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Systemic coordination of organizational roles

The importance of relational capital in port governance

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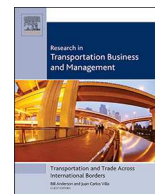
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Systemic coordination of organizational roles: The importance of relational capital in port governance

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ABSTRACT

Modern ports face not only a paradox of combining efficiency and effectiveness, but also a paradox of balancing activities characterized by different time horizons and stakeholder expectations. The structural changes underlying these paradoxes are the co-existence of downward pressures on market premiums and the increasing demands on the relational capabilities of port authorities. The increasing demand on relational capabilities is caused by the fact that modern ports are hubs for industrial activities that span the organizational boundaries of firms, integrating port systems and the hinterland. Thus, port authorities must simultaneously focus on cost efficiency and systemic coordination within complex port systems. As indicated by recent research on port governance and competitiveness, this implies that port authorities must assume and combine different organizational roles. The present paper takes this discussion further by classifying the organizational roles of port authorities in terms of role complexity, relational capital, and systemic functions within the port system. Based on a case study, the paper shows that the use of systemic functions implies the development of new business models, and that the adoption of the roles by port authorities depends on how emerging relational capabilities are embedded in structures of value co-creation and value co-capture.

1. Introduction

Increasingly, modern ports are facing a paradox caused by two competitive challenges that need to be reconciled. First, the globalization of value chains and the logistics in which the value chains are embedded exert a downward pressure on the premium that can be charged for services rendered by ports. In order to be competitive, ports are required to focus on efficiently cutting costs. Second, modern ports are hubs for industrial activities spanning the organizational boundaries of private and public firms through integrated port systems as defined by Bichou and Gray (2004). This implies that port authorities have to be strategically aware of their role and position in the port system (Moore, 1993), effectively engaging in activities that serve the needs of a multitude of stakeholders (Parola & Maugeri, 2013).

For this reason, the strategic challenge facing contemporary port authorities is not only the paradox of combining efficiency and effectiveness, but also the paradox of balancing activities that are characterized by different time horizons and different stakeholder expectations (Cepolina & Ghiara, 2013; Hollen, van den Bosch, & Volberda, 2015; Meersman, Van de Voorde, Van, & Vanelslander, 2016; van der Lugt, Doooms, & Parola, 2013; Woo, Pettit, & Beresford, 2011). As a result, ambidexterity is becoming a central theme regarding the

competitiveness of port authorities, thus highlighting the recurring paradox of exploitation and exploration in port management (Haugstetter & Cahoon, 2010; Hollen, 2015).

The dynamic driving these paradoxes is one of competition among ports and port authorities. Although ports play an important role in providing societal infrastructure, they cannot be compared with infrastructures such as roads, bridges, or highways because they are arenas for various types of competitive and collaborative relationships among economic actors within and across port perimeters (Meersman, Van de Voorde, & Vanelslander, 2010; Parola & Maugeri, 2013; Van de Voorde & Winkelmans, 2002; Verhoeff, 1981) whilst developing within a range of strategic constraints (Cepolina & Ghiara, 2013). This implies that although customers are gaining bargaining power *vis-à-vis* port authorities (Woo et al., 2011), port authorities are strengthening their ability to move themselves and the port system into new positions in the value chain by transcending the traditional landlord function and assuming new roles as network brokers and entrepreneurs (Gjerding & Kringelum, 2015; Notteboom & Rodrigue, 2005; Verhoeven, 2010). One might argue that bargaining power is being met by positioning power. This encounter is not just one of forces counterbalancing one another, but also one of evolving collaboration between port authorities and a variety of economic actors within and beyond the port system e.g.

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in the form of coopetition, where the nature of competition and cooperation becomes intertwined (Song & Parola, 2015). For this reason, the importance of inter-organizational relationships within port systems are increasingly regarded as strategic assets in supply chain management (Zhang, Lam, & Huang, 2014).

To a significant extent, the competitiveness of ports is determined by the drive for cost efficiency (da Cruz, Ferreira, & Azevedo, 2013; Nazemzadeh & Vanelander, 2015; Woo et al., 2011). Cost efficiency may be achieved by pursuing cost-minimizing opportunities in individual activities, or by combining activities in order to achieve a lower overall cost. While the search for cost efficiency is primarily driven by shipping companies (Midoro, Musso, & Parola, 2005; Suykens & Van de Voorde, 1998), port authorities have various roles in this process (Hidalgo-Gallego, Núñez-Sánchez, & Coto-Millán, 2016). These roles may vary from the traditional roles of landlord, regulator, and operator to the emerging role of community manager (Verhoeven, 2010), which may be passive or active to various degrees, as described by Verhoeven and Vanoutrive (2012), who split these functional roles into those of conservator, facilitator, and entrepreneur. Contemporary ports are becoming increasingly customer-centric community ports (Flynn, Lee, & Notteboom, 2011) acting as systemic coordinators (Haugstetter & Cahoon, 2010), thus reflecting the fact that port authorities, as in the case of the Rotterdam Port Authority, can be ambidextrous; that is, they can maintain a ‘dual focus on both exploitation of its traditional landlord role and activities and exploration of new roles and activities’ (Hollen et al., 2015: 93). In doing so, port authorities are strategically reconfiguring their value creation towards becoming hybrid organizations that can manage both public and private objectives (van der Lugt et al., 2013) in the wake of which a multitude of port centric conflicts and challenges are arising (Parole & Maugeri 2013). Especially as it entails for port authorities to manage and balance a variety of business models simultaneously (Kringelum, 2017).

Being ambidextrous and systemically-coordinative implies that port authorities make their own dynamic capabilities available for stakeholders in order to assist the development of the dynamic capabilities of the stakeholders in question. By doing so, port authorities place themselves in a position where they become vulnerable to opportunistic behaviors. A mitigation of the risks involved in being exposed to opportunistic behaviors may be achieved by creating institutional barriers against the effects of opportunism, spanning from extensive contracting to the creation of organizational hierarchies (David & Han, 2004; Williamson, 1985). In addition, opportunistic behavior can be mitigated by forming inter-organizational links based on relational capital which is accumulated by creating trust and mutual mental models among individuals across collaborating organizations. The extent to which these different mechanisms are invoked depends on the role that port authorities play in relation to the stakeholders involved. While the traditional roles of landlord, regulator, and operator primarily involve contractual arrangements, the roles of community manager and systemic coordinator are more likely to depend on relational capital. The importance of relational capital in the latter case reflects the fact that community management and systemic coordination both involve a non-hierarchical alignment of organizational goals across organizational boundaries, while the importance of contractual arrangements involved in the more traditional roles of port authorities reflect the fact that organizational goals are aligned by formalized transactions in the market.

In this paper, we suggest that this diversity of roles can be understood in terms of the amount of relational capital that the port authority must develop as an effect of each role as it plays a central part in managing what Parola & Maugeri (2013:120) termed ‘the intrinsic complexity of port operation’. In presenting this argument, we draw on the distinction between the organizational roles of port authorities in port governance, which have been identified by recent research on ports as being core actors in hubs, networks, and ecosystems (Haugstetter & Cahoon, 2010; Hollen et al., 2015; Verhoeven, 2010;

Verhoeven & Vanoutrive, 2012), as well as the importance of relational capital in business networks (De Martino & Morvillo, 2008). We argue that the development of relational capital depends on the relational capabilities of the actors to create an interplay between trust-building, commitment, and communication in order to manage the tensions between inter-organizational learning and vulnerability to opportunistic behaviors (Blomqvist & Levy, 2006; De Martino, Carbone, & Morvillo, 2015; Kale, Singh, & Perlmutter, 2000; Welbourne & Pardo-Del-Val, 2009). In doing so, we argue that for port authorities to manage the variety of systemic functions embedded in the organizational roles presupposes the development of new business models. We employ a real-life case study of collaboration on business model innovation in order to illustrate our theoretical points, and finally conclude by advancing avenues for future research.

2. The roles of port authorities and relational capital

It is widely recognized in the research on port competitiveness and governance that port authorities play a number of different roles in port systems. Port authorities are not only authorities, they also provide services, coordinate activities across organizational boundaries, develop their own businesses on a stand-alone basis or in collaboration with other economic agents, and initiate new business ventures. Increasingly, port authorities have assumed different roles as they have evolved from being ‘merely the interface locations for cargo between land and sea transport’ (UNCTAD, 1992: 13) to being commercial centers, organizers of value chains, and vehicles for industrial agglomeration based on horizontal integration (Paixão & Marlow, 2003; UNCTAD, 1999). As ports have become increasingly complex systems, port authorities have not only developed new roles, but have also learned to master traditional and new roles at the same time (Flynn et al., 2011; Hidalgo-Gallego et al., 2016; Midoro et al., 2005; Paixão & Marlow, 2003; Suykens & Van de Voorde, 1998). In general, this development has not been a case of discrete qualitative change, but rather one of continuous development (Pettit & Beresford, 2009) where ‘even the most advanced ports in terms of systems, equipment or terminal design often have remnants of earlier stages of development which are still contributing to the ports’ overall effectiveness’ (Beresford et al., 2004: 97), implying that a number of organizational roles are alive and kicking at the same time.

The co-existence of a variety of organizational roles reflects the fact that port authorities are facing a number of strategic challenges simultaneously. Competitive responses to globalization imply that ports increasingly operate in integrated business systems where the close interaction with their customers relies on knowledge intensity and continuous innovation in production processes and services within the port system (Gjerding & Kringelum, 2016). Although there are different types of competition within and between port systems (Meersman et al., 2010) as well as different patterns of regionalization (Notteboom & Rodrigue, 2005), the general pattern of strategic challenges is that port authorities must act as value-generating organizations both on their own terms and as core actors and entrepreneurs in clusters and networks within and across the port system (Hollen et al., 2015; Hollen, Van den Bosch, & Volberda, 2013; van der Lugt et al., 2013). Thus, the co-existence of a variety of roles is not only a remnant of port evolution, but also an adequate response to intra- and inter-organizational complexity.

The variety of port authority roles represents a strategic challenge in itself, as it requires the port authority to adapt different business logics at different points in time and at different interfaces across stakeholders. For instance, the role as operator requires the port authority to adopt arm's-length decision making on ‘whether or not to provide the service itself’ (Verhoeven, 2010: 255), while the role as community manager (De Langen, 2004, 2007) involves decisions on how to combine different stakeholder perspectives, solve conflicts, and assist stakeholders in further developing their capabilities. In some

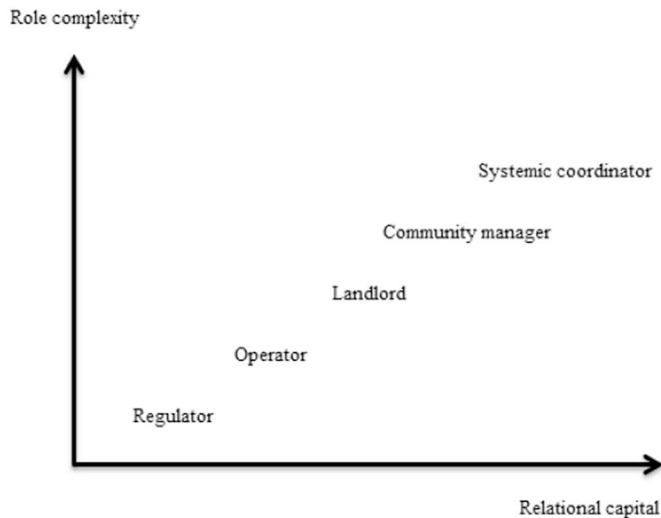


Fig. 1. The importance of role complexity and relational capital in port authority roles.

circumstances (Chlomoudis, Karalis, & Pallis, 2003), the role as community manager may even develop into a role as ‘systemic coordinator that advances and maintains good relationships between all those involved in the achievement of a plurality of targets, thus creating a port culture of trust’ (Verhoeven, 2010: 257).

Each of the port authority roles represents a case that is qualitatively different from the other roles regarding the extent to which stakeholder perspectives and the protection of dynamic capabilities must be aligned. The more complex the situation, the less likely are arm's-length market mechanisms suitable for alignment, simply because the different roles require different degrees of relational capital. Thus, the ability of port authorities to adopt different business logics at different points in time depends on the extent to which port authorities develop relationally based collaboration capabilities; that is, the ability to align stakeholder perspectives by creating mutual trust, communication, and commitment (Blomqvist & Levy, 2006: 40).

Fig. 1 presents our conceptualization of the differential importance of relational capital associated with a number of traditional and new roles that have been identified by contemporary research on port governance and port evolution, to which we have referred in the present paper. Verhoeven (2010) and Verhoeven and Vanoutrive (2012) have explained these roles in terms of degrees of strategic effort, attributing the characters of conservator, facilitator, and entrepreneur to the individual roles. We do not contest this classification, but propose an alternative by which the individual roles are understood in terms of role complexity and relational capital. While the characters of conservator, facilitator, and entrepreneur refer to the strategic content of role behavior pursuing organizational goals, the dimensions of role complexity and relational capital refer to the properties of the process by which organizational goals are strategically pursued as well as to the externally oriented prerequisites for obtaining these goals.

We define role complexity in terms of the variety of organizational goals that an actor must manage in order to accomplish what they have set out to do, while relational capital refers to how important the interplay between trust-building, commitment, and communication is in the bridging of different goals and bringing actors together in joint achievement. Role complexity is especially high in cases where the proximity of goals is low or the goals are ill-defined. This is particularly the case when a multitude of stakeholders need to be dealt with (Freeman, 1984; Friedman & Miles, 2006; Mitchell, Agle, & Wood, 1997). Relational capital stems from the trust, commitment, and shared understandings that have been established among actors (Kale et al., 2000; Welbourne & Pardo-Del-Val, 2009) and comprises the ‘capability

of exchanging different skills, interacting among different actors, trusting with each other and cooperating even at a distance with other complementary organizations’ (Capello & Faggian, 2005: 77). Relational capital is especially important in cases where new business opportunities are being explored or continuous innovation is being undertaken (Miles, Miles, & Snow, 2005). As a consequence, it becomes essential in contexts where the dynamics of the task environment create additional role complexity, as is currently the case in port settings.

Based on the preceding discussion, we argue that the ability to manage role complexity and develop and apply relational capital becomes increasingly important as port authorities engage in roles beyond the traditional ones. This implies that relational capabilities must be an intrinsic property of modern port authorities if they wish to stay competitive. Relational capability grows in importance because contractual and hierarchical methods of protecting the organization against opportunistic behaviors become less effective as port authorities engage in increasingly complex task environments, where role complexity and the importance of relational capital are high.

Relational capability is not a threshold property of an organization, but rather a processual property that develops over time and magnifies through use. The main drivers for the magnification of relational capability are trust building, mutual commitment, and the enrichment of communication among actors in settings where relational capital is critical to outcomes and the achievement of goals. This is especially the case in situations where goals are ill defined and need to be clarified through a process of exploration before opportunities for exploitation can arise. In the following, we explore the dynamics of relational capability and the ensuing development of relational capital in a single case study of collaboration between a port authority and a globally embedded private company acting in the port system. The results of our exploration have implications for the strategic practice of port authorities and for future research into port governance.

3. Research setting and methodology

The setting of this case study is the Port of Aalborg, which is a medium-sized Danish inland port with feeder connections to Cuxhaven, Hamburg, and Rotterdam. It is centrally positioned in the logistics chain between Greenland and the European mainland, including Denmark. Historically, the Port of Aalborg has served as the main logistics interface between the Danish and European mainland and the North Atlantic constituencies of Denmark, although logistics connections between the Danish industry and European markets are gradually becoming more important. For this reason, the strategy of the port increasingly addresses the competitive pressures arising from the European and global contexts and, in addition to focusing on cost efficiency, this strategy includes goals and performance metrics associated with the functioning of distriports and business networks.

This is a recent development that the management of the port authority has undertaken as part of a longitudinal strategy development process during 2013–2016. The aim of the strategy development process was to address the strategic challenge of combining efficiency and effectiveness associated with the evolution of modern ports, including the changing nature and scope of port activities described above. The Port of Aalborg Authority has paraphrased this strategic intent in terms of becoming an ‘intelligent’ port (Gjerding & Kringelum, 2015), which is defined as the interplay between three systemic functions; that is, the functions as a publicly-owned limited company, as a framework, and as an integrator; see Table 1. While the publicly-owned limited company focuses on the roles of regulator and operator, the framework is associated with the landlord role, providing infrastructure to the firms located within the port's perimeter. Finally, the integrator is a community manager and a systemic coordinator facilitating collaboration and networks among firms, knowledge institutions, and authorities, both within and beyond the port's perimeter.

The systemic nature of the intelligent port resembles the idea of an

Table 1
Port roles, systemic functions, and organizational goals in the port of Aalborg.

Roles	Function	Organizational authority goals of the port
Regulator, Operator	Firm	Develop the business and obtain a satisfactory operational result Focus on investing in port management software, safety, certification, and port equipment
Landlord	Framework	Provide infrastructure to firms within the port perimeter Focus on developing port estate and infrastructure, intermodality and sustainability
Community manager Systemic coordinator	Integrator	Contribute to local and regional development Focus on establishing networks of port- related and unrelated firms, facilitating collaboration between firms and knowledge institutions, and stimulating entrepreneurial activities among key actors within and beyond the port perimeter

ambidextrous port (Hollen et al., 2015), which strives to balance exploitation and exploration (March, 1991); that is the paradox of exploiting traditional value-creating activities while exploring new opportunities through the value network of stakeholders involved in the port system (Haugstetter & Cahoon, 2010). The paradox is not merely one of reconciling different types of activities, but is generally founded upon the intricacies of stakeholder management and the port authority's vast interrelations, and thus depends on the activities of other economic actors (De Martino et al., 2015; Hollen et al., 2015; Verhoeven, 2010). The paradox tends to be dynamic rather than static, since the application of multiple roles proactively affects, and to some extent changes, the port setting (Pettit & Beresford, 2009), thus creating new competitive positions to which the port authority itself must adjust. While this type of dynamic creates a market selection pressure on the interplay between the systemic functions, and especially affects the function as a firm (Gjerding & Kringelum, 2015), it also creates incentives to apply and develop relational capabilities in order to cope with overall role complexity.

The fact that the Port of Aalborg Authority is 'up to its eyes' in the strategic challenges and opportunities of modern port ambidexterity makes it an interesting setting for a case study that investigates port evolution phenomena, which are normally studied in the context of large ports such as Rotterdam (Hollen et al., 2015) and Barcelona (Van den Berg & de Langen, 2011). While Rotterdam and Barcelona represent major hubs in the international intermodal transportation system (Medda & Trujillo, 2010), the setting of our case study provides insight into the challenges of the contemporary evolution of small- and medium-sized ports. Indeed, small- and medium-sized ports are becoming important links in global logistics chains, due to, for example, the growth of short sea shipping (Medda & Trujillo, 2010). Consequently, these ports are increasingly facing the strategic challenges of ambidexterity. These challenges have for some time been a focal driver for business development in the case of the Port of Aalborg Authority.

In this context, the following explores the dynamics of relational capability and the ensuing development of relational capital in a single case study of collaboration between the Port of Aalborg Authority and a global private company acting within the port system. The data collection procedures are described in Table 2.

The study was conducted as an embedded single-case study, whereby observations were made in the respective organizations and at eight strategy-developing seminars, which the organizations held co-

jointly over a period of 29 months. The observations from the organizations focused on internal meetings of relevance to the collaboration between the organizations. The role of the researchers has been one of engaged scholarship (Van de Ven, 2007) through a combination of participant observation and active facilitation of the strategy seminars. The qualitative data collection was supplemented by archival data and desk research, which provided insights into the nature and dynamics of the case study's setting, as described above. The qualitative data were explored through several rounds of thematic coding in Nvivo (Bazeley & Jackson, 2013) to identify themes and conceptual categories related to the process (Rees & Gatenby, 2014) see Table 3.

In the following section, the themes will be elaborated to explicate a process of establishing relational capital through collaborative business model innovation. In doing so, the process represents a learning case of how port authorities can mitigate role complexity by establishing relational capabilities through new business models.

4. Case: collaborative business model innovation

Initially, the relationship between the port authority and the private firm was purely transactional and concerned activities associated with the roles of the port authority as regulator, operator, and landlord. Role complexity and the importance of relational capital were relatively low, as the interactions between the port authority and the private firm were confined to the systemic functions of firm and framework (see Table 1). However, an increasing level of interaction took place on a personal level among high-level decision-makers across the two organizations, involving an exchange of ideas on how to optimize processes and share physical assets in order to increase cost efficiency in both organizations. Effectively, the increasing level of interaction reflected a dynamic process, through which trust and shared mental models were created, in turn stimulating the propensity to engage in further interaction. The structural driver of the dynamic process was the recognition among the high-level decision makers that the organizations employed similar physical assets, such as cranes and other means of transportation, the amount and ownership of which represented rational business logics from the point of view of the individual organization, but which constituted an excess capacity within the port system when considered together. Consequently, the high-level decision-makers increasingly discussed ways to stimulate cost efficiency through sharing capacity.

This kind of interaction could have resulted in a simple case of

Table 2
Data collection, type, and format.

Data type	Source	Data format	Length
Observations	In the organizations of the port of Aalborg authority and the private company	Observational notes	More than 150 handwritten pages
Participation in seminars and meetings	CEOs, sales directors, operational directors, etc.	Recorded sound files	Approximately 23 hours of recordings: selections transcribed and coded in Nvivo
Presentations	CEOs, sales directors, operational directors, etc.	Copies of presentations and sound recordings from the seminars	9 physical presentations
Summary of seminar	Memos approved afterwards by all participants	Text	5 pdf-documents of app. 2 pages each
Semi-structured interviews, face-to-face	CEOs	Recorded sound files	Approximately 4 hours

Table 3
Thematic coding of data.

Emergent first order themes	Refined second order themes	Process steps
“Our business models are broken” Challenges of the port system Sharing knowledge of market development Similarity of physical assets	Creating joint understanding	Building trust by sharing existing business models
Asset similarity Exploitation of existing resources Ownership > < control	Inter-organizational coordination	Value creation as operator
Internal communication External communication	Reconfiguring relations	Value capture as landlord
Exploring new possibilities Managing third party Developing “game changer” Creating reciprocal dependency Joint ownership	Knowledge sharing and commitment	Value co-creation as systemic coordinator
Considering approaching customers Timidity Organizational autonomy	Dependency	Value co-capture

collusion or operational collaboration in order to overcome coordination problems that could not be solved by the market mechanism alone. However, the discussions led to reflections on the nature and functioning of modern ports and the potential benefits of coordinating activities within the port system. Both the port authority and the private firm had dealings with other economic actors within the port system, which in some cases were similar and in some cases were complementary, and as reflections on these cases became integrated in the ongoing discussions, the actors started exploring the potentials for systemic coordination and community management. This kind of exploration was mainly driven by the port authority top management, who had a clearer understanding of the systemic function as integrator.

The increasing level of interaction took place during a period of time when both organizations were engaged in processes of strategy development that focused on the positioning of the organizations within the port system. In both organizations, decision-makers were preoccupied with optimizing supply chains and exploring opportunities for creating collaboration with a high potential for enhancing knowledge sharing in order to increase innovation. The fact that the strategic ambitions of the organizations were similar created a strong impetus to commit to coordinated or joint activities. Furthermore, both organizations experienced cases where the opportunities for establishing collaboration within the port system were fruitless because the actors involved focused on protecting capabilities and controlling decision-making processes. As a result, they were seeking alternative windows of opportunity and effectively found each other.

The ensuing cooperation between the two organizations was based on a generally levelheaded approach to the potentials of and opportunities for creating innovative relations across the port system. As both organizations had experienced the difficulties of managing collaborations, the decision was made to pursue opportunities for value co-creation without involving third parties—at least initially. The idea was that if the two organizations succeeded in creating opportunities for value co-creation, then this might serve as an exemplary attraction for third parties, which could broaden the scope of the collaboration and the number of stakeholders involved. So while the interactions between the two organizations involved reflections on the systemic function as

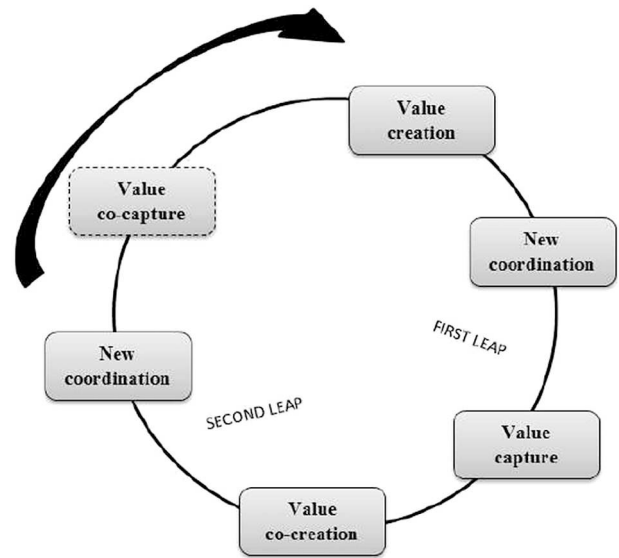


Fig. 2. A cyclical process of establishing relational capital through collaborative business model innovation.

integrator, and to some extent shared mental models of what community management and systemic coordination entail, the main purpose was to initiate value co-creation within a dyad in order to create a foundation for the extension of value co-creation to networks with more actors.

In order to do so, a series of meetings and seminars was instigated (see Table 2), in which researchers from the nearby Aalborg University assumed a facilitating role. The rationale of the process, upon which all actors agreed, was that control of the assets and activities was more important than ownership, reflecting that ‘the locus of value creation is no longer perceived to reside within firm boundaries but value is considered to be co-created among various actors within the networked market’ (Nenonen & Storbacka, 2010: 44). Hereby, the process emerged as a cyclical process with two leaps that qualitatively changed the level and content of interaction, as learning occurred, causing relational capital to emerge during the process (Fig. 2). In the following, the process and the leaps are outlined and explained.

4.1. First leap: value creation and value capture

At the outset, the process focused on providing detailed knowledge among the participating actors regarding the business models of the individual organizations. This was achieved through a combination of presentations made by members of the individual organizations and previous university research on the business models in question. During this process, it became apparent that the private firm could support the port authority’s role as operator, thus providing complementary assets that, in combination with the assets of the port authority, could serve customer needs that had not been previously served by either of the two organizations. While this combination of assets did not change the existing value-creating activities of the organizations, understood as ‘the difference between the benefits that the customers perceive and the costs of providing the benefits’ (Afuah, 2014: 155), it did change the scope of value creation in the sense that the operator role, which was now enhanced through a dyadic relationship, could reach out to customers formerly not interested in the value created separately by the two organizations.

Pooling the assets in question was contractually formalized in order to ensure that the long-term investment of time and resources was not compromised by opportunistic behavior. The contractual arrangement reflected the fact that asset pooling was based on increased communication across the two organizations regarding why, when, and how the

assets were to be deployed. This represented a kind of quasi-internalization (Kale et al., 2000), which gave rise to increased frequencies of communication and a stronger commitment across the organization, thus fostering higher levels of relational capital. Furthermore, commitment was stimulated as the two organizations engaged in external communication regarding the collaboration in order to make actors within the port system become aware of the opportunities of the shared capacity, thus signaling collaborative intent (Blomqvist & Levy, 2006). By extending the range of customers that could be addressed, the dyadic relationship extended the scope of port infrastructure, thus contributing to the classic landlord role of the port. This was possible because the increasing role complexity was also met by increasing levels of relational capital.

4.2. Second leap: value co-creation and the road to co-capture

As previously stated, relational capability is not a threshold property of an organization, but rather a processual property that develops over time and magnifies through use. This implies that relational capital is not depleted, but grows through deployment. Relational capital thus stimulates the development of dynamic capabilities, which enables the actor to engage in new activities embedded in high role complexity. This will, in turn, lead to the transcending of existing business models and the formation of new business models. This is exactly what happened during the second leap (see Fig. 2).

The infrastructural collaboration between the two organizations gradually made the dyadic actors become aware of bottlenecks and potential avenues of demand in the market within the port system. Discussions of different opportunities lead to the conceptualization of a novel transportation solution to solve a specific logistics challenge within a supply chain in which both organizations were involved. The exploration of this new solution was based on the anticipation that a third party, which was important to both organizations, would create product innovation that would render existing transportation solutions inadequate and probably obsolete. In order to meet this challenge, the third party in question would have to engage with service providers regarding the planning and execution of logistic activities. If this happened, it would represent a transcending of the existing business model of the third party. However, in order for the new transportation solution to materialize from exploration into exploitation, the closer cooperation between the two organizations and the third party in question was of paramount importance.

At the time of writing, a new transportation solution has been conceptualized, although its full materialization has yet to occur. The process of materialization has been delayed due to structural changes in the private firm, which, among other things, have led key decision makers to leave the firm. However, the fact that conceptualization exists reflects a high level of relational capability across the two organizations, which has created enriched communication and increased commitment within a regime of trust. This is a prerequisite if the increased role complexity is to be accommodated by an increased amount of relational capital.

The situation represents a potential second leap in the collaboration between the two organizations, which is qualitatively different from the first leap for several reasons. First, existing business models are being transcended and an entirely new business model is being developed. The development of the new business model reflects a process of value co-creation in the sense that the transactional content of the interaction among economic actors is being replaced by a collaborative interaction based on an inter-organizational integration of resources (Prahalad & Ramaswamy, 2004), leading to the reciprocal creation of value (Leclercq et al., 2016). Second, the process of value co-creation leads to an enlargement of the collaborative setup, because in order to capture the value created by the new transportation solution, the collaboration must incorporate the third party, turning the dyadic relationship into an entirely new triadic relationship characterized by value co-capture.

Third, as the third party becomes more dependent on the planning and execution of logistic activities of the service providers, the triadic relationship will have to take into account the business logics and time horizons of other actors in the port system. In consequence, the collaboration takes on a systemically coordinative nature, implying a higher level of role complexity that demands higher levels of relational capital.

5. Discussion and future research

Balancing diverse organizational roles by establishing relational capital through inter-organizational collaboration is by no means an easy task for port authorities. Especially as the complex nature of supply chains that are interlinked through the port system provides a challenging context for information sharing and mutual trust to unfold (Tongzon, Chang, & Lee, 2009). From a strategic management point of view, focusing on tight coupling between smaller groups within a system can reduce the potential of future innovation (Granovetter, 1973). In the case of ports and port authorities this aspect of strategic management reflects the value of loose ties that create a complex context for multi-stakeholder management (Song & Parola, 2015; van der Lugt et al., 2013), by which we return to yet another challenging paradox of port management.

The case study by which we have illustrated our argument shows *how* the different organizational roles of port authorities can be characterized by systemic functions. The co-existence of systemic functions for port authorities not only reflects the fact that ports comprise multiple supply chains (Meersman et al., 2010), but also demonstrates that in order for modern ports to meet current and future strategic challenges, systemic coordination is necessary and must address the increasing importance of networked market behavior (Haugstetter & Cahoon, 2010) and cooperative ecosystems (van der Lugt et al., 2013). Employing the systemic functions implies the development of new business models, which leads to value co-creation and value co-capture, involving increasing degrees of role complexity and relational capital. The outcome of this process depends on the ability of port authorities and their collaborators to develop relational capabilities and, subsequently, relational capital (Kale et al., 2000). If port authorities are to systematically coordinate port systems, they must do so according to their internal relational capabilities and their ability to extend these capabilities towards external stakeholders with the aim of jointly establishing relational capital.

Managing role complexity and developing concomitant relational capital is a process that involves recurrent interaction among the incumbent stakeholders. This recurrent interaction in turn holds the potential to develop new stakeholder relationships that are not only an extension of the range of existing stakeholder relationships, but also become qualitatively different in terms of value propositions and the intensity of collaboration. In the present case study, this process has been portrayed as a cyclical process that involves considerable leaps that qualitatively change the level and content of the interaction. Contrary to much existing research on the development of inter-organizational relations, the underlying logic of the cyclical process depicted in Fig. 2 is that relational capital becomes embedded in the structures of value co-creation and future value co-capture tied into collaborative business model innovation. In the present case, the process results in the creation of a meta-organization, which in general is an emerging feature of the industrial dynamics within and across port perimeters (Manuel, Branco, & Ribeiro, 2016). However, this development presupposes a greater extent of supply chain orientation than often experienced within the port context (Tongzon et al., 2009). This perspective remains open for future research.

As part of the contribution to research on inter-organizational relations, our research addresses an important research gap in research on port governance and business model innovation. The role complexity of port authorities has become a basic assumption in port research, and co-creation among actors is increasingly recognized as a path to ensure

survival in a dynamic, competitive environment (Hollen et al., 2015). The present paper contributes to this line of research by considering the co-existence of organizational roles and how the appertaining intra- and inter-organizational complexity must be matched by the development of relational capital. As the market environment continuous to change, port authorities must be prepared to adjust and ultimately adopt new roles (Notteboom & Winkelmans, 2001) and, as illustrated by the present case study, effective role adoption depends on how emerging relational capabilities are embedded in structures of value co-creation and co-capture. This is an issue that has been somewhat neglected in both research on port governance and business model innovation. Port management and our understanding of the industrial dynamics of port systems may benefit from future studies of how the balance between the co-existing roles of port authorities affects and are affected relational capabilities as a source of collaboration. In addition, how firms in general are to co-capture the rents developed through the establishment of relational capital in a collaboration is yet to be discovered (van der Lugt et al., 2013). Value co-capture is thus an evolving arena of future research in collaboration and business model research (Coombes & Nicholson, 2016), which can advance the understanding of how the systemic functions of port authorities contribute to the industrial dynamics of port systems.

6. Managerial implications and limitations

There are at least two managerial implications of creating relational capital across a diversity of organizational roles in port authorities. First, port authorities have to revisit their perceptions of which capital is important to the functioning of port systems. Traditionally, port systems are endowed with asset-heavy and logistics-oriented investments with long periods of depreciation where the temporal lag between investments and value capture is handled by well-established accounting procedures. However, the increasing importance of relational capital associated with trust-building, commitment and communication requires that port authorities focus more on intangible resources such as human capital and IT (De Martino & Morvillo, 2008), where value capture is less visible and apparent. This might prove a barrier to investments in types of capital that are crucial to the operation of modern ports, and in order to be conscious about this and not overlook the need for important investments port authorities need to contemplate new investment measures and calculus that represents the establishment of relational capital.

Second, port authorities must know not only the existing business models within their port system, but also the opportunities for creating new potent business models across a variety of actors. This implies openness to innovate business models by creating new relations and thus access to stakeholder resources that can add value to port operations (Zhang et al., 2014). This requires that port authorities possess analytical competencies and business experience that are not necessarily a core capability of contemporary port authorities. Therefore, port authorities need to invest in business intelligence and the recruitment of staff experienced in business modelling and market analysis.

These managerial implications are important in order to handle potential adverse effects of interorganizational collaboration and value co-creation. As argued by Tongzon et al. (2009), the loss of autonomy that comes with a stronger degree of supply chain coordination in a port system represents a sacrifice of the individual firm. In addition, the division of costs and potential value co-creation is, as reflected in the present case study, a challenge for which there is no straightforward solution. Therefore, port authorities need to preoccupy themselves with these problems and recognize that systematically coordinating organizational roles within a port system is a resource and time consuming task that may entail non-trivial levels of risk.

Of course, the present study does not present an analytical generalization of port development, because it does not comprise a cross-sectional analysis, but instead is a single case study. However, the

longitudinal case study that we have undertaken is a case of in-depth learning (Flyvbjerg, 2006) that yields important insights into the working of a modern and commercially ambitious port authority and the business relationships within the port system in question. Therefore, the study gives important inputs to how port authorities and scholars can contemplate on role complexity, interorganizational collaboration and value co-creation within port systems.

7. Conclusion

In this paper we argue that port authorities can meet contemporary strategic challenges by adopting a systematic approach to how they combine multiple organizational roles. The application of a systematic approach depends on the nature of the interactions among economic actors, spanning from simple transactional relationships to complex collaboration reflecting various degree of business model innovation. Executing a dynamic approach requires that port authorities engage in creating relational capital that can support business model innovation. This requires port authorities to invest in intangible resources and relational capabilities.

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