prosper, industries are required to transform their way of doing business. The industries are confronted with new business opportunities that emerge from advanced technologies. Benefits of implementing new digital solutions vary from improving small operations and inventing new digital offerings, to establish entirely new value propositions for organisations (Ross, Beath & Sebastian, 2017).

However, when organisations enforce technologies they potentially transfer these new conducts into strategising towards new parts of the business, or unfamiliar domains. This as rapidly advancing technologies that emerge does not allow for organisations to have constant/sufficient expertise in all new domains (Baiyere & Lambaert, 2020). An unfamiliar domain is defined by Baiyere and Lambaert (2020, p.1) as "(...) *a fundamentally different domain that an organization is unaccustomed and one in which it has a general lack of experience – typically characterized by a high degree of unknowns, uncertainty, and newness relative to the present domain of the organization*". The motivation to venture towards this domain arises from a stimulus of either threats or opportunities. The motivational range diversifies from environmental pressure, changing business- and competition dynamics, and opportunities to obtain technological advancements and new value propositions (Baiyere & Lambaert, 2020). Hence, a digitalisation process can be viewed as a complex transformation that could guide industries and organisations towards competitive advantages (Bharadwaj et al., 2013). Yet, this transformation also means that organisation enters new and unfamiliar territories.

One of the industries that have experienced an external pressure to transform to become more data and insight-driven for the last decades, is the maritime logistics and port industry (Deloitte, 2017). According to Heilig et al. (2017a), the port industry has experienced three generations of digital transformation, with the first generation entrenching in the 1960s. This first generation primarily consisted of a transformation to paperless procedures. After a continuous growth in international

container shipping, a demand for an Electronic Data Interchange system emerged, which later developed into a port-community system (PCS). This enabled actors who are involved in port operations to exchange electronic documents and established standardised messages (Heilig et al. 2017a). In the late 1980s, a terminal operation system (TOS) further allowed for integrated planning and automation at the container terminals. Investments in infrastructure, equipment, and basic services could support the port to encounter a new customer demand for value-adding logistics (VAL) services (United Nations, 2002). A complete PCS is still today regarded as an essential factor for port growth and competitiveness (Wiegmans, Hoest & Notteboom, 2008). However, the investments in IT infrastructure and setups are extensive, hence, this digital transformation can only be achieved if the port community´s willingness is present (Heilig et al., 2017b).

The second generation provoked a digital transformation on automated procedures in the period from the 1990s to the 2000s (Heilig et al., 2017a). Laser technologies and new IT systems allowed solutions for automated container handling processes. By providing operations as collision prevention, profiling, and damage detection, these technologies are regarded as key technologies for both safer handling and facilitating automated solutions at the container terminals (PEMA, 2015). This digitalisation process required an integrated system with TOS, and the trend of using IT increased further. At the same time did the expanding vessel size and constant growth of container shipping lead to some ports reaching bottlenecks on their infrastructure (Heilig et al., 2017b). Hence, a demand for new information systems that could administer both traffic and environmental problems arose. While advancements in single-window systems began, the global economic crisis in 2008-2009 drove an expansion of competition as the evaluation and selection of ports became more rigid (Pallis & De Langen, 2010). Two key strategies on how to reach coordination by aligning terminal operations with port administration to other actors were established. This to secure the sustainable development of ports (Pallis & De Langen, 2010). Following this, the second generation required a connection of the different operations in the port's hinterland and a higher level of expertise from the labour force (United Nations, 2002). The changing circumstances therefore led to a focus on decision-making based on accurate data from real-time data processing. Additionally, a demand for information exchanges to both the government and customers increased. This again brought a new requirement for establishing trade networks together with new government regulations and a focus on environmental issues (Heilig et al., 2017b). A concern on the extent of visibility, a willingness to participate, and share information emerged in relation to digital transform the ports.

The new attention of transforming port procedures into smart systems drove the port industry into the third generation from 2010 (Heilig et al., 2017b). Port authorities and the maritime industry started to weigh the importance of just-in-time logistics, value-added information services, and port-centric decision support. While the majority of ports were evaluating the required measures to transform these services, other ports implemented smart port logistics (Heilig et al. 2017a). This led to a diversification where ports such as Hamburg Port Authority invested early in information systems and port infrastructure. The infrastructure allowed integrated road, sea, and railway systems with ongoing interactions from real-time data sharing on mobile computers, to be established. Moreover, they experienced benefits such as intelligent control of current traffic situations, situations at the port, forecasts of parking space for vessels, and individual recommendations. This led to better adaptability and environmental advantages (Hamburg Port Authority, 2021).

The advantages this brought contributed for some ports to follow their footsteps and participate in innovation programs for digitalisation (Puerto de Algeciras, 2021). However, implementation of applications and advanced systems requires multidisciplinary knowledge and relies on collaboration from the IT sector, maritime industry, and facilities to research (Heilig et al., 2017b). Moreover, this new information exchange requires a shift from almost autonomously activities and decisions to an ongoing collaboration with stakeholders, which requires a more active solution approach. Again, this does require a willingness from the port authorities to participate in the transformation. This has therefore contributed to a diversification of digitalisation at ports, whereas ports like the Hamburg Port Authority have made extensive measures rapidly, while other ports still have not adopted possible digitalisation solutions.

On this notion, the first two generations concentrated on additional terminal automation, better information flows, and more global interaction and competition. The third generation, however, focuses on a rapid measure, assisting and controlling the port infrastructure from real-time data sources (Heilig et al., 2017b). A transformation requires an active development, adoption of IT technologies and systems to increase efficiency and logistics, meet environmental issues, and comply with governmental requirements. Still, the benefits of possibly better coordination and communication of previously separated operations, and improving the economic and environmental impact, could be motivations. Nevertheless, the port's business performing changes required a shift from traditional operations to a competing environment where they act as a port information

integrator and provider (Heilig et al., 2017b). The extent of how much the port transforms in relation to digital solutions and inter-organisational integrations still lies within their willingness. This has accordingly contributed to different varieties of transformation among port actors, surpassing problems as breaks in information flows between stakeholders, loss of clients, and not being able to participate in data-driven port operations. More research regarding the value proposition that digital transformation could grant to the port authorities is therefore vital. This to successfully transform ports towards a more technologically driven mode of operation and thus also guarantee the potential strategic advantages of such a transformation.

Based on the above, it is evident that ports in the last decades have experienced a digital transformation in numerous areas. However, as described, the digital transformation process has primarily been founded on the specific port's willingness and the accessible capital. This has accordingly led to that extensive initiatives within digitalisation have occurred in larger ports, and that smaller ports have not established the right competencies and skills to withstand a digital transformation. On this notion, the NON-STOP project has been established to assist the small-and medium sized ports (SMPs) to find New smart digital Operations Needed for a Sustainable Transition of Ports (NON-STOP). The project is organised from a collaboration between SMPs within the North Sea Region and supporting partners to allow port authorities to cope with "*ever-growing multifaced challenges*" (Interreg, 2021a) in the digital transformation, and move towards a more advanced and environmentally friendly future. The aim is for the SMPs to obtain more efficient, agile and transparent data management with their relevant stakeholders, facilitate the ability of ports to meet their clients and targets, and invest in needed future innovations (Interreg, 2021a). As mentioned above, global container handling is increasing, and the new role of ports to serve as both integrator and provider has been acknowledged more. With this, the value of the port industry and accordingly the SMPs, is important to highlight together with the importance of why the SMPs should digitalise to remain their position in the market.

1.2 Problem Statement and Research Question

As has been established above, SMPs are an important part of the maritime industry. A need to transform their way of doing business in the current digitalisation wave has been highlighted in order to remain competitive on the market. However, the SMPs do not always possess the necessary skills and competencies to implement digitalisation in their strategy and daily operations. With this, initiatives such as the NON-STOP project have been established to bring additional support to the SMPs and to help them in the transformation process. On this notion, this master's thesis has been initiated to identify the challenges that SMPs have towards becoming more digitalised. This thesis will therefore explore the following research question:

"How can small-and medium sized ports access the possible benefits of becoming more digitalised?"

To sufficiently answer the research question, the following three sub-questions will be examined:

1. What strategic challenges are the small- and medium sized ports currently experiencing?
2. How could the small- and medium sized ports sense and seize the capabilities to sustain a digital transformation?
3. In which way could the small- and medium sized ports strategise to help them substantially transform their identity?

1.3 Delimitations

The scope of this thesis is affected by certain delimitations. Firstly, as implied by the research question, the thesis will exclusively focus on SMPs. This is due to the NON-STOP project being the case organisation - a project concentrated on supporting and helping SMPs in the North Sea Region to digitally transform their operations. Large ports, and ports not participating in the NON-STOP project, are thus deliberately excluded and not a part of this study.

Secondly, in answering the above research question and the following sub-questions, the thesis is delimited to focusing on the port management at the different SMPs. By this it is understood that the study will investigate perceptions and thoughts of the different port management regarding the topic, complemented with external views on how they are performing. Hence, other companies located at

the SMPs are not subjects for investigation, and their point of view is not included as a part of this study.

1.4 Structure of the Thesis

This section will outline the overall structure of this thesis to provide an overview and disclose the purpose of each chapter.

Preceding this paragraph, it was in the *first chapter* provided an introduction to the thesis. The purpose was to establish the background and motivation for the study, as well as present our research question. Furthermore, delimitations were established. The *second chapter* will set the scene of our case organisation by including a description of the NON-STOP project's origin and structure. A literature review will follow in the *third chapter,* where past research related to this thesis will be presented. The focus will here be on literature related to digitalisation, identity, strategy, and industry change. In the *fourth chapter*, it will be elaborated on the chosen theoretical frameworks- and concepts that later on will be applied in the analysis: organisational responses to identity threats, sensemaking, and dynamic capabilities. A section connecting all of the above theories and illustrating their common importance for this thesis will conclude this chapter.

In *chapter five*, the philosophy of science will be introduced based on the central scientific concepts of ontology and epistemology. Subsequently, *chapter six* outlines the methodology of the thesis intending to clarify our choice of research method-, approach-, and design together with their belonging limitations. *Chapter seven* will disclose the data collection and establish the purpose of using semi-structured interviews as our primary empirical data. Furthermore, this chapter will explain our sample selection and research ethics, as well as our process of data analysis.

Chapter eight marks the start of the analysis, whereas Ravasi & Schultz's (2006) model of *Organisational Responses to Identity Threats* provides the foundation. The purpose of this chapter is to investigate what strategic challenges the SMPs are currently facing, and how they sense- and seize these challenges. Furthermore, the chapter will analyse how the SMPs are responding to a changing identity through investigating how they make sense and give sense of the identified challenges. The chapter will be closed up with a focus on a revised identity understanding based on all of the previously analysed elements.

Following the analysis, *chapter nine* will first provide a discussion of key findings from the analysis, followed by which implications the thesis has for the SMPs, ports in general, and management. Second, it will provide recommendations and additionally suggest further research based on the limitations of our thesis. The *final chapter* will include the overall conclusion of the thesis.

2. Case Organisation: The NON-STOP Project

This thesis is founded on an initiative from the NON-STOP project and Kasper Teilmann at GEMBA Seafood Consulting, the managing partner in the project. To understand the project's desired attributions and goals towards the port industry, the following chapter will elaborate on NON-STOP's origin and structure.

The NON-STOP project was founded by Interreg in 2019 to support and help small- and medium sized ports (SMPs) in the North Sea Region (NSR) to digitally transform their operations. Interreg is an initiative from European Union (EU) with the aim of supporting cooperation across nations to handle interlinked challenges and meet shared solutions within areas such as environment, education, research, and health (Interreg, 2021b). Within the NON-STOP project, the desire is to implement a green and smart digital transition in the management of NSR's ports of regional importance (Interreg, 2021a), with a main goal of reducing the time of pre-defined logistical/maintenance port operations by 10%. Additionally, the goal includes lowering the port energy and pollution by 10% by building on collaborative expertise and practice. NON-STOP founders view these as key aspects to allow port management to survive in ever-growing challenges by moving forward in a more advanced and environmentally beneficial future (Interreg, 2021a).

The NON-STOP project is funded 50% by European Regional Development Funds (ERDF), with the remaining covered by the participating partners, and has a budget of 4,7 million euros. The project is a part of the goals in the EU Cohesion Policy in the period from 2014-2020. The Cohesion Policy is funding hundreds of thousands of projects through ERDF, European Social Fund, and the Cohesion Fund. Interreg projects get funding from this policy to tackle challenges throughout the EU. The funding is divided into cooperation programs responsible for managing project funding. Together they consist of 258 different programs (Interreg, 2021b). One of the programs is the Interreg NSR program which facilitates cooperations from 49 regions in seven countries by the North Sea. It is within this program that the NON-STOP is situated.

Within NON-STOP, the ambition is to secure more efficient, agile and transparent data management amongst the NSR, the SMPs, shipping companies, freight forwarders, and other relevant stakeholders. This will in turn accommodate the partnered ports with an ability to adequately serve their clients, meet the targets of ever-increasing EU/national eco/digital policies and invest in further needed

innovation (Interreg, 2021c). NON-STOP is made up of seven port partners: Port of Zwolle (NL), Port of Oostende (BE), Niedersachsen Ports (Port of Emden, DE), Port of Korsør (DK), and Port of Helsingør (DK) with Port of Narvik (NO) as supporting partner. The port partners are supported by technology and legal partners from CRESCENT NV, Bluebridge NV, BergPackhäuser & Kollegen. The project consists of five work packages, whereas the first two are administrative packages while the last three are content based. Together, they form ten pilots where the project partners participate depending on their desired goals.

The lead beneficiary of the project is Port of Zwolle, which implies that it is representing the partnership and is legally acting on behalf of the partners. The other partners serve as project beneficiaries. This entails active cooperation in the development and implementation of the project, collaboration within the financing of projects, legal and financial responsibility for the activities they desire to implement and share the funds that are brought to them (Particip, 2016). For Interreg, this is a legal requirement that has to be established before the project starts. Even though the Interreg project was founded in 2014, the NON-STOP project started in July 2019 with originally a duration time to December 2022. Due to Covid-19, however, it has been expanded by six months and is now expected to finish in May 2023 (Appx. 1).

3. Literature Review

The purpose of the literature review is to gather and align current knowledge within the field of digitalisation, identity, and strategy. Furthermore, it will focus on how industries change in relation to the growing digitalisation, whereby they experience a changing identity together with a need to establish new strategies. First, we review the literature on digitalisation and how it is producing new ways of organising and transforming organisations. In relation to this, literature on identity and identity changes will be presented as well as research on the concept of strategy and the adaption of new strategies when facing external challenges pushing for organisational change. Second, literature on how these organisational changes lead to a changing industry will be reviewed accordingly. As this thesis investigates the port industry, the final paragraph will examine the changes that they have experienced, and currently are experiencing.

3.1 Digitalisation

As new digital tools and regulations emerge on the market, industries are forced to transform their business towards a digital form of work. According to Ross, Beath & Sebastian (2017), being digital is referred to as a state that organisations are entering through continuous processes of digitisation and digitalisation. Over the last decades, scholars have discussed, documented and described how this digitisation, digitalisation and datafication of social artifacts have created new forms of organising and different organisations (Leonardi & Treem, 2020). *Digitisation* refers to when a company is establishing operational necessities within standardised business processes through technology solutions. It thereby serves as a fundament and an operational backbone for organisations that can eliminate constraints with limitations in time, capital, location, and space (Leonardi & Treem, 2020). On the other hand, an organisation that is *digitalising* is providing new-customer centric value propositions. Hence, they innovate new products and services for customers and consumers which can lead to competitive advantages (Baiyere et al., 2020).

Organisations that can take advantage of the aspect that digitisation can provide to produce new ways of organising, are able to digitalise (Leonardi & Treem, 2020). A process of digitising is according to Flyverbom (2019) when you move analog inputs to digital forms. Moreover, data can additionally be created digitally from start by digital input devices (Bailey, Leonardi & Barley, 2012). It can therefore be connected to work and communication processes in an organisation. The importance of

a digitised infrastructure with the mechanisms and complexity it provides have until recent years not been acknowledged enough (Henfridsson & Bygstad, 2013). Adaptations between the increasing use of information systems and organisations are becoming more intricate to connect. This results in organisations facing challenges to supervise a multitude of systems and technologies that often are introduced for different purposes in recent years (Ciborra et al, 2000). Hence, the appearance of digitisation depends on the effectiveness the systems can provide when the socio-technical aspect is included. Without this evaluation, an organisation could meet interferences that create considerable obstacles to become digitalised (Henfridsson & Bygstad, 2013).

A focus on the importance of socio-technical influence has been introduced to the literature only in recent years (Orlikowski, 2007). The socio-technical system (STS) was introduced with the main objective to improve the overall quality of working life. The system is a "*synergistic combination of humans, machines, environments, work activities and organisational structures and processes that comprise a given enterprise*" (Carayon et al., 2015 p. 550), and it consists of two interrelated subsystems (Appx. 2). The goal is to create comprehensive and accounting 'joint optimisation' of the social and technical systems. This involves interactions synergies among system components and between the system and external environment (Hendrik & Kleiner, 2001; Hancock, 2009). From this, it is argued by scholars that the origin of such system theories is associated with efforts to manage increasingly complex systems as they develop (Carayon et al., 2015). Emphasising articles and theories from STS can be viewed from studies that emerge the intertwining of humans and technologies in practice with actor-networks (Callon, 1986; Latour 1992, 2005), a mangle of practice (Pickering, 1995), object-centered sociality (Knorr-Cetina, 1997), relational materiality (Law, 2004), and material sociology (Beunza et al., 2006). However, the challenge of organisational scholars has been to understand the comprehensiveness that these concepts challenge and transcend from the conventional distinction of social and material work in an organisation (Orlikowski, 2007). Therefore, the importance of evaluating the interaction of humans and technologies and creating digital infrastructure in an organisation to transform have previously not been considered enough (Hinings, Gegenhuber & Greenwood, 2018).

According to Orlikowski (2010), there have been three conceptual positions that technology has played in the management literature in the past decades. In the first position, *absent presence,* technology was essentially unacknowledged to influence the management and organisation by

organisational researchers. In the second position, *exogenous force,* technology is instead viewed as a powerful driver that has determinate impacts on organisational life. The third position of *emergent process* considers technology as a positioned product of ongoing human interpretations and interactions. It is further argued that a fourth perspective has emerged on that technology and organisation is viewed as an *entanglement process,* that is, influenced by longer-standing developments in sociology, science, and technology (Orlikowski, 2010). With this evolution, it is therefore not only the comprehensiveness of the technology itself that is evaluated but also the process of implementation to an organisation is considered. This argument is supported by several scholars as digital innovation processes today are subject to *digitisation* (Nambisan, Lyytinen, Majchrzak, & Song, 2017; Svahn, Mathiassen, & Lindgren, 2017; Yoo, Boland, Lyytinen, & Majchrzak, 2012). Today a digital innovation process should be considered more frequently as our digital world is changing rapidly. Digital innovation is by Nambisan et al. (2017) considered as "*the use of digital technology in a wide range of innovations*" (Nambisan et al., 2017 p. 224). Moreover, digital can be understood as the "*conversion from mainly analog information into the binary language understood by computers*" (Nambisan et al., 2017 p. 224). Hence, digital innovation includes human actions. On this notion, innovations as such do involve orchestration of new products, new processes, new services, new platforms, or new business models in a given context (Nambisan et al., 2017).

As mentioned, the digital innovation process today is considered as a continuous movement of organisational modifications due to new digital technologies. Through the wide range and depth of innovations, it drives an organisation through a *digital transformation*. A digital transformation is viewed as a combined effect of digital innovations that brings new constellations of structures, values, practices and beliefs that change, threaten, replace or complement existing rules of the game within organisations, ecosystems, industries, or fields (Krimpmann, 2015; Loebbecke & Picot, 2015; Mangematin, Sapsed & Schüßler, 2014). Therefore, the process of becoming *digitised* by establishing operational necessities within standardised business processes with finding technological solutions through digital innovations can be viewed as a complex and extensive change for an organisation. Furthermore, this development does entangle the social and cultural systems that are embedded in organisations, as it demands new institutional perspectives and concepts for them (Orlikowski & Barley, 2001). Scholars thus argue that only when the human aspect of implementing technologies in an organisation is recognised it can *digitise,* and digitally transform positively into a *digital* state.

This to reach a capacity of finding new value propositions (Orkilowski, 2010; Ross, Beath & Sebastian, 2017; Hinings, Gegenhuber & Greenwood, 2018).

3.1.1 Changing Identities

The literature above showed an interplay between change in organisations and the growing digitalisation. This interplay suggests that organisational identity also is of importance, as the identity develops when the organisation changes as a result of digitalisation.

In Albert & Whetten´s article from 1985, it is proposed a definition of organisational identity in which they argue that a statement of organisational identity satisfies "*(...) the criterion of claimed central character, (...) claimed distinctiveness, and (...) claimed temporal continuity*" (p. 265). Moreover, identity captures *"who we are"* and *"what we do"* as an organisation (p. 266) and emerges from interaction with others. In subsequent years, this definition has often been referred to as the 'original definition' of organisational identity (He & Balmer, 2007; Ravasi & Schultz, 2006), and several authors have utilised this, or similar versions, in their studies (e.g Gioia et al., 2013; Schultz & Hernes, 2013).

Beyond Albert & Whetten (1985), other students within the field have developed different views and interpretations regarding the phenomenon, which has resulted in two principal lines of thought regarding organisational identities: The Social Actor Perspective (e.g. Whetten & Mackey, 2002; Whetten, 2003) and the Social Constructivist Perspective (e.g. Dutton & Dukerich, 1991; Gioa & Thomas, 1995; Gioa, Scultz & Corley, 2000) (Ravasi & Schultz, 2006). Whereas the former perspective emphasises institutional claims available to members of the organisation, the latter centers around collectively shared beliefs and understandings within the organisation. According to Ravasi & Schultz (2006, p. 436), both perspectives together suggest "*how organisational identities arise from sensemaking and sensegiving processes through which members periodically reconstruct shared understandings and revise formal claims of what their organisation is and stands for*". Hereby, they argue for the need to account for both perspectives to get the full understanding of organisational responses to changes threatening the identity.

The discourse on organisational identity as enduring (Albert & Whetten, 1985) or as ongoing change (Schultz, 2016) is highly debated in organisational literature. From the former point of view,

organisational identity claims change when disruptions from the enduring development of the originally held identity occur (Albert & Whetten, 1985; Whetten, 2006). This could be in periods of crisis or other situations where identity threats appear. Either way, Albert & Whetten (1985) propose the idea that external pressures increase the likelihood that members of an organisation engage in explicit reflection on identity issues. From the latter perspective, organisational identity is seen as being dynamic and continuously changing (Schultz & Hernes, 2013; Gioia et al., 2000). Rather than focusing on identity claims, Gioia et al. (2000) concentrate on the shifting meanings of enduring claims, allowing organisations to accomplish change despite implied threats to the enduring nature of their identities. Within this perspective, organisational identity is viewed as a process (Pratt, 2012; Gioia et al. 2002; Gioia & Patvardhan, 2012). According to Gioia & Patvardhan (2012), this could be compared to viewing the 'full motion picture' of an organisation, whereas the original perspective of endurance of identity only provides a 'single snapshot' of the organisation.

In today's society, competition between businesses with highly exposed business styles is increasing as a result of innovating technologies and increased interactions from consumers (Prahalad & Ramaswamy, 2004). The digitalisation of society as a whole, as well as within organisations, has additionally caused an escalation in radical and disruptive innovations across all industries (Yoo et al., 2012). Change due to digitalisation or new technologies often proves to have implications beyond the technology itself and both people, knowledge, tasks, and processes are argued to be influenced by technological change (Obwegeser & Bauer, 2016). As put by Tripsas (2009, p. 441), digital innovation can impact companies in a way that they "*may ultimately need to develop an entirely new organizational identity whereby both organizational members and external constituents must alter deeply held assumptions and beliefs about what the firm represents*". Compared to traditional, incremental innovations, digital innovation is found to be even more disruptive to an organisation's identity as it requires the organisation to take on more radical approaches (Obwegeser & Bauer, 2016). Following that line of argument, Tripsas (2009) argues that "*even seemingly minor shifts from a technological standpoint may challenge the existing organizational identity if, by pursuing the new technology, the organization violates the core features associated with its existing identity*" (p. 441).

Due to the current world of digitalisation and technological changes, it can thus be challenging for organisations to create and maintain their identities (Albert & Whetten, 1985). It is the continuity of identity that provides stability and long-term survival within an organisation (Hannan & Freeman,

1984), however, when a shift in identity is provoked by environmental conditions, the subsequent process may be risky and difficult to manage (Hannan et al., 2006). According to Tushman & Anderson (1986), established organisations and industries are often those who have the most difficulties in adapting to technological change that requires new knowledge and routines. This argument is supported by Tripas' (2009) case study of Linco, where she argues that established firms find technological changes challenging due to having so deeply rooted beliefs, capabilities, knowledge bases, procedures, and routines in the essence of the organisation. Adopting a technology that is identity threatening in a way that it would violate core beliefs thus creates significant difficulties to adopting it. This results in the identity and culture of organisations becoming more revealed and their images more vulnerable (Whittington, Cailluet & Yakis-Douglas, 2011). Consequently, pressure is put on organisations to maintain their internal culture and their external image to create a common identity.

3.1.2 Establishing a Strategy

Organisations want to exploit the benefits of digitalisation, but to achieve these benefits it is crucial to introduce new digital- and technical solutions in a way that creates understanding and endorsement amongst the organisational members. Especially as digitalisation is an unfamiliar domain for many organisations, solid strategies become important so that the members of the organisation understand the necessity of the digital change and avoid viewing it as an additional and unnecessary workload (Bayiere & Lambaert, 2020). The concept of strategy thus exhibits close ties to digitalisation and organisational identity and is therefore deemed relevant to review.

When reviewing the literature on classical business- and corporate strategies, it becomes evident that strategies often are credited and linked to decisions made by top management (Bonner, 2005; Strategic Change, 2002). This view is similar to looking at strategy as planned and implemented as a top-down process, where the role of the CEO is to be the architect of organisational purpose (Bower et al., 1991). The top-down perspective is developed into formal methodologies by several authors, e.g. Thomson et al. (2007), Hill & Jones (2008), and Jones et al. (2005), who all propose 'step approaches' to strategy assuming a top management steering the organisation's course into the future. Despite being a well-known approach, however, the intended and structured strategy process at the top of a hierarchical company chart is often argued to be an inaccurate misconception (Mintzberg, 1987a).

By stating that "*The notion of strategy is something that should happen way up there, far removed from the details of running an organization on a daily basis, is one for the great fallacies of conventional strategic management*" (p. 68), Mintzberg (1987a) argues that strategies are not merely deliberate or emergent, but rather crafted through a process of actions. When talking strategy, Mintzberg (1987a) views it as an ongoing, growing process that makes sense with actions and initiatives which in turn affects outcomes. Furthermore, Mintzberg (1987b) introduces the 5 P's for strategy (Appx. 3), suggesting that he is hesitant to provide a universal definition of strategy. He emphasises the importance of collective actions and the perception of environments - instead viewing strategy differently given the situation one is currently in.

The process-oriented approach to organisation seems to be a prominent mindset in literature in relation to both strategy, identity, and change. Schneider (1997) proposes that organisational actors may have differing views on how change is perceived through strategies, depending on their worldview and structure of knowledge. She furthermore argues that when new initiatives are communicated across cultures, regions, and social levels within organisations, these misaligned perceptions of change may have immense implications for managers. Schneider's (1997) view can be seen in accordance with Mintzberg's (1987b) research on how organisational actors play an essential role not only in accommodating change but also in influencing and shaping it. As is evident from his research, strategic initiatives and long-term planning are more likely to emerge from unstable conditions within the organisation, which is why the static of these aspects should be questioned (Mintzberg, 1987b). According to Stacey (1993), the concept of order in response to chaos is the basic understanding behind a process-oriented approach to organising, a view relating to the emergent strategies examined by Mintzberg (1987a).

The contemporary literature on strategy also explores the adaption of new strategies when facing external challenges pushing for organisational change. Two challenges that many organisations face today are strategising within uncertain futures and unfamiliar domains (Kaplan & Orlikowski, 2013; Baiyere & Lambaert, 2020). In a study of strategy making in an organisation facing an industry crisis, Kaplan & Orlikowski (2013) observe that organisational actors have difficulties with inconsistent interpretations of what "*might emerge in the future, what was currently at stake, and even what had happened in the past*" (p. 965). Through their research, they develop a model of temporal work in strategy making (Appx. 4) that contributes to the literature by illustrating "*when and why*

interpretations of the past, present, and future cohere into useful strategic accounts" (p. 966). According to Kaplan & Orlikowski (2013), such temporal work contributes to settling on a strategic account allowing participants to switch from disagreeing about meanings to implementing strategic choices, consequently enabling the organisation to move forward in the face of uncertainty.

According to Baiyere & Lambaert (2020), digitalisation is an unfamiliar domain that many organisations have on their strategic agenda. Despite strategy- and business managers being tasked with guiding their organisation through such unfamiliar domains, recent studies show that many of them lack expertise when evaluating the digitalisation-based demands of strategising in the digital age (Baiyere & Lambaert, 2020; Arvidsson & Hölstrom, 2018; Weill et al., 2019). Whereas prior studies have highlighted visionary leadership and domain knowledge as two main explanations of how to deal with strategising in unfamiliar domains (Schulz, 2001; King & Tucci, 2002), Baiyere & Lambaert (2020) argue this may be "*incompatible with the logic underlying unfamiliar domains such as digitalization*" (p. 1). One of their arguments is that the concept of visionary leadership no longer is appropriate for the scale, scope, and speed of the digitalisation characterising today's business landscape (Baiyere & Lambaert, 2020; Bharadwaj et al., 2013). Where issues related to digital technologies previously could be delegated to the IT department, the impact and reach of today's digitalisation are so rapidly advancing that this is no longer possible (Bayiere et al., 2020). Bayiere & Lambaert (2020) thus propose that the focus of strategising within unfamiliar domains should shift to a view that "*gives salience to the team rather than the heroic view of visionary leadership and caters the differences in the cognitive capabilities of the team rather than a plug-and-play view of domain knowledge*" (p. 5)

3.2 Changing an Industry

Based on the previous sections it has become evident that development and innovations within an organisation or industry could transform a previously known identity or strategy into a new 'state'. However, these changes are fraught with risk (Greve, 2003). Theory that could predict identification of conditions that would lead to innovations within an organisation, and at the same time beneficial changes for an industry, would be extremely valuable. Still, argued from Cyert and March (1963) and Fiol (1996) as the constant problem of establishing such a theory is that the innovations themselves are challenging this. The challenge is furthermore that an innovation may be considered ready to launch when a process of the development stage that leads to the innovation is finished, and when

stages of decision-making to incorporate the innovation as a product are fulfilled (Burgelman & Sales, 1986). In *development theory*, the effect of innovativeness within an organisation is considered on the obtainment and knowledge of management and innovative people. On the other hand, *decision-making theory* investigates how an organisation can deal with the contrary of innovation and stability, validity, and risk aversion. According to March (1994), these decisions are based upon the availability of a problem, a solution, and a level of risk tolerance that makes the solution acceptable. This could depend on the current profit situation of an organisation (Kahneman & Tversky, 1979). Recognising that both research and decisions have to be compassed before the innovation is settled could express why the number of innovations diversify and emerges across organisations (Greve, 2003). Greve (2003) further argues that this also could explain why organisations may fail to launch an innovation, as both of the processes have to be aligned.

Organisations of today face constant disruptions as new technological innovations enter their industry. An ability to seize new opportunities or withstand threats of destruction before their competitors is thus important to survive. This capacity depends on their research and development and market-related capabilities to reconfigure the organisation's resources (Daneels, 2002; Teece, 1986). If an organisation can unlock this capacity, the value of understanding and quick-adapting to new customer needs could be assessed (Jaworski & Kohli, 1993; Narver & Slater, 1990). Hence, an organisation has to establish technological know-how to discover new scientific solutions, but also find market know-how on when to commercialise these innovations before competitors do (Agarwal et al., 2004). It is commonly believed that this forms the basis of innovation and differentiation, which again underlie strategic renewals in high-technology markets. This is because when technological disruptions emerge, the organisation will have the ability to create opportunities alongside (Cohen & Levinthal, 1990; Daneels, 2002; Teece, Pisano & Shuen, 1997).

Scholars have found evidence that if an organisation consists of experience within an existing market, this will shape their knowledge and again influence the performance in markets. This could potentially help the company to diversify in a changing industry (Carroll et al., 1996) (Klepper & Simons, 2000; Nelson & Winter, 1982). Moreover, prior work has found that new-venture founders that possess industry experience could be a forecast of venture success (Agarwal et al., 2004). Findings indicate that people with industry-specific knowledge have advantages of human capital that is limited to other industry contexts (Campell, Coff & Kryscynski, 2021). The human capital is embedded in an organisation's tacit knowledge, which is also their team-based and socially ingrained

routines (Nelson & Winter, 1982; Berman, Down, & Hill, 2002; Hitt et al., 2001; Lepak & Snell, 1999) (Szulanski, 2000). Organisations that are in possession of this could therefore threaten new technology companies, as this knowledge to a degree is not possible to spillover (Stinchcombe & Heimer, 1988; Zucker, Darby & Brewer, 1998). This is according to Inzerille & Rose (1983) and Meek (1988) found that when employees internalise an organisation's culture, they also absorb procedural and declarative knowledge related to their research and development and marketing.

However, difficulties are discovered in finding to which extent knowledge spillovers are protected (Arrow, 1962) and how efficient this tacit knowledge is in the industry (Liebeskind, 1996). Researchers argue that knowledge could be reproduced and transferred across a company's boundaries through employee migration to some extent (Almeida & Kogut, 1999). This could therefore lead to new venture formations, product-market strategies, and company survival (Agarwal et al., 2004). Agarwal et al., (2004) furthermore argue that immutable quality that firmly drives performance, can decay. Organisations are thus dependent on new acquired knowledge and expertise. This argument is supported by Gompers et al. (2010) in that organisations that have acquired industry change experience could originate their prior success in new changes which could lead to a decay in their succession rate. Parker (2013) discussed that expertise can decline as industries are in a 'switching behavior' and the effect of using prior success in industry changes. In relation to this, Eggers & Song (2015) found in their studies that an incidence of failure in a previous venture also may lead to industry changes. However, whether the effect of change in behavior of learning is positive or negative is difficult to sense. This arises from that organisations tend to blame external factors for failures and credit their own actions for successes (Jones & Harris, 1967; Weiner, 1985). From other scholars, this is also used to explain a range from how leadership is performed in an organisation (Weber et al., 2001), how the capabilities develop, and how organisations are learning from success and failure (Bingham & Davis, 2012; Lant, Miliken & Batra, 1992; Repenning & Sterman, 2002)

As aforementioned, a lot of research in the field has tried to explain the importance of experience that can interlink to a specific industry in the face of industry changes. Still, as studies from Eggers & Song (2015) and others show, the importance of expertise within strategy establishment, management style, and decision-making style should be highlighted. This originates in that such knowledge may not be as specific and thus could be more rapidly changed and adapted to meet new conditions in the

changing industry. This can accordingly lead to easier organisational adaptations in new developments and innovations (Eggers & Song, 2015).

3.2.1 Port Industry

Extensive and disruptive changes can be found in many industries today. In the port industry, such comprehensive adaptations have been identified in the last decades, and are still occurring (Heilig et al., 2017b). Apart from a decline in the transport of goods in 2009 due to the financial crisis, there has been a steady increase in global container traffic every year. This has led to the fact that over 90% of the world's goods today are being transported overseas (Göpfert & Braun, 2008). As globalisation is advancing, as well as the progress of containerisation of general cargo, further increase in the maritime industry is expected (Fruth, 2016). In combination with their significant use of networking and high level of interfaces, it is thus one of the key sectors for digital transformation (Fruth & Teuteberg, 2017). As electronic revolutions with big data analytics and networking of technologies increase, the industry will change accordingly in traffic, port logistics, and just-in-time shipping. Moreover, it is forecasted that the unused data that is gathered from individual ships can be used through new business models. This model opens up for data exchange from ship to ship, ship to land, and on the hinterland. Hence, it could improve the efficiency, safety, and data security of navigation and communication (Berg & Hauer, 2015). According to Carlan et al., (2017), the port sector can furthermore experience cost savings, increased quality, and further growth by implementing digital innovations.

However, Carlan et al., (2017) also find in their studies that the port industry is experiencing barriers in information and communication (ICT) innovations with "*lack of collaboration by other actors, need for further integration along the maritime supply chain, uncertainty about legislation, and drifting apart of the local needs and the strategic decisions made by headquarters as a result of globalization*" (p. 88). In addition, the new pressure of smart logistics has become a concern for researchers to find and track the prediction for future solutions. As the supply chain is currently uncertain and undefined, the work is not enough to define the effectiveness and intelligence it should provide to the port industry (Douaioui et al., 2018). Especially since the port logistics is constructed on a multitude of actors who interact and share resources to co-produce value, it becomes a complex system (Ciasullo et al., 2016). This has accordingly led to several researchers and development

projects highlighting concerns towards building innovative solutions that demand complex measures for ports (Douaioui et al., 2018).

Furthermore, literature has shown that the port industry is currently lacking behind in the investment decision in transport ICT developments (Carlan et al., 2017). From Tyrinopoulos et al., (2015), it is discovered that road transport currently has marked advantages as they started to develop ICT solutions over 30 years ago. This emerged from external pressures of delivering a more environmental and sustainable transport, which accordingly led to a now beneficial position in cargo flow, technological advancements, and correct strategising (Tyrinopoulos et al., 2015). Van der Horst & De Langen (2008) have enumerated several coordination arrangements and brought communication platforms to prominent positions for ports. With this, they highlight that digital innovation is an important parameter in addition to costs, geographical location, and services to remain competitive in the industry. The ICT developments can help to find communication platforms that monitor equipment and cargo, and at the same time enhance information sharing between port stakeholders (Notteboom & Winkelmans, 2002; Van der Horst & De Langen, 2008). It is further recognised that ICT platforms can optimise the ports' infrastructure capacity usage, whereas ports previously were confronted with excess capacity. Carlan et al., (2017) find that these ICT platforms can lead to competitive advantages, but "*extra effort is required to improve the strategic process leading to integration with other actors, while there is a crealy a win for the objective 'cost reduction'"* (Carlan et al., 2017 p. 79). However, the possible benefits are not always visible, which often is resulting in a low willingness to pay. Moreover, the cost of digital tools does also influence the willingness. An evaluation on whether the IT system should be customised or integrated across different ports must therefore be recognised (Carlan et al., 2017).

As the port industry includes many interlinked and interrelated actors who may not achieve their interests the same way or even share the same interests, it is recognised by scholars to motivate all actors and facilitate their involvement in the implementation. This locks issues in alignment between company strategies and success degrees that could lead to integration (Sys et al., 2016) (Carlan et al., 2017). The current digital transformation is also regarded critically as technology and information cause ethics- and moral problems to arise (Bendel, 2015). Consequently, data protection and data security are brought up as a central role in the implementation strategy to protect the company's internal infrastructural and operation systems (Schweer & Sahl, 2016).

Recent publications on the port industry cover a broad spectrum and highlight areas that require development. It is however argued that there does not exist a systematic literature review on digitalisation in maritime logistics today (Fruth & Teuteberg, 2017). Still, from recent articles, it is displayed that to succeed in the digital transformation of the port industry, the ports are highly dependent on the alignment of strategies as well as cooperation among stakeholders (Heilig et al., 2017a). Moreover, "*does the transformation occur at different levels, which leads to a necessity of a collaborative strategy and structure to govern joint actions for pursuing the achievement of mutual benefits*" (Heilig et al., 2017 p. 15). The success is therefore now recognised to not only lie within the adoption of technologies but also in *how* you adapt it to the organisational structure. With this recognition of the required alignment, the need to consider intra-inter and meta-organisational perspectives, as well as resulting costs and benefits of digital transformation, is highlighted together with an observation that more research is needed in this regard (Heilig et al., 2017a and b). On this notion, this thesis therefore wants to contribute to filling this current gap in digital transformation in the port industry.

Considering the above literature collectively, there is a need to investigate the challenges and potential benefits that the port industry faces today in order to successfully implement digital technology. The focus on identity is a key concept for the SMPs to sense and seize possible threats and opportunities that emerge with the changing industry and identity. Moreover, the concept of strategy is essential in conveying the necessity of a digital change as well as to create understanding and endorsement amongst organisational members regarding new digital- and technological solutions. These considerations will simultaneously contribute to a beneficial digital transformation of the SMPs as the unfamiliarities are weighted more adequately. Hence, the SMPs can access the possible benefits of becoming more digitalised when these components are considered.

4. Theoretical Frameworks

This section presents the theoretical concepts that will be applied for analysing the data and answering the research question. The theoretical frameworks of this thesis were disclosed through the abductive and iterative research approach of reviewing theory, conducting knowledge from the collected interviews, and finally reflecting it in theoretical decisions for the analysis. The first part of the section takes on a three-folded structure, where the theoretical concepts of *Organisational Responses to Identity Threats,* sensemaking and dynamic capabilities will be presented in detail together with an explanation of how they will be utilised in this thesis. Thereafter, the second part seeks to connect the three presented theoretical concepts and outline how they together contribute in explaining this thesis' phenomenon of interest.

4.1 Organisational Responses to Identity Threats

The problem statement brings out a macro perspective on the changes that occur internally in SMP's due to external challenges in the environment. Ravasi and Schultz's (2006) theoretical model of *Organisational responses to identity threats* is therefore found applicable as these changes transpire internally by external pressure, which causes changes in their previously known identity. Moreover, the model proves relevant in highlighting the importance of responding to the identity changes to avoid unnecessary challenges that are associated with shifting external claims and associations within the organisation.

Research on organisational identities suggests that collective self-perceptions and self-categorisations may be challenged when changes in the external environment call into question members' beliefs about the central and distinctive attributes of an organisation. These disrupting events are on a general basis referred to as 'identity threats' (Ravasi & Schultz, 2006). Built on a longitudinal field study of organisational responses to identity-threatening environmental changes, Ravasi & Schultz (2006) present in their article a theoretical model that exemplifies how these responses cause members to question elements of their organisation's identity. It examines how the culture within organisations, defined as "*(...) as a set of shared mental assumptions that guide interpretation and action in organisations by defining appropriate behavior for various situations*" (p. 437), helps in shaping responses to identity threats, and how identity dynamics are driven by this alongside external images. The conceptual framework is overall an understanding of how interactions amongst external stimuli,

internal sensemaking- and sensegiving processes drive organisational identity understanding, whereas their findings provide *"evidence of a dynamic relationship between organizational culture, identity and image (...)"* (Ravasi & Schulz, 2006, p. 433).

According to Ravasi & Schultz's (2006) framework, external threats should be responded to by revising organisational identity claims through making sense of the current identity. The identity claim should be reflected on "*What is this organisation really about?*" (p. 441). Five phases are suggested by the authors in responding to identity threats. In the first phase, the organisation should address the external challenges to the organisational identity. In the second phase, reflections upon the external- and internal perception of what the organisation is about are needed. This leads to the third phase, which is the construction of identity claims, incorporating what the organisation wants to be about. The fourth phase is the one of giving sense of organisational identity, whereas the new identity claims serve as a foundation. In this phase, the identity claims will both be communicated to external stakeholders conveying the desired identity and embedded internally into the organisational culture. Hence, the organisation will preserve a collective self in the atmosphere of change. This will in turn lead to the fifth phase of revised identity understanding, leading to an overall alignment for the collective understanding of the identity of the organisation.

Figure 1 below provides an illustration of Ravasi & Schultz (2006) theoretical model of *Organsiational Responses to Identity Threats*:

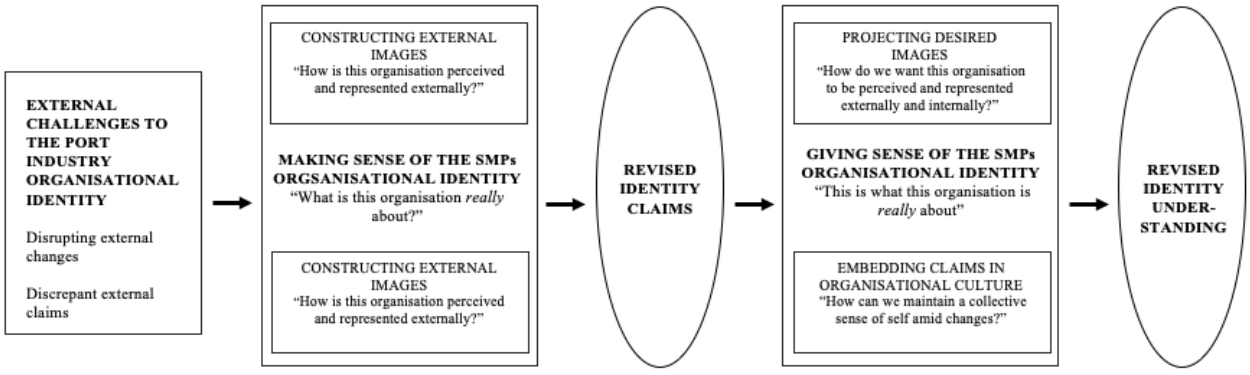

Figure 1: Organisational Responses to Identity Threats: A Theoretical Model. Source: Own illustration based on Ravasi & Schultz (2006)

It can be argued that the model has a twofold purpose in this thesis: First, it will contribute to locate the current external changes that challenge the conceptualisations in the port industry. Second, the model will assist in investigating how the SMPs are finding a collective understanding of 'who they are as an organisation' and 'who they want to be', by projecting the desired image and embedding claims in the organisational culture. With this, the idea is that the SMPs will be able to adapt and respond to external challenges and find a revised identity understanding. For the participating ports in the NON-STOP project, utilising the model will thus accentuate how the ports view their current identity and how they should respond to the identity threat of the increasing digitalisation in the industry.

4.2 Sensemaking

In order to answer the guiding questions of this thesis, sensemaking plays a contributing factor. The concept is a central part of Ravasi & Schultz's (2006) above-introduced model of *Organisational responses to identity threats* and will in this thesis contribute in analysing how the port management due to the external challenges make sense of what the organisation is about, and how they desire to give sense to new revised identity claims. Hence, sensemaking is a theoretical concept that needs to be further outlined and explained prior to the analysis.

The concept of sensemaking holds origins in organisational studies and social psychology, with a focus on micro-processes within organisations (Weick, 1995). Being an extensively discussed concept for decades, several different interpretations of sensemaking can be found in the literature (e.g. Stigliani & Ravasi, 2012; Gephart, 1993). Despite no clear definition, an emergent consensus is that sensemaking is understood to be the cognitive process by which individuals construct interpretations of ambiguous, equivocal, and confusing environmental stimuli (Colville et al., 2012; Weick, 1995). From here, it is evident that sensemaking occurs when people are faced with uncertain situations, implying that organisational changes create frequent opportunities for sensemaking. When facing turbulent times in a chaotic and changing world, members tend to create their own temporality through the past, present, and future. Here, sensemaking helps in guiding the members through future actions and by providing horizons of possibilities (Hernes & Maitlis, 2010). This understanding of sensemaking is adopted by Ravasi & Schultz (2006) in their theoretical model of *Organisational responses to identity threats*, in which this thesis follows. Consequently, this perception of sensemaking will also provide the basic understanding in this thesis.

Utilising this understanding of sensemaking requires one to be aware of an essential distinction between 'ambiguity' and 'equivocality', two terms often mistakenly used as synonyms (Brown et al., 2015). Whereas lessening ambiguity implies that "*through action you can learn to discount what might have been going on and reach an answer to the question as to what is going on*" (Colville et al., 2012, p. 7), reducing equivocality proposes that "*action does not clarify by allowing you to eliminate 'lack of clarity' but that action clarifies by shaping what it is that you are attending to and in the doing, shapes what is going on*" (Colville et al., 2012, p. 7). According to Brown et al. (2015), this distinction is similar to that made by Weick (1995) between 'interpretation' and 'sensemaking'. Weick (1995) argues that interpretation suggests there is already something in the world waiting to be discovered, that will be found once ambiguity is cleared. On the other hand, sensemaking refers to processes by which "*people generate what they interpret"* (Weick, 1995, p. 13) - thus, being less about discovery than invention. Hence, referring to 'reduction of equivocality' is valuable as it recognises that sensemaking is about *both* discovery *and* invention (Brown et al., 2015). By experiencing equivocality, individuals are led to excerpt and understand environmental cues that help them in 'making sense' of circumstances and enacting their environment. Hereby, it is not only interpretation and meaning production that is included in sensemaking, but the "*active authoring of the situations in which reflexive actors are embedded and are attempting to comprehend*" (Brown et al., 2015, p. 267).

Sensemaking can according to Brown et al. (2015) be categorised into five different themes (Appx. 5). One of them is 'sensemaking as a discourse', which can be explained as a process whereby people create their own individual perspective to reflect their perception of an event. By establishing this individual reality, people are allowed to change the storyline or exclude particular details, which further is collectively shared (Brown et al., 2015). As their individual interpretations of the situation are being shared, a collective understanding amongst the members is created. As pointed out by Brown et al. (2015, p. 269), "*Sensemaking stories (...) permit actors to maneuver between contradictions, to ignore and to gloss ambiguities, to both mask and disclose emotional responses and intellectual positions, to simultaneously make and unravel sense in organisational settings*". Hence, in understanding organisational phenomenon, discourse serves as a useful tool (Alvesson & Kärreman, 2011). Discourse can be any form of oral and/or textual communication, e.g. systematic utterances on a matter, epochal defining historically rooted systems of ideas, or a linguistic interaction

(Kärreman, 2014). In this thesis, sensemaking through discourse is analysed in the form of utterances from the port management on the challenges the SMPs are facing in the industry.

By including sensemaking theory it is possible to bring clarity about the new identity of an organisation. As sensemaking is aimed at building new interpretations by revising old conceptions of central and distinctive features, it can help to clarify for the SMPs and the port management which actions will lead to making sense of their identity. Hence, sensemaking can stimulate the port management to take measures and resolve the complexity of their changing identity, claims, and beliefs and make new sense. Sensemaking could thus help to investigate how the SMPs make sense of the ongoing challenges, and additionally, how they give sense to them. As argued from Weick (1995), sensemaking occurs when people are in uncertain situations. Accordingly, sensemaking theory can contribute to aligning the organisation, and revise a desired future identity.

4.3 Dynamic Capabilities

The theory of dynamic capabilities focuses on the role of management in building and adapting core competencies to address rapidly changing environments, with a core consisting of sensing- and seizing threats and opportunities (Harreld et al., 2007). When done properly, this can provide an organisation with sustained competitive advantages, however, a lack of it may cause identity threats to arise (Liu, 2006). Beyond sensemaking, the concept of dynamic capabilities thus also appears relevant in relation to the model of *Organisational responses to identity threats* presented by Ravasi & Schultz (2006) and will be further outlined and explained through this section.

Whereas traditional theories of strategy often view it as being static and unchanging, theories of dynamic capabilities provide a differing view. Such theories indicate that organisations can only benefit from competitive advantages if their capabilities correlate to the environment in which it operates in ways that are valuable to the customer but difficult for competitors to imitate (Harreld et al., 2007). As the environment continuously is changing, competitive advantages need to do so as well (Tallman, 2006). If an organisation solely focuses on developing capabilities that will provide advantages in the *current* environment, the organisation will lose track of investing in competencies that potentially could be successful in the future (Liu, 2006). Consequently, the organisation is investing in a set of activities that gradually are becoming less relevant. Over time, these capabilities are rendered obsolete and the organisation could potentially find itself in a competency trap (Tallman,

2006). Hence, it is the ability to adapt and extend already existing competencies that differentiate dynamic capabilities from other strategic frameworks (e.g. Porter's Five Forces, the resource-based view on strategy and game theory) (Harreld et al., 2007).

This ability, however, is dependent on senior management's ability to perform two vital tasks (Harreld et al., 2007). Firstly, the management team must be able to precisely *sense* changes in the competitive environment. This includes potential shifts in competition, customers, technology, and regulation. Secondly, these threats and opportunities must be acted on. Hence, the senior management must be able to *seize* them by redesigning both tangible- and intangible assets to comply with new challenges (Harreld et al., 2007). These tasks are fundamental for an organisation to survive and grow over time, and according to Teece et al., (1997, p. 515) "*Winners in the global marketplace have been firms that can demonstrate timely responsiveness and rapid flexible product innovation, coupled with the management capability to effectively coordinate and re-deploy internal and external competencies*". In the words of Harreld et al. (2007), this could be translated into the fact that managers need to possess both "*strategic insight and strategic execution*" (p. 25). For long-term success, one without the other is insufficient as the competitive environment is constantly changing. Holding competencies and resources but lacking dynamic capabilities may create a competitive return in the short-term, but will unlikely be able to sustain this in the face of change in the long run (Harreld et al., 2007)

Dynamic capabilities theory is applicable for this thesis as it highlights the importance of building and adapting competencies to meet the changing environment. If the SMPs are *sensing* and *seizing* the threats and opportunities in the developing industry, this could provide them with sustained competitive advantages. However, if they do not strategise accordingly it can cause identity threats to arise. The theory of dynamic capabilities will thus contribute to the thesis by highlighting which challenges the SMPs have *sensed* in the changing port industry. Correspondingly, it will bring knowledge on how the SMPs have *seized* these threats and opportunities to redesign their assets and strategies to comply with the challenges. By using dynamic capabilities the SMPs will therefore be able to invest in competencies that are successful in the future, and prevent avoidable identity threats and claims.

4.4 Connecting the Theoretical Concepts

The background and literature review of this thesis display that the port industry has experienced, and are currently experiencing, external changes. These changes are argued to be substantial as they occur rapidly and hence cause challenges that need to be addressed. For the SMPs to be successful in changing their organisation and adapt their identity, a collective understanding of the intended purpose and results has to be established. To construct this understanding, the SMPs must incorporate fundamental tools to stay competitive in the industry. This is as according to literature crucial to survive. Currently, there is a gap in the changes that SMPs are experiencing today, how they are impacting the industry, and which tools the SMPs should apply to construct the desired external perception of the organisation. Therefore, this thesis aims to contribute to this field of research by helping the SMPs to address the external challenges in the environment successfully and construct a common future identity.

On this notion, the three presented theoretical concepts can be viewed in an alignment. The theoretical model of Ravasi and Schultz (2006) will be applied as the overall framework in the analysis. Dynamic capabilities will be enforced when investigating the external challenges that threaten the identity of the SMPs, which happens in the first phase of the model. Moreover, dynamic capabilities will analyse how the ports have sensed and seized these changes so far. This will locate an understanding of the potential identity threat that is occurring. In the next phases of the model, sensemaking will be utilised to analyse how the port management is currently making sense of what the SMPs are really about and how they desire to give sense to these new revised identity claims. Finally, the revised identity understanding will be investigated. Here, both dynamic capabilities and sensemaking will be used as tools to help the SMPs to collect a common understanding of their new identity, and also establish a new way of strategising in the future.

5. Philosophy of Science

The following section will outline the philosophy of science of this thesis. Establishing the research paradigm in which a thesis takes place is important to be able to "*understand and articulate beliefs about the nature of reality, what can be known about it and how we go about attaining this knowledge*" (Rehman & Alharti, 2016, p. 1). In other words, making explicit the ontology and epistemology of this thesis are essential to create openness around our research method and the following results (Nygaard, 2012).

The research paradigm, in this thesis being social constructivism, will thus in this section be outlined based on the central scientific concepts of 1) ontology and 2) epistemology to provide a better understanding of the importance and relevance of our study. Both subsections will start with a general introduction to the scientific concept, before diving into an explanation of how this view is particularly in the social constructivism. Lastly, it will be explained why the social constructivism paradigm is considered appropriate for our research.

5.1 Ontology

According to Nygaard (2012), three components are constituting a research paradigm: ontology, epistemology, and methodology, whereas ontology could be considered the first level regarding the most abstract question. In fact, ontology concerns the study of the nature of being, in short referring to the question of what we perceive to be the nature of the world (Justesen & Mik-Meyer, 2010). A researcher's ontological assumptions are thus contributing in shaping how we view and study our research objects. Within ontology, it is central to distinguish between realism and constructivism, in which the former believes in an independent reality whereas the latter proclaims that reality is a product of social processes (Egholm, 2014).

In social constructivism, the ontological starting point is that *"(...) reality, to varying degrees and due to different social factors, is socially constructed"* (Spindler, 2013, p. 198). Hence, the social constructivist view on the nature of the world is challenging to the positivistic idea of ontology where reality instead exists irrespective of people, by pointing towards reality as a human construct. Furthermore, social constructivism assumes that what could be known about reality is how and why individuals through 'social factors and interactions' such as shared meanings, norms, ideas, language,

culture, and texts assign meaning to reality (Spindler, 2013). Meaning is essential due to being constitutive of the actors' behaviours, as it reveals the individual's state of mind. Hence, reality, and our knowledge hereof, cannot be understood independently of the social actors, as they construct and make sense of the reality (Orlikowski & Baroudi, 1991). Moreover, the ontological foundation in social constructivism believes that social reality only can be interpreted, unlike positivism where researchers are assumed to 'discover' an objective social reality. Researchers of social constructivism recognise that as *"(...) meanings are formed, transformed and used, they are also negotiated, and hence that interpretations of reality may shift over time as circumstances and constituents change"* (Orlikowski & Baroudi, 1991, p. 15).

5.2 Epistemology

Where ontology concerns the study of the nature of being and the part of reality that we objectify in our study, epistemology regards our ability to attain *knowledge* of this subject area (Justesen & Mik-Meyer, 2010). The epistemological assumption thus implies which underlying premises are used to appraise knowledge, hence, which knowledge can be regarded as acceptable, legitimate, and valid. Compared to ontology which initially may seem rather abstract, the relevance of epistemology is thus more obvious (Saunders et al., 2019). Within epistemology, the central distinction occurs between objectivity and subjectivity, dealing with whether or not we can acquire knowledge about the world as it is without it being distorted by human cognition (Egholm, 2014).

The epistemological starting point of social constructivism is that *"(...) social process is not captured by hypothetical deductions, covariances, and degrees of freedom"* (Orlikowski & Baroudi, 1991, p. 15). Instead, the belief is that a full understanding of social processes can only be obtained by getting involved in the world of those who are generating it. This puts social constructivism in a challenging position to a positivist epistemology, where theory only can be considered true by time and again not being falsified by empirical events. Hence, researchers in social constructivism can only understand the social reality by spending time inside the social world of those who generate it and thus create an understanding of how practices and meanings are formed by the language and norms shared by people working in it (Tuli, 2010; Orlikowski & Baroudi, 1991). What is accepted as true knowledge is the meaning these individuals use to characterise this social world, as this meaning is what creates the social world. Consequently, the epistemological belief is colored by subjectivity, as reality is

constructed through conversation and discourse, and knowledge cannot be obtained without human intervention (Saunders et al, 2019).

5.3 Social Constructivism in Relation to this Research

Our thesis is located within social sciences as we are investigating a digital transformation in SMPs, i.e. in organisations, within the human society. Furthermore, a social constructivist entry to our study is considered useful as we through the use of Ravasi & Schultz's (2006) theoretical framework adopt a view of identity that holds partly a social constructivist perspective. Our view of organisational identity thus includes viewing identity as something *"(...) that resides in shared interpretive schemes that members collectively construct in order to provide meaning to their experience*" (Ravasi & Schultz, 2006, p. 435). Additionally, our view on identity is based on the idea that identity arises from sensemaking- and sensegiving processes. Through the use of sensemaking, we perceive shared understandings as "(…) *a result of sensemaking processes carried out by members as they interrogate themselves on central and distinctive features of their organisation*" (Ravasi & Schultz, 2006, p. 434) – which is in alignment with a social constructivist mindset.

By adopting a view inspired by social constructivism, we as researchers are also contributing to form the social constructions that exist within the SMPs, as we are influenced by our perceptions as observers. This means that we as researchers are subjects who help to create the reality we perceive. At the same time, it also means that the port managers are subjects who themselves help to create their own reality by their perception of reality. For a constructivist, the world is constructed of relationships (Gergen & Gergen, 2005). The focus in our research is therefore not on understanding the individual's inner world, but on how meaning is formed in and between relationships. Consequently, a specific truth does not exist, as knowledge and meaning make sense by its usefulness in a social system, such as within the SMPs.

With regards to the technology view of this thesis, technology is seen as something that creates reality together with the other actors. In other words, the reality is constructed in interaction with technology implying that a view perceiving technology and people relationally is adopted. Humans do not control technology or vice versa. We argue that without an evaluation of the socio-technical aspect, an organisation could meet interferences that create considerable obstacles to become digitalised. Our perception of technology can thus be argued to be consistent with how technology is viewed within

actor-network theory (ANT), however, as observations have not been made in this study – the ANT perspective has not been a guiding paradigm for our thesis/data collection.

6. Methodology

Having established the ontological- and epistemological foundation of this thesis, the following section will deal with the methodological approaches that are applied to gather data. Firstly, the research method will be presented, starting with characteristics of the qualitative method before moving over to the preferred research method for this particular research. Secondly, the research approach will be outlined followed by a presentation of the research design. Lastly, limitations associated with the utilised methods will be described and discussed.

6.1 Research Method

Research methods are characterised as specific procedures used for collecting and analysing data, and a prevalent distinction is made between quantitative- and qualitative methods. The quantitative research method is often used as a synonym for data collection techniques generating or using numerical data which opens for analysis based upon quantification. Quantitative methods are often associated with a positivistic philosophy of science where the general is considered interesting and meaningful, and the findings can be generalised and thus used to draw conclusions regarding resembling situations or contexts (Justesen & Mik-Meyer, 2010; Saunders et al., 2019). On the other hand, qualitative methods strive for an in-depth understanding where the focus lies more on words instead of numbers and are thus to a greater extent associated with an interpretive philosophy. Such methods prove beneficial in describing the phenomenon in context and based on this, provide an interpretation that leads to an even better understanding (Justesen & Mik-Meyer, 2019). As a researcher applying qualitative methods, one becomes able to investigate things in their natural habitats, while simultaneously trying to understand the phenomenon in terms of the meanings people give to them. Consequently, generalisation of results gathered using qualitative methods is less prominent, as the focus to a greater extent lies on providing in-depth explanations and understandings (Carminati, 2018).

6.1.1 Characteristics of the Qualitative Method

Numerous articles are written on the topic of qualitative research, and it can be difficult to navigate in the ocean of all the different sets of characteristics. However, Merriam & Tisdell (2015) provide four characteristics they identify as key to understanding the nature of qualitative research. Firstly, as touched upon in the previous paragraph, focus on meaning and understanding is central in qualitative methods. Hence, the overall purpose of qualitative researchers is to gain an understanding

of how people construct their worlds and make sense of their experiences. Additionally, the phenomenon in question should be understood from the *emic´s* perspectives rather than the *etic´s* perspective, meaning that the understanding must be from the view of the participants - not the researcher. Secondly, due to in-depth understanding being the overall purpose of qualitative methods, the researcher, due to his/her ability to be adaptive and responsive, should be the primary instrument when collecting and analysing the data. Additionally, the human instrument can expand his/her understanding through verbal- and nonverbal communication, process information quickly, clarify and summarise material as well as check with respondents for the accuracy of interpretation (Merriam & Tisdell, 2015).

The third characteristic of qualitative research according to Merriam & Tisdell (2015) is that the process should be *inductive*, meaning that the researcher should start by gathering data to be able to build hypotheses or theories. This stands in contrast to positivist research where one *deductively* is testing hypotheses. However, in practice, much qualitative research uses an *abductive* approach to theory development (Saunders et al., 2019). This will be discussed further in section 6.3 below. Lastly, the product of a qualitative study being richly descriptive is highlighted as a focal point. A qualitative researcher's discoveries about a phenomenon of study is conveyed using words and pictures rather than numbers, and *"(...) data in the form of documents, field notes, participant interviews (...) are always included in support of the findings of the study"* (Merriam & Tisdell, 2015, p. 18). This together contributes to the descriptive nature of a product in qualitative studies.

6.1.2 The Preferred Research Method

Which research methods are considered appropriate depend largely on which philosophy of science the project is grounded in (Orlikowski & Baroudi, 1991). Hence, as our thesis is grounded in social constructivism, the most instinctive research method is using the qualitative method (Nygaard, 2012). However, it is not only theory suggesting that a qualitative method will be most suitable in our thesis. We investigate three sub-questions regarding dynamic capabilities, identity, sensemaking, and strategy, which all require an in-depth understanding of the phenomenon to be answered. To achieve such an understanding, data collected through participant interviews, web-seminar, and documents is beneficial as these research methods provide us with the opportunity to disclose the thoughts, feelings, and interplay in the port management, making it possible to answer our research question. Due to the complexity of these aspects, and the need for us to maintain a holistic and descriptive approach to the

phenomenon, a quantitative research method mostly considering facts and numbers, would not provide us with the same in-depth insight into the port management of the different SMPs.

6.2 Research Approach

The research approach concerns in which way a researcher chooses to approach the theory development. Within research approaches, it is normal to divide between two main reasonings: *deduction* and *induction*. Which reasoning one should adopt depends on whether the research is concerned with theory testing or theory building (Saunders et al., 2019). Within deductive reasoning, the process starts with a theory and a related hypothesis, before proceeding through data collection where one arrives at an observed result. The result is then either verified demonstrating the hypothesis or falsified (Timmermanns & Tavory, 2012). Conversely, inductive reasoning begins with data collection and curiosity before analysing the implied result to establish a theory. The more cases of data collection that illustrate related outcomes, the more certainty is gained to the developed theory (Timmermanns & Tavory, 2012).

Additionally, a third reasoning exists in which combines the two aforementioned reasonings, moving back and forward from theory to data (as the deductive approach) and data to theory (as the inductive approach) (Suddaby, 2006). This reasoning is called an *abductive* approach and starts by making a preliminary guess based on the interplay between existing theories and data when unexpected findings occur (Timmermanns & Tavory, 2012). Hereafter, one is then devoted to finding an explanation switching between the empirical and the theoretical (Saunders et al., 2019). As previously mentioned, the inductive approach is often viewed as a characteristic when using the qualitative method, however, due to the flexibility of the abductive approach, this reasoning can be practiced within several different research philosophies. Much qualitative research is thus using an abductive approach to theory development, as will also be the case in our research. The following paragraph will further disclose our abductive approach to theory development.

Our research started with our curiosity for the area of digitalisation, as in accordance with inductive reasoning. This curiosity led to a dialogue with GEMBA Seafood Consulting, in which they wished for a managerial perspective on the NON-STOP project, more precisely, how the port management relates to the currently ongoing digital transformation. Based on the cooperation with GEMBA Seafood Consulting, we already had some insight and knowledge on the challenges occurring in the

port industry. In that sense, we had a kind of hypothesis before starting our research, which is in alignment with deductive reasoning. However, without the intention to test this hypothesis for it to be verified or falsified. Prior to gathering the data, we had a few theories in mind for the analysis, also in agreement with a deductive approach. Based on these theories, we pre-developed an interview guide and interviewed a port consultant and several port managers. After conducting these first interviews, we dived back into the chosen theory and figured that more external interviews and perspectives would be necessary to get the information we needed. Hence, we changed parts of the interview guide and moved back into the empirical world, conducting additional interviews with selected professionals within the port industry. Finally, we reexamined all the theories used in our pre-developed interview guide and decided on applying them all to highlight the different empirically observed phenomenon.

As abductive reasoning requires moving back and forth, we have illustrated the process in Figure 2 to better get an overview and understanding of the process leading up to our theory development:

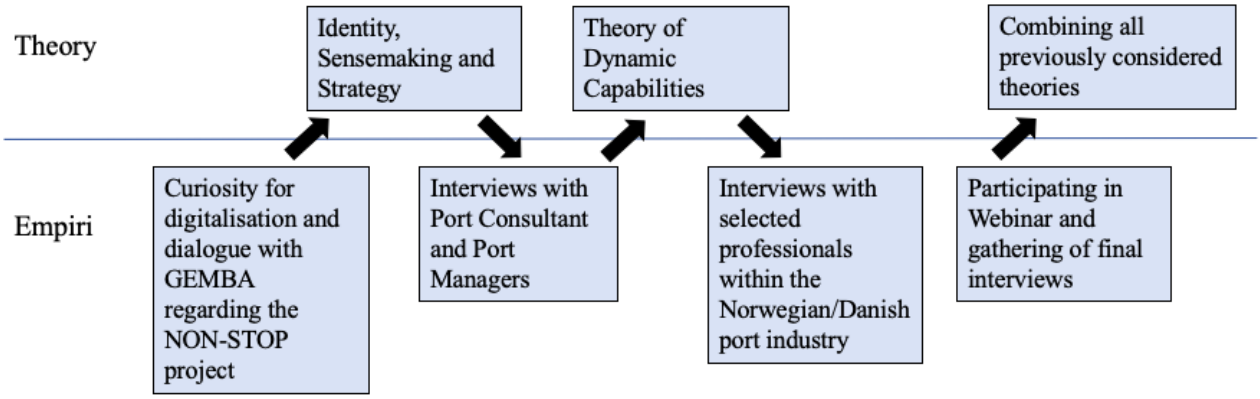

Figure 2: Own illustration of the abductive research process in our thesis

6.3 Research Design

Having established the research method and the research approach, the following section will elaborate on the research design. We have chosen to apply a case study, a well-known research method within qualitative studies.

6.3.1 Case Study

Yin (2014) defines a case study as "*an empirical inquiry that investigates a contemporary phenomenon (the 'case') in depth and within its real-world context"* (p. 16). The case study method is an acknowledged method in the field of academics and is often used to increase knowledge within individual-, group-, organisational-, social-, and other related phenomena. By extension of this, the case study method is often used within the field of psychology, sociology, political science, and social work, but can also be found in economics, e.g. when investigating the economy of a city or a region. The common denominator is that the need for a case study often arises from wishing to understand a complex social phenomenon (Saunders et al., 2019; Yin, 2014). Moreover, when the focus of a study is to answer a question of 'how' and 'why', and the boundaries between phenomenon and context may not be evident, the case study method is recognised as appropriate (Yin, 2014). In our thesis, the case study method is considered applicable as we seek to understand how small-and medium sized ports (SMPs) can access the possible benefits of becoming more digitalised. The focus is thus to provide an answer to a 'how' question, ergo, illustrating the benefit of utilising a case study method. Additionally, in alignment with the social constructivist view of this thesis, the case study method served greatly to give focus to the philosophical objective of understanding interpersonally constructed realities.

Based on Yin's (2014) three main types of case studies; explanatory, exploratory, and descriptive studies, this thesis' overall purpose argues for an exploratory case study. This type of case study is valuable when the objective is to ask open questions and the aim is to explore and clarify your understanding of an issue, problem, or phenomenon (Sauders et al., 2019). Moreover, an exploratory case study is appropriate when there is no clear set of outcomes, or when the precise nature of a phenomenon is unsure (Yin, 2014). In this thesis, we enter the phenomenon in study with curiosity, without knowing the origin or what is at stake. As we aim to examine how SMPs can access the possible benefits of becoming more digitalised, we are in need of asking open questions to clarify our

understanding of the phenomenon. Since the different port managements have differing views on which opportunities they see concerning the digital transformation, there are additionally no clear set of outcomes. Yin (2014) further differentiates between single- and multiple case studies, whereas this thesis falls into the former category due to solely investigating the NON-STOP project. However, as the project includes several different ports in which we all investigate, a single case study with embedded units is applicable. This case study method allows us to analyse data within, between, and across the different subunits (here: SMPs) in the project, in the end contributing in empowering the data collection and illuminating the case (Baxter & Jack, 2008).

6.4 Limitations

Due to the researcher's presence during data gathering- and analysis within qualitative methods, it is difficult not to obtain individual interpretations. This may create biases and affect the interviewees' responses, in the end influencing the findings of the thesis (Merriam & Tisdell, 2015). The outcomes of such interpretations are not necessarily negative; however, it is important to keep in mind that the findings presented in this thesis are coloured by our individualistic perceptions.

Within the field of academics, case studies have over the years been subject to several criticisms, one of the most prominent being that it is too context-specific due to solely investigating one single case. As a result, case studies are argued to hold the disadvantage of not necessarily producing broad and statistical findings, making it inadequate for generalisation (Dyer & Wilkins, 1991). However, Flyvbjerg (2006) is addressing this limitation in his article *Five Misunderstandings About Case-Study Research* whereas he argues that it is incorrect to conclude that one cannot generalise from one single case. He further argues that case studies can prove beneficial for scientific development through generalisation as a supplement or alternative to other methods, but also that "(...) *formal generalization is overvalued as a source of scientific development, whereas 'the force of example' is underestimated*" (Flyvbjerg, 2006, p. 228).

7. Data Collection

This chapter is dedicated to providing an in-depth description of data collection- and analysis. The chapter will start by presenting the chosen data types as well as how they were collected. Furthermore, the sample selection will be outlined and discussed, before providing a description of the ethical guidelines considered during the data collection phase. A presentation of the data analysis, including the recording-, transcribing- and coding process will follow, before closing the chapter with discussing belonging limitations.

7.1 Primary and Secondary Data

To complement the confidence in findings, both primary and secondary data constitute the data collection in this thesis. Whereas the former type is "*(...) data that the researcher collects directly*", the latter type consists of "*(...) data collected by someone else (...) who is not a part of the project*" (Matthew & Ross, 2010, p. 284). In this thesis, the gathering of primary data effectively happened through interviews and web-seminar participation, whilst secondary data was collected through academic articles, books, online newspapers, and reports.

7.1.1 Semi-Structured Interview

Interviews are one of the most widely used sources of collecting information for evidence and according to deMarrais (2004), a research interview could be defined as a *"process in which a researcher and participant engage in a conversation focused on questions related to a research study"* (p. 55). Collecting data through interviews is especially relevant when a researcher is interested in past events that are hard to replicate, as well as when observing emotions, thoughts, and people's own interpretations of the world is impossible (Merriam & Tisdell, 2015). As our intention with this thesis is to get an understanding of how small-and medium sized ports (SMPs) can access the possible benefits of becoming more digitalised, interviews are an essential source of primary data in our research.

An interview can be both a loosely structured conversation, as well as a systematic dialogue following a well-thought designed interview guide. Based on the degree of structure, an interview can therefore be either structured, semi-structured, or unstructured (Justesen & Mik-Meyer, 2012). In accordance with the abductive research approach, our research utilises semi-structured interviews. Such interviews are characterised as having a common set of topics/questions for each interview, typically

formed as 'open-ended', but without the need of introducing them the same way each time. Moreover, the participants are allowed to answer or discuss the topic in their own way as well as touching upon other topics that they find are of relevance (Matthews & Ross, 2010). The semi-structured interview is thus applicable when the research problem regards a wide-ranging problem area where the researcher needs to disclose and identify the issues relevant to understanding the situation. Justesen & Mik-Meyer (2012, p. 53) accordingly argues that this type of interview is applicable for research where it is desirable to *"adopt an exploratory approach that generates new knowledge and to stimulate interviewees' reflections on a number of pre-selected themes".* Utilising the semi-structured interview method thus granted our interviewees freedom to touch upon the inquired areas by both directly answering the questions, and indirectly answering them through subject deviation (Bryman & Bell, 2015).

7.1.2 Interview Guide

Correspondingly with the semi-structured interview method, we pre-developed a semi-structured interview guide before conducting the interviews. Accordingly, this interview guide included a combination of more and less structured questions, without predetermined wording or order and with the flexibility to add or remove questions during the interviews (Merriam & Tisdell, 2015).

As aforementioned, semi-structured interview questions are often formed as 'open-ended' to obtain descriptive and detailed data. With this in mind, we tried to create most of the pre-developed questions as open-ended, such as: "*Can you tell us about the NON-STOP project that 'X-Port' is participating in?*", "*Have you experienced any changes in the industry in recent years?*", and "*How do you imagine the port industry in 20 years?*" (Appx. 6). Rather than just providing a straightforward answer to the question, these questions allowed the interviewees to make their own reflections and tell a story about a phenomenon. As our desire was to gain insight into the world of the interviewees, this was beneficial. On the other hand, creating *all* of the pre-developed questions as open-ended proved difficult, as we also had an interest in the NON-STOP project and the roles and tasks that the different SMPs have in this. These questions were more straightforward as our desire was to gain concrete background information on the specific technology that each port was in charge of, and the strategy around this. However, these questions also opened up for personal interpretations and reflections by the interviewees, which is why they can be characterised as 'semi-closed' questions: *"Which technology do your port develop, and how do you see the role this "play" for the project?"* and *"Have*

you established a strategy in connection to implementing new digital solutions that arise in regards to the NON-STOP project?" (Appx. 6)

In order to secure well-formulated interview questions, we avoided using theoretical language. Even though our questions, as mentioned in section 4.2, were inspired by theoretical concepts, we made use of 'everyday language' when formulating the questions to the interviewees. This to avoid misunderstandings that potentially could arise due to a lack of knowledge of the theoretical concepts. We found that this measure also contributed to making it easier for the interviewees to reply in their own words.

The time horizon over which the interviews extend is a period of approximately nine weeks, whereas the first interview was conducted in late January and the last at the beginning of April. This time span allowed us to make adjustments in the interview guide as 'new' research directions were discovered along the way (Appx. 6; Appx. 7). Consistent with the abductive reasoning guiding this research, the process of adjusting the interview guide clearly illustrates moving back and forth between theory and data collection in the real world.

7.1.3 Webinar Participation

In addition to conducting semi-structured interviews, we participated in a Webinar hosted by Interreg as a part of our primary- and secondary data gathering. The Webinar took place on WebinarGeek.com on the 8th of April 2021, with the theme being 'Digitalisation Opportunities for Port Management'. Besides ourselves presenting the preliminary findings from our thesis, two other speakers presented their work on digitalisation in relation to the port industry: Cheryl Basil, Digitalisation Strategist at Port of Rotterdam talking about '*Crafting and successful implementation of digitalisation strategy in a managerial perspective'* and Robert Philipp from Hochschule Wismar University of Applied Sciences Technology speaking about '*Digital Readiness Index for Ports'*. During the presentations, we took notes of what we perceived as important information (Appx. 8) and after the Webinar, we were fortunate to get the presentation and other relevant documents sent to us from Robert Philip (Appx. 9). Together, the 'field notes' contributed to strengthening our primary data, whereas the presentation and documents sent to us post to the Webinar subsidised our secondary data.

7.2 Sample Selection and Interview Process

In this research, the interview process proceeded in a two-step manner: First, the process of sampling and second, the conducting of the actual interviews. Given that our research is interpretive, the aim was to select a sample that would provide in-depth information about the digitalisation of SMPs together with insight on how different port managements perceived this digitalisation. In order to obtain this, we used a strategy of non-probability sampling, meaning that participants are chosen for the specific purpose that the researcher wants to learn something about. This method stands in opposition to probability sampling, whereas the participants are selected randomly (Merriam & Tisdell, 2015). Within non-probability sampling, purposeful sampling is the most common form and is based on the assumption that "*the investor wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned*" (Merriam & Tisdell, 2015, p. 96). In alignment with our desires for this research, this purposeful non-probability sampling was thus considered as the most appropriate sampling strategy.

As our case study concerns the ports participating in the NON-STOP project, we identified the port managers of these ports to be essential participants to be interviewed. From Kasper Teilmann at GEMBA Seafood Consulting, we were sent a NON-STOP project description containing a list of all the relevant port managers and started contacting these managers by email in a purposive sampling manner. They were presented with information about us, the research topic, and the preliminary research question, and invited for a Teams- or phone meeting. This due to meetings in person not being possible because of the Covid-19 pandemic. Out of the seven port managers we contacted, five had the possibility to participate in an interview.

One of the managers who could not participate himself, did instead lead us to what he thought was another relevant participant - an engineer working at one of the ports. This turned out to provide us with insight into a more technical part of the NON-STOP project, however, information that contributed to a broader understanding of the activities at the port. This type of sample selection is in alignment with the 'snowball method', one of the most common types of purposeful sampling characterised by interviewees referring the researcher to other helpful informants (Merriam & Tisdell, 2015). The strategy has its name from the 'snowball' growing bigger and bigger as interviewees suggest other relevant informants to approach. In some of the interviews we conducted, we asked the

participants if they had any recommendations to other actors that could be of relevance, however, in most cases they were not able to provide us with any names.

In order to have some external interviewees that could provide us with an 'outside-in' view of the industry, we asked Kasper Teilmann if he had any recommendations for people we could contact. He hereby sent us the name of two relevant people in the Norwegian and Danish Trade Union for Ports, which we subsequently contacted in the same way as with the port managers. Both of them were interested in participating and accepted our invitation to a Teams meeting.

Through our participation in the Webinar 'Digitalisation Opportunities for Port Management', we became aware of Cheryl Baskin Sequiera - one of the head speakers in the Webinar. Cheryl Sequeira is the Digital Strategist at Port of Rotterdam, one of the largest ports in Europe. Her presentation and view of digitalisation within ports caught our interest and we believed that she would be a great contribution to our data collection due to her extensive experience within a digital strategy. We found Cheryl particularly interesting as she works for a large port and we became curious about her thoughts on what SMPs potentially could learn from the larger ports. After the webinar, we contacted Cheryl to ask if she was willing to do a short interview for our thesis. She accepted, and the interview was conducted through Teams the same afternoon.

Finally, to obtain one last external perspective of the port industry, as well as more in-depth information regarding the NON-STOP project, Kasper was asked if he was willing to participate in an interview. Due to our collaboration with GEMBA Seafood Consulting and the NON-STOP project, the contact with Kasper was already established, so a formal introduction of the thesis and research objectives was not necessary in this regard. Kasper accepted our proposal, and as with the other participants, his interview was also conducted online using Teams.

Table 1 illustrates the final list of research participants:

Interviewee	Title/Position	Country	Name of Port (if relevant)
Jesper Schrøder	Port Manager	Denmark	Port of Helsingør
Janis Habdank	Engineer	Germany	Port of Emden
Wim Stubbe	Business Development Manager	Belgium	Port of Oostende
Jimmi Jørgensen	Port Manager	Denmark	Port of Korsør
Jeroen van Der Ende	Port Manager	The Netherlands	Port of Zwolle
Arnt Einar Litsheim	Director, Norwegian Ports	Norway	
Eva Fiil Nielsen	Business Policy Consultant, Danish Ports	Denmark	
Cheryl Baskin Sequiera	Digital Strategist	The Netherlands	Port of Rotterdam
Kasper Teilmann	Partner at GEMBA Seafood Consulting	Denmark	

Table 1: Overview of interviewees participating in the research

Having established the sampling selection, the next part of the interview process was conducting the interviews. Prior to every interview, we gained the interviewees' consent to record and after this permission was established, we started recording. When conducting the interviews, we used Gilham (2005)'s three phases as a guiding line on how to structure the process (Justesen & Mik-Meyer, 2010). Consequently, we started by introducing ourselves and explaining the purpose of the study/interview as well as providing a time frame on how long we expected the interview to last (typically 40-45 minutes). Following this, we briefly explained the context of our main questions to ensure that the questions were understood by the interviewee. Especially since the interviews were conducted online,

we were careful to show our interest in their answers and we posed sub-questions if there was something we found hard to understand, to prevent misunderstandings.

As mentioned in section 5.1.2, we posed 'open-ended' and 'semi-closed' questions, always starting with "*Can you please give us an introduction to your role/title at 'X-Port' and what are some of the main work tasks/responsibilities at the port?*" (Appx. 6). Opening with this question, not asking for any opinion but just general information about the person's work, created a space where the interviewee could feel comfortable. Once we felt that the interviewee was comfortable in his/her situation, we moved over to discuss his/her experience with digitalisation and changes within the industry. A series of supplementary cues and follow-up questions were used to prompt the interviewee to provide greater details. However, we made sure not to be intrusive and create bias, so when the interviewee gave closure to the question, we did not push any further for answers. Lastly, when the interviews came to an end, we checked our interview guide to ensure that we had received answers to all of our main questions. Before closing off, we asked if the interviewee did have any questions or any wishes to add and expressed our gratitude for his/her participation.

7.3 Research Ethics

When going through the process of collecting qualitative data, it is important to remain ethical out of respect for the subjects participating in the research (Saunders et al., 2019). In this paragraph, several ethical concerns will be outlined and how we as researchers have strived to comply with these considerations.

The first step to ensure ethicality in our research was to recognise Susanne's work as a Researcher and Analyst in GEMBA Seafood Consulting and how this fact of employment contributed to our commitment to writing the thesis. We made this relation transparent to the contacted participants of the case study by reaching out to them through Susanne's company email and signing off with her company signature on all emails with the participants (Appx. 10). Moreover, transparency was also assured by disclosing the nature and purpose of the requested collaborations. This was achieved by informing the participants prior to the data collection that the interviews would serve a Master's Thesis written by students on Cand. Merc. Strategy, Organisation, and Leadership at Copenhagen Business School. By doing this, risks of suspicions for potentially wrongful purposes of the thesis were addressed.

Another ethical principle to consider when doing qualitative research is informed consent (Saunders et al., 2019). Informed consent regards the fact that research participants are fully informed about what participating in the research project will involve and providing them with the opportunity to decide whether or not they desire to participate (Wiles, 2013). To comply with this ethical concern, we provided all interviewees with an introduction to our project and informed them about their role as contributors of highly valued information. We also stressed that the interviewees could leave the interview at any time, or choose not to answer particular questions, without any consequences if they felt that anything was transboundary or uncomfortable. Furthermore, another important ethical principle to consider is the concept of confidentiality (Saunders et al., 2019). Confidentiality in research means having an agreement with the participants on what to do with, and how to handle, the data resulting from their contribution. Herein lies the importance of whether the interviewees would like to maintain their anonymity (Saunders et al., 2019). Together with our interviewees, it was decided that anonymity was not a requirement. In the analysis, however, they are referred to as their title and location as this provides a better understanding of the arguments than their name. Lastly, an ethical concern was secured by sending the transcribed interviews to all participants. This allowed them to read and confirm if the content was interpreted correctly and provided them with an opportunity to remove parts of the interview if desired.

7.4 Data Analysis

Data collection- and analysis are an interrelated and dynamic set of processes when doing qualitative research (Saunders et al., 2019). Even though the section of data analysis follows the section of data collection, the two processes to a large extent happen simultaneously. Data analysis is undertaken both during- and after the collection of data and contributes to shaping the direction of the data collection (Saunders et al., 2019; Merriam & Tisdell, 2015). Merriam & Tisdell (2015) argue that the main contribution of the data analysis is to make sense of the collected data, consequently illustrating the need to consolidate and interpret the conducted interviews. The following paragraphs will thus describe our process of data analysis, i.e. how we recorded, transcribed, and coded our collected data.

7.4.1 Recording and Transcribing

As stated in section 7.2, we acquired the participants' consent to audio-record the interviews prior to conducting every interview. The audio recordings made it possible to fully concentrate on the subject

and dynamic of the interviews (Kvale & Brinkmann, 2015), as well as providing us with the ability to analyse and interpret the interviews posterior to conducting them. After every interview, we thus got a new audio recording, which left us with nine recordings that needed to be interpreted and structured. We figured that the best way to do this was by transcribing the interviews from oral to written form, which according to Kvale & Brinkmann (2015) structures the interview dialog into a form suitable for further analysis. This again helps in establishing an initial analytical process. Reproducing verbatim as a word-process account, however, is a time-consuming process as differences between oral and written text may raise both practical and fundamental questions (Kvale & Brinkmann, 2015). Moreover, transcribing an interview does not only require writing down what was said and by whom, but also to "*(...) try to give an indication of the tone in which it was said and the participants' non-verbal communications*" (Saunders et al., 2019, p. 645) to avoid leaving out important incidents that express something about the context of the interview.

With this in mind, we decided to keep the language literal, hence, to write the same words as what was said in the original recording. However, we agreed to exclude small words such as "*ehm*" and "*øh*" that were repeated time and again. Moreover, we transcribed the interviews in the language they were conducted in to make the original phrases and understanding of the subjects as authentic as possible. The interviews conducted in English are thus transcribed in English, whereas the interviews conducted in Danish and Norwegian are transcribed in Norwegian. This due to the similarity of the Danish and Norwegian written language. Consequently, with these interviews, we did not translate any text into English before deciding upon which quotes were relevant for our analysis.

7.4.2 Coding

Coding involves characterising a unit of data within the transcript with a code that summarises the meaning of that quotation. The act of coding is thus a key element in data analysis, as it helps to handle the data to rearrange and recapture it under relevant codes (Saunders et al., 2019). The chosen coding approach in this thesis is based on the coding method used by Ravasi & Schultz (200) and is carried out using NVivo. NVivo is an analytical tool frequently used when analysing qualitative data (QSR International, 2021), and contributed to making the coding process more structured and manageable.

With Ravasi & Schultz's (2014) method of coding as a point of reference, we chose to build the coding categories on the 'Stages of Response to Identity Threats', as these steps contribute to forming the basis of our analysis. These steps, and hence also our initial coding categories, are: 'External Challenges to Organisational Identity', 'Constructing External Images', 'Reflecting on Cultural Practices and Artifacts', 'Revised Identity Claims', 'Projecting Desired Images' and 'Embedding Claims in Organisational Culture' (Ravasi & Schultz, 2006). Coding our data this way, that is with codes derived from prior conceptual work, is in alignment with a deductive approach as we apply 'a priori' codes to our data (Saunders et al., 2019). However, we found that solely coding our data into these 'a priori' codes was not sufficient for our study. One reason for this is that Ravasi & Schultz (2006) did a study of only one company (Bang & Olufsen), whereas we are doing research including several ports. Having data from several ports opens for opposing views on some matters, which led us to find that important information would have been omitted if we did not create an additional coding category that caught these segments. This category we named 'Misalignments'. Consequently, our coding procedure is in alignment with our abductive research approach as part of our coding is deductive, due to having codes derived from existing literature, as well as partly inductive, due to deriving a new coding label from our data (Saunders et al., 2019).

Having coded all of the interviews, we ended up with the following output in NVivo, where 'Name' corresponds to the coding categories, 'Files' shows the number of interviews who are present within a code, and 'References' corresponds to the number of quotations included within the coding category:

Name	Files	References
Constructing External Images	9	40
Embedding Claims and Organisational Culture	9	60
External Challenges to Organizational Identity	9	42
Misalignments	9	34
Projecting Desired Images	9	62
Reflecting on Cultural Practices and Artifacts	9	54
Revised Identity Claim	5	12

Figure 3: Output of the primary coding categories in NVivo.

As illustrated above, some of the codes such as ‘Projecting Desired Images’ and ‘Embedding Claims and Organisational Culture’, attract a large number of data whereas only nine quotations/sections constitute the code of ‘Revised Identity Claims’. As the codes with a large number of quotations proved hard to navigate within, we recognised the need to subdivide the codes even more. Once again with inspiration from Ravasi & Schultz (2006), we thus categorised the data in each of the coding categories into whether we considered it as ‘Strong Evidence’, ‘Moderate Evidence’ or ‘Sporadic Evidence’. We are aware of the fact that in the article, Ravasi & Schultz utilise these categories in order to evaluate *sources* and their levels of empirical evidence, however, we figured that this would be a good way to further classify the quotations within a single coding category. As an example, data was considered as ‘strong evidence’ if it was mentioned by several interviewees or several times by one interviewee. After this second round of coding, our NVivo output looked the following (full output available in Appx. 11):

Name	Files	References
Constructing External Images	9	40
Moderate evidence	8	13
Sporadic evidence	6	8
Strong evidence	7	19
Embedding Claims and Organisational Culture	9	60
Moderate evidence	8	11
Sporadic evidence	7	17
Strong evidence	9	32
External Challenges to Organizational Identity	9	42
Moderate evidence	6	12
Sporadic evidence	4	4
Strong evidence	9	26

Figure 4: Excerpt from NVivo output after second round of coding

7.5 Limitations

As with the methodology, there exist limitations with the data collection that are relevant to account for. First, collecting primary data through semi-structured interviews with the researcher as the primary instrument opens for biases due to subjective interpretations. To fully rule out bias is not possible, however, the fact that we are two researchers conducting the research contributes to increasing the credibility of the data collection. Triangulation through having multiple investigators collecting and analysing the data helps to counter the concern that the findings of a study are an output of the blinders of a single investigator (Merriam & Tisdell, 2015). Second, a limitation is found in

the sample selection- and size of our research, as it is non-probability sampling and only contains interviews with nine participants. Third, all interviews were conducted online through Teams, which made it difficult to fully observe the participants' body language, a fact that plays an important role when trying to interpret another human being. The chance that misunderstandings and misinterpretations will arise is also greater when the interview does not take place in person, especially when the interviews are conducted in a foreign language which is the case with a majority of our interviews.

Lastly, a potential drawback from this study is the nature of our collected data. Our primary data consist of interviews and participation in a webinar, however, we do not generate any insight from first-hand data collected through our own field research. Due to social constructivism being the epistemological point of view in this thesis, stating that a full understanding of social processes can only be obtained by getting involved in the world of those who are generating it, observations would be beneficial to our study. By doing observations at the different SMPs, we could have achieved a better understanding of the processes and interactions ongoing at the ports, instead of just relying on the interviews. Nonetheless, it should be mentioned that a significant effort was made in order to make observations possible. Despite this, the current Covid-19 pandemic became too big of an obstacle to overcome, so our attempts to arrange physical meetings at the ports were unfortunately, but very understandable, turned down to comply with the restrictions.

7.6 Validity and Reliability of the Collected Data

Within the constructivist tradition, several researchers are critical to the well-known quality criteria of reliability and validity, as they stem from the natural sciences and hence from a more positivist- and realist tradition (Justesen & Mik-Meyer, 2012). Based on this, the question is posed on whether these concepts can be directly applied to studies that are conducted within other perspectives and hereby have different methodologies (Justesen & Mik-Meyer, 2012). As this thesis is rooted in the social constructivist paradigm, it can thus be asked whether these quality criteria provide a suitable basis for the evaluation of trustworthiness and quality. The concept of reliability and validity is, however, in most traditional textbooks on qualitative methodology highlighted as essential quality criteria (Yin, 2014). Furthermore, the criteria can be applied in a variety of different ways, depending on, among other things, the theoretical perspective of the researchers (Justesen & Mik-Meyer, 2012). We consequently choose to apply the two concepts in our evaluation of the quality of this thesis,

nonetheless, with a certainty of the fact that the criteria initially were made for another type of research.

In the following section, the reliability and validity of our study will thus be outlined. Furthermore, with the above criticism in mind, it will be addressed whether the reliability has a significant impact on the results of this thesis.

7.6.1 Validity

In general, the degree of validity covers the connection between the collected dataset and the subject that is desired to be examined (Stavnsager et al., 2006), in other words, "*whether we measure what we say we will measure*" (Justesen & Mik-Meyer, 2012, p. 38). Within social sciences, validity is thus about whether the chosen method examines what it is intended to examine and the extent to which the researcher's observations reflect the phenomenon that are desired to be elucidated. This view of validity helps to ensure that qualitative research can be seen as scientific knowledge (Kvale & Brinkmann, 2015).

According to Bryman (2012), validity can be divided into internal- and external validity. Internal validity, often referred to as *credibility* within qualitative research, regards the confidence in the 'truth' of the findings and whether the perceptions of the interviewees match how the researchers portray them (Bloomberg & Volpe, 2008). Securing this validity entails that we as researchers carry out good practice to make it believable (Bryman, 2012). In our data collection, an attempt is made to carry out good practice by getting informed consent from all of the participants prior to the interviews. Additionally, we recorded and transcribed the interviews to be able to look back and recollect what was being said and the *way* it was said. As mentioned in section 7.3, we have also attempted to ensure that the feelings- and thoughts of the interviewees are presented without twisting their words by sending them the transcribed interviews for them to review and approve. Nonetheless, a 'truth' in the findings is hard to obtain as our interpretations and socially constructed reality as researchers do not necessarily reflect the same 'truth' that the interviewees have. The reason for this is that the interviews are being constructed in social interactions between the interviewees and us as researchers (Gergen & Gergen, 2005). Credibility is thus established by individual perceptions, as each reality will be viewed as the truth.

According to Bryman (2012), internal validity can also be assured by triangulation. The concept of triangulation is commonly referred to as the application of multiple methods of investigation. However, as stated in section 7.5 above, it can also refer to having multiple investigators collecting and analysing the data (Merriam & Tisdell, 2015) or as proposed by Denzin (1970), multiple theoretical perspectives (Bryman, 2012). In our research, triangulation regarding the application of multiple methods of investigation is assured due to the use of both primary- and secondary data sources. Supplementing with participant observations is believed to have strengthened the credibility even more by achieving triangulation of *primary* data sources. Still, semi-structured interviews themselves are enhancing for internal validity, as this type of interview allows for follow-up questions to the different issues that were identified throughout the interviews. With regards to the data collection- and analysis, this process reflects triangulation as we are two researchers and thereby can compare perceptions- and reflections after the interviews were conducted. This helps to ensure that we get a sufficient overview and understanding of what is told, and *how* it was told, by the interviewees. Furthermore, we have through the literature review provided several perspectives on the concepts of identity and sensemaking, implying that triangulation is achieved with regards to multiple theoretical perspectives.

Regarding external validity, this concerns the generalisability of the results and whether the study can be transferred to other settings (Bryman, 2012). Based on this understanding of the concept, external validity is often referred to as *transferability* within qualitative research (Bloomberg & Volpe, 2008). Unlike internal validity which is argued to be a strength of qualitative research, external validity often represents a problem for qualitative researchers due to the "*tendency of employing case studies and small samples*" (Bryman, 2012, p. 384). With regards to our case of the NON-STOP project, many social realities have been constructed making it hard to transfer our *exact* case to another setting. However, by Bloomberg & Volpe (2008) it is argued that instead of generalising, researchers should provide a large amount of data to allow the reader to decide whether similar processes may be used in different settings. In connection to this, it can be argued that we through our case produce what Geertz (1973) calls a 'thick description'. This means that we provide others with a database for making judgments about the possible transferability of our findings to other surroundings (Bryman, 2012). Flyvbjerg (2005) supports this fact by arguing that "*formal generalization is only one of many ways by which people gain and accumulate knowledge*" (p. 227). This implies that even though our

case cannot be formally generalised, it does not equal that it cannot contribute to the collective process of knowledge accumulation in a given society or field, e.g. for SMPs outside the NON-STOP project.

7.6.2 Reliability

Reliability is an expression of measurement accuracy. The degree of reliability depends on whether the same result would be obtainable if the study was repeated, and whether independent researchers who investigate the same will get the same result (Stavnsager et al., 2006; Justesen & Mik-Meyer, 2012). With regards to qualitative research, it is particularly relevant if the participants would change their answers in the interviews and whether they would provide other answers to a different researcher (Kvale & Brinkmann, 2015). In this thesis, an attempt is made to strengthen reliability by avoiding asking leading questions to the interviewees. This as leading questions, when asked unconsciously, can affect the answers of the respondents and eventually influence the outcome of the final results (Kvale & Brinkmann, 2015). Furthermore, reliability can reflect on the trackability of the processes and procedures used to collect and interpret the data (Bloomberg & Volpe, 2008). To further strengthen the reliability, we have thus through chapter 7 tried to provide detailed and thorough explanations on how the data in this thesis was selected- and collected. By recording and transcribing all of our interviews, we have also made the data accessible for the reader as well as illustrated how we reached our findings.

Despite making an effort to increase the reliability of our collected data, a complete replication and reliability are hard to achieve as we take on a social constructivist view on the case (Bryman, 2012). By this it should be understood that we perceive our findings to be socially constructed, and hence depending on the contextual settings and subjective perspectives. Consequently, precisely determining whether any procedures have been followed in collecting the data is difficult as the social construction of reality between researchers and the interviewees will differ every time. Even though the same initial questions were proposed to the participants, the social construction of the conversation was different in every interview. This means that each interview flow would never be the same as the previous one and if other researchers were to ask the same questions, the social construction would yet again be distinctive. Hence, weakening the reliability in its original form.

It has been argued that complete replication and reliability cannot be achieved when being researchers rooted within social constructivism. As researchers within this paradigm, we are influencing what we

perceive as reality from the conducted interviews, which is weakening the reliability as the concept is understood within natural sciences (Bryman, 2012). However, as social constructivists, we are not seeking a universal truth, which is why a complete replication and reliability do not have the greatest impact on the results of this thesis. A weakened reliability does not equate to a weak validity within qualitative research (Golafshani, 2003).

8. Analysis

The aforementioned academic research displays that the current changes in the port industry require extensive considerations and willingness of adaptation. To be successful, the small- and medium sized ports (SMPs) need to create a collective understanding of the intended purpose and results. As such, the SMPs should incorporate necessary tools as these according to the literature are crucial to stay competitive. As previously stated, there is a lack of research on the resulting costs and benefits of digital transformation in the port industry. It is therefore identified a need to investigate the challenges and potential benefits that the port industry faces today to implement digital technology successfully. This will accordingly help the industry to avoid unfamiliarities and transform more adequately.

Ravasi & Schultz's (2006) theoretical model for *Organisational Responses to Identity Threats* will serve as the overall framework of the analysis, and the analysis will thus follow the structure of the model presented in section 4.1. To make it clearer where in the framework the analysis is at any given time, an illustration of the model will be presented each time the analysis is moved forward to a new step. In these illustrations it will be highlighted what part of the model the analysis currently addresses.

To get a better understanding of how the identity of the SMPs is changing, the analysis starts by investigating how the overall port industry is evolving and the challenges it carries. The concept of dynamic capabilities is the point of departure when investigating the external challenges to the organisational identity of SMPs: Initially to identify the challenges in the surroundings of the SMPs and further to analyse how the SMPs have seized these challenges. This will lay the foundation to understand a potential identity threat. In the following phases of the model, sensemaking through discourse will be applied to analyse how the SMPs are making sense of what they are *really* about, and how they give sense to these new revised identity claims. Following the framework of *Organisational responses to identity threats*, complemented with the theory of dynamic capabilities and sensemaking, a thorough understanding of the challenges towards the SMPs identity and its reactions to it, will be achieved. Finally, a desired revised identity understanding will be discussed.

8.1 What Strategic Challenges are SMPs Currently Experiencing?

The port industry is in constant change and development, and the SMPs attempt to accommodate the experienced challenges to keep up in the increasingly competitive landscape of maritime logistics and port business. The first part of this section will analyse which external challenges the overall port industry is currently facing. Furthermore, the second part will investigate how the SMPs are trying to incorporate new capabilities to maintain their position in the industry. Consequently, this section will first analyse the *sensed* challenges in the port industry and which implications these have for the SMPs, and thereafter how the challenges are *seized* by the SMPs.

Figure 5 below highlights that section 8.1 will address the first phase in the framework presented by Ravasi & Schultz (2006):

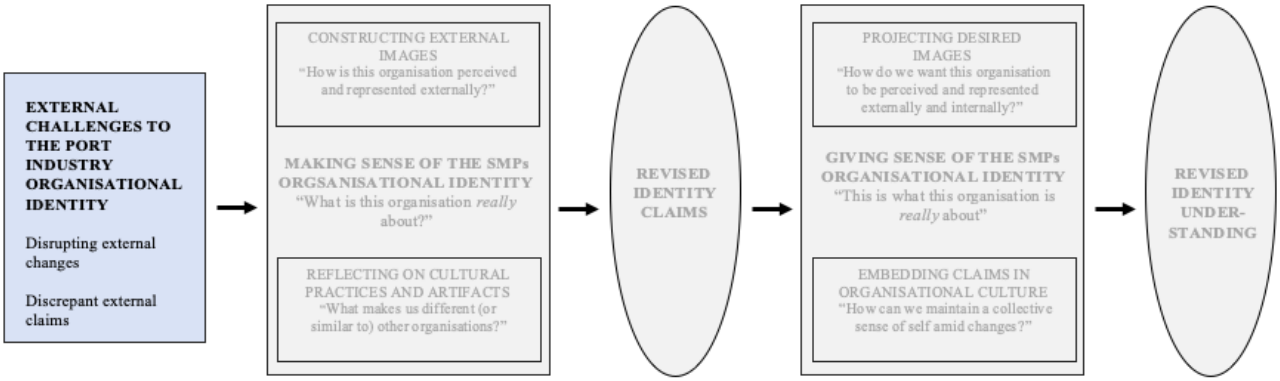

Figure 5: Own illustration based on Ravasi & Schultz (2006)

8.1.1 Sensing the Challenges in the Industry

According to our collected interviews, four main challenges are currently identified as dominating the port industry: 1) Increasing demand for digital solutions, 2) A move towards a more commercialised organisation, 3) Sustainability becoming a 'licence to operate' and 4) Increased competition.

8.1.1.1 Increasing Demand for Digital Solutions

As the market is prospering new technological solutions for industries and organisations to implement, the consumer and producer behaviour is changing. An increase within a demand for

information management and sharing through digital tools are recognised by the Port Manager (PM) at Port of Oostende in the following: "*I definitely see a challenge. Information becomes more and more important, and the management of information even more"* (PM, Port of Oostende, p. 9). This is exemplified through recent development projects within the construction of eight wind parks in front of their port where all the turbines have to be monitored 24/7. With this, the owners can ensure that the turbines are producing what they 'should', as the companies that are buying the wind energy have established strict contracts on information sharing on production (PM, Port of Oostende). Through this, the importance of finding solutions within information technology is considered crucial to deliver on producer demands. Moreover, it displayed possible information that can be accessed and monitored, also in the port industry (PM, Port of Oostende).

A demand for IT solutions to share information is also found in that ports can interact within the port and the surrounding area. Possible digital solutions within areas as operators and apps are recommended as this could both "*simplify things and make it more efficient*" (Director, Norske Havner, p.2). An example of a possible technology solution is to digitalise the port call operations. Implementing such technologies is found to secure better efficiency and securement in the operations of entry and unloading of goods together with divisive collaboration, but also to reduce costs and emissions for ports and maritime logistics. This technology alongside others is already available for the port authorities to enforce (Director, Norske Havner). It is emphasised by the Digital Strategist at Port of Rotterdam that if ports are not ready to meet digital wise on these available solutions "*they could miss it and become obsolete*" (Digital Strategist, Port of Rotterdam, p. 2). It is also found that other threats of not digitalising within available IT is that the vessels change their routes. This as certain ports have to digitalise their routes to ensure fast and secure handling of goods (Digital Strategist, Port of Rotterdam). Furthermore, the Partner at GEMBA Seafood Consulting does emphasise that this 'need' to digitalise to avoid becoming obsolete is creating "*Great challenges for small and medium-sized ports that do not have capabilities or capacities in the port office to work with digitisation"* (Partner, GEMBA Seafood Consulting p. 2). He further elaborates on experienced limitations that emerge within SMPs in the increasing demand for digital solutions:

"Have you talked to the [PM] in Korsør? He is the port director there but does everything himself. We tried to ask him if anyone could help him with the work and build new shore power facilities, but no one really knows anything about it. So, he is a port director, and has five to seven employees he

has to lead. In addition, he needs to be responsible for all digitalisation projects. He also drives an electric car and has a great love for electricity and wants to [digitalise] the port. But he does not specialise in that field" (Partner, GEMBA Seafood Consulting p. 2)

Further challenges are highlighted with that:

"*The technology says that they must offer more services than before. They should e.g. be happy to offer shore power to ships that come, they must have charging power infrastructure to the ships that come and must be able to offer alternative fuel such as hydrogen. All this cost*." (Director, Norske Havner, p.3).

An increase in demand for digital solutions hence requires several investments. The PM at Port of Zwolle argues that "*Money is always challenging. (...) There is currently a mission in Europe, where everybody wants us to change our system and energy consumptions. Therefore, we search to find money for our projects, and start with small pilots*" (PM, Port of Zwolle, p. 3). Moreover, the demanded new services within services and IT are creating three acknowledged challenges: (1) creating a safe product so that both the consumer and the different ports want it, (2) that it is voluntarily if the ships want to use the provided electronics and (3) the civil society in relation to taxes and fees, reporting and VAT, with how much the port have to pay for the solution (PM, Port of Korsør). Accordingly, it is argued from several PMs that they experience limitations in instructions of the needed finances, time frame, capabilities, and contributions from institutions (PM, Port of Zwolle) (PM, Port of Korsør) (PM, Port of Helsingør). The SMPs are therefore currently experiencing challenges in establishing "*how can ports work on development of new services whereby the use of data also becomes a source of income*" (PM, Port of Oostende, p. 9).

The investments that should be established are not only viewed in relation to monetary assets. As these digital solutions arise, a need for highly skilled workers emerges whereas the traditional port employees previously were more unskilled. This is creating a strategic challenge in that they would need to invest or train their employees to implement and develop digital technologies to their port.

"In the ports in the old days, most of the port workers were unskilled. Today, I would say that around 70% of the people working at the ports have a bachelor's degree or more. I think you have a big

change in the way people are working, towards the identity of your port. If you speak with the people working with marine drones, they are not simple port workers. We see a shift from 'low-skilled workers' to 'high-skilled workers'. And this will furthermore have an impact on how you manage and organise your port" (PM, Port of Oostende p. 10).

Accordingly, as new technological solutions could provide efficient and secure operations, a challenge within implementing digital solutions is addressed for the SMPs. These technologies require an obligation to educate the port employees or hire new workers and access the needed finances that are required. Hence, to conform to the increasing demands, extensive adaptations have to be pledged.

8.1.1.2 Moving Towards a Commercialised Organisation

A significant development in the port industry in recent years is the change towards a more commercialised organisation. Whereas ports until a few years ago were seen as *"(…) monolithic dinosaurs from ten million years ago"* (PM, Port of Oostende, p. 1) with a primary task of moving boxes from one side of the world to another, they are in today's society viewed more as economic centers where several activities are concentrated (PM, Port of Oostende). This argument is further supported by the Director in Norske Havner, which states that the ports traditionally have been concerned with the arriving ships/vessels and the maritime part, whereas they now have a greater focus on the market and where they can create an income. Beyond the maritime part, *"(…) the hinterland has thus in the recent years become of increasing importance, as most of a port's income actually is related to the activities happening on the land side*" (Director, Norske Havner, p. 2).

According to the Director in Norske Havner, one reason behind the increasing commercialisation in the Norwegian ports is the new 'Havnelov' (Port Law), which pulls the ports even further towards the business part. Previous to this new law, the ports' capital was sealed, meaning that if they profited from the port business, this had to be reinvested or stay within the ports. As of 1st of January 2020, however, municipalities and shareholders can now withdraw dividends like in any other company (Director, Norske Havner). Also in Denmark, a new 'Havnelov' was reformulated in 2012, which encouraged the ports to shift from being public to become more like joint-stock companies and to be run as businesses instead of being within the municipal practice (Business Consultant, Danske Havne). With the reformulation of the Norwegian- and Danish 'Havnelover', they are now in line with how the port business is run in the remaining part of Europe (Director, Norske Havner).

Consequently, the ports need to be more conscious of their capital to develop in line with the current needs. While it was previously known that all profits stayed within the ports, the possibility of withdrawing dividends now means that the ports must increase their awareness of its future development (Director, Norske Havner). This argument is further supported by the Partner in GEMBA Seafood Consulting, which states the following:

"*The way I understand it is that the port administrations are becoming more like port developers, where they develop their port to benefit its users. Before, it seemed like they acted more like a host, who just made sure it was nice and clean in the port area. Now they have become more professional as well, so there has been a focus on that there should be some development in the ports*" (Partner, GEMBA Seafood Consulting, p. 1)

From the point of view of the PM at Port of Oostende, ports are acting more as enterprises and economic players due to stricter- and increasing regulations. Moreover, he argues that competition rules are becoming increasingly relevant, which means that ports to a larger extent are importing, so that the traditional ports substitutes are declining. Transforming into a public enterprise, however, brings new challenges:

"*What I see now for our systems/my port in the last two years is that we are now a public enterprise, which means that we need to pay taxes. So that means that we are really considered within the public enterprises. However, this does not seem to be the same case all over Europe, which for me is strange. I still see a lot of differences in a lot of countries*" (PM, Port of Oostende, p. 2)

Beyond different ground rules in different countries, another challenge that follows the increased commercialisation of ports is that they now also have to make investments to ensure profitability on their port operations. This is causing challenges as developments within the vessel industry are affecting the ports' opportunities to accommodate their needs.

"What is a small challenge in general, and which can be a challenge in smaller ports, is that the ships get bigger (...) if you see in Europe and how big those boats and ships have become. Then you see that it requires large investments to handle them, both in the form of cranes and quays. The quays

must be dimensioned based on the largest ship and not the smallest. So, there are huge costs associated with this" (Director, Danske Havner p. 5).

For SMPs who are limited in their physical framework, obstacles to encounter these vessels are found as *"there is nothing else we can do [within the framework they have now]*" (PM, Port of Helsingør p. 5). The PM further acknowledged that the SMPs would need to build a larger port to adapt to the large vessels, however, "*the case with ports is that they are adapted to the history in which they have worked. So, if your port is small, then you can not offer what the current ships need - they now need a much larger quay"* (PM, Port of Helsingør p. 6). Therefore, the SMPs have to adapt to meet the future vessels and avoid loss of possible incomes as they now need to develop their business. This is as illustrated creating challenges for them.

In addition to the above, it can be challenging to create an understanding of the new economic earning model. The PM at Port of Oostende is unsure whether people/companies will still be able to, or willing to, pay for every service they get in the port. He argues that they now instead expect a fully integrated package, which includes both safety, security, and all the associated services: *"It is another way of thinking, and that is for me the biggest challenge*" (PM, Port of Oostende, p. 9). The commercialisation can thus put the survival of the SMPs into question. As further stated by the PM at Port of Oostende:

"*We all have to learn how to survive. We cannot survive only on the basis of fish, like we did in the 19th century, where much of the smaller ports only were based upon fish. So, in general, I find that the survival of the smaller ports become much more difficult due to these changes"* (PM, Port of Oostende, p. 2).

8.1.1.3 Sustainability as a 'License to Operate'

A further challenge that the port industry currently is experiencing is the increased focus on sustainability. The Partner at GEMBA Seafood Consulting argues that sustainability in the past was just something 'that was talked about', but that it has gradually turned into an important competitive parameter. This argument is supported by the PM at Port of Helsingør which states that "*I experience that it gets more and more evident that a green transition is, or very soon will be, a competitive parameter in relation to some of the customer segments we want to attract*" (p. 1) and further also by

the Business Consultant in Danske Havne which claims that "*[the green transition] in the beginning was not a competitive parameter, but we believe that it in the near future will be the 'license to operate'*" (p. 2). Illustrating the increased focus on sustainability in recent years and the importance of this to survive, the Partner at GEMBA Seafood Consulting brings out the following example:

"*In Norway, it is now the case that if cruise ships are sailing through Geiranger, they need a zero-emission fuel, i.e. they will not emit any CO2. Then the cruise companies will have to do something, otherwise they have to remove from that area. Right now, the shore power only applies to cruise ships, but soon it will be for fishing vessels as well - there will be someone who demands that the fish that come in must also be within certain requirements for sustainability. Then the entire value chain will eventually become more sustainable, and that also applies to ports*" (Partner, GEMBA Seafood Consulting, p. 5)

By the above, it is implied that following along on the green wave is not only something that the ports should do but something that *must* be done to survive in the future. The PM at Port of Helsingør further elaborates on this notion by stating that the "*already conscious consumer is becoming more and more conscious*" (p. 5). The conscious consumers want to go on a vacation without straining the environment too much, and in the same way, they want vessel operations where the goods are transported electrically. By offering a business model that is in line with the green transition, the PM at Port of Helsingør thus believes that competitive advantages are within reach: "*Look here! We are docking in the Port of Helsingør because Helsingør offers what our customers demand, namely less Co2 emission*" (p. 5). Furthermore, the PM at Port of Helsingør also acknowledges the following concern:

"*As people are living close to the port here in Helsingør, this has the consequence that they are very sensitive to what we do in the port. If we don't meet their concerns, the port will have to close. In that way one can say that this competitive parameter is forced down on us - if we do not have a green port then we have no port*" (PM, Port of Helsingør, p. 2)

With this, it is evident that the challenge following the increased focus on sustainability is not only that the industry itself and the consumers/users of the ports are expecting greener operations. The

residents living in the cities where the ports are located have this as an important requirement and concern as well and is thus something the SMPs must consider carefully to continue operating.

For the SMPs, the increased focus on sustainability creates challenges in that they have to invest in 'green' technologies. *"I also just have to say that the question of how green we should be is also a question of finance"* (PM, Port of Helsingør p. 3). With the increase of 'political pressure' to bring new sustainability conditions to the port industry, it is requested rules and regulations for the maritime logistics market in general.

"*Ships are designed to be self-sufficient units without a place where there is electricity. It is like the nature of the ship to be able to sail around the world with some fuel on board. So this whole discussion that when the ship is in a port it must not pollute is completely new in the industry (...) I think that we [the ports] must start by being able to offer the power, and then we must say to the ships that "if you come here you will get one price for coming with your diesel engine, and then you will get another price if you connect on the electrical network". But first of all, we would desire that there is legislation that says that shore power have to be used [from the vessels]"* (PM, Port of Helsingør p. 1-2)

As the stakeholders are demanding that the market should develop more sustainably, it causes new strategic challenges. This is because, as of now, it is not a requirement that vessels have to connect to shore power, while there is a demand that the port has to invest to offer it (PM, Port of Helsingør). For SMPs these investments are considered extensive, and how and where the needed monetary assets should be required is not established (PM. Port of Zwolle). Therefore, as the investments lie on the land side without what the SMPs consider as an 'equal level playing field', more of their budget is bound on these requirements than on other parts of the maritime logistics market (PM, Port of Helsingør).

8.1.1.4 Increased Competition

All of the aforementioned external challenges that the port industry currently is experiencing have accordingly led to challenges regarding increased competition. It has especially been recognised by several interviewees that a new competition within "*other modes of transport and especially truck transport*" is rising (Business Consultant, Danske Havner, p. 2). This has emerged as "*the truck*

transport is on its way in becoming green and automated" (Business Consultant, Danske Havner, p. 2). In the development of the truck industry through the last ten years, they have accustomed abilities that make it "*cheaper and cheaper to drive trucks*" (PM, Port of Korsør, p. 1). It has therefore been acknowledged as one of the port industry's biggest challenges:

"*For ports, of course, it is a challenge to drive green. Not at the port itself because we are [green], but the problem lies in shipping. The fact is that driving on rubber wheels is getting cheaper and cheaper, so we are caught up in our weak points. Which is that we have to handle the goods*." (PM, Port of Korsør p.1).

Moreover, challenges in competing against the salary of the international truck industry and working conditions have been highlighted:

"*Sometimes it seems completely hopeless to drive the trucks everywhere instead of sailing them. This is however occurring because you compete against some incredibly low rates. There are Philippines who live in trucks, and drive around the clock. They have absolutely terrible working conditions, where they like to earn 95 DKK a day. The type of competition that you compete against where it is so insanely cheap, it is difficult to stand up to*" (Partner, GEMBA Seafood consulting, p.6).

Not only is the growing competition amongst transport affecting the industry, but as new innovations enter the market rapidly and regulations on sustainability emerge, competition on adapting technological solutions arises. The more technology that is integrated into the business, the more the port management can focus their time demanding other value-adding services from their consumers and producers. This as previously manual processes now are automated. As the port industry has commercialised in recent years, competition to provide new services as these have increased:

"*Being on the market and being competitive is vital. In relation to these electronic challenges we have to deal with shore power and reduction of particulate emissions and noise reduction. These two sources of pollution, noise and particles, can be eliminated by 'going electric'*" (PM, Port of Helsingør p. 3).

The demand for these services is furthermore acknowledged in that ports are situated close to citizens that are sensitive to their operations. If the management do not follow their concerns they could invoke on their ability to operate, especially if they do not adopt sustainability measures (Partner, GEMBA Seafood Consulting). Therefore, they have also experienced a competition parameter with the more acknowledged stakeholders (PM, Port of Helsingør). With consumers that are expecting and demanding more for their capital, the port industry is pushed to offer more than simply loading and unloading of goods to its customers.

For the SMPs, an emerging competition that has arisen with the increased commercialisation, focus on sustainability, and digital technologies is their competition with the larger ports. "*(...) you can look at the larger ports, then you can really see that digitalisation in the port is really important. In the Maersk harbor, the whole harbor is autonomous. There is now no one working there"* (Partner, GEMBA Seafood Consulting p. 5). Port of Rotterdam is the largest seaport in Europe (Port of Rotterdam, 2021) and in the interview with their Digital Strategist, the focus on digital solutions is rapidly addressed:

"*My main role is that I am a digital strategist at DNT so I am sitting in the digital technology department. This department's job is to work with other departments on how they should digitise their services or business, and I am responsible for the commercial part of it* " (Digital Strategist, Port of Rotterdam p.1).

Hence, it is emphasised that the port has hired a team to solely focus on implementing digital solutions. Moreover, the digital strategist is answering a question regarding if they find themselves ahead of other ports in terms of digitalising with *"Hmm, yes, one of the inputs there [that the Digital Strategist was presenting when working in Denmark] was that the port of Rotterdam is way ahead in what they are doing*" (Digital Strategist, Port of Rotterdam p. 3)

The Port of Rotterdam and other larger ports are furthermore in possession of considerable budgets:

"(...) *if you go in and look at the accounts of, for example, the port of Aarhus, you will see how completely insane with money they earn. And I say yes, we in Korsør will definitely invest in*

digitalisations, but in relation to the large ports, we do not have the same finances as them. Like Aalborg, Aarhus - WOW! they make a lot of money" (PM, Port of Korsør p.2).

This has led to first-mover advantages within digitalisation of their port, and possibilities to investigate different technologies and implement accordingly after what is proven to find better safety and efficiency. Opposite to this, the smaller ports have constraints with their budgets that grant limitations with the number of technical solutions they could implement (PM, Port of Korsør) (PM, Port of Oostende).

As the increased competition demands expertise, capabilities, capacities, and investments that are limited within SMPs it creates strategic challenges to meet the changing and new requirements and adhere with their stakeholders and competitors (Director, Danske Havne) (Partner, GEMBA Seafood Consulting).

8.1.2 Seizing the Challenges in the Industry

By extension of the above external challenges to the overall port industry and the implications this brings onto the SMPs, this section will further elaborate on how the SMPs have seized these challenges. From our primary data, it can be argued that the SMPs as of now, have compassed this in three ways by 1) Participating in the NON-STOP project, 2) Investing in technological solutions, and 3) Creating new service offerings.

8.1.2.1 Participation in the NON-STOP Project

By participating in the NON-STOP project, the SMPs display motivation and a willingness towards adapting to the challenges that currently are facing their industry. As stated by the Partner at GEMBA Seafood Consulting: "*When projects like NON-STOP are set in motion at the ports, it shows signs of motivation. This is because the participants need to pay 50% of their costs themselves (…) so it is not something they profit from right away*" (p. 4). This is further supported by the Engineer at Port of Emden who argues that a certain self-motivation is needed, due to 'only' getting a 50% contribution to their pilot projects from the Interreg program. What this self-motivation consists of varies between the participating ports. According to the PM of Oostende, their incentives towards participation is two-fold:

"*The motivation to get into the NON-STOP project is firstly to make the bridge with new technologies, because if small ports want to survive they have to be more efficient than bigger ports. The second argument is that we all have limited resources, meaning limited staff, and sometimes we have areas to cover that are quite large*" (PM, Port of Oostende, p. 3)

Like with the Port of Oostende, the PM at Port of Helsingør also has a two-fold purpose with participating in the project: "*It is two things: Firstly, we want to contribute to the green conversion, and secondly we want to show other small ports that this is not so hard. In that way, you can say that there is some 'teaching' to it*" (p. 1). By this, he implies that a business case profiting from a shore power system for a long time has been viewed as impossible – something he finds incorrectly and thus wants to illustrate to others is possible through the project. For the PM at Port of Korsør, the motivation is to make the production more efficient using a sensible form of energy, as running the port on electricity will reduce the operating costs at the port. This incentive is supported by the PM at Port of Zwolle, who wants to reduce the global footprint by making an efficient and electric system at the port. All seen together, a repetitive motive for participating in the NON-STOP project seems to be the desire to meet the sustainable development and make the production more digitalised and efficient to reduce costs – together contributing to a strengthened competitive position in the industry (PM, Port of Helsingør; PM, Port of Oostende; PM, Port of Korsør; PM, Port of Zwolle).

By joining the NON-STOP project, each of the participating ports gets a pilot project that will contribute in addressing some of the challenges they are facing (Appx. 1). Even though it from conducted interviews is evident that some of the ports already are well underway with their pilots, it is possible to observe that unforeseen changes occur that make the ports want to change their project:

"*Right now, I am actually preparing a nice letter to GEMBA [Seafood Consulting] saying that I would like to change my pilot project. The issue is that 2-3 years ago when we were writing the proposal, there was a lot of attention around digital twin. I have been investigating more in the last two years about this digital twin and the only people who are using this is the ministry of interior affairs and justice. (...) So, digital twin, safety and security - it is important for us, but as a port it is not <u>that</u> important. We need to work like an economic entity and we have to be smarter and more open for commercial uses than just safety, which is the role of the public authority*" (PM, Port of Oostende, p. 5).

These changes in pilots are emphasised by the Partner in GEMBA Seafood Consulting in that new additional claims towards the ports' pilots are occurring rapidly. This can translate into the fact that the ports have not concretised their measures enough or made exact thoughts on how the project should become a reality, consequently causing postponements in the executions of pilots (Partner, GEMBA Seafood Consulting).

8.1.2.2 Investments in Technological Solutions

In order to digitally transform and move their business towards a more sustainable, efficient, and secure way the SMPs have to invest in different technological solutions. It is found evident through the interviews that ports in recent years have adapted to solutions that can automate and monitor operations:

"*That is what we have been doing the last two years. [For example] in the old days, we were working with glass fiber cables to have communication within the port area (...) people who were doing road works, they forget that there are glass fiber cables - so they end up cutting them (...) [and] when a port needs to be on 24/7 in order for people to book their activities, this gets big consequences (...) So, today we have been working really hard to get everything in the port wireless"*(PM, Port of Oostende, p. 8)

As this port became wireless it opened for further interconnections in the port area with making camera analysis. Previously there had been issues related to "*illegal dumping of waste, and other strange activities taking place in the port*" (PM, Port of Oostende p.8), whereas they now can oversee the port activities and monitor this operation. This has accordingly led to investing in a new platform where possible new products and new tools can be displayed (PM, port of Oostende). These monitoring technology investments are also seen at Port of Emden. Here, a monitoring system on the micro bacteria and the fluid mud that exists in their river is important to promote. This as the level of fluid mud and sentiment has influx, which is causing issues concerning how the ships could enter their port. "*We need to monitor certain locations in the ports, what happens to the composition of the ports. (...) And therefore, we build, and develop sensor-based monitoring and infrastructure*" (Engineer, Port of Emden p.6). This technology should be disclosed in a dashboard that will help

them keep track of "*The water conditions, the spectrum of micro bacteria and the volume and the frequency of the water in which water should be drained into the port"* (Engineer, Port of Emden p.7)

It is further recognised from several interviewees the importance of investments within shore power. As aforementioned, this is in Norway placed as a service enabler and viewed as a technologic service offering that is demanded from several stakeholders (Partner, GEMBA Seafood Consulting) (Director, Norske Havne). Port of Zwolle has implemented this on the notion that "*as we have several cruise vessels in our port and they make a lot of sounds during the night. Now we can offer electric energy and they are quiet*" (PM, Port of Zwolle p.2). This has accordingly increased the satisfaction with people at the port and surrounding areas. An investment in shore power is according to the PM at Port of Helsingør found with the following: "*I believe that [with an investment] for 4 million DKK we can make a shore power system that can fully live up to what we need*". A strong discrepancy between larger ports and SMPs can be identified as it takes large investments to acquire the needed technology. "*(...) for a small port like us, there are a lot of challenges. I have sort of looked at a number of IT systems, and such a system will cost well over 1 million for us. And that's a lot of money for us*" (PM, Port of Korsør p. 6). Due to smaller budgets and limited capacities and capabilities in employees, SMPs are struggling to adapt to the available technological solutions on the market as larger ports do (Partner, GEMBA Seafood Consulting).

8.1.2.3 Creation of New Service Offerings

In addition to participating in the NON-STOP project and doing investments in technological solutions, the creation of new service offerings has received increased attention amongst the SMPs in recent years. By the Partner in GEMBA Seafood Consulting it is recognised that it has been a clear development in creating more value, implying that the SMPs now have expanded their offerings towards their users and stakeholders:

"*Before, they were just sitting in their towers monitoring that the boats in the ports arrived on time, and controlled that things were happening correctly. Now, they will also make something more for them and offer them more services. I think this development goes hand in hand with the fact that a large part of what the ports did before has been privatised*" (Partner, GEMBA Seafood Consulting, p. 2).

He further elaborates on the fact that the SMPs have become better in attracting the companies located outside the port, as well as delivering additional services to the companies located at the port (Partner, GEMBA Seafood Consulting). The PM at Port of Zwolle does also stress the importance of this value creation:

"*I am also building on a network around the ports so that clients of use and companies can use that network. (…) As a director of ports, you must be like what we call a 'thousand leg' - meaning you have to do a lot of things to become a good director and deliver opportunities to your clients and stakeholders*" (PM, Port of Zwolle, p. 1)

Included in the creation of new service offerings is a focus on increasing the port's visibility amongst stakeholders. As recognised by the Director of Norske Havner, the ports need to communicate their importance and the repercussions they have for the current business. He exemplifies this with the Port of Drammen in Norway, which arranges visits from school classes to show and explain the impact that the port has on their city. Furthermore, he proclaims that most ports nowadays have meetings and events where they explain their value to stakeholders and stress the importance of the jobs they create within the municipalities (Director, Norske Havner). At the Port of Helsingør, measures have also been done to increase the service offerings and raise awareness of the port and its surroundings. Here, crew members of the arriving ships get several advantages – including free entrance to the Maritime Museum, discounts on various sights, and access to sports activities that are adjacent to the port (Port of Helsingør, 2019).

This therefore underlines that SMPs have done measures to increase their service offerings. However, it is acknowledged that further considerations on complementing their communities and finding the ports service offerings are important. This to increase profit and expand their business;

"*One of the things that you need to know when you start at a company is not what you can contribute with, but where you can contribute. So before this I have worked with three different ports and they need to find terms of their capacity and what they need and so on*" (Digital Strategist, Port of Rotterdam, p.2).

8.1.3 Sub-Conclusion

In the changing port industry, the increased demand for digital solutions, the move towards a more commercialised organisation, sustainability becoming a 'licence to operate', and the increased competition have been identified as central indications for the SMPs to adapt to. The SMPs seize the four challenges by participating in the NON-STOP project, investing in technological solutions, and creating new service offerings. The new demands, services, and skills bring significant implications on the role and identity of the port management. This will be considered and further analysed in the coming sections.

The reorientation of the port industry by moving towards an extensive digital transformation raises discussions and poses a threat to the previous role and identity of port management in SMPs. The historical and traditional industry was identified as a part of the public practice where goods should be loaded and unloaded. This role is now being redefined as they need to be market- and economically concentrated, make technological investments in where they can increase their profit, and concentrate their port activities. Additionally, the port management needs to invest in consumer- and producer demands, become more proactive as well as accessing the skills and capabilities required to survive in the changing environment. This leads to an ambiguous and confusing setting for the SMPs where they have to commit to new measures that are expected from them as well as realising what their new role should become. For SMPs to counteract this identity threat they must first make sense and second give sense to what the organisation is 'really about'.

8.2 Small- and Medium Sized Ports Responses to a Changing Identity

The following section will through a sensemaking- and sensegiving phase analyse how the SMPs are responding to the above identified challenges. The port industry is changing as a shift in their previous known role from new regulations- and demands from stakeholders. This poses an identity threat towards the SMPs and forces them to change. The following section is divided into four, whereas the three first subsections will investigate how the SMPs respond to the identity threat by 1) Making sense of the identified challenges, 2) Revise their identity claims, and 3) Give sense of these challenges. Lastly, the fourth subsection will provide a sub-conclusion, summarising and connecting the first three paragraphs.

8.2.1 How are the SMPs Making Sense of the Identified Challenges?

Building on the identified external challenges, this section will investigate how the SMPs are trying to construct their new desired image. This is in alignment with the second phase in the framework presented by Ravasi & Schultz (2006):

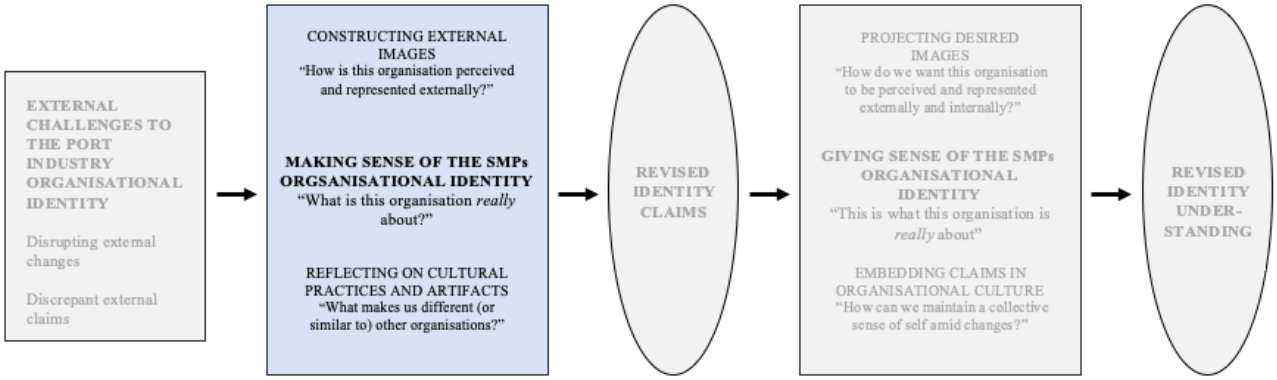

Figure 6: Own illustration based on Ravasi & Schultz (2006)

The structure of the section is twofold: In the first part, it will be analysed how the SMPs make sense of how they want to be represented and perceived externally in their new role as commercial-, digital- and sustainable organisations. In the second part, the focus will be on investigating how the SMPs are trying to internally keep their core culture and artifacts while undergoing the changes to differentiate themselves in the overall port industry.

8.2.1.1 How is the SMPs Perceived and Represented Externally?

As previously analysed, SMPs have until recently been viewed as 'traditional' – i.e. places where boxes are moved from one side of the world to another, and where goods are put on land without any further activities going on (PM, Port of Oostende). The discovered identity threat, however, is questioning this view of traditional work tasks and the value that the SMPs should provide to their stakeholders. Due to the external pressure from both stakeholders and the changing environment, the SMPs are forced to develop and adapt to a more commercial-, digital- and sustainable business to secure their position and remain competitive. This is confirmed by the PM at Port of Korsør: *"We need to digitalise so that such incidences [losing track of what was in storage, and what was handed out, due to lack of registering] does not happen"* (p. 3). It is further elaborated by the PM at Port of Helsingør that *"If our port does not turn green, we have no port. (…) It's an agenda that is forced*

down on us, if we do not switch to a greener operation, we will close ourselves down" (p. 4). The SMPs are thus aware that change is needed to assure their survival in the industry.

By extension of this, it becomes evident through the conducted interviews that the SMPs want to be perceived as enterprises/economic players (PM, Port of Oostende) as well as digitalised and sustainable entities (PM, Port of Korsør). The PM at Port of Zwolle acknowledges this notion: *"We want to grow into a short-sea port. (...) When the locks are widened we can handle short-sea vessels (...), set some step forwards in the energy transition (...) and develop a circular port. So that it will be all in one package"* (p. 4). Moreover, he states that his mission is to have a port that deals with *"(...) energy, carbon footprint, digitalisation, and all those changes"* (p. 6). The Engineer at Port of Emden further argues for the need to bring economy to the port and turn it into an environment that makes companies want to move there: *"It [the port] needs to be attractive, not only for shipping but for everybody to go there. An area where good things happen"* (Engineer, Port of Emden, p. 10). It can thus be argued that the SMPs collectively want to be perceived as ports adapted to *"(...) the modern way of functioning"* (PM, Port of Oostende, p. 9).

Despite the SMPs having a vision of how they want to be represented and perceived externally, the gathered data display that they are not yet successful in positioning themselves as digitalised- and sustainable economic entities. This is evident from the following quote, where the PM at Port of Korsør acknowledges that the municipality first needs to recognise the port's relevance for digital development to happen: *"There is no doubt that the biggest challenge at Port of Korsør is that the municipality must understand the importance of us and want to invest in us. So that we can get digitalised"* (p. 3). Furthermore, he states that in other transport modes such as the truck industry, the pressure of becoming green has been presented within the last 30 years. This has persuaded them to become more 'green' and automated earlier than the ports. By this, he recognises that the SMPs currently are not represented or perceived as being 'green' as competing transport are ahead in their transitions. It is therefore found that stakeholders do not amid the SMPs new role as to become digitalised. Moreover, the view of being sustainable is not accomplished as they are lacking behind their competitors. The SMPs thereby do not affirm their desired external view. From the point of view of the Engineer at Port of Emden, SMPs thus need to enhance their position: *"The port obviously needs to develop and develop in a way that helps them strengthen what they have been doing till now"* (Engineer, Port of Emden, p. 10). He is hereby arguing that SMPs have opportunities to change

their external representation- and perception, but for them to do that, thorough development is required.

As previously argued, the new role of the SMPs is being both a commercial-, digital and sustainable organisation. As a result of their new accustomed role, it is found that the SMPs are constructing a new image as 'digitalised- and sustainable economic entities'. However, the findings indicate that the SMPs currently only are viewed as economic entities - hence, lacking the digital- and sustainable perception of their new role. The economic entity perception is supported externally from the Director in Norske Havner: "*The new 'Havnelov' has pulled the ports in the direction of further commercialisation, which again pulls them even further towards the business part*" (Director, Norske Havner, p. 1). Regarding the digital- and the sustainable perception, as the findings listed above indicates, the SMPs still have a way to go to achieve the external perception they aspire to permit.

8.2.1.2 Reflecting on Cultural Practices and Values

In order to create the desired image and embed it into the organisational culture, the SMPs do not only face struggles with creating the external image to match the facing industry challenges but also their organisational culture and perceptions must be adapted accordingly. With the reinterpretation of organisational identity, the port employees reflect upon their original heritage as 'members of a port community'. The ports have since their establishment, as stated by Sys et al. (2016) in the literature review, been constructed on a multitude of actors who interact and share resources to co-produce value. This has accordingly led to, as argued from Fruth & Teuteberg (2017), that the ports need to network and stress a high level of interfaces in their work of business. As illustrated below in Figure 7, this community can be viewed as the port stakeholders and contains internal- and external stakeholders, community stakeholders as well as legislation- and public policy stakeholders.

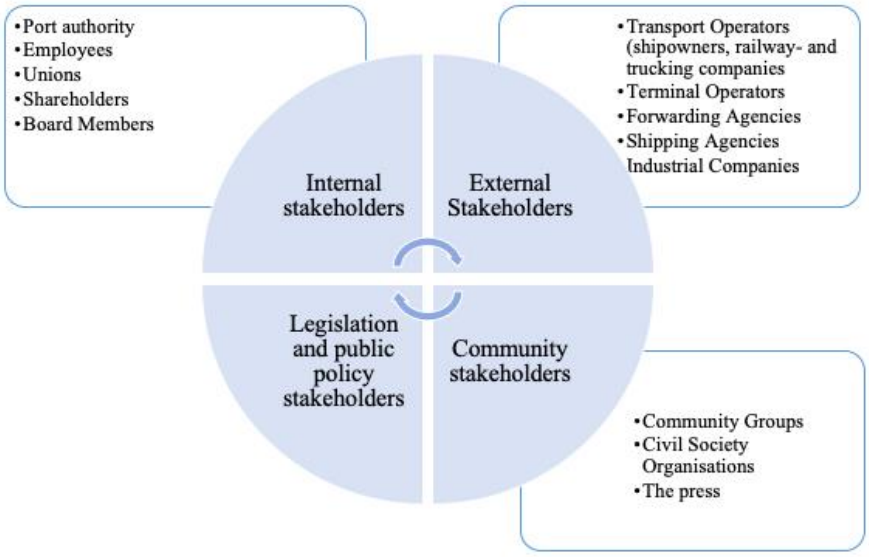

Figure 7: Stakeholders at the port. Source: Own illustration based on Nottebom & Winkelmans (2002)

As part of the above illustrated 'port community' it has been recognised from port management that competition has always been present within their industry. "*I have now been 39 years in the business, and everyday it is competition*" (PM, Port of Zwolle, p.5). This has accordingly led to one of the working tasks of the port management being to consistently network with their stakeholders (PM, Port of Zwolle). This embedded pattern of working is found in several of the port managers, as they have worked in the port industry for numerous years and in different ports with these tasks. Therefore, the importance of establishing the same interests between the different facilitators has regularly been present.

As the SMPs are experiencing an identity threat to change to meet the new demands of their various stakeholders, they find considerable importance in viewing the embedded and unique communication with their 'community'. This to find their distinctive traits and remain in their position. Even though the SMPs' previous ways of collaborating and doing business have changed due to increased commercialisation, digital solutions, focus on sustainability, and increased competitions they devote their original 'ways of working': "*(...) when you are working with a community you really have to complement them on their business (...). If that artitecture does not complement their architecture then it is a mess, so that is important"* (Digital Strategist, Port of Rotterdam). It is reflected from the PM at Port of Korsør that the citizens are very sensitive to what they do in the port. Subsequently, if they do not address any of their concerns or complaints, the port will have to close (PM, Port of

Korsør). This is commenced by other port managers who find that the digital solution that needs to be developed is not necessarily 'that complicated' but needs to connect towards the municipalities and cities in order to be implemented (PM, Port of Zwolle). Accordingly, the PM furthermore highlights that now "*We act as role models, pointing out to the others that there is a bit of [needed] teaching - a green transition ", (...) [it] also shows our port industry that we can do this*" (PM, Port of Korsør p.2). Therefore, to meet the new 'community' demands the SMPs find themselves reflecting upon 'what they are doing' as an organisation to discover their differentiations.

Through the interviews, it is emphasised the importance of networking and finding new business opportunities. Participation within the NON-STOP project, investments in technology, and creating new service offerings demonstrate the SMPs dedication and care to grow and remain in their industry. By trying to discover digital solutions that address all the stakeholders' concerns and 'act as role models', they aim at differentiating themselves among competitors. Using the 'community' to find to areas to digitalise will benefit SMPs to digitalise faster:

"*As the next step is implementation, here the smaller ports can go faster as they accelerate. They can talk to their customers faster. (...) They have known eachother since they were kids and people live around the port so everyone talks to each other after work as well. So when that happens convestations are faster, and you connect faster. If you find a goal that everyone believes in, the implementation goes faster as everyone already is on the same terms. In the larger ports this is a bigger challenge*" (Digital Strategist, Port of Rotterdam, p. 3-4).

The above illustrates that the SMPs have figured out that they need to change according to the desires of their community. However, as argued by the Engineer at Port of Emden SMPs they also need to "*strengthen their position by doing something that helps them find an individuality.*" (Engineer, Port of Emden, p.10). To meet advancements and access the benefits of being a part of a 'community', the SMPs thus need to find their 'niche'. Moreover, the gathered data also highlights that the SMPs need to define what digitalisation is to them, and how they could help their customers specifically (Digital Strategist, Port of Rotterdam).

8.2.2 Revision of Identity Claims

The following section addresses the third phase in Ravasi & Schultz's (2006) model of *Organisational Responses to Identity Threats*. This is illustrated in Figure 8 below:

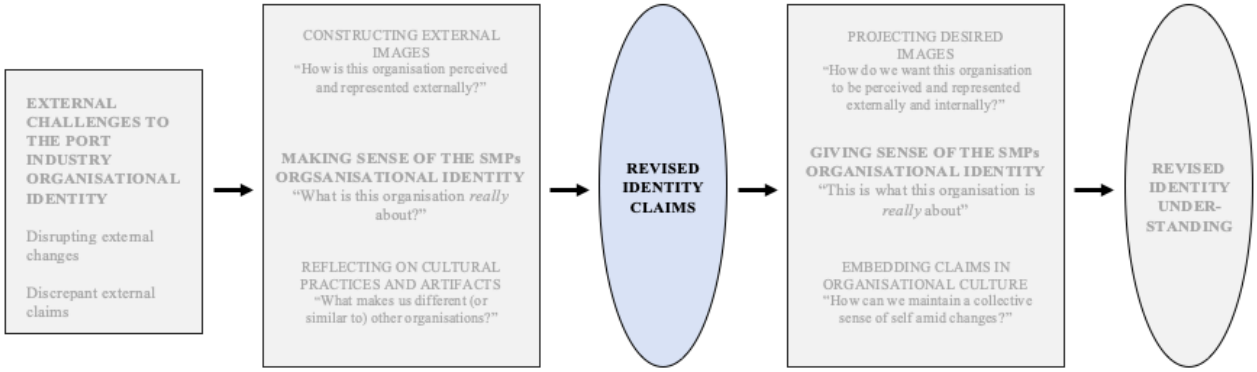

Figure 8: Own illustration based on Ravasi & Schultz (2006)

It has become evident that the external, as well as the internal image of the SMPs, is not aligned today. Furthermore, in the prevalent industry developments- and challenges, their current identity is not adequate. To remain competitive under the new environment, the SMPs are trying to modify from being viewed as economic entities who are lacking behind in digital- and sustainable transformation. The desired image to be proficient in the changing industry is to be perceived as digitalised- and sustainable economic entities who thereby are considerate to its stakeholders and provide new service offerings.

As a result, the rising uncertainties on what the fundamental and distinctive characteristics of what the SMPs are, require port management to fill a gap and reestablish a reasonable and persistent narrative for both internal and external observers (Ravasi & Schultz, 2006). This will help the SMPs rebuild the sense of who they are as an organisation.

8.2.3 How are the SMPs Giving Sense of these Challenges?

Having established the identity claims, the following section will investigate how the SMPs are trying to give sense to the revised identity, placing this section in the fourth phase in the framework of Ravasi & Schultz (2006):

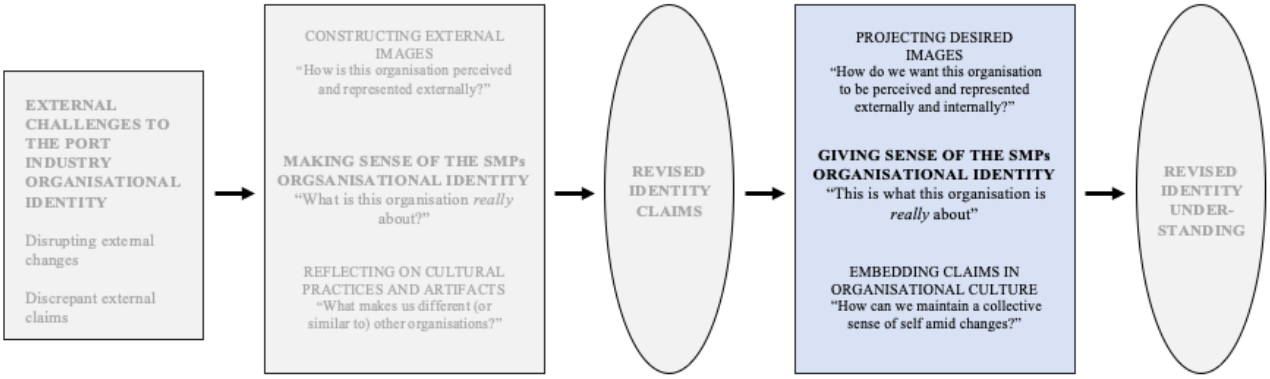

Figure 9: Own illustration based on Ravasi & Schultz (2006)

In the first part of the section, it will be demonstrated how the SMPs try to project the desired image both externally and internally. Furthermore, in the second part, it will be analysed how the SMPs are embedding the new identity claims into the organisational culture.

8.2.3.1 Projecting the Desired Image

The SMPs have taken various image-related actions to influence their external stakeholders' perception of their organisational identity and hence, to be more aligned with their desired image. These actions are primarily targeted towards some of the SMPs core stakeholders: Existing- and potential clients, the civil society- and community in which the ports are located as well as legislation- and public policy stakeholders (Figure 7), whose constructed view of the SPMs currently are not aligned with their desired image.

One of the image-related actions taken by the SMPs to influence the perception of their external stakeholders regarding their identity is increased communication of their importance and the repercussions the ports have on business and civil society. Whereas the focus previously has been concentrated around the maritime and nautic part of the port, the SMPs are now inviting citizens, e.g. schools, down to the port. This to increase their visibility as well as announcing which measures are done to reduce pollution in the city (PM, Port of Korsør; Director, Norske Havne). At the same time, online communication tools are adopted at the request of Interreg (Appx. 12) to leave favorable impressions on external audiences. Through the NON-STOP webpage, the SMPs are collectively sharing news regarding their progress in the project and posting relevant media coverage/articles that have been published elsewhere about the participants. On this webpage, all of the pilot projects are furthermore thoroughly described, including which digitalising measures and green actions each port

are going to take in order to increase knowledge for external stakeholders. Additionally, the webpage informs about student collaborations with the NON-STOP project - again an incentive aimed at influencing external stakeholders' perceptions of the SMPs.

In addition to the above, the SMPs are trying to project a desired image externally by hosting- and participating in a series of webinars (Partner, GEMBA Seafood Consulting). In terms of the current Covid-19 pandemic, the SMPs represented through the NON-STOP project, are offering several webinars whereby they focus on the implementation of new IT technologies to improve the energy and work efficiency in SMPs. The webinars are free and available for everyone who wants to participate and provide inputs to the ports (Interreg, 2021d). Hence, the webinars are providing a great direct marketing opportunity for the SMPs to project their desired image, as well as an opportunity to include their stakeholders through a subsequent panel discussion following the presentations (Partner, GEMBA Seafood Consulting; Interreg, 2021d).

Additionally, annual participation in European Week of Regions and Cities creates opportunities for the SMPs to showcase their capacity to create growth and jobs, implement the EU cohesion policy, and prove the importance of the local and regional level for good European governance (Partner, GEMBA Seafood Consulting; European Union, 2021). Furthermore, Interreg is also hosting some events, such as the North Sea Conference, where the SMPs can participate to present their achievements through the different Interreg programs they engage in (Partner, GEMBA Seafood Consulting). Both of these image-related actions contribute in affecting their representation towards external stakeholders.

Despite making efforts to influence their external stakeholders' perception of their organisational identity, several of the above image-related actions are found to be initiatives made by Interreg and the NON-STOP project, and not the SMPs themselves. This is confirmed by the PM at Port of Korsør in the following: "*Until now we have not as such communicated about our measures. It will be a part of the NON-STOP project and together with GEMBA*" (PM, Port of Korsør, p. 6). Thereby a strategy on how they could project their desired image can be viewed as absent.

8.2.3.2 Embedding Claims in the SMPs Culture

It has become evident that the SMPs are moving towards a more digitalised way of working, and that other abilities and knowledge are needed to meet the new demands. Consequently, to meet the developments, the port management has done measures in finding a collective sense of how the SMPs are in the midst of changes. Through a previous project named DUAL-PORTS (North Sea Region, 2021), and now the NON-STOP project, the participating partners have met frequently to discuss the situated pilots and additional projects in their port.

"*There is something happening with the ports that are involved in the project, but also some clear effects of the cooperation that happens when they meet each other. (...) Then you can hear a little more what you are working on, and that is positive. Now I have been a part of the partner meetings and it does not bring out very much specifically, but afterwards the meeting with the companies is important. Then they sit (...) and talk about what is happening, what to do and learn from each other. Although not directly related to the NON-STOP project, the network that is created outside is valuable"* (Partner, GEMBA Seafood Consulting, p .3).

Accordingly, the project has helped to learn from each other and assisted in figuring out how the SMPs should embed the claims. This is affirmed as:

"*I also find it important to be honest and be vice when it comes to developing things. Obviously, this applies to the pathway of where NON-STOP also is on, making sure that you do use the capacities that digital technology brings forward but also making sure that you do it wisely* (Engineer, Port of Emden, p. 11).

As the port industry is changing and the SMPs are adapting to new requirements, an interest in finding new ways of strategising is initiated: "*In order to realise all of our plans, it must not just be something that lies in the air. It needs to be plans that are possible for them [ports] to grab. Realistic.*" (PM, Port of Zwolle, p. 4). Furthermore, the PM at Port of Oostende has underlined that as they cannot expand their staff with 20-30% they should subsequently strategise smarter and train their employees to conform to this (PM, Port of Oostende). Various port managers also make the distinction that they today strategise differently as they use external resources through consultants. This to resolve obstacles in attaining complemented employees and still correlate in achieving the desired change

(PM, Port of Helsingør). By employing consultants, the SMPs can avert extensive educating with their employees and alternately avoid barriers with proficiency and motivation. The Engineer at Port of Emden was hired as a result of this perception (Engineer, Port of Emden). However, as the Engineer states:

"*It takes time to find out what really needs to be done (...) when I started there were only basic concepts and very basic elements that were intended to be pursued. So, since I was kind of thrown into the cold water with this project as the project coordinator, I had to find out what really needed to be done. Which data did we have available already, and what was maybe false assessments in terms of mental concepts that we had. With writing concepts, we have to do it this way and this way. There was quite a phase of going back and forward and making sure that we found one track on which we should be going and this took some time"* (Engineer, Port of Emden, p. 8-9).

The above could therefore indicate that there is a struggle in finding what the SMPs are pursuing and how they should embed the identity claims in their culture. These indicators can be viewed from port management. In a question to the PM at Port of Korsør related to if there is a strategy on how to implement digital solutions, it is replied: "*I have to say that we do not have that. We can say, we did not have a certain strategy but it is also a follower strategy as it would not make sense not to include it when we first start. It does not cost much to just create a system as well"* (PM, Port of Korsør p. 5). Subsequently, this demonstrates that considerations on the required consulting within the employees of the SMPs is not weighted. At Port of Oostende there are detected further complications "*(...) What we first need to do is to understand the market better and to understand what are the challenges, what is really needed to have this kind of inside advantages*" (PM, port of Oostende, p. 6). This is problematised by the Engineer at Port of Emden who argues that in the project of digitalising "*you can say that it is about learning on the way"* (Engineer, Port of Emden, p.9). In the first phase of finding consultants, the port did not succeed in creating a description of what they wanted to investigate as they did not settle on exactly what they esteemed to achieve. As a consequence, they did not get any consultants to work on what they desired and also got proposed something completely different than intended: "*You also need to take a step back, and look into the whole thing again. It is quite shifting on the way*" (Engineer, Port of Emden p.8).

Thus, the above indicates that, as of now, the SMPs have not submitted a strategy on how they should implement digital solutions and transform in their organisations. This accordingly results in conflicts on how the SMPs should embed their identity claims within their culture to reach the desired image. As it is not defined how they will implement the solution and what they will implement, possibilities to find a collective sense is not obtainable.

8.2.4 Sub-Conclusion

The findings have displayed that the SMPs are responding to the recent identity threat by moving towards becoming digitalised- and sustainable economic entities and thereby provide new and demanded service offerings to their stakeholders. The port management thus has a clear image of how they want the SMPs to be represented and perceived externally. The SMPs are however only identified as economic entities who are lacking behind on digital and sustainable solutions. As new market conditions prosper and the industry is experiencing increased competition, new ways of operating, and advanced stakeholder demands, the SMPs are trying to change accordingly. This by focusing on meeting the requirements from their established 'communities'. To give sense to the SMPs new identity, multiple actions have taken place. These include an increase in usage of communication tools, webinars, participation in conferences, visitations, meetings with other SMPs, and engagement of consultants.

Despite this, the findings indicate that the SMPs currently have not been able to project the desired image and find how they should embed the claims in their culture. Thereby a revised identity understanding of what the SMPs should really be about is not found. This emerges from the fact that the port managers have not settled on how they should strategise to meet the new identity claims. Accordingly, this results in that the SMPs today cannot reach their desired image of being digitalised- and sustainable economic entities who provide new and demanded service offerings to their stakeholder, and thereby not give sense to- and transform their identity.

8.3 Revised Identity Understanding

It has through the analysis been displayed that the port industry is currently experiencing four strategic challenges that are changing their former known identity. Previously they were known as a traditional industry where goods were loaded and unloaded, whereas they now should be market- and economically concentrated, make technological investments in which they can increase their profit,

and concentrate their port activities. Accordingly, the SMPs have by sensing these challenges and seizing them with three measures, constructed new identity claims. The claims operate as a foundation on how the port management desire that the SMPs should be perceived. Despite that they have created a definite goal of their desired identity, it has throughout the analysis been evident that both external- and internal stakeholders are not able to give sense of the SMPs desired image. Externally, the SMPs are viewed as economic entities who are lacking behind on digital and sustainable solutions. Internally, the management are struggling to find out how they can, and should, embed the claims into the SMPs culture and thereby find out what the SMPs should be about.

Through the interviews with the port management at the different SMPs, it became evident that they have a clear vision of how they want to be represented and perceived. In section 8.2.2 it is established that the desired image is to be proficient to the industry developments- and challenges by being perceived as digitalised- and sustainable economic entities who are considerate to its stakeholders and provide new service offerings. In further investigations on how the port management has tried and still is trying to embed the desired image externally and internally, it became apparent that the port management is struggling to find a common ground on how they should reorientate the SMPs. This has accordingly led to disorientations throughout the organisations. The port management is thus experiencing trouble encountering the desired image.

Through image-related actions, it can be argued that the port managements have attempted to influence the external- and internal attitudes and motivations of their stakeholders. However, the findings show that port management has not succeeded. The SMPs can therefore not reach their desired image or establish a common understanding. It can be argued that for them to accomplish this, port managers first need to determine their beliefs and behaviors. Furthermore, it has also been found through the analysis that port management has not been able to form a way of strategising that can create a social movement and help reach the goal of a collective understanding. Not before this is settled, will the SMPs have the opportunity of reaching a revised identity understanding and correspondingly sense and seize the capabilities to sustain a digital transformation. This will accordingly help the SMPs to avoid unfamiliarities and transform more adequately. Hence, with the formation of such a settlement, the SMPs could access the possible benefits of becoming more digitalised and strategise to transform their identity substantially.

A summary of the analysis and the associated findings to each phase in the framework of *Organisational Responses to Identity Threats* (Ravasi & Schultz, 2006) is provided in Figure 10 below:

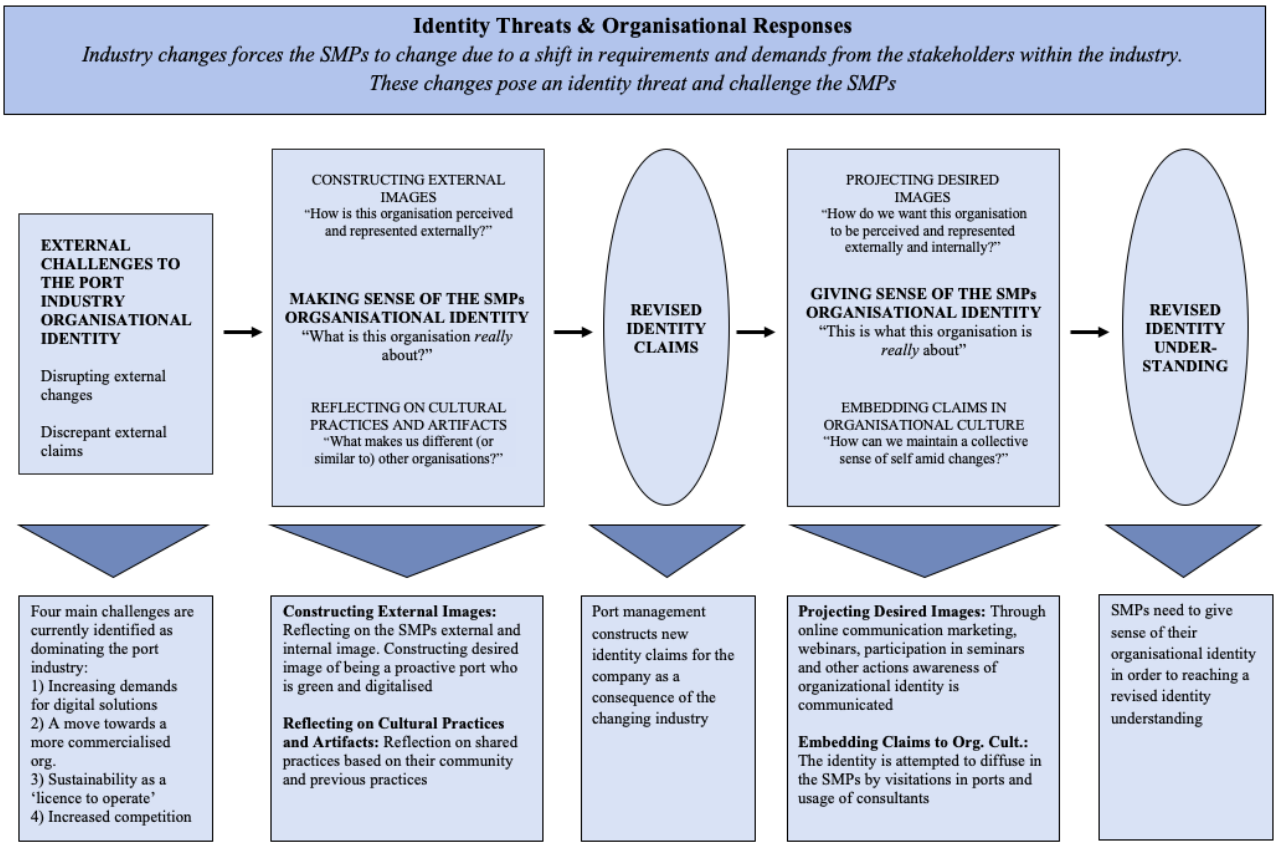

Figure 10: Summary of the analysis and the associated findings to each phase in the model presented by Ravasi & Schultz (2006).

9. Discussion

Through the analysis, it has been evident that there is an absence of a common identity understanding amongst the SMPs. This is argued as they have not found a way to obtain their projected desired image and furthermore, how they should embed it into their organisational culture. Based on this, together with confiscating findings from the literature review, it will in section 9.1 be discussed two considerations as to why the SMPs are currently not able to access more of the potential benefits of becoming digitalised. These are: 1) Lacking behind in Digital Transformation, and 2) Lacking behind in Strategising. A sub-conclusion hereof will follow, summarising the main points from this discussion. By extension of this, section 9.2 will review the implications this thesis has on the SMPs participating in the NON-STOP project, other ports in the industry, and port management in general. Following this, section 9.3 will provide specific recommendations to the SMPs on how they can strategise to access more of the potential benefits of becoming digitalised.

In section 9.4, limitations that were discovered during the process of writing this thesis will be discussed. This will include limitations regarding both the theoretical frameworks, the data collection, and the time frame. Finally, section 9.5 will provide suggestions for further research.

9.1 Absence of an Identity Understanding

As acknowledged, the port management has not yet been able to find a way to project their desired image and embed a cultural understanding, and thereby not provided an identity understanding. From Albert & Whetten's (1985) definition of identity, it is found that an identity captures "*who we are " and* "*what we do "* as an organisation. Since the SMPs have not captured their identity, the criterion of a claimed central character, claimed distinctiveness, and claimed temporal continuity, cannot be established (Albert & Whetten, 1985). These considerations are constructed through interactions with others: "*From sensemaking and sensegiving processes through which members periodically reconstruct shared understandings and revise formal claims of what their organisation is and stands for"* (Ravasi & Schultz, 2006, p. 436).

It was chartered from the port managers at Port of Helsingør and Port of Korsør a need to change their way of working due to external pressures and changing environments. Accordingly, the SMPs have to become digitalised and sustainable on their initiatives to meet today's competitive society

with their increasing demands. However, an understanding of *how* this should be achieved is lacking. It is found that digital innovations have extensive implications beyond the technology itself (Obwegeser & Bauer, 2016) and create a disrupting time where organisational members must alter what the firm represents (Tripsas, 2009). The findings illustrate that the SMPs are experiencing limitations preventing them from estimating these connotations. These limitations will therefore be discussed in the following subsections to capture what it implies for the SMPs.

9.1.1 Lacking Behind in Digital Transformation

Through the analysis, it has become evident that the SMPs are currently lacking behind in their digital transformation compared to other transport modes, especially towards the trucking industry (PM, Port of Korsør). These modes are becoming more 'green' and automated and have transitioned in the last 30 years. This has accordingly led to them being in advance of innovation developments and brought them advantages to meet today's requirements (Director, Norske Havner).

In the two first 'waves' of digital transformations within the port industry, the adaptation was mainly built upon a willingness and motivation to change their operations. Only in the third wave with the accustomed shift towards a commercialised organisation, ports were to a larger extent pushed to acquaint technological solutions (Hellig et al., 2017) (Director, Norske Havner). Inconsistencies in the appliance of digital tools within the ports are thereby present. For instance, the SMPs have only in recent years started to be invested in projects such as NON-STOP and DUAL-PORTS to find digital and sustainable solutions (Interreg, 2021) and they are still trying to establish what they should implement (PM, Port of Oostende). This entails that the SMPs have not followed the digital 'waves' that have occurred in the last decades and are behind in the implementation of technological solutions. The lack of recognition could accordingly question the SMPs' prior willingness and motivation towards digital investments.

Drawing on Tushman & Anderson (1986), it was viewed that established organisations and industries have the most difficulties in adapting to technological change that need new knowledge and routines. This is found in that if you adopt such technologies that are identity threatening, it could violate core beliefs (Tripas, 2009). The adjustments that are required in the digital transformation of SMPs are through the analysis established as extensive and pose an identity threat onto the ports. As the SMPs are part of a traditional industry that possesses rooted knowledge bases, procedures and routines, they

will find this transformation challenging as it threatens their previous 'way of working'. Consequently, until the SMPs now were pushed to adapt to both industry developments and stakeholder demands, they have to some extent tried to maintain their integrated business processes while adapting to the 'needed' technological solutions (Business Consultant, Danske Havne) (Partner, GEMBA Seafood Consulting). From the lack of adaptation, it can be observed that the needed changes are highly pressured and more comprehensive than before. This increases difficulties to obtain their internal culture and external image.

The SMPs are currently threatened on their ability to acquaint all vessels as it is demanded from maritime logistics that operations have to be digitalised to ensure fast and secure handling of goods (Digital Strategist, Port of Rotterdam). As it is argued from the Partner at GEMBA Seafood Consulting that the SMPs have not accustomed to the needed capabilities and capacities to undergo such a transformation, this threat is causing challenges for the ports. An urgency to establish operational necessities within standardised business processes through technology solutions is hence discovered as crucial. A comprehensiveness is further found in that the SMPs first need to *digitise* their operations to avoid becoming obsolete before they can find their desired *digital* direction (Digital Strategist, Port of Rotterdam). This is found as organisations that are able to take advantage of the aspect that digitisation can provide, could produce new ways of organising and accordingly digitalise (Leonardi & Treem, 2020). Based on this, the SMPs have to establish more technical know-how and knowledge regarding the possibilities this can withdraw.

The empirical data collection has shown that several of the SMPs are viewing themselves as limited within opportunities of meeting the industry with notions as "*the case with ports is that they are adapted to the history in which they have worked. So if your port is small, then you cannot offer what the current ships need - then you need a larger quay*" (PM, Port of Helsingør, p. 6). Furthermore, the findings illustrate that the SMPs have not established which technological solutions they should adapt and currently view them as expensenes instead of possible incomes (PM, Port of Oostende). Such indications imply that SMPs as of now do not possess the ability to *sense* and *seize* all of the opportunities in implementing technological solutions and become *digitised* in order to undergo a *digital transformation*. From Treem (2020) it is discovered that the establishment of an operational backbone can eliminate constraints with limitations in time, capital, location, and space. Therefore, it can be observed that if the SMPs are able to *sense* the importance of *digitisation* it could contribute

to discard challenges that they today view as definite. If technological solutions are implemented to make previous analog operations digital, the SMPs can potentially improve the efficiency, safety, and data security of navigation and communication (Berg & Hauer, 2015). According to Carlan et al., (2017), the port industry can furthermore experience cost savings, increased quality, and further growth by implementing digital innovations. It has furthermore been highlighted from the Business Consultant From Danske Havne, that a technological system for the SMPs does not require extensive expenses as it typically costs 200.000 DKK or less. This is hence something that the SMPs can implement and access the above mentioned benefits.

If the SMPs do not invest in the available and needed big data analytics, and the networking of technologies increases, they arguably fall even further behind their competition. In that case, one can question whether the SMPs could even continue to operate as ports. This as a possible threat is found in that vessels will change their routes to other ports instead (Digital Strategist, Port of Rotterdam). Instead of focusing on trying to establish new innovative solutions, their focus should be on *digitising*. Only when this operational backbone is integrated, the SMPs can find new value propositions and figure out "*not what you can contribute with, but where you can contribute"* (Digital Strategist, Port of Rotterdam, p.2). This can thereby help the SMPs to withstand and *seize* possible threats as they will differentiate themselves and be innovative in the industry.

The above-mentioned is accordingly what drives organisations through a digital transformation. Still, this transformation brings new constellations of structures, values, practices, and beliefs that change, threaten, replace, or complement existing rules of the game within organisations, ecosystems, industries, or fields (Krimpmann, 2015; Loebbecke & Picot, 2015; Mangematin, Sapsed & Schüßler, 2014). This can hence describe why the SMPs, who have operated in the industry for decades, have lacked the willingness and motivation to adapt previously. However, now that they have to be more responsible to ensure a profit and are competing with larger ports that are *digitalised* (Partner, GEMBA Seafood Consulting) they have accessed the opportunity to become *digitised.* With secure and rationalised operations they can be more efficient and concentrate on value-adding activities, which again will help the SMPs to view that "*the use of data also becomes a source of income*" (PM, Port of Oostende, p. 9).

9.1.2 Lacking Behind in Strategising

The findings from the analysis emphasise that the SMPs are trying to move away from being 'monotonic dinosaurs' and digitally transform their business. It has been argued that to succeed with the digital transformation in the port industry, as the transformation occurs at different levels, a necessity of "*a collaborative strategy and structure to govern joint actions for pursuing the achievement of mutual benefits*" (Heilig et al., 2017a p. 1) has to be found. This implies that to succeed in the transformation, the SMPs have to consider not only the adoption of technologies but also *how* they adapt it in the organisational structure. Moreover, it entails alignments and considerations on intra-inter and meta-organisational perspectives as well as resulting costs and benefits of digital transformation (Heilig et al, 2017a). This indicates that the SMPs now have to strategise and change accordingly. For the SMPs, this change demands another way of thinking, which is identified as being challenging for them (PM, Port of Oostende).

From the interviews with the port management, it was settled that they have worked with ports in the last decades. Findings have indicated that this will benefit the SMPs as they have industry-specific knowledge and are in possession of human capital that is limited to other industry contexts (Campell, Coff & Kryscynski, 2021). It was found in section 8.2.1.2 that port management has worked with networking and their established 'community' constantly and are reflected upon the importance of meeting their requirements. With further considerations on how they can use this asset to their advantage in terms of their experience and insights, values, institutions, and expertise, they could find specialised skills within the industry.

Furthermore, it has through the revision of identity claims in section 8.2.2 been initiated, with the rising uncertainties on what the fundamental and distinctive characteristics of the SMPs are, that they should fill the gap by creating a reasonable narrative for both internal and external observers to achieve a better understanding (Ravasi & Schultz, 2006). When the SMPs now should construct their new way of strategising it can be discussed whether it would be useful for them to adapt to a more 'temporal way of working' in their strategy-making (Appx. 4). As organisational actors often have difficulties in finding a consistent interpretation of what "*might emerge in the future, what was currently at stake, and even what had happened in the past*" (Kaplan & Orlikowski, 2013, p. 965), this can contribute to creating an organisational narrative. If the port managers are able to access their tacit knowledge through reflections, the SMPs can search in the past to find insight into when and

why situations occur. Accordingly, they can cohere them into useful strategic accounts and face fewer uncertainties of entering an unfamiliar domain (Kaplan & Orlikowski, 2013).

However, concerns have been raised regarding to which extent managers with well-established industry-specific knowledge can strategise towards what is currently at stake and what might emerge in the future (Kaplan & Olrikowski, 2003). Drawing on the theory of dynamic capabilities, this is identified as a common phenomenon where top managers lack the right approach to industry changes. Instead of investing in the future, top management concentrates on preserving past success instead of shaping the future industry to the firm's benefit (Harreld et al., 2007). From the collected data there have been indications that the port management is having a hard time strategising in the present and future: "*There was quite a phase of going back and forward, and making sure that we found one track on which we should be going and this took some time"* (Engineer, Port of Emden p.9). The findings also highlight that the management has not settled on how they should implement the digital solutions and which solutions they should implement. Hence, it can be experienced that the port management originates their prior accomplishments, which could lead to a decay in their succession rate (Gompers et al., 2010).

From Jones & Harris (1967) it is further emphasised that organisations tend to blame external factors for failures and credit their own actions for successes when established organisations are in times of 'switching behavior'. Through the analysis, it became visible that the port managers find the trucking industry having it easier to adapt towards 'green' and automated operations than them (PM, Port of Korsør). Moreover, they find that the shipping industry as of now has no requirements in contributions of 'green' solutions, which make the responsibility lie solely on the ports (PM, Port of Helsingør). This can accordingly cause trouble for them. Even though this is argumental from prior market developments, it does not bring less opportunities for the SMPs possible successes. As shown by the Digital Strategist at Port of Rotterdam, their port is 'far ahead' in digitalising. The Digital Strategist is young, has recently been hired, has a Ph.D., and can thus be viewed as a 'high-skilled' worker (Digital Strategist, Port of Rotterdam). Her being a 'high-skilled' worker has, as displayed by the Port Manager at Port of Oostende, impacted how the port is managed and organised (PM, Port of Oostende). From the interviews, it is evident that she is working on a team to find capacities, how they should commercialise and make the departments work together as communities (Digital Strategist, Port of Rotterdam).

On this notion, it can be observed that the SMPs are dependent on newly acquired knowledge and expertise. This as it can influence how the capabilities develop and how organisations are learning from success and failure, which may be beneficial for them in future strategising (Bingham & Davis, 2012; Lant, Miliken & Batra, 1992; Repenning & Sterman, 2002). With new internal or external employees, the SMPs could gadget new knowledge within strategy establishment, management style, and decision-making style as these competencies may not be as specific and thereby more rapidly changed and adapted. This to meet new conditions in the changing industry (Eggers & Song, 2015). The findings acknowledged that the SMPs have tried to hire consultants to develop new digital tools, and thus some recognition of the importance of new expertise is found. Still, it is observed that the actors have difficulties in adapting to this new required knowledge and take advantage of the opportunities of new employees. Such a capacity depends on their research and development and market-related capabilities to reconfigure the organisation's resources (Daneels, 2002) (Teece, 1986). This capacity is currently not found in the lack of projecting their desired image and embedding claims. If the SMPs are able to unlock this capacity, the value of understanding and quick-adapting to new customer needs could be assessed (Jaworski & Kohli, 1993; Narver & Slater, 1990). Hence, they could find opportunities for innovation and differentiation, which again underlie strategic renewals as they can adapt and also create opportunities alongside (Cohen & Levinthal, 1990).

The current participation of the SMPs in the NON-STOP project has illustrated a motivation and willingness to adapt to the changing environment. For the SMPs, it has brought them advantages within innovations, networking, and funding (Partner, GEMBA Seafood Consulting). Thus, resulting in adaptations to meet the new stakeholders' requirements. This was underlined in section 8.1.2 on how the SMPs sense the currently ongoing challenges. Furthermore, the findings indicate that the SMPs are trying to collect further knowledge and expertise from other participants in the NON-STOP project by visitations on their port and meetings (Partner, GEMBA Seafood Consulting). However, as highlighted in section 8.2.3.1, they rely to a great extent on the project management to find and develop webinars and events to find additional solutions. Even though this brings additional value to the SMPs, as they can strategise better, the organisations should search for opportunities outside their current business units to unlock future capabilities (Harreld et al., 2007). As viewed in the ABP Project in Port of Algeciras, a greater use of network effects can bring advantages (Puerto de Algeciras, 2021). Furthermore, the SMPs can take advantage of observing how technologies are integrated in larger and more digitalised ports. This can help the SMPs to get an understanding of available solutions and provide them with insights on what they should do (Digital Strategist, Port of

Rotterdam). Accordingly, this can help the SMPs to *sense* the changes in the competitive environment which includes potential shifts in competition, customers, technology, and regulations (Harreld et al., 2007).

The use of network effects can also indicate which technological solutions the SMPs should adapt depending on how much value it will deliver to them. From the Partner at GEMBA Seafood Consulting it was brought forward that the larger ports have invested in automated solutions and while some of the integrations have not been successful, they have now found many beneficial solutions on efficiency, safety, and reduction in costs. The aspect of this also highlights the importance of evaluating the socio-technical aspect of the technology. It has been found that the appearance of *digitisation* depends on the effectiveness the system can provide when the interrelation of the social and technology is evaluated (Henfridsson & Bygstad, 2013). Accordingly, when organisations implement new technology, it is important to evaluate how this affects people at the workplace and also if this technology complements the organisation. The goal is to create a comprehensive and joint optimisation where the system features the distinctive characters that the organisation would need to operate successfully (Hendrik & Kleiner, 2001; Hancock, 2009). Looking at larger and more digitalised ports and how they now have interlinked the systems, innovations, and communication on developments can therefore benefit the SMPs (Digital Strategist, Port of Rotterdam). Furthermore, the considerations of which system to integrate, and *how* they should integrate it to their port, will contribute to finding specific solutions, bring risk aversions, and provide stability. This is found as the SMPs can consider which technologies are needed and how they should implement them. Consequently, this brings fewer uncertainties and unfamiliarities to the SMPs together with possible cost reductions.

As initiated by the PM at Port of Zwolle, the strategising cannot just be something that 'lies in the air' for their stakeholders, it needs to be plans that are possible for them to grab. In recent literature, the value of using a team-based approach instead of visionary leadership is discussed as it caters to the differences in the cognitive capabilities of the team (Baiyere & Lambaert, 2020). As argued from Mintzberg (1987b), the organisational actors play an essential role not only in accommodating change but also in influencing and shaping it. It has become evident that long-term planning and strategic initiatives are more likely to emerge when the differing views of organisational actors are considered (Schneider, 1997). As the findings illustrate that the port management is currently experiencing troubles in strategising and implementing technological solutions, this could therefore help to

overcome obstacles in integration. Furthermore, by considering this socio-technical aspect, it could benefit them in finding their 'niche' and how they can access the most beneficial solutions to reach this.

The port industry includes many interlinked and interrelated actors who may not achieve their interests the same way or even share the same interests (Sys et al., 2016). Therefore, the considerations of technologies and a 'niche' should also involve the community. Using the SMPs' network to figure out which technology is of most importance for them to provide a secure and efficient system, is of interest. Thereby, they could overcome the identified obstacles towards the municipalities and requirements from consumers (PM, Port of Korsør). As organisations should pursue a long-term view of customer relationships, since it reflects the length and history of provided value propositions, this could be beneficial for the SMPs (Payne et al., 2008). Customers and customer needs change over time and it is therefore vital that the SMPs can adapt rapidly. By considering all of the above, the decision-making can be of higher validity. The decision will be based upon the availability of the problem, a considered solution, and evaluation of the level of risk tolerance (March, 1994). Moreover, as the SMPs are limited in capabilities and capacities of monetary assets and employees (Partner, GEMBA Seafood Consulting), this can be favorable on the profit situation. It can make the SMPs open to find interpretations of what will emerge in the future and what is currently at stake, and thereby make useful strategic accounts (Kaplan & Orlikowski, 2013). Hence, SMPs can interpret technological solutions that would benefit them in a preferred manner on the considerations of their stakeholders' demands in a legitimate way. This will allow the SMPs to move forward in the changing industry with lower uncertainties.

9.1.3 Sub-Conclusion

In the previous section several indications towards why the SMPs are limited in finding their identity from "*who they are*" and "*what they do*" have been displayed. In the changing environment of the port industry, the SMPs' strategy should be formed promptly to correlate to the operating environment (Tallman, 2006). From the concept of dynamic capabilities, it is found that organisations can only benefit from competitive advantages if their capabilities correlate to the environment. It became evident through the above discussion that the SMPs are lacking behind in digital transformation. The lack of digital transformation implies that the SMPs have to focus on *digitising* to meet the current environment and that they cannot find new digital innovations before this is settled. If the SMPs do not become *digitised*, this could imply that they will find themselves in a

competency trap (Tallman, 2006). This situation arises when an organisation is investing in activities that only will provide them advantages today and losing track of investing in competencies that could be successful in the future (Liu, 2006).

The findings of the analysis discovered that the SMPs have an absence of *capacities* and *capabilities* to correlate their strategising towards the changing industry. Accordingly, the port management does not *sense* and *seize* what is currently at stake and how they should strategise to meet future requirements (Kaplan & Orlikowski, 2013). For the SMPs this implies that they are not able to find their 'niche', which technological solutions they should focus on adapting, and how they should adopt them. Hence, this further implies that the management cannot *sense* all the changes and act on the threats and opportunities by *seizing* them by redesigning both tangible and intangible assets, to comply with new challenges (Harreld et al., 2007). Therefore, the absence of an identity understanding suggests that the SMPs are currently lacking behind in digital transformation and strategising. Overall, for the SMPs this has implied they cannot access the possible benefits of becoming more *digitalised.*

9.2 Implications

This case study aims to discover how the SMPs can access the possible benefits of becoming more digitalised, as the port industry is undergoing a changing environment. Practical implications can be drawn by the participating ports in the NON-STOP project, other ports in the industry, and management.

For the SMPs in the NON-STOP project this study can provide insight into how they can adapt to the industry changes and stay competitive on the market. The participating SMPs can use the information on their current absence of an identity understanding, as well as what this has implied, to cancel out the current limitations. To start with, this thesis brings implications to how the port management's inadequacy of what the SMPs should be about, has brought two significant disruptions to change. Furthermore, the SMPs can use the provided information to transform their 'way of working' to meet the demands and requirements of today. By first *digitising* their operations by smaller investments in technological solutions they can transform their 'way of working' and find innovative solutions needed for the future. The SMPs can also use the knowledge of the current confusion on how they should give sense to their identity, to constantly investigate in their changing environment as well as

their stakeholders' preferences. They can thereby investigate identity claims and possible questionings of their organisational beliefs and consequently, become ahead of the challenges. Accordingly, the SMPs can access the possibility of strategising towards *sensing* and *seizing* the capabilities that will be utilised in the future and thereby gain competitive advantages. This can furthermore provide them with long-term success as they can adapt rapidly and have a constantly shared understanding of "*what they really are about"*. Lastly, this thesis can prove useful for the SMPs to understand the importance of finding their individuality and 'niche' by investigating their heritage. Hereby they can identify essential parts of their traditions and culture, and use this to discover what the organisation should *really* be about.

Other ports in the industry can use this case study to draw useful conclusions through the identified developments and how the organisation should transform accordingly towards them, to access possible benefits. On the one hand, they can use this study as an admission to see the potential progress the NON-STOP ports will be accustomed to. On the other hand, the ports can utilise it to adjust their capabilities and capacities so that they can strategise- and digitalise beneficially. Even though this case study is based on the NON-STOP's ports culture, values, identity, and history, other ports can use it as insight to analysing their own identity understanding and the importance of doing it continuously.

Managers can use this thesis to discover the importance of leaders adopting the right attitude which matches the goal the organisation wants to reach, before changing the organisation. Moreover, it can bring implications for the relevance of first adopting technological solutions continuously and maintaining an operational backbone. As this can pose identity threats, they should furthermore evaluate the impact that this implementation means on the organisation, avoid distress, and encounter resistance. The management needs to analyse what the technology can contribute with, to avoid disorientation of the tools. The study can also bring implications on the attention towards using their stakeholders and a team-based approach to implement appropriate tools and meet their desired demands. However, as mentioned in section 7.6.1, this case study solely focuses on the SMPs participating in the NON-STOP, which is why it cannot be fully generalised. Other leadership approaches may therefore be more applicable under different circumstances.

9.3 Recommendations

The analysis showed that the SMPs are currently not able to give sense to their organisational identity and hence an absence of a common identity understanding is discovered. To project the desired image and embed claims into their culture, the SMPs must first align what they should *really* be about. Based on this, the following section will highlight four recommendations in order for the SMPs to achieve a revised identity understanding that consequently may help them to access the possible benefits of becoming more digitalised:

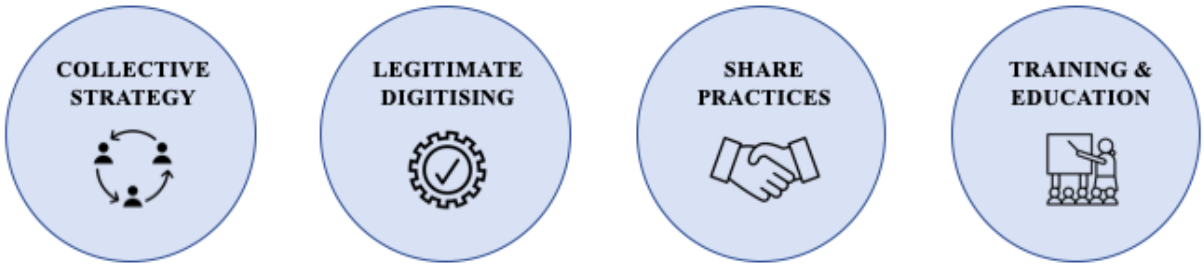

Figure 11: Overview of the four recommendations

1. Collective Strategy

For the SMPs to strategise and unlock the ability to meet future requirements, identify what is currently at stake, and what has happened in the past, it is recommended that they rapidly integrate the demands of their stakeholders. Hence, create a collective strategy. By catching awareness of their considerations they can access what the needed capabilities and capacities are, and thereby strategise according to their environment. From this, they can identify possible opportunities and threats and make ongoing enchantments. Consequently, the SMPs can take a more proactive role in the industry.

2. Legitimate Digitising

The SMPs should implement required technological solutions, and integrate their organisations with tools that can complement available digital infrastructure that they have not yet taken advantage of. In today's industry there exist technologies of different functionalities and with adaptation to the needed tools, the SMPs can access capabilities of security, efficiency, and cost savings. They can

hereby meet the environmental changes and after the integration, be able to adapt more rapidly to new innovations and regulations.

3. Share Practices

For the SMPs to meet the competing environment better, it is recommended that they use their network to share practices. This can provide them with admission to find the best implementation strategy and transfer successfully integrated tools into their port. Furthermore, it can contribute in developing their individuality and niche with development on collaboration for the goods, instead of competing on them. This way it will be possible to complement each other on the needed offerings. Consequently, the SMPs can differentiate themselves on the market.

4. Training & Education

For the SMPs to meet today's requirements and become *digitised* it is recommended that the port should rapidly educate and train to apply best practices. This can help them to find out what needs to be done, better consider decision-making processes and strategy more beneficially. If they access their network or find new knowledge externally they can target the digital and green environment better. Altogether, this will bring advantages to becoming *digitalised* and innovative and take on a proactive role in the industry.

The four explained recommendations will collectively help the SMPs to strategise and transform their organisation in a more substantial way. By taking a more proactive role in the port industry through taking advantage of their network to a greater extent, adapt their strategy rapidly, and implement new technologies they can meet today's environment better. Accordingly, this will help the SMPs to differentiate themselves on the market by finding their individuality and have better potential to survive. Thereby the SMPs can sense and seize the opportunities and threats in the market and strategise in a substantial way, which will give them access to potential benefits of becoming digitalised. Hence, for the SMPs to reach a revised identity understanding major adaptations are not needed. Instead, it requires a better appearance of motivation and willingness from the port management themselves in the future, which can be demonstrated through the adaptation of the above recommendations.

9.4 Limitations

As researchers of this thesis, we have gone lengths to ensure that no stone has gone unturned in the process of the data collection- and analysis. However, intrinsic aspects related to the data collection, the time frame, and the theoretical framework have caused several limitations to the thesis that will be addressed in this section.

9.4.1 Theoretical Limitations

In relation to the applicability of the theoretical framework presented by Ravasi & Schultz (2006), a limitation can be found in that this framework is based on a case study of Bang & Olufsen, where three separate instances of organisational responses to identity threats are compared. Based on the criticism associated with case studies, the generalisability of this model can thus be questioned and whether it actually can be used when investigating a different organisation and industry. However, Ravasi & Schultz (2006) argue that they have observed similar patterns of behavior across different cases. This reinforces both their and our confidence in the generalisability of their interpretations beyond the limitations of their study of Bang & Olufsen. Furthermore, the presented framework is a result of a *longitudinal* case study over 25 years, which is not the case with our study of the NON-STOP project as it provides a 'snapshot' of the current situation. Despite this, we find the framework to be applicable as the port industry has experienced three waves of disruptive digital changes in the last decades. Even though this thesis will focus on the changes that have happened in the last decade, it is recognised that some of the changes that are happening today originate from previous developments. Lastly, we find the current identity changes that appear in the port industry today to strongly correlate with the phases that are described in the theoretical model.

Regarding the sensemaking theory (Ravasi & Schutz, 2006; Weick, 1995; Brown et al., 2015), a limitation is found related to the inherent complex reality of the theory when it comes to settings occurring in real life. Both on paper and in theory it can seem easy to understand 'sensemaking', nonetheless, the processes described in papers often happen instantly and automatically in the real world, without much weight attached to the enactment process. Consequently, limitations are created for us as researchers when we have to account for complex organisational studies of sensemaking related to digitalisation and identity change. Changes in an organisation that are not radical do not typically stand out to the average person in their everyday activities and interactions, which is why it can be difficult to recreate a precise account for the sensemaking happening organisations. In the case

of the SMPs in the NON-STOP project, this is no different. As changes, e.g in identity, due to the increasing digitalisation typically not stand out as radical, it is hard to duplicate a precise picture of reality as the participants might only account for what they perceive as the larger events or changes occurring at the SMPs. However, this may also be close enough to reality, as meaning creation within sensemaking does not have to be completely accurate, but account for the most probable happening (Weick, 1995).

9.4.2 Data Collection- and Time Frame Limitations

It has previously been stressed that both identity and sensemaking theories are based on processes and continuity (Ravasi & Scultz, 2006; Weick, 1995). This implies that the findings of this thesis solely represent the SMPs and their impacts for the exact moment in which the data was collected. Consequently, the collected data could look fairly different if the thesis was to be reproduced at a later point. By stating this limitation we do not wish to imply that the findings of this thesis do not contribute to theory and relevance for the understanding of identity and sensemaking and that the thesis cannot be reproduced. Our intention, however, is to clarify that in the case of a future reproduction of this thesis, the gathered data *could* potentially tell another story that can change the way meaning creation occurred for the SMPs.

Furthermore, due to the set deadline of this thesis, our study holds a limitation in that the interviews are conducted over a period of 1,5 months. This means that the understanding of the sensemaking process solely can be seen and analysed based on this specific timeframe. Consequently, all events happening prior to the data collection are studied as aggregate and retrospective accounts. Conducting a longitudinal study could prove beneficial in that it would allow for follow-up interviews and observations providing us with the opportunity to study change and meaning creation as it happened. Instead, we need to trust the data to the accounts of the interviewees, as mentioned above.

9.5 Further Research

This thesis has highlighted several findings on the topic of how SMPs can access the possible benefits of becoming more digitalised. However relevant, these findings also lead to further questions and this section will provide suggestions for further research.

In light of the limitations related to the data collection of this thesis, an obvious suggestion for further research arises with regards to conducting research that includes observations at the different SMPs. The reality we are presented to in this case study is solely from the perspective of the port management and how they interpret their way of working with the technology. If further research on the topic were to be collected, a study investigating and observing how the different port management more specifically works with technology would provide an interesting point of view. Such a study would preferably include even more of the socio-technical perspective than what is adopted in this study, and thereby embrace more of an ANT view of technology. Furthermore, even though this study holds interviews with both port managers and several other external actors within the port industry, the focus of the thesis is mainly on port management at the different SMPs. In further research, we thus recommend including interviews with other employees at the ports to unveil whether their perceptions and interpretations mirror the ones of the port management. In Ravasi & Schultz's (2006) definition of identity, it is pointed out that organisational identities arise from sensemaking and sensegiving processes through which *members* reconstruct shared understandings and revise claims of what their organisation is about. Hence, highlighting the importance of including more organisational members when discussing the organisational identity at the SMPs.

By extension of the above, we also believe research including several other groups of stakeholders would be interesting. This could provide a more complete picture of the challenges the SMPs currently are experiencing and also, how the society around them perceives how the SMPs have managed, and are still managing, these challenges. Especially as it through this case study has become evident that the ports are facing increasing demands from the communities, we think that including them in a study would be beneficial. Additionally, as our delimitations demarcated us away from including the companies located at the various ports, we also recommend including their point of view if conducting further research on the topic. As they are located *at* the ports, it can be argued that they are one of the most important stakeholders of the SMPs and their perceptions should thus be included when investigating the future of the SMPs regarding a digital transformation.

Lastly, as one of the limitations of this case study is the narrow time frame in which the data is collected within, we recommend further research to conduct a longitudinal study. We believe that this would present a possibility to follow and explore how the perceptions and interpretations of the port management (and other organisational members/stakeholders) unfold over time as part of a processual identity-building. A longitudinal study would also be beneficial as it would allow for even more follow-up interviews and observations providing researchers with the opportunity to study the meaning-creation when it happens.

10. Conclusion

This thesis started by presenting the following research question: *How can small-and medium sized ports access the possible benefits of becoming more digitalised?*

In order to provide an answer to this question, the focus of our study has been to explore three sub-questions that has contributed in addressing: 1) The strategic challenges the small-and medium sized ports (SMPs) currently are experiencing, 2) How the SMPs can sense and seize the capabilities to sustain a digital transformation and 3) In which way the SMPs can strategise to help transform their identity substantially. Through a qualitative study with a social constructivist stance, we have aimed to co-construct knowledge and meanings between us as researchers and the different port managements. The NON-STOP project was selected as our case organisation, and hereupon we conducted a single case-study research with embedded units (the different ports participating in the project). Our primary data was collected through semi-structured interviews with the port managers at the participating ports as well as external actors with relevance for the SMPs and within the port industry in general.

Our findings from the first part of the analysis identified four main challenges that the SMPs are currently experiencing: 1) Increasing demand for digital solutions, 2) A shift towards a more commercialised organsiation, 3) Sustainability becoming a 'licence to operate' and 4) Increased competition. The primary data revealed that these challenges have been central indications for the SMPs to adapt towards. Furthermore, the findings disclosed that the SMPs have tried to seize the four challenges by participating in the NON-STOP project, investing in technological solutions, and by creating new service offerings. The reorientation of the port industry by moving towards an extensive digital transformation, however, raises discussions and poses a threat to the previous role and identity of the SMPs which demands further considerations. We found that the 'traditional' role of the SMPs is being redefined as they now need to be market- and economically concentrated, make technological investments, and concentrate their port activities. Subsequently, this leads to an ambiguous and confusing setting for the SMPs where they do not perceive which measures are expected from them and what their role should become. For SMPs to counteract this identity threat we thus argued that they first must make sense and second give sense to what the organisation is 'really about'.

Following this, the second part of the analysis investigated the SMPs' responses to the changing identity. By analysing how the SMPs make sense of the identified challenges both externally and internally, it became evident that the external, as well as the internal image of SMPs, are not aligned as of today. We furthermore established that their current identity is not adequate and that the SMPs are trying to modify from being viewed as traditional 'monolithic dinosaurs', to remain competitive in the new environment. We found that the desired image to meet the industry developments- and the identified challenges are to be perceived as digitalised- and sustainable economic entities who are considerate to its stakeholders and provide new service offerings. As a result, we discovered that the rising uncertainties on what the fundamental and distinctive characteristics of each SMPs are, require port management to fill a gap and reestablish a reasonable and persistent narrative for both internal and external observers. This in order to help the SMPs rebuild their sense of who they are as an organisation.

Subsequent to revising the identity claims, we analysed how the SMPs are giving sense of the identified challenges. The findings indicate that the SMPs currently have not been able to project the desired image and figured how they should embed the claims in their culture. Thereby, a revised identity understanding of what the SMPs 'should really be about' is not identified. We found that this emerges from the fact that the port managers have not settled on how they should strategise to meet the new identity claims. Accordingly, this results in that SMPs as of today cannot reach their desired image of being digitalised- and sustainable economic entities who provide new and demanded service offerings to their stakeholder, and thereby not transform their identity.

By bringing the above findings into a discussion, we found that the absence of an identity understanding has emerged from the SMPs lacking behind in digital transformation and strategising. This has developed as the SMPs have not accessed the needed capacities and capabilities to accommodate these needed measures. With this notion, four recommendations on how the SMPs could sense and seize the capabilities that are essential to sustain a digital transformation, and thereby strategise to transform their identity substantially, were composed: 1) Create a Collective Strategy, 2) Legitimate Digitising, 3) Share Practises, 4) Training & Education.

Overall, it has been evident that for the SMPs to be able to access the possible benefits of becoming more digitalised, they must sense- and seize the needed capabilities to undergo a digital

transformation by creating an aligned identity understanding. In order to align how they want the organisation to be perceived and represented externally from stakeholders and internally from employees, they have to give sense to what the organisation should be about with the establishment of a substantial strategy. With this, they can find how to project the desired image and how they should embed the claims in the organisation. This transformation requires a motivation and willingness from the port management in order to guide their stakeholders to give sense to the new organisational identity of the SMPs. Consequently, the SMPs can find their individuality and transform their organisation to meet the changing environment and hence survive on the market in the years to come.

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