



Unfolding the digital servitization path from products to product-service-software systems: Practicing change through intentional narratives

Marko Kohtamäki^{a,*}, Rodrigo Rabetino^b, Suvi Einola^b, Vinit Parida^c, Pankaj Patel^d

^a University of Vaasa, School of Management, Luleå University of Technology, Entrepreneurship and Innovation, University of South-Eastern Norway, USN Business School, PO Box 700, FI-65101 Vaasa, Finland

^b University of Vaasa, School of Management, PO Box 700, FI-65101 Vaasa, Finland

^c Entrepreneurship and Innovation, Luleå University of Technology, University of Vaasa, School of Management, University of South-Eastern Norway, USN Business School, Luleå, Sweden

^d Villanova School of Business, Villanova University, 800 E. Lancaster Avenue, Villanova, PA 19085, USA

ARTICLE INFO

Keywords:

Digital servitization
Product-service systems (PSS)
Remote monitoring technology (RMT)
Strategy as practice (SAP)
Organizational change
Ecosystems and interorganizational networks
Processual research

ABSTRACT

Manufacturers are increasingly struggling with the transition from products to product-service-software systems. Our study takes stock of the current research on servitization and digital servitization to investigate the challenging transition process from product to more complex product-service-software systems. We examine how does the digital servitization journey unfold as sayings and doings, and how do intentional narratives guide digital servitization. The present in-depth single case study spanning 8 years reveals the emergent process during the transition of a leading solution provider from servitization to digital servitization. The study uses social practices, such as managers' sayings and doings, to map the change process that unfolds first as servitization and, in a second stage, as digital servitization. Even more importantly, this study unpacks the role of intentional narratives in shaping digital servitization as a lengthy change process. For managers, this study provides a detailed depiction of the servitization and digital servitization processes, and some intentional narratives for guiding the process. Thus, the process may be challenging but perhaps manageable by using intentional narratives as a strategic practice.

1. Introduction

Defined as the convergence of digitalization and servitization (Lerch & Gotsch, 2015), digital servitization (DS) is considered an important concept by industry and academics (Kohtamäki, Parida, et al., 2020; Lerch & Gotsch, 2015; Paschou et al., 2018). In this context of digital servitization, we define digitalization as a transition from remote monitoring to optimization, control, and often ultimately to autonomous systems (Porter & Heppelmann, 2015). In contrast, servitization is defined as the transition from products to integrated product-service systems (Baines et al., 2013). Recently, scholars have started using the concept of digital servitization to combine digitalization and servitization, defined as "...The transition towards smart solutions (product-service-software systems) that enable value creation and capture through monitoring, control, optimization, and autonomous function. Digital servitization

emphasizes value creation through the interplay between products, services, and software." (Kohtamäki, Parida, Oghazi, Gebauer, & Baines, 2019: 383). Thus, digital servitization represents and promises growth and future competitiveness for traditional manufacturing firms.

The burgeoning servitization literature over the past 15 years has only recently focused on product-service-software systems (Kohtamäki, Baines, et al., 2021). The software component and, more broadly, digitalization have been part of servitization research from its infancy. However, servitization research strongly emphasized digitalization only after the emergence of the digital servitization substream (Coreynen et al., 2017; Hsuan et al., 2021; Rabetino et al., 2021). Digital servitization attempts to explain the complex interplay among digital technologies, processes and activities; strategies and offerings; and other actors in the ecosystem (Jovanovic et al., 2021; Möller & Halinen, 2017; Ritter & Pedersen, 2020). Thus, for manufacturing companies, the

* Corresponding author.

E-mail addresses: marko.kohtamaki@uva.fi (M. Kohtamäki), rodrigo.rabetino@uva.fi (R. Rabetino), suvi.einola@uva.fi (S. Einola), vinit.parida@ltu.se (V. Parida), pankaj.patel@villanova.edu (P. Patel).

<https://doi.org/10.1016/j.jbusres.2021.08.027>

Received 18 January 2021; Received in revised form 10 August 2021; Accepted 13 August 2021

Available online 1 September 2021

0148-2963/© 2021 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

transition toward digital servitization is complex, holistic, and, hence, difficult to manage and requires understanding not only stronger strategic alignment between digital capabilities and servitization, processes, hardware, and software technologies but also shaping the ecosystem and firm boundaries to implement digital servitization for the customer and ecosystem (Sklyar, Kowalkowski, Tronvoll, & Sörhammar, 2019). Current digital servitization research has limited empirical examinations of complex and holistic change processes, as previous servitization and digital servitization studies have primarily focused on content research (Kohtamäki, Baines, et al., 2021; Rabetino et al., 2018). There has been a call for studies acknowledging the context and multilevel nature of digital servitization as a change without fully neglecting the role of the ecosystem (Kohtamäki et al., 2019; Sklyar et al., 2019). Thus, scholars have called for a deeper analysis of how the process of digital servitization unfolds (Kohtamäki et al., 2019; Tronvoll et al., 2020).

Previous literature reviews have suggested that servitization research has developed based on multiple case study methodologies, literature reviews, and quantitative analysis (Rabetino et al., 2018). However, fewer empirical studies have been conducted using process methodologies and narrative methods (Luoto, Brax, & Kohtamäki, 2017). Servitization research calls for an improved understanding of the microprocesses of servitization. The literature should go beyond objectivist variance research by, for instance, using social practices and practice theory to analyze strategic change. Our argument, among others, is that the field needs more microlevel processual research on social change (Kohtamäki, Baines, et al., 2021). Practice theory (Schatzki, 2001; Vaara & Whittington, 2012), microlevel conceptual tools (including practical and discursive practices), and intentional narratives can be used to understand organizational change (Jarzabkowski, 2008; Ravasi et al., 2020). The strategy-as-practice literature divides social practices into sayings and doings (Schatzki, 2012; Seidl & Whittington, 2014), a distinction we also use in this study. There is a need to understand how intentional narratives can be used as a tool to create a change narrative to manage digital servitization as organizational change, as a narrative view can be taken considering strategy “... to be a ‘fictional’ discursive construction that builds on the past to project the organization into the future (Barry & Elmes, 1997; Dalpiaz & Di Stefano, 2018; Fenton & Langley, 2011) in such a way as to give meaning to the proposed actions” (Ravasi et al., 2020: 14). Thus, there is a need to apply a practice-theoretical perspective and a narrative view to study the microprocesses related to digital servitization.

The present study addresses the following questions: How does the digital servitization journey unfold as sayings and doings, and how do intentional narratives guide digital servitization? Using data from 81 interviews conducted since 2012 and company reports released since 2000, we examine the path from standard products to complex product-service-software systems in the context of a single case of a leading solution provider. The contribution of the present study to the servitization and digital servitization literature is twofold: This study attempts to develop an understanding of a holistic, continuous, and emergent process of digital servitization by using social practices, such as managerial sayings and doings, to map the change process from the micro (firm) to macro (ecosystem) level, as was suggested by Kohtamäki et al. (2019). Second, and even more importantly, this study unpacks the intentional narratives used to shape digital servitization as a lengthy change process (Luoto et al., 2017). For managers, this study describes the servitization journey and reveals the relevant micropractices during the journey. This study complements the technology-oriented servitization literature by providing an alternative view from practice theory.

2. Theory

2.1. Digital servitization as a concept

2.1.1. Defining digital servitization

Despite the limited emphasis on the topics (Coreynen et al., 2017;

Kohtamäki et al., 2019), remote diagnostics and digitalization have been part of the servitization literature since its early development (Grubic, 2014). Based on the servitization literature, digital servitization has typically been seen as a full-fledged business model transformation involving strategies and offerings, digital artifacts, microprocesses and practices, and stretching beyond company boundaries (Adrodegari et al., 2018; Kowalkowski et al., 2017; Rabetino et al., 2017). Considering that in product-service-software systems, these elements become increasingly interdependent, studies have emphasized the role of modularity in managing the tensions between them (Hsuan et al., 2021; Kohtamäki, Einola, et al., 2020; Rajala et al., 2019). This integration between products, software, and services may take place through the product life cycle (Rabetino et al., 2015), while the potential value created by information and communications technology (ICT) and software is sometimes embedded in advanced services, such as optimization and outcome-based services (Sjödin, Parida, Jovanovic, et al., 2020; Visnjic et al., 2018). Effective integration enables higher use value by optimizing combinations of products, services, and software (Sjödin, Parida, Kohtamäki, et al., 2020). Thus, the change process toward integrated product-service-software systems is far from easy. Digital servitization is a comprehensive and complex process of business model change, where the environment, strategy, and structure are in interplay. Our focus on digital servitization builds around the offerings and the front end of the company while delimiting a detailed focus on the back-end processes of IT-driven manufacturing and supply chain management (Tao & Qi, 2019).

2.1.1.1. Defining digital servitization. The present study approaches the digital servitization process covering the primary dimensions from the micro to macro levels, including 1) innovative service technologies, 2) microactivities and capabilities that enable value creation, 3) strategy and offerings, and 4) collaboration with ecosystem actors. Next, we cover these four perspectives and their interplay in short.

The present study emphasizes the vital role of connected product-service-software systems; the evolution of smart solutions has received increasing attention in recent digital servitization research (Thomson et al., 2021). These so-called service technologies involve many components and applications, but the core purpose of these technologies has been to enable monitoring, control and optimization from remote locations. Hence, these technologies have often been called remote monitoring technologies (Grubic, 2014). Many labels, such as remote diagnostics, remote repair, condition monitoring and remote monitoring technologies, have been utilized (Grubic, 2014; Grubic & Jennions, 2018). Remote monitoring technologies have had their place in servitization research, although studies have proclaimed that servitization research has not given enough attention to digitalization (Coreynen et al., 2017; Grubic, 2018; Kohtamäki et al., 2019). Porter and Heppelmann (Porter & Heppelmann, 2014) provide a framework to understand the steps of smart solutions, from remote monitoring to control, optimization, and ultimately, autonomous systems (Ardolino et al., 2018; Opresnik & Taisch, 2015; Porter & Heppelmann, 2015; Vendrell-Herrero et al., 2021). Novel service technologies are driving new service development, therefore enabling new types of smart solution offerings through remote diagnostics, data acquisition by using various sensors, data warehousing, data analytics, and their related microactivities and processes. Remote technologies require processes and competencies to create value from technology (Oliva & Kallenberg, 2003).

The development of the internet and cloud computing has recently enabled new ways of value creation and appropriation through the Internet of Things (IoT) (Ardolino et al., 2018; Ritter & Pedersen, 2020; Rymaszewska et al., 2017) but has demanded the capacity to develop these capabilities rapidly through agile R&D processes (Sjödin, Parida, Kohtamäki, et al., 2020; Vendrell-Herrero et al., 2020). Previous studies have devoted attention to the question of how remote diagnostics can create and appropriate value from the installed base when

complemented with appropriate capabilities (Grubic, 2014). For instance, Grubic and Peppard (2016) describe how servitized manufacturers use remote monitoring technologies to identify factors enabling and constraining the achievement of desired outcomes. Lenka et al. (2017) identify digitalization-related capabilities—such as intelligence, connection, and analytic capabilities—that feed perception and responsive mechanisms, thereby enabling value cocreation. Ardolino et al. (2018) find digitalization critical to any servitized manufacturer while identifying a set of capabilities based on four cases. Hasselblatt et al. (2018) identify strategic, IoT-related capabilities in servitized manufacturers; these capabilities include solution platform building, value selling and delivery, business intelligence, and digital business model development. Boldosova (2020) emphasizes the role of analytics and storytelling in smart service sales.

Digital servitization strategies have been considered from different perspectives. By strategy, we refer to the means used by a company to create, deliver, and appropriate customer value. Thus, by definition, strategies are used for creating differentiated, low-cost, or hybrid customer value promises. Studies have identified a variety of digital servitization strategies and business models. For instance, Kowalkowski et al. (2015) identify business models, such as 1) industrializers, 2) availability providers, and 3) performance providers. Kohtamäki et al. (2019) extend their work by recognizing an additional five business models: 1) product-oriented service providers, 2) industrializers, 3) providers of customized integrated solutions, 4) outcome providers, and 5) platform providers.

Automation and connectivity generated by the Internet of Things (IoT) eventually change manufacturers' value chains and operations within ecosystems or platforms (Adner, 2017; Iansiti & Lakhani, 2014; Jacobides et al., 2018). These circumstances impact manufacturers' strategies and capabilities and change their ecosystem collaboration, firm boundaries, and make-or-buy decisions (Bustinza et al., 2019; Huikkola et al., 2020; Vendrell-Herrero et al., 2017). Moving toward digital, optimized, and autonomous operation within an ecosystem may enable significant productivity gains but also imposes requirements regarding collaboration for standard setting, even between competitors (Jovanovic et al., 2021; Porter & Heppelmann, 2014).

As digitalization processes in servitized manufacturers are particularly lengthy, planned, and emergent and involve multiple organizational layers and functions, discursive tools, such as intentional narratives can provide valuable assets in managing this organizational transition. To date, very little is known about the process of digital servitization and how intentional narratives can be used as a discursive tool to steer the progress of organizational change.

2.2. Micropractices of organizational change in digital servitization

2.2.1. Sayings and doings as social practices

Grounded in practice theory, the strategy-as-practice (SAP) approach conceptualizes strategy as an action that organizations take, not a quality they possess (Whittington, 2006). In contrast to the content view of strategy, the practice theoretical perspective concentrates on the process of strategy and strategic change, particularly micropractices. Kohtamäki, Whittington, Vaara and Rabetino (2021) identify five six clusters of SAP research: praxis, sensemaking, discourse, socio-materiality, institutional and a sixth process cluster. They also connect the disconnections between 1) micro and macro; 2) sociomaterial and discourse, 3) critical and more mainstream research; and 4) practice and process perspectives. Seidl and Whittington (2014) divide micropractices into sayings and doings, reflecting the discursive and practical forms of strategic change. SAP is interested in the interplay between the micro and macro levels in organizational theory and emphasizes the role of the micro level constituting the macro level: how microlevel sayings (speech or text) and doings (e.g., remote technologies or sociomaterial practices) eventually produce or perform higher-level structures (e.g., organizational capabilities and the ecosystem) (Kouamé & Langley,

2018). SAP also suggests the use of narratives as an important managerial practice in organizational change situations (Fenton & Langley, 2011; Vaara & Tienari, 2011).

Aligned with the practice theory view of strategy, organizational change, such as the transition from products to product-service systems and, ultimately, to product-service-software systems, is considered a process of strategic change in which actors make sense of and give sense to activities both retrospectively and prospectively (Stigliani & Ravasi, 2012). Hence, digital servitization as strategic change is continuously constructed and reconstructed at the microlevel when activities are planned, implemented, and adjusted through reconstruction and implementation processes. Hence, in practice, digital servitization should be interpreted chronologically over a lengthy period; as the change unfolds through continuous interactions between actors and technologies, digital servitization should be interpreted chronologically over a lengthy period involving the transition from products to product-service systems and, ultimately, to product-service-software systems (Kaplan & Orlikowski, 2013; Langley et al., 2013). In this process, through both retrospective and real-time empirical data, digital servitization, as a strategic change process, unfolds as a sociomaterial interplay between digital technologies, organizational micropractices, strategy and offerings, and the organizational ecosystems in which the company is engaged. Thus, organizational change involves processual activities in which actors perform microlevel activities and tasks. These tasks comprise activities linked to processes, which reflect the doings in strategy and organizational change (Johnson et al., 2003). In addition to processes and activities, doings also comprise tools and routines.

In addition to the doings, another stream in practice theory focuses on discourses and narratives, the so-called sayings (Barry & Elmes, 1997; Vaara et al., 2004). The role of discourse and narratives has become increasingly important over the decades in studies on strategic and organizational change (Sonenshein, 2010; Spee & Jarzabkowski, 2017; Vaara et al., 2016). These studies characterize the proliferation of discursive research as a linguistic turn in the social sciences (Mantere, 2013; Vaara & Whittington, 2012). Narratives have become more central in the practice of processual strategy (Fenton & Langley, 2011). While researchers of this sayings stream have described strategizing as storytelling, scholars have discussed about how senior managers and employees use narratives to explain events, particularly when making sense of organizational change (Barry & Elmes, 1997; Ravasi et al., 2020; Vaara & Tienari, 2011). Routines, practices, and ways of working are continuously constructed and reconstructed by stories, narrative fragments, told within the organization (Fenton & Langley, 2011; Pentland & Feldman, 2007). This idea is aligned with Mintzberg's notion of strategic emergence (Mintzberg, 1978), according to which planned strategies are challenging to implement as intended, and strategies tend to look clear only afterward, whereas "strategy formation walks on two feet, one deliberate, the other emergent" (Mintzberg & Waters, 1985: 271). In complex organizational change, which digital servitization certainly must be, we can assume that the intended and emergent intertwine during implementation, thereby calling for managerial tools to support coping with implementation challenges (Kohtamäki, Einola, et al., 2020). Intentional narratives may provide such means.

2.2.2. Intentional narratives in managing digital servitization

In practice theory and strategy-as-practice, organizational storytelling is considered to be an intentional managerial practice (Vaara & Tienari, 2011) that can connect micropractices in change efforts to generate consistent storylines that people can remember and follow. The narrative stream in strategy research considers that stories can be used "to give meaning to the proposed actions" (Ravasi et al., 2020: 14). The narrative perspective can be considered to be part of a linguistic perspective in strategy-as-practice, i.e., the discursive view, which involves different genres, such as critical discourse studies, narratives, conversation analysis, metaphor analysis, rhetorical analysis, and language games (Balogun et al., 2014; Golsorkhi et al., 2015). The narrative

view concurs with the sayings and doings approaches, thereby acknowledging the change as intended and emergent (Mintzberg & Waters, 1985), which can be integrated into a change narrative through intentional storytelling. For instance, practices can be intentionally mobilized through “storytelling” to construct “interests and identities” (Vaara & Tienari, 2011: 372). Storytelling provides a means to create intentional narratives that give sense to past, present, and future actions undertaken in an organization, a context that is emergent, dynamic, and dispersed in many ways (Czarniawska, 2004; Vaara & Tienari, 2011). Lengthy organizational changes, such as digital servitization, may be facilitated by structural changes, but intentional narratives can significantly facilitate these changes (Ravasi et al., 2020).

In digital servitization, intentional narratives can be used by managers responsible for change processes to create a sense of urgency (Kotter, 2008), to cope with various tensions, or to enable change processes. As a systemic and complex process (Eloranta et al., 2021), digital servitization requires tools that steer the process in the long term. For this purpose, intentional narratives used through storytelling can provide the appropriate means. Intentional narratives can be mobilized using different media, such as “strategic plans, CEO speeches, newsletters, books, and even annual reports” (Ravasi et al., 2020: 14). In this study, we adopt the perspective of intentional narratives, representing the strategic communication provided by the top management of the studied multinational corporation. We suggest that digital servitization may be guided and enabled by intentional narratives, i.e., stories deliberately constructed by managers to support the organizational transition.

3. Methodology

3.1. Research strategy

This article uses an in-depth processual single-case study to perform a thorough analysis of digital servitization by examining the micropractices of managerial sayings and doings. This approach is recommended when researchers attempt to understand a rich process, its complex structures, and its characteristics in depth instead of explaining variance (Dubois & Gadde, 2002; Langley, 1999; Piekari et al., 2009). This research strategy aims to provide a holistic and contextualized interpretation of how the case works (Eriksson & Kovalainen, 2016). Single intrinsic cases are valuable when they provide considerations of a phenomenon that stands alone as relevant or when the study represents a revelatory and powerful example (Siggelkow, 2007) or a longitudinal case. A single-case study is an appropriate methodological choice because we aim to a) explore digital servitization in detail (Patton, 2015), b) have in-depth data to provide a detailed description of the case, c) understand the longitudinal evolution of the organizational change related to digital servitization, d) unravel the process in context (Eriksson & Kovalainen, 2016; Langley, 1999), and e) carefully combine case analysis with theoretical analysis (Dyer & Wilkins, 1991).

3.2. Case selection

This article takes an industrial solutions provider as its case. The company is a global manufacturer of large, customized solutions and is highly advanced regarding the technological level of IoT solutions, servitization, and utilization. In some product segments, the solution provider is the global market leader. The company has more than 20 years of experience with servitization and already has much experience developing various advanced services and related IoT solutions. Hence, the case company provides an exciting platform to study the complex change processes related to digital servitization. The case company is an important research partner for the research team, with whom it has collaborated for more than 15 years. Hence, the research team has excellent access to in-depth processual data. The studied case provides a powerful example (Siggelkow, 2007) with novel insights into theory (Dyer & Wilkins, 1991) and represents a valuable case to explore in

detail (Patton, 2015).

3.3. Data collection, data and analysis process

We used multiple data sources to identify the micropractices used during the transitional process toward digital servitization. The research process was lengthy, starting in 2012 and continuing until 2020. We collected data based on interviews, informal discussions, strategy presentations, annual reports, press releases, and newspaper reports during the process. The use of various sources of data enabled us to increase accuracy (Lincoln & Cuba, 1985; Yin, 1994) and reliability (Beverland & Lindgreen, 2010) and to identify novel perspectives (Dubois & Gadde, 2002). We conducted interviews as part of the servitization research program between November 2012 and June 2020.

The interviews focused primarily on describing the case company's servitization process; digitalization; remote technologies and business intelligence; and strategies and organizational practices, including enabling and disabling factors of the change process. We selected interviewees from various business units and organizational levels. Interviewees had to have experience at the firm and a perspective regarding the servitization process. They had titles such as CEO, executive vice president, vice president of digital transformation, director, general managerial manager, business development manager, after-sales manager, and business intelligence manager. We had 81 face-to-face interviews with employees at the case company. Interviews lasted from 25 to 172 min. All the interviews were recorded and transcribed. Verbatim quotations were identified using codes to guarantee the anonymity of the interviewees.

Due to the extensive data gathered and validated during the 8-year data collection process, access to the case company created an opportunity to collect rich and thorough information. Therefore, the data analysis process was inherently abductive (Dubois & Gadde, 2002; Mantere & Ketokivi, 2013). When analyzing the data, we analyzed the case over time (temporal dimension), considering that sayings and doings evolve temporally and, thus, so do the intentional stories used to manage change. The analysis was performed in the following phases. First, we wrote a detailed description of the company case: we described the company, its development over time, and the main practices at different layers of product and services. At this point, based on the case observations and the previous theory, we understood that we would use four layers to describe the social practices: 1) strategy, 2) service technologies, 3) micropractices and processes, and 4) shaping the ecosystem. Second, we coded the data using NVivo based on first-order categories (observations/direct quotes), during which we started to form second-order themes below the third-order themes (the themes reflected the layers). Thus, the layers shaped the analysis and allowed substantial freedom to identify relevant first-order observations and second-order themes. Throughout the study phases, we constantly compared the findings against the prior literature on servitization and digital servitization. Despite the abductive character of the process, we wanted to use the data structure to display the identified structure of the results (Nag et al., 2007), as displaying the data structure had an essential role in the analysis (Miles et al., 2014).

The use of a data structure did not eliminate the possibility for creative interpretation that is always present (Langley, 1999) but was intended to explicate the links between data and the main findings. Third, we located the social practices in a company timeline based on the interviews and annual reports. We also continued analyzing the interviews and annual reports to ascertain whether the temporal location of the social practices was understood correctly. In later interviews (2018–2020), the identified timeline was also explicitly discussed to ensure that the company management agreed on how we had interpreted the social practices and their temporal position (Lincoln & Cuba, 1985). Fourth, and partially simultaneously with the analysis of social practices, we analyzed and identified the intentional narratives used to manage the change process over time. By this point, we better

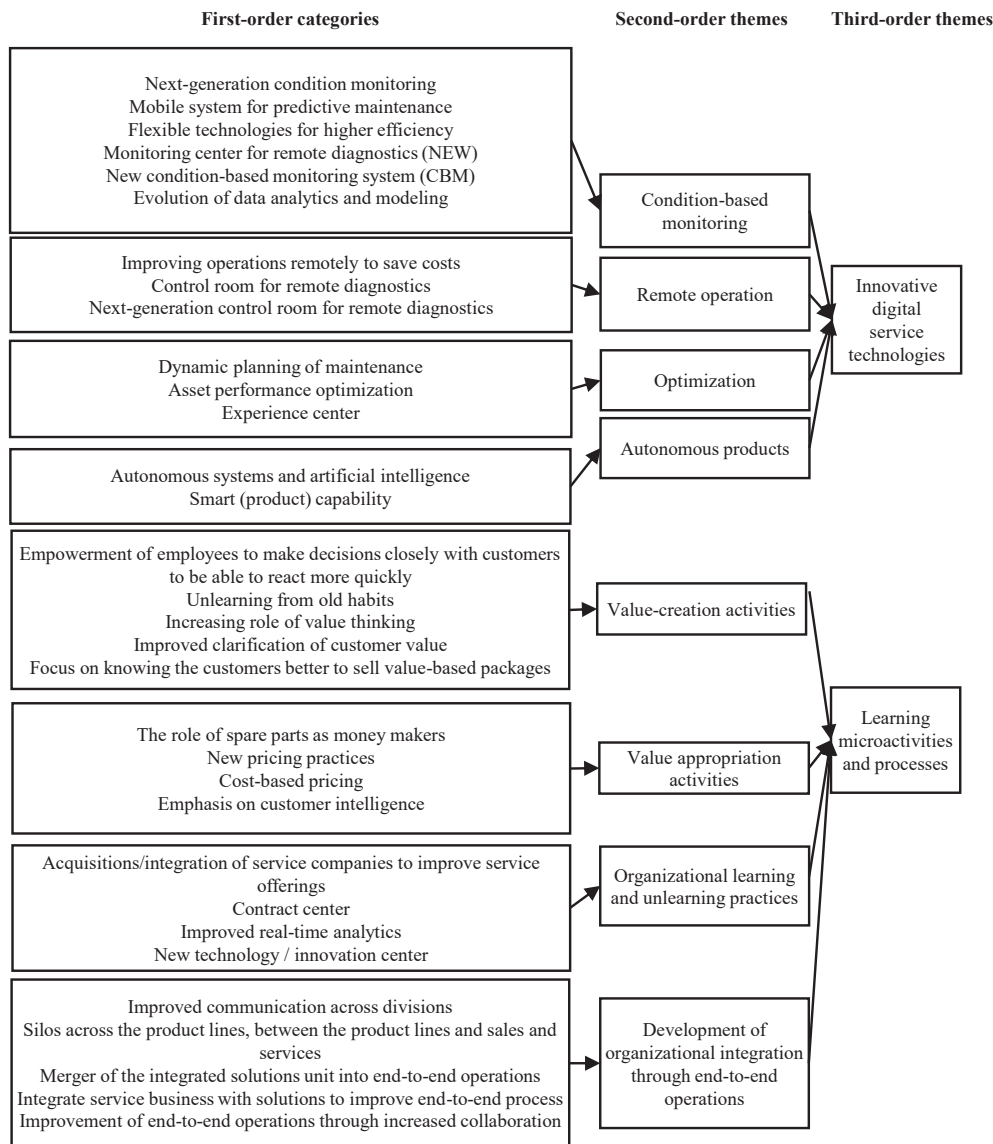


Fig. 1. The data structure of the micropractices.

understood the interplay between intentional narratives and social practices and the role of strategic emergence during the process. Fig. 1 depicts the data structure related to identified micropractices in the timeline (direct quotes mostly in Appendix 1), while Fig. 2 depicts the data structure of the intentional narratives (direct quotes mostly in Appendix 1).

4. Findings

We begin our discussion of the findings by presenting the case company context instead of the methodology, as this structure provides a clearer continuum from the case context to the analysis. After the case presentation, we introduce the change process toward digital servitization by demonstrating the micropractices from 2000 to 2020. This discussion is structured based on the IoT and digital technologies, microprocesses, strategy and offerings, and ecosystems. The identified micropractices create the context where intentional stories are being utilized. Stories are utilized to shape the micropractices within the firm and the ecosystem. Without this in-depth contextualization, we would not have proper grounds to discuss strategic emergence; as in this work, intentional narratives represent the planned intentional strategy. The

micropractices reflect the emergent side of the strategy, i.e., what actually happens. We use “power quotes” in the text and “proof quotes” in the Appendix to align with the suggestion of Pratt (2009). The power quotes represent the most compelling issues, while the proof quotes provide additional evidence of and validity to our interpretations.

4.1. The case context

The empirical study concentrates on a case company operating in the manufacturing industry. We study a global technology company, a provider of integrated solutions, including complex customized products, advanced services, and well-developed software. Listed on the stock exchange, the case company is a leader in providing complete life-cycle solutions for two different markets. The company provides smart integrated solutions in the form of products, services, and software for “optimizing installation performance throughout the life-cycle, using data analytics and artificial intelligence to support customers’ business decisions” (Company report 2017). By emphasizing technological innovation and total efficiency, the company provides advanced services related to its large, customized integrated solutions, which are then often operated by the customer’s customer – the case company provides

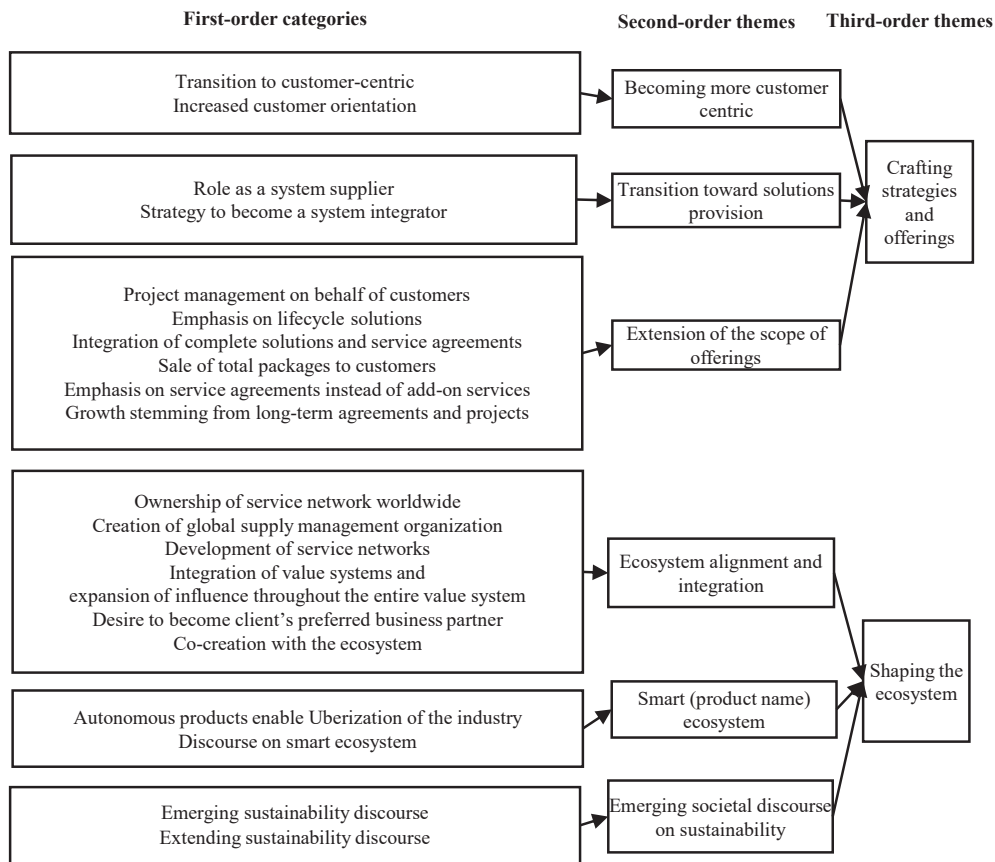


Fig. 1. (continued).

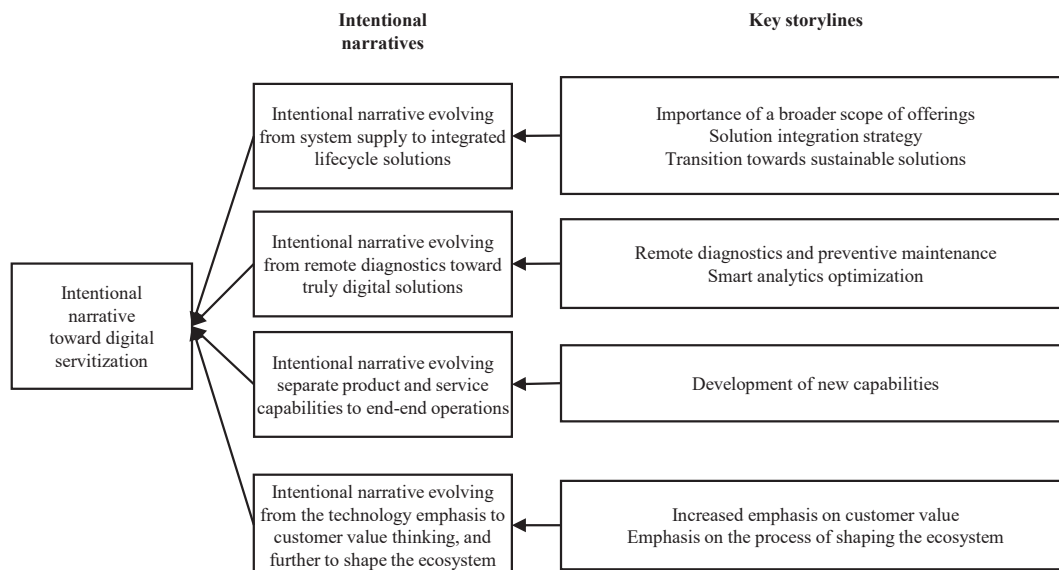


Fig. 2. Illustration of the data structure of intentional narratives.

integrated solutions as part of moving vehicles, and the digital transformation toward autonomous vehicles is relevant for the case firm. In 2017, the company’s net sales totaled approximately 5 billion euros, with EBITA from net sales over 15%. The net sales of services cover over 40% of revenues, and the company employed more than 15,000 employees. The company has clearly defined its core competencies and centralized divisional structure. The studied operations use thousands of suppliers, including suppliers of raw materials, systems, finishes, and

software.

4.2. Micropractices on digital servitization

When analyzing the company transition toward digital servitization, we identify sayings and doings structured in four key layers and main themes: 1) crafting strategies and offerings, 2) creating new service technologies, 3) learning microactivities and processes, and 4) shaping

the ecosystem. We start by explaining the company's transformation from strategy and offerings, then highlight the transformation in service technologies and the IOT, then progress to a description of microactivities and processes that enable utilization of technologies, and finally describe the transformation of ecosystems.

4.2.1. Crafting strategies and offerings

We begin the case analysis with the evolution of strategy. In early 2000, the case company was developing a system supplier strategy. At that time, the company had decided to broaden the scope of offerings to operate as a system supplier. In addition, the company already had a long history of service development to support production operations. Later, the company established a strategy to become a system integrator to expand the scope of offerings, integrate larger bundles of products, and protect spare parts sales by using maintenance agreements.

"...still in the middle of the 1990 s, you could say that 80 percent of our service turn-over was spare parts, 80 percent. Today, it is pretty much fifty-fifty; 50 percent is spares, and the other 50 percent are other services, agreements, modernization, and upgrades, whatever life-cycle support solutions there are. And this is continuously changing, so I assume after five years, it's probably 40 percent spares, 60 percent other related services." (WM3)

Later, in approximately 2011, the company launched a new remote operation center and the provision of integrated life cycle solutions; providing these solutions has been part of the company's strategy ever since. Solution integration and life-cycle emphasis are intended to serve customers better, emphasizing the customer's customers, so-called operators. Throughout the study period, the company expanded the scope of product-service offerings while moving from simple system supplies to integrated life-cycle solutions and more advanced services building on digital technologies, such as remote diagnostics. During the company's 20-year experience with servitization, digitalization was discussed in strategy documents, where the company emphasized its involvement in digital transition.

4.2.2. Innovative digital service technologies

Our analysis regarding the evolution of 'the digital' in servitization begins in the early 2000 s when the company was already exploring the use of mobile devices with a wireless-access-point (WAP) connection for remote diagnostics (this use of mobile devices serves as an example of the advanced technologies used around the millennium). Today, approximately twenty years later, we can look back and acknowledge that the company has developed its basic IoT capabilities from remote diagnostics to remote operations and toward semiautonomous products, including multiple product generations of development and innovation. Since the early experiments with remote technologies, the company has emphasized digitalization in its strategic statements, despite being limited by internet connections to distant locations where its installed base is spread. The spread of the installed base to distant locations can be considered a distinctive characteristic of the case. This characteristic motivates the development of remote diagnostics, preventive maintenance, remote operation, and autonomous functions and makes the development of these functionalities challenging. Since early 2000, the company has explored various remote technologies, including the first version of a remote diagnostics center. While the company has tested and developed relatively advanced remote technologies during the period studied, remote technologies have been limited by weak connectivity. This circumstance results from the firm's global installed base being spread to distant locations, where the company needs to use expensive satellite connections to transfer data to its central servers. Hence, even in 2018, unreliable and costly connections continued to constrain the acquisition of installed base data. Despite these limitations, which many global solution providers face, in approximately 2010, the company launched its first control room for the installed base using remote diagnostics and real-time data collection: a hub meant for the remote control of the installed base, data acquisition, warehousing, analytics, and preventive maintenance. A few years earlier (in

approximately 2008), the company began to sell advanced services geared toward optimization. A new version of the program geared toward optimization was launched in 2015, with more ambitious targets. Other initiatives have included flexible technologies to improve the efficiency of customer operations and preventive maintenance involving mobile systems. Various generations of condition-based monitoring have been created, including dynamic planning of maintenance. Recently, the company has been active in developing more sophisticated analytics, including big data, by using various data sources for route optimization. In recent years, the company has become more active in exploring the possibilities of autonomous systems and artificial intelligence while also launching new technology generations of condition monitoring and an experience center to improve customer experience.

"...we'll be able to capture the data from whatever we have sold to the life-cycles that will be held sort of as offered, as sold, as delivered, as maintained. So, we can follow the data of the installation even after the second or third upgrade or this kind of thing." (WM14)

Throughout these twenty years, the company, similar to many others, has struggled with technological limitations. When new technologies related to remote diagnostics, the IoT, and condition-based monitoring have emerged, the company has intended to be at the forefront in developing new concepts.

"A majority of their cost is fuel consumption, so, again, if we can be there with a smart solution, and they are maybe based on condition monitoring, maybe remote condition monitoring. Maybe we sit here and follow hundreds of parameters, and we can immediately figure out this is wrong, they should change the trim, or they should, because of weather, they should change the routing, or actually they should load two engines instead of four or..." (WM3)

4.2.3. Learning microactivities and processes

In this transformational journey toward smarter product-service offerings, various microactivities and processes have been implemented to exploit (IoT) digital capabilities for customer value creation (Ardolino et al., 2018). While extending its product, service, and software offerings, in alignment with the solutions provider strategy, the company has intended to expand its offerings to cover a much broader scope of the end product. As such, expansions of the scope of product-service systems and software have played a significant role in the last twenty years in company strategy. However, the integration between products, services, software, and environmental solutions has been far from simple. During the research, the interviewees highlighted the integration challenges caused by many issues, including sales of life-cycle solutions.

Since the early 2000 s, the company's service developers have created a broad scope of life-cycle services that facilitate customer value cocreation. Gradually, and through various customization and preventive maintenance, the company has moved from simple and basic services to a variety of customization and preventive maintenance and further to advanced smart services intended to cover the full scope of the product life cycle. The concept of life-cycle services seemed to be a convenient way of integrating products, services, and software into PSS that would be sellable to B-to-B customers. While expanding the scope of its service offerings, the company has developed skillsets regarding the sales and delivery of life-cycle solutions, including remote diagnostics and preventive maintenance. The direct financial value of the IoT is mostly captured through a variety of optimization services. In these integrated solutions, the value of new innovative service technologies and smart products is best captured by optimization services, and the value created through the optimization of the PSS is part of the customer's process.

"(This program) is a platform that collects data and provides it for our data center to be analyzed. And these tools, therefore, form the platform concept: the data collection, provision of data for analytics, and the analysis platform." (WM31)

As an interesting insight, the case company was also already conducting pilots on autonomous product systems at the time of the study.

Thus, regarding role advances in smart products, the company seems to have followed the digitalization path from monitoring, control, and optimization toward autonomous products. As shown in the above account, the case company has been developing digital capabilities embedded into the product-service portfolio, emphasizing the embedded role of digital technologies and the importance of the interplay between digital technologies and product-service systems. We observed that the case company had challenges in creating routines to capture the value created by new digital technologies.

The empirical evidence suggests that digital servitization calls for the use of digital technologies such as the IoT and CBM as well as digital systems and software (e.g., customer relationship management (CRM), enterprise resource planning (ERP), and value-based pricing software) to support the development and delivery of smart PSS. The implementation of digitalization requires the alignment of product-service strategies within the ecosystem when providing PSS.

According to our interviewees, ICT enables product maintenance, repair, and field service operations as well as the collection of significant information concerning how customers use the products sold and how the installed base performs. In doing so, CRM systems support project management and mass customization. For instance, CRM systems support customer segmentation and provide substantial information concerning current and potential customer needs (e.g., when the company digitally integrates field services reports). Thus, the company can use customer data to initiate new sales processes, customize current offerings based on customer needs, and develop future offerings based on available customer knowledge. Moreover, the company can use these data to prioritize customers and implement a wide range of online services, digital and technical, and establish remote support centers for less

critical customers.

In addition to creating a stream of revenue, CBM technologies provide valuable data on a product’s performance and customer habits when using it. These technologies increase reliability and support risk management and cost savings by preventing unforeseen expenditures (e.g., using performance-based agreements). In turn, the company can reduce its cost by increasing internal efficiency, cost estimation and risk assessment capabilities. Fig. 3 intends to describe the sayings and doings and, by so doing, convey the historical embeddedness of strategizing (Vaara & Lamberg, 2019).

4.2.4. Shaping the ecosystem

Over the years, aligned with the evolution of company strategy from system supplier to system integration and integrated life-cycle solutions, the company’s position within the value system has been changing. The case company has been moving downstream, from supplier status to an integrator, particularly in some customer segments. Additionally, the company has been using mergers and acquisitions to expand the scope of offerings while developing the supply chain. From the relational level and development of the vertical supply chain, we witnessed an expansion of strategic focus to cover an ecosystem view. Adapting digital technologies requires an improved capability to manage the ecosystem and to influence the surrounding technologies within the ecosystem to move toward more autonomous systems, as emphasized by previous studies.

Digital technologies are developed to enable better management of the supply chain (e.g., customer and supplier relationships and interactions) while improving service delivery processes and work practices. For instance, ERP systems enable modularity and support solution

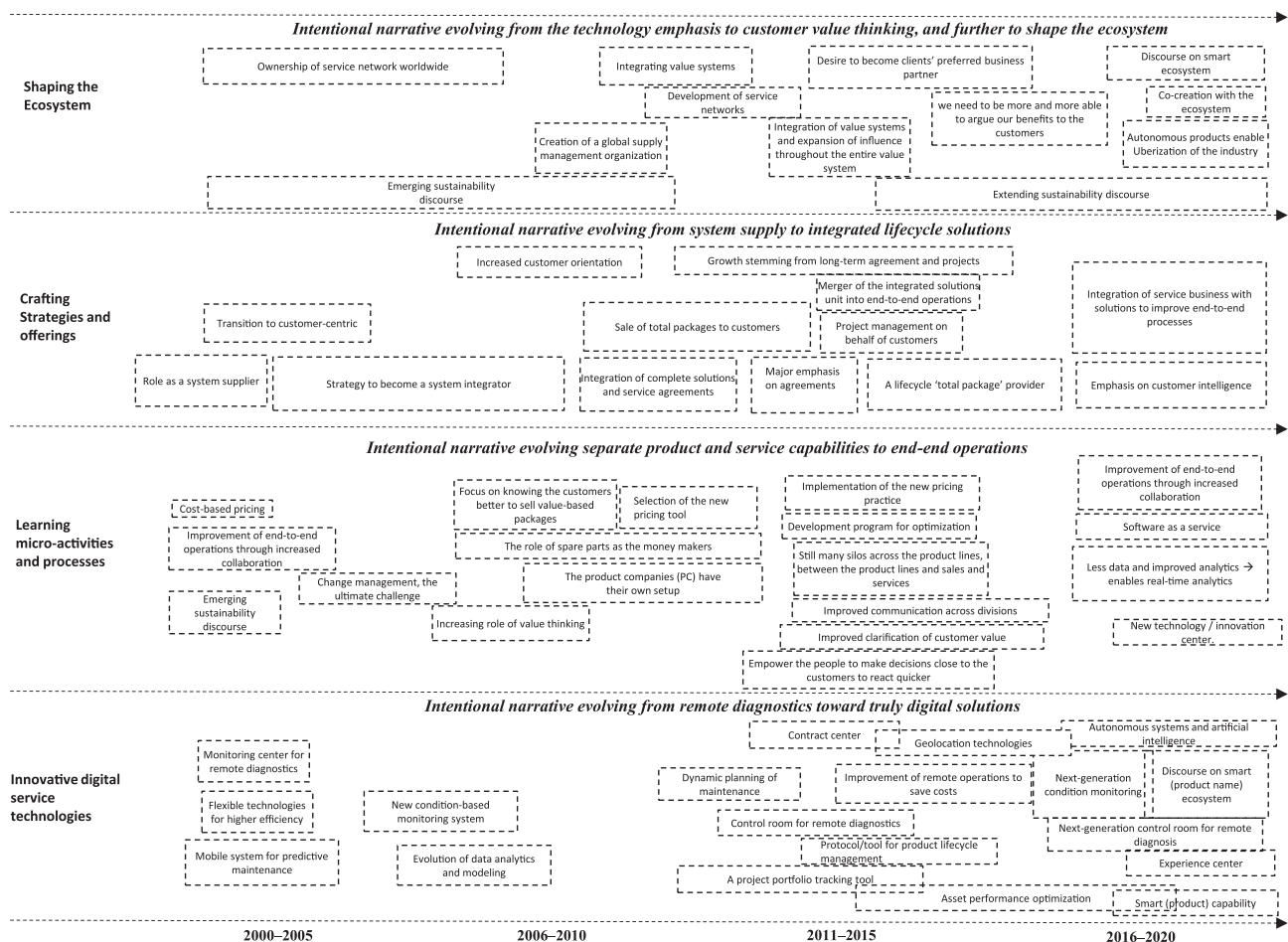


Fig. 3. Social practices and intentional stories (in italics) in digital servitization over time.

configuration, project management, and supply chain integration. Jointly used with value calculation methods, systems such as ERP/PDM/PLM enable value visualization when selling the PSS and constitute tools for configuring and pricing offerings with minimum total costs of ownership.

Thus, the ecosystem concept also plays a significant role in emerging digital servitization. The company’s integrated solutions are part of a large end-product system where the solution must have the capability to interact with product systems from other manufacturers in the ecosystem. Hence, the firm’s ability to manage the ecosystem and develop product-service systems that effectively integrate with other manufacturers’ product systems has a central role in the function of the product.

“...and the ecosystem word is used a lot, but it has supported the discussion within the company, that our customer base and others in the ecosystem, and what the ecosystem actually is. It has opened up the discussion, how we should approach it and what is our position in it.” (WM32)

Over time, as the IoT has received more emphasis, the role of the ecosystem perspective has become more evident. From a vertically organized supply chain, company emphasis has moved toward a value cocreating ecosystem in which various products and systems—and even, to some extent, systems of systems—produce data for the solution provider to cocreate customer value. For instance, the company uses data provided by weather forecasting firms to plan routes to save fuel and reduce emissions.

4.3. Intentional narratives to mobilize digital servitization

Intentional narratives can be used to manage or steer organizational change by influencing the micropractices of sayings and doings to facilitate sensemaking at different organizational levels. We use the concept of intentional narratives to describe the use of storytelling and rhetoric to facilitate digital servitization as an organizational change process. From micro- to macroperspectives, the analysis begins from the change narrative used by the case company to facilitate the evolution of the digital transition, which includes stretching from microlevel changes in service technologies through organizational micropractices and capabilities, guided by strategies and offerings to reach other actors within the ecosystems. The ecosystem layer here reflects the requirement to stretch the firm’s influence beyond the company’s boundaries, as the development of digital technologies requires effective collaboration with customers and other ecosystem actors. During the collaboration with the case company, we observed the company management’s use of narratives as a discursive resource to steer organizational change and development while navigating this change process toward digitalization since the late 1990 s. We identified intentional narratives by analyzing annual reports to reflect storytelling by the top management team.

The findings from the case study emphasize the importance of the interplay between the discursive resources (namely, the intentional narratives) used by top management (these intentional narratives are our focus here) and the social practices adopted by the organization. While the intentional narratives reflect the top-management team’s

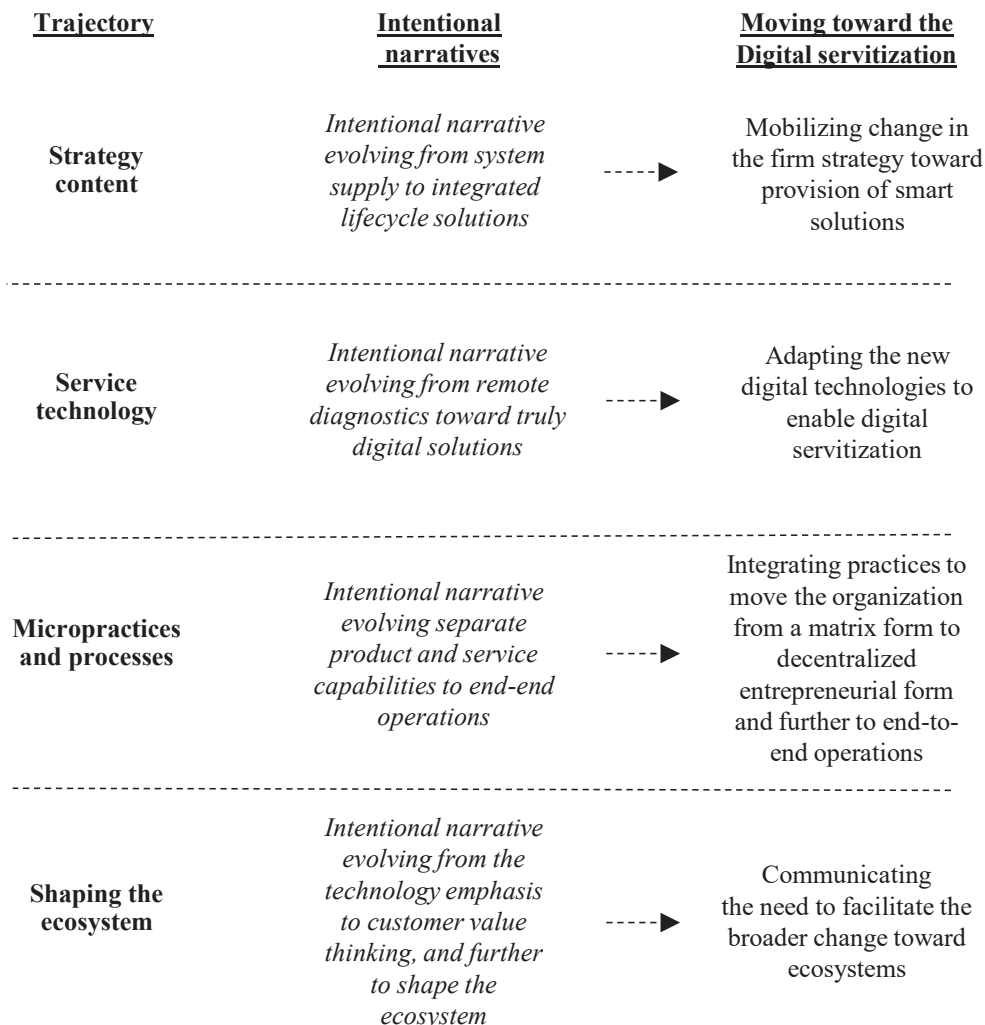


Fig. 4. Synthesis of the evolving intentional stories used to mobilize social practices when moving toward digital servitization.

strategic thinking and are intended to shape the social practices adopted by the organization, the team is also influenced by the social practices that emerge in the organization from the bottom up. Thus, Fig. 3 integrates the four intentional narratives and social practices into a single timeline picture to demonstrate the interplay between strategic intent and strategic emergence.

The empirical analysis highlights four intentional narratives used to facilitate the transformation toward digital servitization (Fig. 4): from system supply to integrated sustainable life-cycle solutions; from remote diagnostics to remote control, optimization, and digital solutions by using smart analytics; from separate product and service activities to end-to-end operations; and from valuable technology to customer value to further shape the ecosystem. Accordingly, these results expose the layered nature of the narratives. The outcomes of this study suggest that digital servitization may often begin from top management but are then spread and talked into action by the middle management of the organization – sayings become doings.

The first of the four identified intentional narratives focuses on the strategic transition from system supply to integrated sustainable life-cycle solutions. This intentional narrative communicates the change from the system supplier position toward system integration and provides sustainable life-cycle solutions. Based on annual reports, it seems that company management has intended to broaden the scope of the company's product-service-software offerings, thereby clearly communicating a need to move from a technology supplier role toward a more strategic integrator role and, later, to take responsibility for the product life cycle, thus using digital tools for preventive maintenance to also give performance guarantees. This intentional narrative can be read very clearly from the annual reports.

“(The company) enhances the business of its customers by providing integrated systems, solutions, and products that are efficient, economically sound, and environmentally sustainable for the (specific) industry. Being a technology leader in this field, and through the experience, know-how and dedication of our personnel, we are able to customize innovative, optimized life-cycle solutions to the benefit of our clients around the world.” (Company report 2010)

This strategic narrative seems relatively consistent over time in that it has developed toward improved utilization of digital capabilities but has maintained the idea of providing a broader scope of integrated offerings. This intentional narrative has materialized in the transition from products and add-on services to broader customized solutions, advanced services, and, in particular, software, including remote diagnostics, smart analytics, remote operations, and autonomous systems. Hence, this narrative was intended to expand the scope of offerings into life-cycle solutions and, as a result, the required capabilities and organizational networks. Thus, we can conclude that the broad strategic narrative seems to have remained consistent and has carried over top management changes, while nitty-gritty practices vary more over time. This consistency is one of the important findings.

Second, we find the intentional narrative from remote diagnostics to remote control, optimization, and digital solutions by using smart analytics. This intentional narrative has steered the technological development of the company. The company has been technology-oriented; it has been a technology, engineering, and above all, a manufacturing company, moving from the system supplier role toward integrated life-cycle solutions. During this transition, digital technologies have had an important role, and therefore, intentional narrative has been intended to facilitate the explorative development of digital technologies, even when the direct financial benefits may have been slightly uncertain.

“Maintenance is focusing on the life cycle of the product as thinking has shifted from reactive to proactive maintenance, meaning more predictive measures and longer-term agreements. These factors have resulted in the development of new forms of service and the launch of new Internet products.” (Company report 2000)

The implementation of technologies has been far from linear and specific, but it seems that overall, the intentional narrative has

supported the strategic narrative that emphasized broader, integrated life-cycle offerings. In practice, digital technologies have been embedded in integrated product-service systems and have advanced from diagnostics to optimization, performance services, remote diagnostics, cloud solutions, and data analytics, thereby enabling optimization services. Hence, in many ways, digitalization is embedded in advanced services, optimization, and performance guarantees, all enabled by smart analytics and related microprocesses. Strategy, life-cycle offerings, and smart analytics are interconnected; thus, their synchronous development is challenging. Instead, these four issues coevolve emergently in an interplay with one another. For this purpose, effective internal and external collaboration is required. The interconnectedness and resulting complexity of development may demand intentional narrative – top management needs to manage the organization through consistent storytelling and rhetoric, which may eventually shape the company's social practices. Annual reports, strategy presentations, and top-management discourse have a role in advancing change, although the change looks far from linear and manageable.

Third, company management used an intentional narrative from separate product and service activities to end-to-end operations. This intentional narrative emphasizes the customer and suggests that organizational capabilities should be directed toward creating customer value. The narrative has gained influence over the years, whereas the organizational structure has developed from a matrix to become relatively decentralized and has developed toward a clear emphasis on the end-to-end process. Consequently, this company serves various customer segments vertically in different value system linkages (direct customers, customers' customers, etc.). This emphasis has been far from easy to be received and managed. As such, the complex organizational reality must have hampered the influence of this intentional narrative. This observation also describes the challenge of strategy implementation while emphasizing the power of intentional narratives. Narratives and rhetoric can steer the organization in complex situations, where employees can adjust their interpretation and enactment in practice. This intentional narrative aims to communicate the need to develop customer-oriented end-to-end processes and improve collaboration within the organization to develop process integration, activities, processes, and capabilities.

“...reputation is based on a good understanding of customer businesses, design capabilities, a broad product portfolio, and technological leadership. The organization is structured into end-to-end business lines with full control over sales, R&D, engineering, procurement, and manufacturing. This enables increased flexibility, fast decision-making, and the optimal utilization of resources to provide superior customer service.” (Company report, 2015)

Based on empirical evidence from the case company, digital servitization requires that manufacturing companies develop significant software-company-like knowledge-based capabilities. This result poses a significant challenge, often for somewhat conservative industrial manufacturing companies, such as our case company. Hence, management understood the challenge of capability development and acknowledged that the manufacturing company had to develop service- and software-related capabilities:

“(The company's) aim is to lead the industry's transformation towards a Smart (Product) Ecosystem. Building on the sound foundation of being a leading provider of innovative products, integrated solutions, and life-cycle services to the (specific product) industries, (The company) aims to unlock new customer values through connectivity, digitalization and smart technology.” (Company report 2017)

Finally, the fourth intentional narrative we identified was about extending the technology emphasis to customer value thinking and further shaping the ecosystem. Digital servitization demands active bridging between ecosystem actors because product-service systems must interact with other product-service systems, particularly in the studied industry. When moving toward autonomous solutions, shaping the ecosystem through standardization is important. Technological standardization enables more rapid implementation of autonomous

systems, and where the different actors within the ecosystem can develop new solutions. Thus, technological software platforms are needed to advance the IoT in this sector to enable ecosystem-level interaction because “No one company alone can drive the transformation; cocreation is required to drive progress in the right direction” (Company report, 2017). It is important to highlight how digital servitization is mobilized through the four themes of intentional stories.

5. Discussion and conclusions

5.1. Theoretical contribution

This study advances the discussion of the transition toward digital servitization. We used an in-depth case study to unfold the emergent process of digital servitization by using social practices, such as managerial sayings and doings, to map the change process. Second, and even more importantly, this study unfolds the intentional narratives used to shape digital servitization as a lengthy change process. We argue the importance of seeing the change as a process of intended and emergent characteristics (Mintzberg & Waters, 1985), where the company moves from standard product firm toward complex product-service-software systems balancing sayings and doings between the micro- and macro-levels (Kouamé & Langley, 2018; Seidl & Whittington, 2014), to steer the change by intentional narratives (Vaara & Tienari, 2011).

As the first theoretical contribution, this study reveals the path from standard products to complex product-service-software systems, a transition reflecting the characteristics of servitization and, later on, digital servitization. We unpack the change process by using practice theory and investigating microlevel sayings and doings that eventually reflect and shape the journey toward servitization with digital emphasis, so-called digital servitization (Coreynen et al., 2020; Kohtamäki et al., 2019; Paiola & Gebauer, 2020). We identified a broad scope of micropractices in four time periods. The interplay between empirical data and current servitization theory resulted in 14 s-order themes of a range of micropractices focused on four main topics: strategies and offerings, innovative digital service technologies, microactivities and processes, and the ecosystem. We find that social practices, sayings, and doings provide an interesting description of the change process over twenty years. The four layers depict social practices well to reveal the digital servitization process.

The evolution of digital technologies from remote diagnostics to condition-based monitoring systems and from control rooms to geo-location technologies is far from easy. We find the “digital” in digital servitization progressing in much the same way as the model suggested by Porter and Heppelman (2015), i.e., from remote monitoring to control, optimization, step-by-step, finally moving toward the autonomous systems. However, we emphasize the role of servitization, which Porter and Heppelman (2014, 2015) entirely neglect with their concept of smart products. This difference is important, as the business model change does not take place only through products, but the change involves products, services, and software – it would be dangerous to leave the service component out from the consideration (Hsuan et al., 2021). Effective models are created as a successful interplay of products, services, and software – this not easy, but it is crucial. This transition, which has been coined digital servitization, the transition from products to product-service-software systems, takes place through the four central themes identified in this study, namely, 1) strategies and offerings, 2) service technologies, 3) microactivities and processes, and 4) the ecosystem; these themes resonate with the previous servitization and digital servitization literature, which also emphasizes the need for a servitizing company to shape the surrounding ecosystem (Kohtamäki et al., 2019). The servitizing company must, as Jeffrey Immelt (2017: 46) states, “be all in.”

The identified model of social practices and intentional stories in digital servitization over time also demonstrates how digital servitization evolves from servitization. Based on the empirical data, the model

(Fig. 3) illustrates the evolution of digital servitization; the figure suggests that digital servitization builds on the early activities around servitization and how digital and servitization activities align together to form a set of more coherent activities over time. As Mintzberg and Waters (1985) note, strategies look clear in retrospect, and the same is true for the path toward digital servitization. When planning, the future path often looks foggy and uncertain. During the transition, investments in servitization (Fang et al., 2008; Kohtamäki et al., 2013) and digital servitization (Kohtamäki, Parida, et al., 2020) require enough emphasis to reach the desired outcomes.

Concerning the second main contribution of the article, we study the intentional narratives and analyze four intentional narratives used to mobilize the change toward digital servitization. At the highest strategy level, the intentional narrative guides the change from system supply to integrated sustainable life-cycle solutions. At the level of service technology, the intentional narrative describes the need to evolve by using smart analytics, from remote diagnostics to remote control, optimization, and digital solutions. At the level of micropractices and processes, the narrative is from separate product and service activities to end-to-end operations. The fourth intentional narrative focuses on the need to shape the evolving business ecosystem to support digital servitization. We find digital servitization to be complex and lengthy and require managerial tools that can guide change without creating unnecessary bureaucracy. Perhaps intentional narratives can respond to this requirement: Intentional narratives are stories that management consciously uses to guide organizational change, such as digital servitization. Based on the findings, social practices evolve, guided by intentional narratives. Hence, strategy walks on two feet: one intended, one emergent, as was indeed already suggested by Mintzberg (1978) decades ago. However, servitization and digital servitization have rarely been depicted as complex processes managed through intentional narratives. This endeavor is the contribution of this study and is perhaps best described by Figs. 3 and 4 in the findings section. As such, we suggest that intentional narratives provide an important flexible managerial practice for managing digital servitization. Intentional narratives may play an imperative role in digital servitization; this role must be recognized in the servitization literature.

At the higher conceptual level, using our observations in the case and reflecting on the literature, we can see two other findings when looking at the change process: 1) change takes place through mobilization and integration, and a paradoxical tension exists between these. Moreover, 2) the change process occurs between the micro- and macrolevels, and a paradoxical tension exists between these. The first tension between mobilization and integration points to the need for creativity and joint effort when mobilizing change; during change, mobilization occurs in interplay with creativity and new initiatives, which cause dispersion. This dispersion interacts with the need to integrate. Effective implementation of any change requires target setting and organizational integration. Thus, managers of the digital servitization process should manage the paradoxical tension between mobilization and integration. Paradox theory has much to contribute to future servitization and digital servitization research (Kohtamäki, Einola, et al., 2020). The tension between micro- and macrolevels points to practice theory and is informed by works discussing the interplay between micro and macro and how micro constitutes the macro (Kouamé & Langley, 2018; Seidl & Whittington, 2014). This tension reflects the interaction between practice theory and institutional theory. Institutional theory should be better utilized in servitization and digital servitization studies (Korkeamäki & Kohtamäki, 2020).

As a minor methodological contribution to the servitization literature, we bring in the concepts of micropractices (sayings and doings) and intentional narratives from the strategy-as-practice literature (Vaara & Tienari, 2011). These two concepts can be further elaborated and used when studying the transition toward digital servitization. These ideas provide conceptual tools to understand how change processes progress and can be managed using discursive approaches. These concepts assist

the microprocesses through which sayings finally become doings.

5.2. Managerial implications

The process of digital servitization provides an outlook for managers to understand how change processes are shaped over time. Understanding the construction of the change process is important when planning large-scale organizational change, which presumably requires a lengthy period. It is crucial to understand the large-scale change both planned and emergent and depict the progress over time, not only as a simple linear plan but also as a complex process with different layers, as depicted in Fig. 3 in the findings section. This type of methodical tool can provide a valuable asset when trying to understand how the change unfolds in multiple layers without neglecting the importance of the ecosystem. The change process should be understood and facilitated from the micro to macro levels.

Moreover, this study reveals four intentional narratives used to facilitate the change toward digital servitization. The study suggests that managers should plan their communication when implementing digital servitization and they should design the narratives they intend to use. Storytelling should be used intentionally. In addition to other tools such as the strategy map (Rabetino et al., 2017), intentional narratives provide a powerful but underused tool for managing digital servitization, and we recommend that managers make full use of this tool when planning digital servitization.

Finally, digital servitization is often obscure and almost unmanageable for many managers. The process involves many tensions, persistent paradoxes, and voices that suggest turning back and focusing on products. This study clarifies the process and suggests that managers persist in their path to digital servitization. The journey is lengthy and requires the managerial capability to understand both rational planning and emergence in change. Managing emergence expects persistence in both sayings and doings when “walking the talk”.

5.3. Limitations and suggestions for future servitization research

Every study has limitations, and this study is no exception. First, the identified framework emerges from an in-depth study of a single case. While this research approach does provide high validity regarding the depth of data, the use of a single case limits generalizability. Nonetheless, the results can provide valuable guidelines for other cases struggling with digital servitization. Servitization calls for research using in-depth data, single-case studies, interviews, and observations to provide empirically detailed and holistic descriptions of mechanisms and explanations. Second, digital servitization research and servitization research in general, would benefit from a broadened scope of the research methodologies used. In particular, discursive and narrative methods can provide opportunities to enrich our understanding of servitization processes. We encourage future servitization and digital servitization studies to use processual research and in-depth single case studies to provide richness to the empirical base in servitization. Third, very few studies emphasize digital servitization as a phenomenon. More empirical research is needed to understand the interplay between products, services, and software and the transformation toward the digital servitization business model. Fourth, perhaps the study can provide some ideas on how to analyze strategic change in other industry contexts (Gomes et al., 2021). Finally, we hope that our study has provided some rich insight to further plan interesting studies around servitization and digital servitization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

This paper is a product of the MIDAS (Mastering the Next Industrial Revolution: From product-service solutions to Autonomous Systems) research project. The financial support of the Finnish Academy is gratefully acknowledged.

References

- Adner, R. (2017). Ecosystem as Structure: An Actionable Construct for Strategy. *Journal of Management*, 43(1), 39–58. <https://doi.org/10.1177/0149206316678451>.
- Adrodegari, F., Saccani, N., Perona, M., & Agirregomezkorta, A. (2018). Business Model Innovation: A Process Model and Toolset for Servitizing Industrial Firms. In M. Kohtamäki, T. Baines, R. Rabetino, & A. Bigdeli (Eds.), *Practices and tools for servitization: Managing service transition* (pp. 97–120). Springer International Publishing. https://doi.org/10.1007/978-3-319-76517-4_6.
- Ardolino, M., Rapaccini, M., Saccani, N., Gaiardelli, P., Crespi, G., & Ruggeri, C. (2018). The role of digital technologies for the service transformation of industrial companies. *International Journal of Production Research*, 56(6), 2116–2132. <https://doi.org/10.1080/00207543.2017.1324224>.
- Baines, T., Lightfoot, H., Smart, P., & Fletcher, S. (2013). Servitization of manufacture: Exploring the deployment and skills of people critical to the delivery of advanced services. *Journal of Manufacturing Technology Management*, 24(4), 637–646. <https://doi.org/10.1108/17410381311327431>.
- Balogun, J., Jacobs, C., Jarzabkowski, P., Mantere, S., & Vaara, E. (2014). Placing strategy discourse in context: Sociomateriality, sensemaking, and power. *Journal of Management Studies*, 51(2), 175–201. <https://doi.org/10.1111/joms.12059>.
- Barry, D., & Elmes, M. (1997). Strategy retold: Toward a narrative view of strategic discourse. *Academy of Management Review*, 22(2), 429–452.
- Beverland, M., & Lindgreen, A. (2010). What makes a good case study? A positivist review of qualitative case research published in *Industrial Marketing Management*, 1971–2006. *Industrial Marketing Management*, 39(1), 56–63. <https://doi.org/10.1016/j.indmarman.2008.09.005>.
- Boldosova, V. (2020). Telling stories that sell: The role of storytelling and big data analytics in smart service sales. *Industrial Marketing Management*, 86(May 2018), 122–134. [10.1016/j.indmarman.2019.12.004](https://doi.org/10.1016/j.indmarman.2019.12.004).
- Bustanza, O., Lafuente, E., Rabetino, R., Vaillant, Y., & Vendrell-Herrero, F. (2019). Make-or-Buy configurational approaches in product-service ecosystems and performance. *Journal of Business Research*, 104(November), 393–401.
- Coreynen, W., Matthyssens, P., & Van Bockhaven, W. (2017). Boosting servitization through digitization: Pathways and dynamic resource configurations for manufacturers. *Industrial Marketing Management*, 60(42–53), 42–53. <https://doi.org/10.1016/j.indmarman.2016.04.012>.
- Coreynen, W., Matthyssens, P., Vanderstraeten, J., & van Witteloostuijn, A. (2020). Unravelling the internal and external drivers of digital servitization: A dynamic capabilities and contingency perspective on firm strategy. *Industrial Marketing Management*, December 2018, 1–13. [10.1016/j.indmarman.2020.02.014](https://doi.org/10.1016/j.indmarman.2020.02.014).
- Czarniawska, B. (2004). *Narratives in social science research*. SAGE Publications Ltd.
- Dalpiatz, E., & Di Stefano, G. (2018). A universe of stories: Mobilizing narrative practices during transformative change. *Strategic Management Journal*, 39(3), 664–669.
- Dubois, A., & Gadde, L.-E. (2002). Systematic combining: An abductive approach to case research. *Journal of Business Research*, 55(7), 553–560.
- Dyer, W. G., & Wilkins, A. L. (1991). Better Stories, Not Better Constructs, To Generate Better Theory: A Rejoinder To Eisenhardt. *Academy of Management Review*, 16(3), 613–619.
- Eloranta, V., Ardolino, M., & Saccani, N. (2021). A complexity management approach to servitization: The role of digital platforms. *International Journal of Operations & Production Management*. <https://doi.org/10.1108/IJOPM-08-2020-0582>.
- Eriksson, P., & Kovalainen, A. (2016). *Qualitative methods in business research*. Sage.
- Fang, E., Palmatier, R. W., & Steenkamp, J. B. E. M. (2008). Effect of service transition strategies on firm value. *Journal of Marketing*, 72(5), 1–14. <https://doi.org/10.1509/jmkg.72.5.1>.
- Fenton, C., & Langley, A. (2011). Strategy as Practice and the narrative turn. *Organization Studies*, 32(9), 1171–1196. <https://doi.org/10.1177/0170840611410838>.
- Golsorkhi, D., Rouleau, L., Seidl, D., & Vaara, E. (2015). *Cambridge handbook of strategy as practice*. Cambridge University Press.
- Gomes, E., Lehman, D., Vendrell-Herrero, F., & Bustanza, O. (2021). A history-based framework of servitization and deservitization. *International Journal of Operations and Production Management*, In Press.
- Grubic, T. (2014). Servitization and remote monitoring technology: A literature review and research agenda. *J. Manuf. Technol. Manag.*, 25(1), 100–124. <https://doi.org/10.1108/JMTM-05-2012-0056>.
- Grubic, T. (2018). Remote monitoring technology and servitization: Exploring the relationship. *Computers in Industry*, 100(December 2017), 148–158. [10.1016/j.compind.2018.05.002](https://doi.org/10.1016/j.compind.2018.05.002).
- Grubic, T., & Jennions, I. (2018). Remote monitoring technology and servitized strategies—factors characterising the organisational application. *International Journal of Production Research*, 56(6), 2133–2149. <https://doi.org/10.1080/00207543.2017.1332791>.
- Grubic, T., & Peppard, J. (2016). Servitized manufacturing firms competing through remote monitoring technology An exploratory study. *Journal of Manufacturing Technology Management*, 27(2), 154–184. <https://doi.org/10.1108/JMTM-05-2014-0061>.

- Hasselblatt, M., Huikkola, T., Kohtamäki, M., & Nickell, D. (2018). Modeling manufacturer's capabilities for the Internet of Things. *Journal of Business and Industrial Marketing*, 33(6), 822–836. <https://doi.org/10.1108/JBIM-11-2015-0225>.
- Hsuan, J., Jovanovic, M., & Clemente, D. H. (2021). Exploring digital servitization trajectories within product-service-software space. *International Journal of Operations & Production Management*, ahead-of-p. <https://doi.org/10.1108/IJOPM-08-2020-0525>.
- Huikkola, T., Rabetino, R., Kohtamäki, M., & Gebauer, H. (2020). Firm boundaries in servitization: Interplay and repositioning practices. *Industrial Marketing Management*, 90(June), 90–105. <https://doi.org/10.1016/j.indmarman.2020.06.014>.
- Iansiti, M., & Lakhani, K. R. (2014). Digital Ubiquity: How connections, sensors, and data are revolutionizing business. *Harvard Business Review*, 92(11), 90–99. <https://doi.org/10.1017/CBO9781107415324.004>.
- Immelt, J. (2017). How I remade GE: And what I learned along the way. *Harvard Business Review*, 95(5), 42–51.
- Jacobides, M. G., Cennamo, C., & Gawer, A. (2018). Towards a theory of ecosystems. *Strategic Management Journal*, 39(8), 2255–2276. <https://doi.org/10.1002/smj.2904>.
- Jarzabkowski, P. (2008). Shaping strategy as a structuration process. *Academy of Management Journal*, 51(4), 621–650.
- Johnson, G., Melin, L., & Whittington, R. (2003). Micro strategy and strategizing: Towards an activity-based view. *Journal of Management Studies*, 40(1), 3–22.
- Jovanovic, M., Sjödin, D., & Parida, V. (2021). Co-evolution of platform architecture, platform services, and platform governance: Expanding the platform value of industrial digital platforms. *Technovation*, 102218. <https://doi.org/10.1016/j.technovation.2020.102218>.
- Kaplan, S., & Orlikowski, W. (2013). Temporal work in strategy making. *Organization Science*, 24(4), 965–995. <https://doi.org/10.1287/orsc.1120.0792>.
- Kohtamäki, M., Baines, T., Rabetino, R., Bigdeli, A. Z., Kowalkowski, C., Oliva, R., & Parida, V. (2021). Theoretical landscape in servitization. In M. Kohtamäki, T. Baines, R. Rabetino, A. Bigdeli, C. Kowalkowski, R. Oliva, & V. Parida (Eds.), *The Palgrave Handbook of Servitization*. Palgrave MacMillan.
- Kohtamäki, M., Einola, S., & Rabetino, R. (2020). Exploring servitization through the paradox lens: Coping practices in servitization. *International Journal of Production Economics*, 226(August), 1–15. <https://doi.org/10.1016/j.ijpe.2020.107619>.
- Kohtamäki, M., Parida, V., Oghazi, P., Gebauer, H., & Baines, T. (2019). Digital servitization business models in ecosystems: A theory of the firm. *Journal of Business Research*, 104(November), 380–392. <https://doi.org/10.1016/j.jbusres.2019.06.027>.
- Kohtamäki, M., Parida, V., Patel, P., & Gebauer, H. (2020). The relationship between digitalization and servitization: The role of servitization in capturing the financial potential of digitalization. *Technological Forecasting and Social Change*, 151(February), 1–9. <https://doi.org/10.1016/j.techfore.2019.119804>.
- Kohtamäki, M., Partanen, J., Parida, V., & Wincent, J. (2013). Non-linear relationship between industrial service offering and sales growth: The moderating role of network capabilities. *Industrial Marketing Management*, 42(8), 1374–1385. <https://doi.org/10.1016/j.indmarman.2013.07.018>.
- Kohtamäki, M., Whittington, R., Vaara, E., & Rabetino, R. (2021). Making connections: Harnessing the diversity of strategy-as-practice research. *International Journal of Management Reviews*, In press.
- Korkeamäki, L., & Kohtamäki, M. (2020). To outcomes and beyond: Discursively managing legitimacy struggles in outcome business models. *Industrial Marketing Management*, 91(February), 196–208. <https://doi.org/10.1016/j.indmarman.2020.08.023>.
- Kotter, J. (2008). *A Sense of Urgency*. Harvard Business School Press.
- Kouamé, S., & Langley, A. (2018). Relating microprocesses to macro-outcomes in qualitative strategy process and practice research. *Strategic Management Journal*, 39(3), 559–581. <https://doi.org/10.1002/smj.2726>.
- Kowalkowski, C., Gebauer, H., & Oliva, R. (2017). Service growth in product firms: Past, present, and future. *Industrial Marketing Management*, 60(1), 82–88.
- Kowalkowski, C., Windahl, C., Kindström, D., & Gebauer, H. (2015). What service transition? Rethinking established assumptions about manufacturers' service-led growth strategies. *Industrial Marketing Management*, 45(1), 59–69. <https://doi.org/10.1016/j.indmarman.2015.02.016>.
- Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management Review*, 24(4), 691–710. <https://doi.org/10.5465/AMR.1999.2553248>.
- Langley, A., Smallman, C., Tsoukas, H., & Van De Ven, A. H. (2013). Process studies of change in organization and management: Unveiling temporality, activity, and flow. *Academy of Management Journal*, 56(1), 1–13. <https://doi.org/10.5465/amj.2013.4001>.
- Lenka, S., Parida, V., Sjödin, D. R., & Wincent, J. (2017). Exploring the microfoundations of servitization: How individual actions overcome organizational resistance. *Journal of Business Research*, 88(November 2017), 328–336. <https://doi.org/10.1016/j.jbusres.2017.11.021>.
- Lerch, C., & Gotsch, M. (2015). Digitalized Product-Service Systems in Manufacturing Firms: A Case Study Analysis. *Research-Technology Management*, 58(5), 45–52. <https://doi.org/10.5437/08956308X5805357>.
- Lincoln, Y., & Guba, S. (1985). *Naturalistic Inquiry*. Sage.
- Luoto, S., Brax, S., & Kohtamäki, M. (2017). Critical meta-analysis of servitization research: Constructing a model-narrative to reveal paradigmatic assumptions. *Industrial Marketing Management*, 60(1), 89–100. <https://doi.org/10.1016/j.indmarman.2016.04.008>.
- Mantere, S. (2013). What is organizational strategy? A language-based view. *Journal of Management Studies*, 50(8), 1408–1426. <https://doi.org/10.1111/joms.12048>.
- Mantere, S., & Ketokivi, M. (2013). Reasoning in organization science. *Academy of Management Review*, 38(1), 70–89.
- Miles, M. B., Huberman, M. A., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook*. Sage Publications.
- Mintzberg, H. (1978). Patterns in strategy formation. *Management Science*, 24(9), 934–948. <https://doi.org/10.1287/mnsc.24.9.934>.
- Mintzberg, H., & Waters, J. (1985). Of strategies, deliberate and emergent. *Strategic Management Journal*, 6(3), 257–272.
- Möller, K., & Halinen, A. (2017). Managing business and innovation networks—From strategic nets to business fields and ecosystems. *Industrial Marketing Management*, 67(November), 5–22. <https://doi.org/10.1016/j.indmarman.2017.09.018>.
- Nag, R., Corley, K., & Gioia, D. (2007). The intersection of organizational identity, knowledge, and practice: Attempting strategic change via knowledge crafting. *Academy of Management Journal*, 50(4), 821–847.
- Oliva, R., & Kallenberg, R. (2003). Managing the transition from products to services. *International Journal of Service Industry Management*, 14(2), 160–172. <https://doi.org/10.1108/09564230310474138>.
- Opresnik, D., & Taisch, M. (2015). The value of Big Data in servitization. *International Journal of Production Economics*, 165, 174–184. <https://doi.org/10.1016/j.ijpe.2014.12.036>.
- Paola, M., & Gebauer, H. (2020). Internet of things technologies, digital servitization and business model innovation in BtoB manufacturing firms. *Industrial Marketing Management*, 89(August), 245–264. <https://doi.org/10.1016/j.indmarman.2020.03.009>.
- Paschou, T., Rapaccini, M., Adrodegari, F., & Sacconi, N. (2018). Competences in digital servitization : a new framework. July.
- Patton, M. Q. (2015). *Qualitative research and evaluation methods*. Sage.
- Pentland, B. T., & Feldman, M. S. (2007). Narrative Networks: Patterns of Technology and Organization. *Organization Science*, 18(5), 781–795. <https://doi.org/10.1287/orsc.1070.0283>.
- Piekkari, R., Welch, C., & Paavilainen, E. (2009). The Case Study as Disciplinary Convention. *Organizational Research Methods*, 12(3), 567–589. <https://doi.org/10.1177/1094428108319905>.
- Porter, M., & Heppelmann, J. (2014). How smart, connected products are transforming competition. *Harvard Business Review*, 92(11), 66–68.
- Porter, M., & Heppelmann, J. (2015). How smart, connected products are transforming companies. *Harvard Business Review*, October, 96–112.
- Pratt, M. G. (2009). For the lack of boilerplate: Tips on writing up (and reviewing) qualitative research. *Academy of Management Journal*, 52(5), 856–862. https://aom.org/uploadedFiles/Publications/AMJ/Pratt_Oct_2009.PDF.
- Rabetino, R., Harmsen, W., Kohtamäki, M., & Sihvonen, J. (2018). Structuring servitization-related research. *International Journal of Operations and Production Management*, 38(2), 350–371. <https://doi.org/10.1108/IJOPM-03-2017-0175>.
- Rabetino, R., Kohtamäki, M., Brax, S., & Sihvonen, J. (2021). The tribes in the field of servitization: Discovering latent streams across 30 years of research. *Industrial Marketing Management*, 95, 70–84. <https://doi.org/10.1016/j.indmarman.2021.04.005>.
- Rabetino, R., Kohtamäki, M., & Gebauer, H. (2017). Strategy map of servitization. *International Journal of Production Economics*, 192(October), 144–156. <https://doi.org/10.1016/j.ijpe.2016.11.004>.
- Rabetino, R., Kohtamäki, M., Lehtonen, H., & Kostama, H. (2015). Developing the concept of life-cycle service offering. *Industrial Marketing Management*, 49(August), 53–66. <https://doi.org/10.1016/j.indmarman.2015.05.033>.
- Rajala, R., Brax, S. A., Virtanen, A., & Salonen, A. (2019). The next phase in servitization: Transforming integrated solutions into modular solutions. *International Journal of Operations and Production Management*, 39(5), 630–657. <https://doi.org/10.1108/IJOPM-04-2018-0195>.
- Ravasi, D., Tripsas, M., & Langley, A. (2020). Exploring the strategy-identity nexus. *Strategic Organization*, 18(1), 5–19. <https://doi.org/10.1177/1476127019900022>.
- Ritter, T., & Pedersen, C. L. (2020). Digitization capability and the digitalization of business models in business-to-business firms: Past, present, and future. *Industrial Marketing Management*, 86(December 2019), 180–190. <https://doi.org/10.1016/j.indmarman.2019.11.019>.
- Rymaszewska, A., Helo, P., & Gunasekaran, A. (2017). IoT powered servitization of manufacturing – an exploratory case study. *International Journal of Production Economics*, 192(October), 92–105. <https://doi.org/10.1016/j.ijpe.2017.02.016>.
- Schatzki, T. (2001). Introduction: Practice theory. In T. Schatzki, K. Knorr-Cetina, & E. von Savigny (Eds.), *The Practice Turn in Contemporary Theory* (pp. 20–23). Routledge.
- Schatzki, T. (2012). A primer on practices: Theory and research. In J. Higgs, R. Barnett, S. Billett, M. Hutchings, & F. Trede (Eds.), *Practice-based education: Perspectives and strategies* (pp. 13–26). Sense Publishers.
- Seidl, D., & Whittington, R. (2014). Enlarging the Strategy-as-Practice research agenda: Towards taller and flatter ontologies. *Organization Studies*, 35(10), 1407–1421. <https://doi.org/10.1177/0170840614541886>.
- Siggelkow, N. (2007). Persuasion With Case Studies. *Academy of Management Journal*, 50(1), 20–24.
- Sjödin, D., Parida, V., Jovanovic, M., & Visnjic, I. (2020). Value Creation and Value Capture Alignment in Business Model Innovation: A Process View on Outcome-Based Business Models. *Journal of Product Innovation Management*, 37(2), 158–183. <https://doi.org/10.1111/jpim.12516>.
- Sjödin, D., Parida, V., Kohtamäki, M., & Wincent, J. (2020). An agile co-creation process for digital servitization: A micro-service innovation approach. *Journal of Business Research*, 112(May), 478–491.
- Sklyar, A., Kowalkowski, C., Tronvoll, B., & Sörhammar, D. (2019). Organizing for digital servitization: A service ecosystem perspective. *Journal of Business Research*, 104(October 2017), 450–460. <https://doi.org/10.1016/j.jbusres.2019.02.012>.

- Sonenshein, S. (2010). We're changing - Or are we? Untangling the role of progressive, regressive, and stability narratives during strategic change implementation. *Academy of Management Journal*, 53(3), 477–512.
- Spee, P., & Jarzabkowski, P. (2017). Agreeing on what? Creating joint accounts of strategic change. *Organization Science*, 28(1), 152–176. <https://doi.org/10.1287/orsc.2016.1105>.
- Stigliani, I., & Ravasi, D. (2012). Organizing thoughts and connecting brains: Material practices and the transition from individual to group-level prospective sensemaking. *Academy of Management Journal*, 55(5), 1232–1259. <https://doi.org/10.5465/amj.2010.0890>.
- Tao, F., & Qi, Q. (2019). New IT driven service-oriented smart manufacturing: Framework and characteristics. *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 49(1), 81–91. <https://doi.org/10.1109/TSMC.2017.2723764>.
- Thomson, L., Kamalaldin, A., Sjödin, D., & Parida, V. (2021). A maturity framework for autonomous solutions in manufacturing firms: The interplay of technology, ecosystem, and business model. *International Entrepreneurship and Management Journal*, In press. <https://doi.org/10.1007/s11365-020-00717-3>.
- Tronvoll, B., Sklyar, A., Sörhammar, D., & Kowalkowski, C. (2020). Transformational shifts through digital servitization. *Industrial Marketing Management*, January, 293–305. [10.1016/j.indmarman.2020.02.005](https://doi.org/10.1016/j.indmarman.2020.02.005).
- Vaara, E., Kleymann, B., & Seristö, H. (2004). Strategies as discursive constructions: The case of airline alliances. *Journal of Management Studies*, 41(1), 1–35. <https://doi.org/10.1111/j.1467-6486.2004.00419.x>.
- Vaara, E., & Lamberg, J.-A. (2019). Taking historical embeddedness seriously: Three historical approaches to advance strategy process and practice. *Academy of Management Review*, 41(4), 633–657.
- Vaara, E., Sonenshein, S., & Boje, D. (2016). Narratives as sources of stability and change in organizations: Approaches and directions for future research. *The Academy of Management Annals*, 10(1), 1–58. <https://doi.org/10.1080/19416520.2016.1120963>.
- Vaara, E., & Tienari, J. (2011). On the narrative construction of multinational corporations: An antenarrative analysis of legitimation and resistance in a cross-border merger. *Organization Science*, 22(2), 370–390.
- Vaara, E., & Whittington, R. (2012). Strategy-as-Practice: Taking social practices seriously. *The Academy of Management Annals*, 6(1), 285–336. <https://doi.org/10.1080/19416520.2012.672039>.
- Vendrell-Herrero, F., Bustinza, O., & Opazo-Basaez, M. (2020). Information technologies and product-service innovation: The moderating role of service R&D team structure. *Journal of Business Research*, 128(May), 673–687.
- Vendrell-Herrero, F., Bustinza, O., Parry, G., & Georgantzis, N. (2017). Servitization, digitization and supply chain interdependency. *Industrial Marketing Management*, 60, 69–81. <https://doi.org/10.1016/j.indmarman.2016.06.013>.
- Vendrell-Herrero, F., Bustinza, O., & Vaillant, Y. (2021). Adoption and optimal configuration of smart products: The role of firm internationalization and offer hybridization. *Industrial Marketing Management*, 95, 41–53.
- Visnjic, I., Neely, A., & Jovanovic, M. (2018). The path to outcome delivery: Interplay of service market strategy and open business models. *Technovation*, 72–73(April-May), 46–59. <https://doi.org/10.1016/j.technovation.2018.02.003>.
- Whittington, R. (2006). Completing the practice turn in strategy research. *Organization Studies*, 27(5), 613–634. <https://doi.org/10.1177/0170840606064101>.
- Yin, R. K. (1994). *Case study research: Design and Methods* ((2nd ed.)). Sage.

Marko Kohtamäki is a Professor of Strategy, and a director of the “Strategic Business Development” (SBD) research group at the University of Vaasa, and a Visiting Professor at Luleå University of Technology and University of South-Eastern Norway, and as a Docent at University of Oulu. Prof. Kohtamäki takes special interest in digital servitization, product-service-software innovation, organizational change, strategic practices, business intelligence and strategic alliances. Prof. Kohtamäki has published in Strategic Management Journal, International Journal of Operations and Production Management, Strategic Entrepreneurship Journal, International Journal of Management Reviews, International Journal of Production Economics, Long Range Planning, Technovation, Industrial Marketing Management, Journal of Business Research, amongst others.

Dr Rodrigo Rabetino is an Associate Professor of Strategic Management in the School of Management and the Vaasa Energy Business Innovation Centre (VEBIC), at the University of Vaasa. His current research activities concern servitization and product-service systems, industrial service business, business intelligence, business models, strategy as practice, and small business management. He has published articles in international journals such as Regional Studies, International Journal of Operations and Production Management, Industrial Marketing Management, International Journal of Production Economics, Journal of Small Business Management, and Journal of Small Business and Enterprise Development.

D.Sc. (Admin) Suvi Einola is Assistant Professor at the University of Vaasa. She acts as a program manager of the Master's Programme in Strategic Business Development. Before joining academia, she worked in the public sector for fifteen years, holding managerial, training, and development responsibilities. In her research, Einola focuses on strategic practices and servitization challenges both in public and private organizations. Her articles have been published in journals and books focused on both the public sector and industrial marketing.

Vinit Parida: Vinit Parida (Ph.D.) is a professor at entrepreneurship and innovation at Luleå University of Technology, Sweden, and a visiting professor at the University of Vaasa, Finland. His-research interests include servitization, product-service system, business models, open innovation, and organizational capabilities. He has published more than 80 journal articles, including articles in Strategic Management Journal, Journal of Management Studies, Long Range Planning, Industrial Marketing Management, Production and Operations Management, Journal of Cleaner Production, and others.

Pankaj C. Patel: is a professor of management at Villanova University. His-research interests are at the intersection of technology and governance. He received his PhD from the University of Louisville.