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MANAGING COMPETING CONCERNS IN DIGITAL INNO-VATION: A CASE STUDY OF AN INCUMBENT MARITIME COMPANY

Research paper

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Abstract

The need for new digitally enhanced solutions has led companies in traditionally non-digital industries to explore the potential of digital innovation. Various process frameworks claim their ability to support this endeavor by facilitating the digital innovation process. However, such frameworks alone may not be sufficient because digital innovation in established firms tends to involve numerous actors with competing interests. This introduces the need to manage the competing concerns in order to orchestrate the digital innovation process. Knowledge about how the organizational actors negotiate, agree, and collectively drive the innovation process forward thus becomes crucial. This interpretive case study describes how participants of a digital innovation program in an established maritime company manage their competing concerns through four negotiation episodes: Mobilizing of internal stakeholders, Developing capacity for faster decision-making, Pricing new digital services, and Establishing a connection between business and development. The results indicate that negotiating competing concerns is necessary for the incumbents to move forward with their digital innovation and that communities of practice can facilitate such negotiations. We conclude that recombination of the established processes as an outcome of such negotiations is necessary to succeed with digital innovation in incumbent firms.

Keywords: Digital innovation, Competing Concerns, Maritime industry, Incumbent firms, Communities of practice, Recombination.

1 Introduction

Digital innovation can be understood as the use of digital technology during the process of innovating or the outcome of innovation (Nambisan et al., 2017). Organizations increasingly digitize their products (Nambisan et al., 2017; Nylén and Holmström, 2015) and embed software in physical products (Henfridsson et al., 2014). However, many digital innovation initiatives fail because of organizational (social) and technical (material) challenges that are related to the making-building-implementing new technology within existing organizations (Edison et al., 2018; Tilson et al., 2010).

Digital innovation is about recombining existing components (e.g., technology and processes) to create new products and services (Henfridsson et al., 2018). But recombination in incumbent firms, that is, firms that are well-established, can be challenging because it introduces the need to manage competing concerns (Svahn et al., 2017). These concerns may be represented by numerous actors (finance, marketing, line management) that are often involved in the innovation process and have different criteria of the organizational "good" (Stark, 2009). Moreover, digital innovation requires its own governance mode because it is fundamentally different from non-digital innovation. Digital innovation is not well-bounded, does not have a pre-defined agency, and has a process that is inseparable from its' outcome (Nambisan et al., 2017; Yoo et al., 2012). The uncertainty around end products, digital environment, organizational properties, and success criteria (Nambisan et al., 2017; Nylén and Holmström, 2015)

makes it hard to orchestrate digital innovation using linear, sequential innovation frameworks (e.g., Desouza, 2011; Tidd and Bessant, 2020; Viki et al., 2017). Therefore, the existing frameworks alone are not sufficient to facilitate digital innovation. To support the enactment of digital innovation in practice, organizations need to rely on self-organizing networks of employees (Ciriello et al., 2018). Negotiations among the involved actors with different interests are also crucial to drive digital innovation forward (Eriksson et al., 2009), especially in incumbent firms where value networks are complex and inflexible. Knowledge about how organizational actors negotiate, agree, and collectively drive the innovation process forward thus becomes crucial for embracing digital innovation in incumbent firms. However, few studies provide empirical descriptions of such negotiations.

Digital innovation arguably has gotten furthest in media (Eriksson et al., 2009), second furthest in finance and banking (Mikalsen et al., 2018), and now, other traditionally "non-digital" industries such as maritime (Sporsem et al., 2021) are following suit. With an increasingly growing amount of ship data (e.g., sensor data, weather, location) and the capacity to analyze this data, diagnostics, and maintenance of maritime vessels can be sufficiently improved. Even though some descriptions of the data-driven digital innovation in the maritime sector begin to emerge (e.g., Sporsem et al., 2021), empirical studies in the IS field appear to be lacking. Acknowledging this and the need for additional knowledge on how various organizational actors negotiate to manage digital innovation, we in this paper raise the following research question:

> *How do actors in an incumbent maritime firm negotiate competing concerns around digital innovation to achieve recombination?*

Our case study illustrates how different concerns manifest within the digital innovation process in a maritime service provider. We thus contribute both to the literature on digital innovation management and provide insight into the maritime industry where studies on digital innovation are still limited. The rest of the paper is organized as follows. Section 2 gives an overview of the literature on digital innovation, its management, and its nature. Section 3 describes our research methods. Section 4 presents the findings that summarize four negotiation episodes between the actors involved in digital innovation from the case. Finally, section 5 discusses the findings with regards to earlier literature on digital innovation.

2 Background: Digital Innovation, its Nature, and Management

Incumbent firms need to manage competing concerns to successfully govern digital innovation (Eriksson et al., 2009; Svahn et al., 2017). To achieve this, the existing innovation frameworks need to be supported by self-organizing networks of employees (Ciriello et al., 2018). Negotiations between the actors in the networks have a potential for recombination of the existing technologies and processes, which is the key to succeeding with digital innovation (Henfridsson et al., 2018). This section summarized the literature that relates to this claim

2.1 Managing competing concerns around digital innovation in incumbent firms

Digital innovation can be defined as combining digital technologies and associated digitizing processes that lead to creation and transformation of market offerings, business processes, and models (Nambisan et al., 2017). An example of a new digital market offering is remote diagnostics systems that allow to continuously collect, store and analyze data about the state of machinery or other production processes (Jonsson et al., 2009). By helping to determine when maintenance or other intervention is needed, remote diagnostics make maintenance less intrusive, more targeted, and thus less costly.

Digital innovation, particularly in incumbent organizations, implies tensions between the involved actors, which brings up the challenge of competing concerns. For example, a case study of the e-newspaper demonstrated how a news service published with e-paper technology led to tensions between publishers, device producers, readers, and advertisers who had conflicting interests (Eriksson et al., 2009). The progress of digital innovation thus depended on negotiations between the actors involved in the process.

In the banking sector, Mikalsen et al. (2018) showed how digital innovation teams regularly negotiated with the sales department, marketing department, and product department concerning how and what digital product to deliver. Similar issues have been found in the automobile industry, where competing concerns needed to be managed to move forward with leveraging connectivity to deliver digitally-enhanced cars (Svahn et al., 2017). The authors describe four areas of concern that Volvo Cars had to balance: capability (existing versus requisite; to manage the competing concerns Volvo Cars created a Hub that united different functional silos and create new capabilities; focus (product versus process; Volvo Cars focused more on the process by engaging in thematic workshops and learning to appreciate platforms); collaboration (internal versus external) and governance (control versus flexibility).

In order to manage the competing concerns, one needs to understand how the conflicting interests among a wide array of actors can be brought into some form of balance, such that moving forward with innovation is practically possible. Balance, in this case, can be seen as convergence of different interests in the value network (Eriksson et al., 2009), that is, how various actors in an organization overcome differences in opinions and practices to become capable of moving forward with digital innovation. To converge involves a focus on the differing values, building upon existing digital systems that provide value, and including relevant stakeholders in the valuation processes (Parmiggiani and Mikalsen, 2013). In digital innovation, where the final product is unknown, ascribing value can be problematic. Stark (2009, p. 17) suggests that there rather are competing and contradictory principles of evaluating value because "there is a principled disagreement about…what is valuable, what is worthy, what counts" (p. 17). To grasp digital innovation in incumbent organizations, it is, therefore, necessary to investigate how these processes of negotiating value occur across the involved actors.

2.2   Digital innovation management

Digital innovation management may be defined as " […] the practices, processes, and principles that underlie the effective orchestration of digital innovation" (Nambisan et al., 2017, p. 224). The earlier literature has suggested several frameworks that aim to explain how digital innovation process can be managed in the incumbent firms. Such frameworks describe the innovation process in clearly ordered consecutive phases. By suggesting readily available tools to demonstrate the market potential, the innovation frameworks allow to establish viability and proof of concept and thus to secure resource allocation for the emerging offerings. For example, Viki et al. (2017) describe the innovation process in four stages. At the Create ideas stage, employees generate ideas. In Test ideas, a minimum viable product (MVP) is made and validated through experimenting, iterating back to create ideas if needed. Then, in Scale ideas, growth strategies are explored, selected, and tuned to gain customers and market shares. After achieving scale, renewing ideas start to ensure continuous evolution of the software products. The company monitors trends and responds to them by iterating back to earlier stages to make necessary changes to the product and business model. Similar processes are described by other frameworks (e.g., Desouza, 2011; Tidd and Bessant, 2020).

Although the existing innovation frameworks are clearly useful for organizing the innovation activities, they appear to be too generic to capture the complex nature of digital innovation; and thus are not sufficient to manage it. The complexity of digital innovation relates to its unique characteristics as 1) being non-bounded, 2) not having a pre-defined agency, and 3) inseparable digital innovation process and outcomes (Nambisan et al., 2017). 1) Since digital offerings continue to evolve also after they have been launched, the boundaries between when an innovation process begins and ends are fluid (Nambisan et al., 2017). For example, in digital platforms and such as Apple ioS (Constantinides et al., 2018), it is not clear whether the innovation begins with the platform core (Apple) or third-party app providers. Also, after the app is launched, it can be continuously monitored and updated. 2) In contrast to more traditional innovation models that can be attributed to a certain agent (e.g., a company), digital innovation is often performed as a collective action (Nambisan et al., 2017; Yoo et al., 2012). For example, Open Source Software projects are characterized by decentralized problem-solving, self-selected participation, self-organization, and free revealing of knowledge, and have been referred to as distributed innovation (Lakhani and Panetta, 2007). 3) The outcomes (products and services) and the process of digital

innovation are mutually shaped by each other (Nambisan et al., 2017). Since the innovation success depends on the actors' generativity or ability to collectively produce a new output without additional input from the system's originator (Tilson et al., 2010), the outcome of digital innovation is heavily dependent on how the innovation process is organized. For example, rather than focusing on specific problems of end-users, Volvo Cars developed generic design patterns that were subsequently specialized for different contexts (Svahn et al., 2017). In digital innovation, product development is continuous with a minimal number of handovers between specialized units, as it is often the same people that make the digital innovation that must maintain and operate it.

The complex nature of digital innovation led Ciriello et al. (2018) to conclude that the innovation process frameworks alone are not sufficient to manage digital innovation. Organizations thus need to rely on self-organizing networks of employees that support the enactment of the innovation frameworks in practice. One suggested way to activate the networks of employees is communities of practice (Wenger et al., 2002) that are commonly used in technology-intensive companies to support such activities (Smite et al., 2019). Communities of practice (CoP) are known to enable innovation (Swan et al., 2002) by sharing knowledge and learning, coordinating work (Paasivaara and Lassenius, 2014), solving problems, and providing recommendations to the management (Smite et al., 2019). CoP spontaneously emerged from networking among individuals with similar work-related activities and interests (Swan et al., 2002) to deepen their expertise in the area by interacting on a regular basis (Paasivaara and Lassenius, 2014). However, the role of CoP in digital innovation has not yet been sufficiently examined.

2.3   Digital innovation as recombination

Recombination is key to digital innovation management (Henfridsson et al., 2018). Recombination is essentially about creating new value by recombining the existing components (e.g., technologies, processes) in a new way. Digital technologies can be recombined relatively easily because they are reprogrammable (Kallinikos et al., 2013), layered (Yoo et al., 2010), pervasive (Yoo et al., 2012), and provide data homogenization (Yoo et al., 2012, 2010). However, the use of new digital technologies in an organization is not merely technical but a sociotechnical process, which requires new social connections and cognitive models (Tilson et al., 2010). Recombination of the social processes is, therefore, more complexed than that of digital technologies.

Different frames for recombination of digital technologies have been found. First, according to the hierarchy-of-parts frame (Henfridsson et al., 2014), companies split digital technology products into modules that can be easily recombined. Digital technology is decomposed into parts, which increases design flexibility. Interfaces exchange information between components. This is the dominating way of recombination. Digital technology, since it is so cheap and easy to reproduce, has its value from design. Consequently, exploiting these benefits requires the design of a product to be "frozen" before production, and therefore only allows limited windows of functionality design and redesign. Apple iOS, for example, is not continuously updated, rather every year around September, which is also the case for software in cars. Arguably, this does not take advantage of the key properties of digital technology, such as unbounded design flexibility and scalability (Henfridsson et al., 2014). A second recombination frame is therefore relevant, the network-of-patterns frame. Here, design processes are considered acts of generalization and specialization to achieve an architecture that preserves and enhances a network of loosely coupled solution patterns. Generalization is a cognitive process that derives generic concepts or patterns that abstract from irrelevant information regarding implementation. To accomplish functional fit within specific settings, the patterns are being contextualized through specialization. Specialization is the process of creating a pattern by combining and adapting existing patterns to create a new solution to a recurring problem. Rather than focusing on hierarchies of parts, the network-of-patterns frame focuses on how generic components can be re-used. Patterns are generic resources that can be used to manage technological change (Henfridsson et al., 2014). The development of UX templates constitutes codes that are generic, and thus they must be specialized (e.g., by instantiating to mobile phones and web). General-purpose scripts and general-purpose programming languages allow developers to focus on problems rather than dealing with details of the language itself. Finding ways to deal with this

generalization and specialization is key to digital innovation. Although the frames for recombination of digital technologies have been examined, less is known about the recombination of the social processes involved in digital innovation.

In summary, insufficient knowledge exists on how organizational actors in incumbent firms negotiate and converge on digital innovation, how it is affected by self-organized networks of employees (such as CoP), and how recombination of the established social processes can be achieved. To address these topics, we have designed a case study, as described in the next section.

3   Method and Case Context

To answer the research question, we collected data from an established maritime company, MarComp (real name suppressed for anonymity), which we were following up between December 2019 to February 2021. MarComp was chosen because of its strong focus on digital innovation within maritime products and services. Being an established company within a traditional (maritime) industry, the company consists of numerous units that, one after another, became involved in the digital innovation process. This made the case suitable for answering our research question because the digital innovation triggered numerous negotiations between the actors from different units.

Our research approach is interpretive (Walsham, 1995) longitudinal case study (Yin, 2009). We report here findings from five different product ideas that followed the digital innovation process in MarComp. We kept an exploratory approach as we did not set out to test any specific theory or hypothesis (Runeson and Höst, 2009). Also, we investigated the phenomenon broadly by talking to several different stakeholders, seeking to understand the context of the digital innovation. Our research team was granted access to MarComp because the company participated in a research project on digital innovation. We collected data in three different ways (see Table 1). First, we conducted 11 interviews with product managers, innovation facilitators, and line managers. The interviews were recorded and transcribed into 61 pages of text. Second, we did observation by facilitating workshops concerning the innovation framework. One researcher facilitated the workshops, and another researcher took notes to document. Summaries of the workshops were sent to the participants. We also observed meetings that we did not facilitate, such as meetings of Communities of practice. Here, all researchers took notes. Third, we analyzed documents on the innovation framework, internal emails, and status reports. We were also granted access to reports from the venture board on the status of the startups, as well as emails.

Data source	Location	Time	Participants	Data gathered
Interviews	Virtual	Sep.2020 – Des. 2020	11 Interviews (5 product managers (3 of which twice), 2 innovation facilitators, marketing manager)	Interviews on the innovation process, work processes, and the innovation context
Observations from meetings	Virtual	Jun. 2020	Workshop: 8 participants (5 product managers, 3 line managers)	Meeting notes describing the innovation process, work processes, context, stakeholders
	Face-to-face	Sep. 2020	Workshop: 17 participants (6 product managers, 9 line managers, 1 facilitator, 1 head of the innovation process)	
	Virtual	Oct. 2020-Jan. 2021	6 meeting of the Community of practice (CoP) with varying number of participants (product managers, Program manager, line managers, innovation facilitators, software development, finance, marketing)	
	Virtual	Sep. 2020 – Feb. 2020	4 planning meetings of the CoP	
	Virtual	Jun. 2020 – Feb. 2020	5 Venture board meetings: 8-17 participants (Venture board members, product managers, head of the innovation process)	
Documentation	Virtual	Jun. 2020 – Feb. 2020	Descriptions of the Innovation Program, the innovation framework, and email correspondence	Venture board reports on the status of startups, emails describing barriers to the innovation process, strategic documents

Table 1.   Data collection and data sources

For the data analysis, all textual data was entered into the qualitative data analysis tool NVivo. The coding process was inductive and was performed in three steps. First, the first author coded the data according to which representatives (actors) expressed their opinions in the transcript, which resulted in a total of 162 coded instances. The second step was to group the coded opinions into groups of concerns and to identify which of them were competing with each other. Following Eriksson et al. (2009), we defined a concern as an interest of a particular stakeholder or a group of stakeholders involved in the digital innovation. To identify the concerns that were competing, we relied on our understanding of the case context combined with the insight from our contact persons at MarComp. At this step, all the authors took part in the analysis and agreed on the table's content. After the Results section was completed (Section 4), we validated it with the contact persons who found it to be a suitable representation of the competing interests in the company. Third, the first and the second author arranged the concerns in four themes that reflected the negotiation episodes. Here all authors agreed on the list of the episodes and their significance. Each particular episode was formulated to reflect how the competing concerns converged.
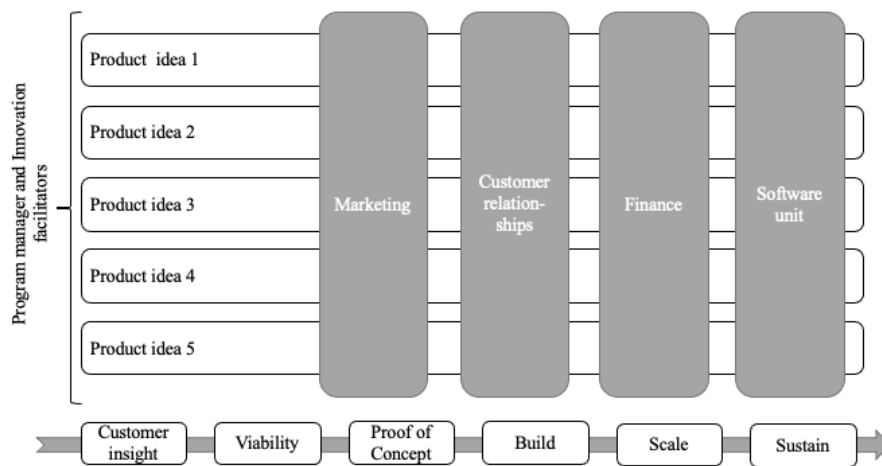

Figure 1.   Organization of the Digital Innovation Program at MarComp

MarComp (name suppressed for anonymity) is a business-to-business provider of maritime technical services with more than 3 000 employees. The Digital Innovation Program (Figure 1) has been part of the company's strategy to shift towards digital products and services. The Program was motivated by the need to increase the quality of services, maintain a competitive advantage, and generate new revenue. Based on an innovation process inspired by Lean startup principles, the Program started in 2019 by encouraging operative employees to submit ideas for new digital products. After an 8-week campaign, some of these product ideas were chosen to be followed up by the Digital Innovation Program. Each product idea was driven by an employee who submitted the idea, thus becoming a dedicated Product manager and responsible for its realization. The progress of the ideas could be monitored according to six maturity stages: Customer Insight, Viability, Proof of Concept, Build, Scale, and Sustain. To progress to a new stage, the Product managers needed to fulfill certain criteria by answering pre-defined questions, such as how many customers have committed to the proof-of-concept testing? And what is the estimated ROI? The answers were validated by a Venture board based on the evidence collected by the Product managers. The venture board was run by Innovation facilitators and Program manager that draws on the expertise of the line managers and business experts.

We closely followed 5 product ideas from the Customer Insight to the Scale stages. The technologies being developed are, in general, digitalizing maritime technical services through remote monitoring systems. The product ideas address different aspects of this overall digitalization by employing AI-enabled algorithms to analyze an increasingly big amount of data from vessels. Due to corporate concerns, we

give only a general description of each product idea. Product idea 1 and Product idea 3 provide real-life insight into ships' emissions, whereas Product idea 2 and Product idea 4 address the vessel's body and machinery. Product idea 5 gives an insight into vessels' compliance with standards and regulations. MarComp has a dedicated IT unit that develops new digital solutions. This implies that MarComp does not only acquire their solutions from third parties but develop them itself, which in principle gives the digital technology, in this case, a higher degree of re-programmability. Instead of manually entering the ship data into reports, the data is to be collected by instruments on ships, then collected centrally, being combined, analyzed, and visualized to provide additional insight. It is not the same people who design the equipment on the ships and the technology used centrally. Instead, different technologies interoperate through more stable interfaces and protocols that allow for separated design hierarchies. The technologies make the ship monitoring digital; they continuously evolve through generating and analyzing data used for the digital innovations.

4 Results

We now turn to the description of episodes of negotiation among the actors (representatives of various organizational units) identified through the data analysis.

4.1 Managing competing concerns: Episodes of negotiation

Our data analysis resulted in a list of concerns among the key representatives from Finance, Marketing, Customer relationships, Business development, as well as Program managers, Innovation facilitators, and Product managers (Table 2).

Representatives	Concern
Finance	Current payment mechanisms are hard to combine with new pricing models
	Validating emerging pricing models with the top management
Marketing	Company's brand
	Pre-defined marketing process
Customer relationships	Including new products in the existing offerings
Product managers	Making fast decisions
	Prepare handover to IT
Program manager and Innovation facilitators	Give Product managers access to expertise
	Generating new revenue
	Explore market fit through experimentation
Business development	Strong business cases
	Existing expertise in the business domain
Software development unit	Shortage of development resources

Table 2.   Perspectives on the digital innovation process of representatives from different interest groups.

The analysis also showed that concerns raised by the representatives of the Digital Innovation Program (see Table 3, white field) came in conflict with the concerns brought up by the representatives from the established units (Table 3, grey field). Below we describe these competing concerns in detail by focusing on four crucial episodes of negotiation that eventually allowed to manage the conflicts: mobilizing internal stakeholders, developing capacity for faster decision-making, pricing new digital services, and establishing a connection between business and development.

Mobilizing internal stakeholders. One aspect of the Digital Innovation Program was providing new service offering to the existing customers and reaching out to new customer groups, thus generating new revenue. However, there were disagreements about which groups of customers should be prioritized. Since the existing customers were already providing a significant share of the revenue, many stakeholders from Business development were concerned with expanding the services towards the existing customers to keep them loyal. One proponent of this from Customer relationships emphasized: «It is important to expand the service sector to the customers we already have. A lot of effort is put in the existing portfolio». However, prioritizing the existing customers meant that the new products had to be included

in their existing contracts for no fee. This contradicted the mere goal of increasing the revenue and led several managers to warn against "giving the products away for free."

Digital Innovation Program		Representatives from the established units	
Representatives	**Concerns**	**Concerns**	**Representatives**
Product managers	Making faster decisions	Pre-defined marketing process	*Marketing, Finance*
	Handover to IT	Shortage of development resources	*Software development unit*
Program manager	Give Product managers access to expertise	Existing expertise in the business domain	*Business development*
	Generating new revenue	Including new products in the existing offerings	*Customer relationships*
Facilitators of the innovation framework, Program manager	Explore market fit through experimentation	Company's brand, strong business cases	*Marketing, Business development*
Facilitators of the innovation framework, Program manager	Experimentation with different pricing models	Current payment mechanisms are hard to combine with new pricing models, validate emerging pricing models with the top management team	*Finance*

Table 3.   Competing concerns of representatives involved in the Digital Innovation Program

Such contradicting opinions were a challenge for the Product managers in charge of their respective products. The Program manager realized that there was a need to give the Product managers access to the existing expertise from the business domain. Along with an Innovation facilitator, he suggested establishing a Community of Practice that became an arena for negotiations between the representatives with various concerns. The Community gathered approximately every month to discuss a topic problematic for the Product managers (such as pricing, software development, customer insight, etc.) by drawing on the expertise of relevant representatives. The Community's mandate was formulated as "supporting the company in getting digital products into the market."

Developing capacity for faster decision-making. According to the innovation framework (see Section 3), the new products must show evidence of a potentially good market fit prior to being accepted for the Build phase. The Venture board was responsible for such acceptance and consisted of domain experts, line managers, and Innovation facilitators. Although the idea behind the Venture board was to facilitate the decision-making necessary for the progress of the startups, in practice many Product managers experienced unclear decision-making authority. Product manager 5 acknowledged: "[…] sometimes I am reluctant to take those kinds of decisions because I feel it's a decision on behalf of the company, and do I really have the mandate to say, "Ok, let's charge for it" or other things"? So I felt unclarity there". Unclear decision-making authority raised a concern among the Product managers to make faster decisions. At the same time, many stakeholders expected that all the necessary decisions could be taken by line managers and the innovation process can be planned in advance. For example, a representative from Marketing expressed an opinion that the innovation process should be more pre-defined when it comes to marketing and sales: "In innovation you also need processes, it doesn´t mean that you don´t want to innovate, it´s just you help the innovators with the solutions they have on the shelf."

According to the innovation framework, The Program manager and the Innovation facilitators inspired the Product managers to explore the market fit through experimentation with customers. However, making faster decisions was also required here. The digital innovation process was based on customer insight interviews and incremental testing of a minimal viable product (MVP) with pilot customers. For example, one Product Manager decided in collaboration with an Innovation facilitator to run a LinkedIn campaign to identify potential demand for her product idea. This was met with critique from Marketing. A Marketing representative was concerned with preserving the company's brand; she said: "Maybe such things as a LinkedIn campaign can work in the B2C business but not when you have larger customer groups. The maritime market is very closed, so when we go out with new products, we don´t just throw them out; we decide early on". The Community of practice became a way to facilitate closer

collaboration between Product managers and the Marketing unit. In October 2020, Marketing gave a presentation during a meeting of the Community, which provided an overview of how the unit can support Product managers in contacting the customers (target customer segments, target contacts, market intelligence). The workshop contributed to stronger connections with the marketing unit and led to increased enthusiasm among Product managers. One of them said: "Now I know whom to ask. I am very happy" (Product manager 4). With access to the expertise from Marketing, Product managers increased the speed of their decisions about the pilot customers.

Exploring market fit through experimentation with pilot customers was challenging because business experts in the Venture board were often concerned with strong business cases. This raised a threshold for Product managers to share MVPs with customers for feedback because they were not "perfect." One Product manager said: "We received a feedback that our business case is week because we are not sure whether customers will buy what we offer." (Product Manager 1). These competing concerns were acknowledged in November 2020. More decision-making authority was needed to allow Product managers to speed up the experimentation. To solve this, the Venture board changed its mode of interaction with Product managers at the meetings by asking, "how can the board help?" rather than Business development challenging the business cases in early stages. Individual Product managers also found workarounds to shorten the decision pathways when it came to business. Product manager 5 said that she established a steering committee to back up the necessary decisions: "[…] it feels safer to take decisions as a committee because I feel that I have a backing to move forward", she said.

In this way, the Community of practice contributed to a closer collaboration between the Product managers, Marketing, and Finance to speed up decision-making in the first three stages of the innovation framework. However, unclear decision-making authority was still perceived as the most problematic digital innovation area reported by the Product Managers in February 2021.

Pricing new digital services. The digital nature of new products led MarComp to discuss how to price them, as there was no prior experience in pricing such products. Inspired by the Community of practice and the Innovation facilitators, many Product managers became proponents of incremental price setting to establish price through customer insight and experimentation with different pricing models. An Innovation facilitator commented: "The discussions we have had in the Community led us to use the innovation framework to experiment with pricing models with the customer." However, it turned out that the current payment mechanisms were hard to combine with new pricing models, which did not offer sufficient flexibility to experiment with pricing. A representative from Finance commented: "Product Managers should suggest an idea on how their products can be priced, but it is important for us to find out which pricing models we can offer." Additionally, there was a concern among the representatives from Finance to validate the emerging pricing models with the top management team who were not involved in the Innovation program. "Pricing is not something we are not good at. Also, we have a problem that we don't have the decision-makers on board," – said the Program manager. These competing concerns were blocking the development of the pricing models.

To address these competing concerns, the Community of practice facilitated a workshop on pricing in November 2020. A representative from Finance prepared a list of pricing models that were technically possible and explained the logic behind them to Product managers who found the guidelines useful. Product manager 3 commented: "A list of what pricing models are possible and not is great. I am really happy to see this happening". Product manager 4 later developed a tool for future Product managers to identify suitable pricing options depending on the business logic of a product, thus facilitating the price-setting process in the innovation framework.

Establishing a connection between business and development. As more product ideas were continuously emerging, MarComp needed to orchestrate a continuous digital innovation process. The new products needed to be designed, piloted, launched to larger customer groups, and subsequently maintained. This was challenging due to the shortage of software development resources in the development unit. Whereas in the first stages of the innovation framework, the progress was fast, the speed dropped in the transition to the Build phase, as the innovation process was not aligned with internal planning and budgeting cycles. The transition was initially seen as a handover to the software development unit. Most

Product managers had insufficient experience with the IT and were uncertain what they should prepare for the handover to the developers. One Product manager commented: "It's all about bridging a need in the market to a piece of working software, but how do I determine if it's possible to make?" (Product manager 3). To align Product managers and the IT, a closer collaboration was needed. At the same time, the IT unit could not allocate the developers in earlier stages due to the shortage of software resources in the unit. The head of the IT unit expressed the concern: "We need to increase the capacity on front-end programming and UX; this is our main bottleneck."

To address this problem, the Community of practice facilitated two workshops in November-December 2020 with the purpose of increasing collaboration between the IT and the Product managers. As a result, the Venture board acknowledged that the developers should, to some extent, be involved in the innovation process from the start. "We must avoid handover to IT and build as one team," said a line manager. A Product manager who was among the first ones to collaborate with a software team meant that working as one team with the stakeholders from software was positive for her product. She expressed: "I think it helped to first work together in a small team with a software lead and a business lead and discuss together. And even agree on the terminology to get a common understanding of what the software needs to know and to what level of detail." (Product manager 3). Although the software developers were booked, it was still possible to use slack to involve them in the innovation work early. The solution was to invite the developers to pitch nights where the new product ideas were presented, so the connections for early collaboration could be made.

5 Discussion

Established companies, or incumbents, must deal with competing concerns (Svahn et al. 2017) when numerous actors are involved in the digital innovation process (Eriksson et al., 2009; Mikalsen et al., 2018). This makes digital innovation hard to manage based solely on the existing process frameworks and thus requires self-organization of the employee networks (Ciriello et al., 2018). Recombination of digital technologies is a key to digital innovation (Henfridsson et al., 2018; Tilson et al., 2010; Yoo et al., 2012). Recombination of the digital innovation processes may also be required, cutting across organizations and organizational units (Nambisan et al., 2017), something that complicates the recombination in practice. We, therefore, asked the following research question: how do actors in an incumbent maritime firm negotiate competing concerns around digital innovation to achieve recombination? Through an interpretive case study of digital innovation in an established maritime company, we have shown how, despite having a well-formulated digital innovation framework, in practice, there are many actors with many different values and concerns that need to be negotiated in order for digital innovation to succeed. We proceed to discuss how the concerns were managed, the negotiations occurring within the frames of digital innovation frameworks, and the challenge of recombining various processes.

5.1 Managing competing concerns to drive digital innovation

Negotiations between different actors are needed to manage these interactions both between humans and the technology involved in digital innovation. The representatives in our case needed to include relevant stakeholders and build upon the existing systems (Parmiggiani and Mikalsen, 2013) to converge (Eriksson et al., 2009) on various values and practices and move the innovation forward. Earlier studies have given examples of competing concerns that may arise in digital innovation and that have to do with *capability*, *focus*, *collaboration,* and *governance* (Svahn et al., 2017). Our findings go further to demonstrate how different concerns are raised by concrete representatives or actors, how the concerns compete with those of other actors and how they are eventually managed through negotiations. For example, concerns about faster decision-making were about *governance* (flexibility of Product managers vs. control of the management team), whereas connecting business and development tapped into *capabilities* (existing software capability vs. requisite). *Collaboration* (both internal and external) appeared to be a driver for digital innovation. External collaboration (customer insight and experimenting) ensured a better market fit, whereas internal collaboration (Community of practice) allowed to recombine the existing resources and competencies in a way that supported the new products.

Representatives from different contexts within an organization naturally tend to disagree on ascribing value within innovation processes (Stark, 2009). Such disagreements were problematic in the context of digital innovation in MarComp and led to numerous negotiations. Our results show that ascribing value was challenging because numerous actors were involved in the price-setting and resource allocation. The actors often had competing opinions on what value the new products have for the market. Incumbents are often characterized by established business models on the one hand and the need to establishing new digital capabilities on the other. In such a situation, digital innovation introduces the need to maintain the existing business model but potentially also challenge it, effectively creating different value spaces (Henfridsson 2018). Our results show that providing the new digital offerings to the existing customers can jeopardize their existing revenue potential. The new digital market offerings need to compete for resources with the existing business model. In our case, the examples of the resources were software development resources or the financial resources that MarComp was willing to invest in the digital innovation in the pilot phase. Negotiating such competing views was necessary for digital innovation to move forward.

5.2 Communities of practice to facilitate the digital innovation process

The earlier literature has suggested several frameworks that aim to explain how digital innovation process can be managed in the incumbent firms (Desouza, 2011; Tidd and Bessant, 2020; Viki et al., 2017). Such frameworks describe the innovation process in clearly ordered consecutive phases. Containing readily available tools to demonstrate the market potential allows the innovation frameworks to establish viability and proof of concept and thus to secure resource allocation for the emerging offerings. The innovation process in MarComp resonates with these frameworks in that it relies on six distinct phases (e.g., Customer Insight, Viability Proof of Concept, etc.). While digital innovation frameworks are necessary to organize activities within digital innovation, they alone are not sufficient for advancing. Ciriello et al. (2018) argue that in order to drive digital innovation forward, organizations need to rely on self-organizing networks of employees that support the enactment of the innovation frameworks in practice. Our findings support this argument highlighting that organizations should be prepared to open for negotiations between the existing business experts who rely on their domain experience; and the innovators who rely on customer insight. What is valuable and what should count is brought into a debate (Stark, 2009).

In our case, the Community of practice became an arena for such debates between finance managers, marketing managers, business development, product managers, etc. Earlier research has shown that communities of practice can enable innovation (Swan et al., 2002) by sharing knowledge and learning, coordinating work (Paasivaara and Lassenius, 2014), collectively making strategic decisions, and providing recommendations to the management (Smite et al., 2019). In our study, the CoP was a driver behind digital innovation. The CoP spontaneously emerged from networking among individuals with similar work-related activities and interests (Swan et al., 2002) to deepen their expertise in the area by interacting on a regular basis (Paasivaara and Lassenius, 2014). Our study contributes to the literature on CoPs by emphasizing their role in facilitating negotiations between the stakeholder involved in digital innovation in incumbent firms. They can be a way for the stakeholders to converge on value by negotiating the competing concerns (Eriksson et al., 2009), such as price or resource allocation.

5.3 The challenge of recombining the established processes

The key to digital innovation is the recombination of the technology and processes to develop new digital products (Henfridsson et al., 2018; Tilson et al., 2010; Yoo et al., 2012). Our findings show how digital technology has the characteristics needed for recombination. It is reprogrammable (Kallinikos et al., 2013), utilizes data homogenization (Yoo et al., 2013), is layered (Ibid.), and pervasive (Yoo et al., 2012). In terms of the process, however, we find that there are practical limits to recombination. While the theorists argue that digital innovation is unbounded, not pre-defined, and makes innovation process and outcomes inseparable (Nambisan et al., 2017), our findings indicate that incumbent companies need to work hard to achieve such flexible characteristics in order to succeed. Our findings show how the

Digital Innovation Program at MarComp cuts across the boundaries of initially isolated silos (see Figure 1, organization of the Digital Innovation Program). Product ideas cut across different organizational units, such as marketing, customer relationships, finance, and software. Because of the interdependence between different organizational units on the one hand and the innovation processes on the other, re-combination of the established processes is problematic. MarComp facilitated a closer collaboration between these units (using the Community of practice), which reduced the pre-existing dependencies, thus increasing opportunities for recombination of the innovation processes.

The theoretical framework suggested by Henfridsson et al. (2014) discusses the network-of-patterns concept as a means for recombination. The key idea here is to have a generic technical architecture or pattern that allows for specialization in certain contexts. Our findings indicate how such architectures or patterns need to be aligned with organizational processes and practices. The original process at MarComp resembled a more traditional process, where digital products are "frozen" before production, i.e., a hierarchy-of-parts approach (ibid.). However, such an approach led to handovers between different units (e.g., from product managers to IT). Eventually, MarComp acknowledged that fewer handovers and rather a more continuous and flexible process were preferable. As a result, the software developers started to be involved in the innovation process earlier to ensure that the solutions that the product managers suggested were possible to implement in terms of specializing what they already had technologically. We are suggesting that such process recombinations resulting from negotiations among the organizational actors are necessary for succeeding with digital innovation in incumbent firms.

6 Conclusion

This case study illustrates that negotiating competing concerns among the organizational actors can be necessary for driving digital innovation in incumbents. To negotiate such concerns, MarComp leveraged communities of practice which can be a way of mobilizing internal networks and support the pre-defined innovation processes. Digital innovation is largely about the recombination of the existing capacities and processes. Based on the findings, we concluded that negotiations of competing concerns might lead to better collaboration between isolated silos and thus create more opportunities for process recombination, which is the key for digital innovation.

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