

“Without friction, no shine:
Coping with servitization tensions among
Knowledge Intensive Businesses”



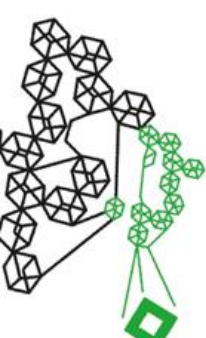
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Master of Science Thesis

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Abstract

In today's world, servitization is seen as a global trend to stay competitive in the current business environment. However, as firms progress in servitization, they often encounter tensions. Research suggests that managers often fail to understand the implications of tensions at organizational levels and lack managerial practices needed to cope with tensions across different levels. Although resolving problem- and dilemma-based tensions has been extensively researched in servitization, ways to resolve paradoxical tensions in servitization have largely been neglected, especially at an organizational level.

Therefore, this study aims to uncover insights into the complexities of managing servitization tensions by investigating paradoxical tensions that Knowledge Intensive Businesses (KIBs) face during the servitization innovation process and an exploration of managerial perceptions regarding the coping-mechanisms of these tensions. Using an inductive method, an exploratory qualitative multi-case study was conducted for this research. Using semi-structured interviews, 18 interviews were conducted with employees across three KIBs. Afterwards one additional interview was held with a service-consultant and an innovation consultant, expert in innovation paradoxes.

After applying the Gioia method (2012) and using principles of Corbin & Strauss (1990) to find patterns within the data, a framework was developed. This presents three identified paradoxical tensions in this study, as well as five coping-mechanisms employed by managers and two adaptation approaches suggested by the innovation consultant, expert in innovation paradoxes.

This study adds literature on servitization paradoxes by proposing two novel paradoxes, expanding the range of tensions organizations face during servitization. Furthermore, this study identified one existing paradox in a different context, strengthening the validity of this paradox. Our findings also contribute to research on coping-mechanisms by uncovering four novel coping-mechanisms and reaffirming one existing mechanism for managing servitization tensions. Finally, we add to managerial perceptions literature by explaining why managers often fail to recognize tensions as paradoxes, proposing two new approaches to better adapt coping strategies and improve servitization outcomes.

Keywords: Servitization, Service innovation, Paradoxes, Tensions, Coping-mechanisms, Multi-case study.

“The purpose of a business is to create and keep a customer” – Peter Drucker

I. Introduction

Manufacturers continuously seek value creation opportunities for customers. They do so through developing new service offerings to complement or replace product offerings (Baines & Lightfoot, 2014). Integrating products and services into bundled product/ service offerings by manufacturing organisations is seen as a global trend in today’s competitive business environment (Fang, Palmatier & Steenkamp, 2008). The shift of product-based manufacturers towards offering business solutions and value-added services to customers is termed as ‘Servitization’ (Vandermerwe & Rada, 1989) or service infusion (Brax, 2005). Existing literature describes servitization as an organizational transformation process from a manufacturer largely focused on offering only products, transforming to a service-logic, offering advanced services next to the products (Baines & Lightfoot, 2014).

Manufacturers are consistently on the lookout for these servitization opportunities as it offers various benefits. For example, research has shown that it enhances firm performance financially (Fang et al., 2008). Servitization also positively impacts strategic and marketing-related factors such as customer centricity, relationship learning, and organizational learning (Faramarzi et al., 2023). Additionally, servitization may contribute to environmental sustainability. This is done by promoting efficiency, recycling, and the dematerialization of value creation (Baines et al., 2007; Beuren et al., 2013; Tukker, 2004).

Shifting towards servitization is a well-researched topic, leading to the development of numerous frameworks on servitization strategies (e.g. Kamal et al., 2020; Vandermerwe & Rada, 1989), proposed service-offerings (Tukker, 2004), transitioning journeys (Baines et al., 2020), and required internal capabilities (Baines et al., 2020). This literature offers valuable insights into the complexities and strategies involved in adopting servitization within organizations.

Although various topics have been thoroughly researched, servitizing is still not as simple as it may sound. As firms progress in servitization, they often encounter tensions (Kothamäki et al., 2020; Chaudhary et al., 2022). Scholars have only recently begun to delve into these tensions, which are often phrased as *“problems”*, *“dilemmas”* or as

literature often calls it: *“Paradoxical tensions”* (Dmitrijeva et al., 2022).

Organizations that try to change, create pressure by balancing stability against change. This creates tensions for actors who experience this contradiction (Lewis, 2000; Smith & Lewis, 2011). These tensions are problematic for organizations as they may lead key actors to actively resist ideas, initiatives, and processes developed by others (Burton et al., 2016). Especially in servitization tensions are problematic, as there are many actors playing a role in this process, which causes tensions to emerge in intra and inter-organizational contexts (Dmitrijeva et al., 2022). These tensions may destroy value or derail the servitization process altogether (Burton et al., 2016).

Tension stem from three main causes. Problem-based tensions, which emerge from a gap between the current state and a desired goal (Nickles, 1981). Like a shortage of personnel in order to be a problem to grow in servitization (Karatzas et al., 2020). Dilemma-based tensions, which results from conflicting demands between various stakeholders (Donaldson & Preston, 1995). Oliva & Kallenberg (2003) sketched servitization as a dilemma in which organizations must choose to move to ‘either’ products ‘or’ services. Lastly, the most complex tensions stem from paradox-based tensions, often referred to as paradoxical tensions (Smith & Lewis, 2011). The core definition of paradoxes relates to a seemingly contradiction of two elements (Klokgieters, 2020). These elements reflect conflicting, non-combinable viewpoints, or intentions (Fang et al., 2011; Öberg et al., 2020).

Recent literature has begun to explore paradoxical tensions. For example, scholars like Kothamäki et al. (2020) presented four paradoxes in servitization: 1) effectiveness in the customization of solutions vs. efficiency in product manufacturing, 2) building a customer orientation vs. maintaining an engineering mindset, 3) organizing product and service integration vs. separated services and product organizations, and 4) exploratory innovation in solutions vs. exploitative innovation in product manufacturing.

Building on this, more recent studies have utilized theories such as paradox theory, the four-flows model, and the servitization stage model to unravel the complexities of paradoxical tensions in servitization (Raja et al., 2022; Dmitrijeva et al., 2022).

While literature highlights various tensions that hinder the servitization process, scholars stress the importance of resolving these tensions effectively to achieve strong performance from their servitizing efforts (Burton et al., 2016; Raja et al., 2022). Especially resolving paradoxical tensions in servitization on an organizational level have largely been neglected (Dmitrijeva et al., 2022; Kothamäki et al., 2020). Due to its complexity as paradoxes persist over time, paradoxes often are not something easily resolved. Instead, organizations need to learn how to balance and stretch resources to meet these conflicting yet interrelated demands. In servitization-literature, this is often related to as “ *coping* ”. (Kothamäki et al., 2020)

Scholars such as Kothamäki et al. (2020), Burton et al. (2016), and Raja et al. (2022) highlight the need for a deeper understanding of coping-practices for tensions emerging from paradoxes at organizations undergoing this service-transition. As Raja et al. (2022, p. 376) note, “*Further research is needed to consider what managerial practices are needed to cope with identified tensions across different levels.*” Gaining more insights into these coping-mechanisms is crucial for improving tension management and anticipating servitization strategies.

In response, this study aims to uncover insights into the complexities of managing servitization tensions by investigating paradoxical tensions that Knowledge Intensive Businesses (KIBs) face during the servitization innovation process and an exploration of managerial perceptions regarding the coping-mechanisms of these tensions.

This study has four key objectives, which align with our research question. First, we aim to uncover the challenges and contradictions faced by KIBs during servitization, clarifying the nature and scope of these tensions. Second, we explore how managers in our case organizations perceive and interpret these tensions, providing insights into how their interpretations shape coping strategies they employ. Third, we examine the specific coping-mechanisms managers use to address these tensions, directly contributing to answering the research question of how KIB managers manage paradoxical tensions during servitization. At last, we evaluate the practical outcomes of these coping-mechanisms, helping to identify effective management of servitization tensions.

We approach coping-practices relating servitization tensions by addressing the following research question:

RQ: “How do managers of Knowledge Intensive Businesses cope with paradoxical tensions while servitizing?”

To tackle this research question, this study adopted a qualitative exploratory approach with an inductive method to explore Dutch KIBs, chosen through purposeful sampling. “Knowledge Intensive Businesses,” refers to firms whose primary value creating activities compromise the accumulation, creation, or dissemination of knowledge to provide a customized service or solution that satisfies client needs (Bettencourt et al., 2002). This study was tackled through an intra-organizational lens, meaning to look at tensions from managers’ perspectives on strategic and operational levels of organizations.

This study contributes to the field of Industrial Marketing Management by offering empirical insights into coping practices for tensions arising during servitization at KIBs. First, we contribute by addressing the servitization challenges faced by managers in industrial and business-to-business (B2B) markets by bridging the gap between theoretical concepts and practical application. Through a qualitative approach focusing on KIBs, the study enhances the effectiveness and efficiency of marketing strategies in these markets by providing insights into how managers may navigate complex paradoxical tensions. Second, this study contributes by offering valuable insights into managing the complexities inherent in the servitization transition, thereby aiding in better decision-making and strategic planning. This supports organizations in navigating this transition effectively. Lastly, by identifying coping-mechanisms used by managers to effectively manage servitization tensions, this study contributes to both theory and practice, by offering actionable insights for organizations facing similar challenges, enabling them to adopt effective management strategies. Additionally, this study contributes to literature by addresses the gap highlighted by Kothamäki et al. (2020) by exploring additional coping-mechanisms for tensions inherent in servitization transformations among KIBs. Drawing on arguments by Burton et al. (2016) and Raja et al. (2022), the study contributes by aiming to uncover novel insights into effectively management of servitization tensions by managers to achieve strong performance outcomes from their servitizing efforts.

This paper is structured with an introduction, setting the context, topic, relevance, and research objectives. The theory section includes literature on servitization, servitization tensions, paradoxical tensions, and coping-mechanism. The paper will then follow up with the methodology section, explaining the research design, collection method, and data-analysis. The findings are next, followed by practical recommendations for organizations that are currently innovating by servitizing. The paper concludes with a discussion and reflection on limitations and suggestions for future research.

“What a customer buys and considers value is never the product, but the utility for what that product or service does for them” - Peter Drucker

II. Theory

In this chapter, we explain the theoretical literature relating this research. We start by describing the servitization phenomenon, its related offerings, and servitization as a process. We then move on to explaining servitization tensions, and paradoxical tensions. This is followed by describing the existent literature of coping-mechanisms on servitization tensions.

2.1 Servitization phenomenon

In daily life, people buy products to achieve specific outcomes. However, most businesses view this primarily as an opportunity to sell more products, rather than focusing on the value customers derive from them. People buy cars to travel or buy DVDs, Blu-rays or CDs to keep themselves entertained. While businesses profit from these sales, customers only experience true value when these products help them achieve their intended goals. This is called value-in use (Grönroos, 2017, p. 128).

Following this logic, firms seek opportunities by entering the service market, with the purpose to further support the customer to reach their goals so it creates more value for them (Grönroos, 2017). Firms like Netflix and Spotify are probably the most well-known examples of servitization, delivering media-as-a-service rather than selling physical DVDs, Blu-rays or CDs that offer these outcomes. Also in the automotive sector, we see examples like Tesla that try to enter the service market by offering aftermarket features and enhancements by a subscription model aiming to further support the customer in creating a better travel experience.

Servitization is argued to have various benefits on different branches. Research has shown that it enhances firm performance financially (Fang et al., 2008). Servitization also positively impacts strategic and marketing-related factors such as customer centricity, relationship learning, and organizational learning (Faramarzi et al., 2023). Additionally, servitization may contribute to environmental sustainability through promoting efficiency, recycling, and the dematerialization of value creation (Baines et al., 2007; Beuren et al., 2013; Tukker, 2004).

Origin of servitization

Servitization is currently seen as a transitioning process from selling standardized products and add-on services to offering customized solutions and advanced services (Kothamäki et al., 2020). Over time, its definition has evolved as the phenomenon developed. Servitization was introduced in the 80's, where it originally referred to the integration of products and services into bundled product/ services to offer customers better solutions through more complete market packages (Vandermerwe & Rada, 1988).

After 30 years, the meaning of servitization shifted to the innovation of a company's capability and processes to better create mutual value through a shift from selling products to selling integrated product-service systems (Baines et al., 2007).

In most recent literature, Baines et al. (2024) saw a hiccup in the term of *'shift'* and *'transition'* from products *'to'* services. A transition was argued to suggest that servitization is restricted to manufacturing firms, and that it suggests a reduction to less production, people, or even factory closure. This meaning of a transition leads to people feeling threatened by servitization.

Therefore, Baines et al. (2024) view servitization as a transformation towards delivering *'outcomes'* rather than *'outputs'*, suggesting that firms can compete by offering these outcomes to customers. In contrast, Kothamäki et al. (2020) describe servitization as a transition from offering standardized products and add-on services to providing customized solutions and advanced services. This conceptualization more accurately reflects the nuances of the servitization process. Therefore, Kothamäki et al.'s (2020) conceptualization is argued to provide a clearer understanding of servitization.

2.2 Service-levels and Product-Service Systems

In servitization, the bundling and integration of products and services are typically referred to as product-service systems (PSSs) (Baines and Lightfoot, 2007; Parida et al., 2014; Rabetino et al., 2018). Different products and services lead to different PSSs, which deliver different value propositions (Baines & Lightfoot, 2013).

It leads to propositions for customers who want to do it themselves, customers that want the provider to do it together, and customers that want the provider to do it for them (Baines & Lightfoot, 2013). Having these value propositions in mind, services can be grouped into three principal types of service. Base services, intermediate services, and advanced services (Baines et al., 2024).

Organizations that deliver *base services* provide the customers by selling the product, and perhaps spare parts, along with the usual guarantees and warranties. *Intermediate services* are for customers who might want the product, but occasionally also want help with maintenance and repairs. Intermediate services consist of organizations restoring the condition of the product, guaranteeing performance by restoring conditions of the product, and advising customers how they could capture more value from the products. For example, consider car dealerships that offer a base service by selling cars with warranties, but also provide regular maintenance and check-ups as an intermediate service to ensure optimal performance.

Advanced services are for customers who tend to be results-orientated. They are described as '*integrated PSSs, that when used, delivers outcomes that directly align with value creation and capture processes within a customers' own organization*' (Baines et al., 2024). It is characterised by delivering outcomes for customers rather than improving the accessibility or condition of the products. For example, Rolls-Royce's *Power-by-the-Hour* service provides aircraft engines along with ongoing monitoring and maintenance, ensuring customers pay based on engine uptime and reliability rather than engine ownership. Customers benefit from these outcomes as a result of 'using' the service. This use of the service is often related to as value-in-use (Lah & Wood, 2016).

Baines et al. (2024) encompasses three levels of advanced services for customers. Advanced services around a product, a business process, and a business platform. An advanced service around

product means that the product is supplied by the provider and is only used by the customer. Think of Products-as-a-service (PaaS) in which customers use products in a form of leasing, renting or pay-per-unit type of revenue model. Advanced services around processes involve providing not just products but entire operational processes to customers. The most advanced service that Baines et al. (2024) explain are services around platforms. This goes further than servitizing a product or operational process by delivering an entire outcome of a platform to the customer.

Distinguishing different service levels is important, as it shows the different gradations that firms can undergo when innovating in servitizing. Servitization revolves around innovating in and towards advanced services and setting up the organization in a way that these services can be rolled out effectively (Baines et al., 2024). However, transitioning to advanced services around products, processes or platforms is not a simple, easy-to-manage, linear transformation (Kothamäki, 2019), and can be seen as an iterative process (Baines et al., 2019), requiring significant organisational change (Kowalkowski and Kindström, 2015).

2.3 Progressing in servitization and organizational change

Servitization is often seen as an iterative process of becoming more servitized (e.g. Kothamäki et al., 2020; Baines et al., 2019). By becoming more servitized, firms transition from a product-centric logic to a service-centric logic, which requires significant organizational change (Kowalkowski & Kindström., 2015).

Servitizing impacts organizations on several levels. First of all, it impacts the current business-model and day-to-day operations (Crowley et al., 2018). Next, servitization also implies change to the organization's core offering. Furthermore, firms must consider the implications for their resources and staff competences concerning the specific skills required to deliver these new value propositions (Smith et al., 2014, p. 260).

Organizational change involves moving an organization away from its present state towards a desired future state (Singh, 2012). In servitization literature, this change is often approached from a processual perspective, as it provides deeper insights into the intricacies of organizational transformation (Dmitrijeva et al., 2022). A prominent framework in servitization literature facilitating the understanding of organizational

change in servitization is the servitization progression model (Baines et al., 2019). This model shows the four stages that firms undergo, while transforming a firm to also compete through offering 'outcomes' to customers (Baines et al., 2019). These stages are exploration, engagement, expansion, and exploitation (Baines et al., 2019). Firms explore servitization opportunities by researching and evaluating the concept and implications. They focus on delivering outcomes to customers and evaluating the potential of advanced services. After evaluating potential, they move to the expansion stage, where pilots become commercial offerings. If successful, they continue to develop new offerings and scale them, while also investing in improving the efficiency of existing services. Importantly to note in this study, is that several factors influence the progression of servitization: Organization readiness and commitment, technology push, customer pull, and value network positioning. Baines et al. (2019) poses that each stage of progression and each factor creates different tensions. Several scholars acknowledge that different factors challenge servitization and may even act as barriers that mitigate a servitization transition (Alghisi and Saccani, 2015; Martinez et al., 2017; Raddats et al., 2018; Raja et al., 2017; Zhang and Banerji, 2017).

2.4 Challenges and paradoxical tensions during servitization

As firms progress in servitization, they stumble upon "*dilemmas*", "*problems*", "*barriers*", and "*challenges*" (Alghisi and Saccani, 2015; Martinez et al., 2017; Raddats et al., 2018; Raja et al., 2017; Zhang and Banerji, 2017).

Literature on servitization suggests various barriers, like a lack of servitization intent (Crowley et al., 2018), an embedded manufacturing culture (Martinez et al., 2010), or a misfit between various characteristics of strategy, structure, and business environment (Kothamäki et al., 2019). Literature also analyses challenges for servitization. These challenges include the need to redesign service-related processes to include advanced services (Kindström & Kowalkowski, 2015), and the task of aligning product and service design processes in general (Martinez et al., 2010). Furthermore, the scarcity of service-based performance indicators, along with the complexity of creating strategic alignment and transactional relationships with suppliers, create problems for a successful implementation of servitization initiatives (Martinez et al., 2010).

When organizations change, it creates pressure to balance stability against change. This creates tensions for actors who experience this contradiction (Lewis, 2000; Smith & Lewis, 2011). Tensions stem from three main causes. Firstly, tensions can be caused by problems. A problem is a gap between the current state and a desired goal, requiring solutions, explored through inquiry within a specific theoretical and historical context (Nickles, 1981). Like for example a shortage of personnel in order to grow in servitization (Karatzas et al., 2020). Secondly, tensions can be caused by differing, and often conflicting, demands of varied internal and external stakeholders (Donaldson & Preston, 1995). Oliva & Kallenberg (2003) sketched servitization as a dilemma in which organizations must choose to move to 'either' products 'or' services. Lastly, the most complex tensions stem from paradox-based tensions, often referred to as paradoxical tensions (Smith & Lewis, 2011).

Several studies have examined tensions in servitization. For example, Burton et al. (2016) identified 19 tensions, categorized in five broad groups within servitization: (i) direct challenge to expertise; (ii) pressure to learn; (iii) cost-focused challenges; (iv) process-change risk aversion; (v) external impact by actors on value creation. They note that tensions occur on different levels and within and between organizations. Other work, like Wagstaff et al. (2020) present that servitization causes tensions within organizations, by individuals and groups defending their current position which they perceive is under threat. Tensions within organizations are referred to as intra-organizational tensions (Wagstaff et al., 2020). Research presents that besides internal tensions, also inter-organizational tensions emerge by innovating in servitizing (Burton et al., 2016). Inter-organizational tensions are tensions arise between the organization and other actors, like competitors, customers, suppliers, and end-users (Galvani & Bocconcelli, 2022)

Tensions are a broad and ambiguous concept. They are often used interchangeably by scholars to describe underlying problems, dilemmas, or paradoxical dynamics (Putnam et al., 2016). 'Paradoxes are coexisting, contradictory, interrelated differences within and between organizations, which reflect conflicting, non-combinable viewpoints, or intentions (Fang et al., 2011; Öberg et al., 2020). Paradoxes originate from underlying tensions (Raja et al., 2022). The term paradox can have different meanings in different contexts. However, the core definition relates to a

seemingly contradiction of two elements (Klokgieters, 2020).

In the context of servitization, the term paradox is often employed in different ways. For example, studies use it to describe the difficulty of integrating services into established product businesses (Brax, 2005), or the challenges of simultaneously managing a product-based and service-based business models (Palo et al., 2019).

Few scholars (e.g. Kothamäki et al., 2020; Dmitrijeva et al., 2022; Raja et al., 2022) have delved deeper into tensions by framing it through the paradox perspective. Kothamäki et al. (2020) identified several paradoxical tensions, like competing demands in servitization in the form of learning (customising solutions vs. manufacturing products efficiently), belonging (developing customer orientation vs. maintaining an engineering mindset), organising (integrating vs. separating services and product organisation) and performing (innovating service solutions vs. exploiting product innovations). A study by Toth et al. (2022) also applies the paradox theory to explain tensions within servitizing manufacturers, focusing on digital servitization. Raja et al. (2022) identified various paradoxical tensions such as in organizing, service development, multiple business models, technology, and service belonging within a product business. At last, Dmitrijeva et al (2022), looks at paradoxes in servitization through a processual perspective, adopting the progression model by Baines et al. (2019). In there they find four tensions, being exploiting the established product-knowledge and building up new frame-breaking service-knowledge in exploration phase, between own identity and the identity of the wider group in the engagement phase, between separating and integrating entities within structures and processes in the expansion phase, and between short-term and long-term targets in the exploitation phase.

Paradoxical tensions are an important topic, as it reveals the difficulties that organizations face when servitizing to more integrated advanced solutions. While research has provided valuable insights into the paradoxical tensions inherent to servitization, limited attention has been paid to exploring how organizations can effectively cope with these tensions (Burton et al., 2016; Kothamäki et al., 2020; Raja et al., 2022).

2.5 Coping-mechanisms in servitization

Why must we cope with tensions? Why can't we just choose option A or B when dealing with a tension? And is it possible to synthesize an option C to deal with tensions?

Several authors have documented different ways of approaching competing demands and dealing with the resulting tensions in general organizational tension management at organizations (Gaim & Wählin, 2016). First, there is repression, denying and ignoring the existence of a tension (Lewis, 2000). Another common method is suppression, meaning to favour one option over the other, often leading to temporary resolutions such as compromise or reconciliation (Jarzabkowski et al., 2013). A third strategy involves separation, which can take the form of spatial or temporal ambidexterity. Spatial separation means assigning different departments to handle different demands, while temporal separation involves focusing on one demand at a time (Poole & Van de Ven, 1989). The problem with these types of responses is that they often only provide short-term relief (Smith & Lewis, 2011; Jarzabkowski et al., 2013). Moreover, while these approaches are applicable to general organizational tension management, servitization presents distinctly different challenges. These include for instance integrating product and service offerings and balancing service innovation with operational efficiency, complexities not typically encountered in other organizational contexts (Baines et al., 2009; Zhang & Banerji, 2017).

Consequently, scholars in servitization have tried exploring tensions management through different approaches. Scholars have categorized tension management into four principal approaches: seeing tensions as problems, dilemmas, dialectics, and paradoxes. Dilemmas arise when there are two mutually attractive or unattractive options that needs to be selected (Cameron & Quinn, 1988). Managing these options leads to 'either-or' choices, meaning that 'either' option A 'or' B needs to be selected (Smith, 2014). For example, earlier research by Oliva & Kallenberg (2003) sketched servitization more like a trade-off in which organizations must choose to move to 'either' products 'or' services (Raja et al., 2022).

Dialectics also arise from contradictory options. However, a dialectic involves a dialogue between different points of view. It recognizes contradiction of in the form of a thesis and antithesis, where the

conflicting ideas are resolved through integrating a third option. This is known as synthesis (Smith & Lewis, 2011). In servitization literature, research by Stegehuis et al. (2023) used dialectic process model to identify several inter-organizational tensions in servitization. They showed that for some conflicting elements, an alternative third option arose, creating a possibility to working around the tensions.

Paradoxes differ from dilemmas and dialects in the way of dealing with the tensions. This is because with paradoxes, option A and B are not actual contradictions, they only seem like it. This means that they coexist with each other (Putnam et al., 2016). This leads to an 'both-and' way of thinking, meaning that 'both' option A 'and' B can often be balanced (Smith, 2014). Therefore, a paradox is not something easily resolved and persists over time, so organizations should learn how to balance and stretch resources to meet these conflicting yet interrelated demands (Kothamäki et al., 2020). When considering ways in which organizations can deal with paradoxes, studies suggest that organizations must accept, appreciate, make sense of, and cope with paradoxes (Beech et al., 2004; Lewis, 2000; Poole and Van De Ven, 1989).

Limited exploration of coping-mechanisms in the context of servitization is understandable. Coping-mechanisms are complex, as servitization tensions emerge at different organizational levels (Raja et al., 2022). Though servitization research is limited on coping-mechanisms that manufacturers can use, some studies do provide several managerial practices that can be used to manage the service transition (Kothamäki et al., 2018). Servitization studies provide insights how organizations can better manage their practices for designing, selling, producing, and delivering integrated solutions. This includes defining explicit service-oriented strategies (Gebauer and Fleisch, 2007), describing the strategic logic of servitization (Rabetino et al., 2017), developing scalable platforms (Raja et al., 2017), involving personnel in coping with organizational inertia (Antioco et al., 2008), and decentralizing sales operations (Gebauer and Fleisch, 2007).

There are two studies that shed some light on coping-mechanisms on servitization tensions. In a study by Kothamäki et al. (2020), nine practices were identified that manufacturing firms employ to cope with four paradoxical tensions emerging during their servitization transition. To cope with customization and efficiency, organizations used new management systems to support both aspects,

used modular integrated solutions, and coordinated end-to-end operations. In managing tensions between customer orientation and engineering mindset, organizations focused on strategy development and implement programs to improve shared understanding among employees. To integrate products and services while maintaining separate structures, organizations used cross-boundary routines and personnel, fostering organizational integration. Lastly, to balance exploratory and exploitative innovation, organizations invested in training and development for solutions integration and establish information-sharing routines to support innovation in both domains (Kothamäki et al., 2020).

Another study presents four coping-mechanisms to overcome their identified paradoxical tensions (Chaudhary et al., 2022). Relating to ten tensions, they identified change management, open communication, training & digitalisation as used coping-mechanisms by organizations.

Though research presents several coping-practices for servitization tensions, research on this has just began. There is a gap in research on coping-mechanisms for tensions inherent in servitization transformations among manufacturers (Kothamäki et al., 2020). Burton et al. (2016) emphasizes the importance of managing tensions across organizational networks for achieving strong performance outcomes in servitization efforts. Another recent study also calls for further research on managerial practices needed to cope with identified tensions across different levels (Raja et al., 2022). Moreover, despite valuable insights into identifying tensions and coping-mechanisms, there remains a limited understanding of the implications of tensions at the organisational level (Dmitrijeva et al., 2022). Given these gaps in the literature, there is a pressing need to deepen our understanding of coping practices for tensions emerging within organizations undergoing the service transition.

To give a visual representation of the contexts in which tensions arise during servitization and to illustrate how coping-mechanisms relate to tensions, a theoretical framework has been developed. This framework categorizes the identified coping-mechanisms in servitization literature into three distinct pillars for easier interpretation. The theoretical framework can be found in Figure I.

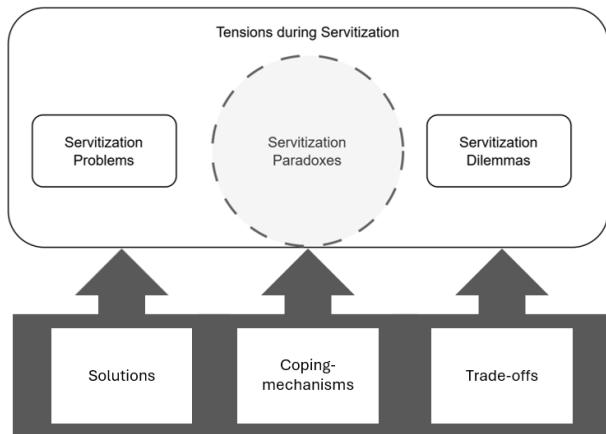


Figure 1 Theoretical framework

III. Methodology

The objective of this study is to uncover insights into the complexities of managing servitization tensions by investigating paradoxical tensions that KIBs face during the servitization innovation process. In this, we explore managerial perceptions of these tensions and coping-mechanisms. Against this background, the central research question in this study is:

RQ: *“How do managers of Knowledge Intensive Businesses cope with paradoxical tensions while servitizing?”*

In addressing this question, we zoom into several key objectives. First, we aim to uncover the challenges and contradictions faced by KIBs during servitization, clarifying the nature and scope of these tensions. Second, we explore how managers in our case organizations perceive and interpret these tensions, providing insights into how their interpretations shape coping strategies they employ. Third, we examine the specific coping-mechanisms managers use to address these tensions, directly contributing to answering the research question of how KIB managers manage paradoxical tensions during servitization. At last, we evaluate the practical outcomes of these coping-mechanisms, helping to identify effective management of servitization tensions.

To address these key objectives, this study is structured around three sub-questions. These are the following:

SQ1. *What paradoxical tensions arise during Knowledge Intensive Businesses’ servitizing?*

SQ2. *What coping-mechanisms do managers employ to deal with these tensions?*

SQ3. *How can firms adapt coping-mechanisms to evolving paradoxical tensions?*

3.1. Research Design

Researchers must make three critical decisions when conducting a study: 1) choosing between a quantitative, a qualitative or a mixed-method approach; 2) determining whether to conduct broad or in-depth research; and 3) opting for either an empirical or non-empirical setting (Babbie, 2021).

This research focuses on exploring paradoxical servitization tensions and coping-mechanisms by managers. Several paradoxical tensions in servitization have been researched, though research drawing on coping-mechanisms on these tensions is scarce (Kothamäki et al., 2020; Raja et al., 2022). To answer the research question, stated in the introduction, this research design draws upon a qualitative approach, known for its suitability to create valuable insights and deepen understanding of complex relationships, and capture the perspective of participants (Gioia et al., 2012; Orb et al., 2001).

An exploratory multiple case study approach is used to conduct this research. This approach is suited to study complex and dynamic organizational phenomena (Eisenhardt and Graebner, 2007) that have not been extensively analysed (Leonard-Barton, 1990). The use of multiple-case studies, allows for cross-case comparison, enhancing richness and depth of analyses (Yin, 2009). Next to that, the use of case studies is a proper strategy to extensively explore issues that are difficult to replicate (Dubois and Araujo, 2007; Dyer and Wilkins, 1991; Siggelkow, 2007). Performing this study approach is similar to existent studies like Kothamäki et al. (2020) and Raja et al. (2022) in the related field of servitization tensions and coping-mechanisms. Considering the complexity of servitization, paradoxical tensions, and coping-mechanisms, an exploratory multiple case study approach can be deemed as a fitting choice.

3.2. Research setting

The research setting is in Dutch Knowledge Intensive businesses (KIBs). The term “Knowledge Intensive Businesses,” refers to firms whose primary value creating activities comprise the accumulation, creation, or dissemination of knowledge to provide a customized service or solution that satisfies client needs (Bettencourt et al., 2002). The decision to focus on KIBs is

motivated due to purposeful sampling in which the case-companies all shared the common features of KIBs, namely: 1) the knowledge intensity of the service provider; 2) the problem-solving function; and 3) the strongly interactive or client related character of the service provided (Muller & Zenker, 2001).

KIBs are ideal for studying servitization tensions due to their reliance on specialized expertise (Løwendahl, 2005), complex problem-solving processes (Gummesson, 1978), and close client interactions (Jaakkola & Halinen 2006). These characteristics create unique challenges when integrating advanced services with traditional products.

The dependency on expert knowledge (Løwendahl, 2005), coupled with the need for continuous innovation and customization (Gummesson, 1978; Jaakkola & Halinen, 2006; Lapierre, 1997; Løwendahl, 2005), makes KIBs a suited choice for exploring paradoxical servitization tensions and coping-mechanisms by managers.

Besides the case-companies all being KIBs, they share other common threads. Firstly, they are all based in the Netherlands, and operate internationally. Some firms are partially located in other countries. Lastly, they are all B2B-companies, meaning that transactions take place between two businesses and not between business and an individual end-consumer (Purmonen et al., 2023). The case-companies differ in core-businesses and represent diverse industries. Because of confidentiality, this paper refers to the companies as “*BakeCo*”, “*LabTech*”, and “*SecureCo*”. An overview of the participating companies and core businesses can be found in Table I below.

3.3. Data Collection

Data is collected through purposive sampling with an additional snowballing-approach. Using this method allows for selecting individuals that are well-informed with the phenomenon under investigation (Etikan, 2016), allowing for reliable and robust data (Tongco, 2007). This research originated from a challenge-based learning project at the UT, where seven KIBs expressed interest in servitization and signed up to participate. This research initiative then started with exploratory

meetings involving nine participants representing seven organizations. These meetings provided an opportunity to gain insights into the organizations' core products, services, and their linkages to servitization and servitization tensions. Following careful evaluation, three organizations were selected to proceed with in-depth investigation.

Subsequently, follow-up meetings were conducted with these participants of the selected organizations. This approach was taken for two main reasons. First, it allowed us to gain a deeper understanding of the participants' perspectives on their main tensions and coping-mechanisms related to servitization. Second, the follow-up meetings helped us identify the most relevant individuals at these organizations to interview for our study. We selected participants who either held a managerial position or played an important role in their organization's transition towards servitization. As the initial contacts at the case-companies were already actively involved in their companies' servitization journey, we valued them well-informed enough to recommend the most suitable people to interview for this research. Data from these interviews were used to answer what paradoxical tensions arise during servitizing and what coping-mechanisms managers employ to deal with these tensions.

After these interviews with key individuals at the case-companies, a seminar was held to present the preliminary findings of this study and to discuss these results for further validation. After the seminar, an additional interview was held with a service-consultant and an innovation consultant, expert in innovation paradoxes. This interview was held to validate the preliminary findings from this study and to answer how firms can adapt coping-mechanisms to evolving paradoxical tensions.

This study involved 18 participants, and the interviews were conducted mostly in person and partially online due to logistical challenges. Specifically, some interviewees lived abroad or were traveling at the time of the interviews, making in-person meetings unfeasible. The interviews were conducted in either Dutch or English.

Dutch was chosen for Dutch-speaking interviewees as it is the native language of some participants, which facilitates better communication and

Table I Company info

Company	Industry	Core business (product)
BakeCo	Bakery-machines	Builds machines and production lines.
SecureCo	Security hard- and software	Offers software and hardware for security of buildings.
LabTech	Scientific equipment	Offers innovative technologies and pharmaceutical services.

reduces language-barriers. All interviews were transcribed, and the Dutch interviews were translated afterwards. An overview of the participants and function can be found in Table II below.

ID	Company	Job Title
1	BakeCo	Managing Director Service
2		Global IT-Director
4		Service Sales Manager
5		Product-Service Manager
6		Field Service Manager
7		Team Lead E&A ¹ Service
8		LabTech
9	Digital Service Manager	
10	Financial Controller	
11	Service Sales-Manager	
12	SecureCo	Team Proposition Lead
12		Community Manager
13		Business Controller
14		Sales-Consultant
15		Sales-Consultant
16		Technical Lead
17		UX-Workflow Designer
18	Market Group Director	
Total amount of data:		
234 pages – transcripts		
35 minutes – Average interview length		

Table II Data Collection

The research instrument chosen for this study is semi-structured interviews with open-ended questions (as provided in Appendix A). This method was chosen for its flexibility and comprehensiveness, enabling a deep exploration of servitization tensions and coping-mechanisms (Babbie, 2021). Semi-structured interviews allow for adaptability during conversations, comprehensive insights, and the capturing of direct voices from individuals directly involved in these processes (Saunders et al., 2000). This approach aims to understand the various ways in which organizations cope with tensions that arise during servitization.

3.4 Data-analysis

Thematic analysis was used to analyse collected data. This is a common method to identify common themes, topics, and patterns mentioned during the data collection phase in qualitative research (Braun & Clarke, 2012). The data-analysis followed the principles of Strauss & Corbin (1990), as also described in detail by Gioia et al. (2012). This approach allowed us to progress from detailed

empirical data towards overarching themes with greater generality. Grounded theory follows the structure of open, axial, and selective coding (Strauss & Corbin, 1990).

Firstly, we started with open-coding, meaning to collect numerous first-order codes and themes from the collected data (Strauss & Corbin, 1990). This provided an overview of all the qualitative data collected during the interviews. Secondly, we performed axial-coding, meaning to group all initial codes based on their similarities to establish several ‘second-order themes’ (Strauss & Corbin, 1990). This helped to organize the data set and reduce the number of themes. This phase was followed by selective coding. With selective coding we merged the second-order themes, so they formed aggregate dimensions (Strauss & Corbin, 1990). Aggregate dimensions ensure a more comprehensive data structure that is easier to interpret (Gioia et al., 2012). Selective coding “*helps us describe and explain the phenomena we were observing*” (Gioia et al., 2012, p. 20). The first-order, second order and overarching themes are the basis for the data structure that was built to visualize the thematic analysis. It shows how progress was made from raw data towards overarching themes. This is key for demonstrating rigor in qualitative research (Gioia et al., 2012; Pratt, 2007; Tracy, 2010)

IV. Findings

This chapter includes the findings collected through qualitative research. The findings include semi-structured interviews conducted with various managers of three KIBs. The collected data were first transcribed, where needed translated, and followed up by coding the elements using an inductive approach. This involved identifying various concepts and themes related to the theory, which were then organized into three overarching dimensions that were discovered through analysing the data. The findings progress according to the set sub research questions. Beginning with explaining what paradoxical tensions we identified, the findings continue by explaining what coping-mechanisms managers used to tackle these tensions. The findings end by explaining how firms could adapt coping-mechanisms to deal with the tensions. In Figure II, there is an overview of all the first order concepts and second order concepts that lead to these overarching dimensions.

¹ E&A is an abbreviation for Electronics & Automation.

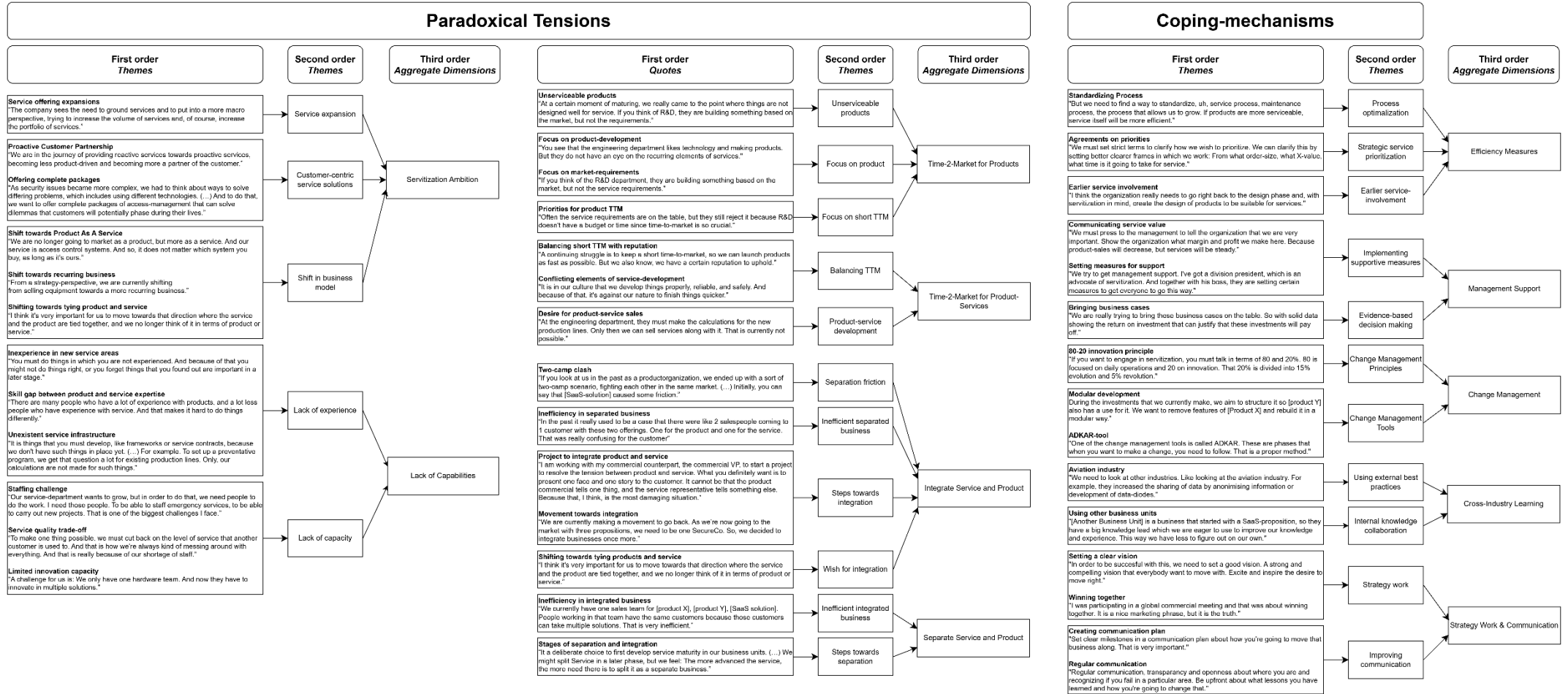


Figure II Aggregate Dimensions of Paradoxical Tensions and Coping-mechanisms

4.1 Paradoxical tensions

This section delves into the first sub research question of this paper. Explaining what paradoxes we identified during the interviews. In total, we identified three paradoxes. These are 1) Servitization ambition VS lack of capabilities, 2) Time-2-market of products VS Time-2-market of product-services and 3) Integrating products and services VS Separating products and services.

Each paradox is explained by delving into both aspects of the paradox and is ended by an interpretation of the paradox to show how the aspects form a paradox and to show the importance.

4.1.1 Servitization Ambition VS Lack of Capabilities

This section delves into the paradox of the servitization ambition and lack of experience and capacity.

Servitization-ambition

Within the interviews, we observed that each case-company had different ambitions in servitization. To give context to the servitization-ambition, each the ambition of each firm will be explained.

BakeCo | Servitization Ambition

BakeCo is a manufacturer of machines up to complete production lines in the bakery industry. The company is currently undergoing a servitization transition, evolving from a firm where service was a minor part of the organization to one where service plays a central role.

“Ten years ago, I was asked to lead the service-department. It was very tiny at that point. In that time, we did some break-fix-services and sell spareparts to customers when parts of machines broke” (Field-Service Manager, BakeCo)

In recent years, management of BakeCo developed a strong servitization ambition.

“The company sees the need to ground services and to put into a more macro perspective, trying to increase the volume of services and, of course, increase the portfolio of services.” (Product-Service Manager, BakeCo)

BakeCo aims to shift its approach towards customers by moving from being a reactive to proactive service provider. Instead of merely responding to problems, they aspire to become a partner to their customers, anticipating their needs and offering proactive solutions.

“We are in the journey of providing reactive services towards proactive services, becoming less product-driven and becoming more a partner of the customer.” (Service-Sales Manager, BakeCo)

This ambition represents a significant shift in how BakeCo wants to position itself in the market. By focusing on building stronger, more supportive relationships with its customers through enhanced service offerings, BakeCo is clearly servitizing. This approach aligns well with the definition of servitization provided by Kothamäki et al. (2020), which emphasizes on transitioning from selling products to offering solutions.

SecureCo | Servitization Ambition

SecureCo is a provider of hard- and software which helps managing security through access control on buildings, though emphasizing on providing software for access control. This company is also undergoing a servitization transition. They are evolving from selling one access control-software product towards offering solutions by offering several solutions in which one is offered as a “Software as a service”.

“As security issues became more complex, we had to think about ways to solve differing problems, which includes using different technologies. (...) And to do that, we want to offer complete packages of access-management that can solve dilemmas that customers will potentially phase during their lives.” (Market Group Director, SecureCo)

Transitioning from selling a product towards selling a Product as a Service (PaaS), is a part of servitization. Innovating services in such a way that products are delivered as a service, is part of offering advanced service. This is part of servitization (Kothamäki et al., 2020)

The servitization ambition of SecureCo also lies in the fact that they want to stop selling their product to the customer and become the partner of the customer by providing suiting solutions to their specific problems.

“We are no longer going to market as a product, but more as a service. And our service is access control systems. And so, it does not matter which system you buy, as long as it's ours.” (Sales Consultant, SecureCo)

LabTech | Servitization Ambition

LabTech is a firm that sells chemical analysis equipment to life-science industries, like for example microscopes. They come from a place in which complete focus was on selling products.

"LabTech is historically seen, just a manufacturer of equipment. (...) We have factories, R&D-workers and business units that all have been historically focused on products." (Sr. Global Service Manager, LabTech)

However, in recent years, management of LabTech came up with a strategy that revolves around servitization.

"From a strategy-perspective, we are currently shifting from selling equipment towards a more recurring business." (Sr Global Service Manager, LabTech)

In that servitization strategy, lies their ambition. Trying to tie services and products together and move from selling equipment towards a more recurring revenue model.

"I think it's very important for us to move towards that direction where the service and the product are tied together, and we no longer think of it in terms of product or service." (Sr. Digital Service Manager)

As we can see from these examples, each case-company in this study is attempting to transition towards servitization in its own unique way. This ranges from providing proactive rather than reactive services, offering multiple solutions instead of a single product, to integrating services and products and shifting towards a recurring business model. While these servitization ambitions are promising, we observed that tensions emerged as a result from this ambition.

Lack of experience

While we observed that each case-company had different ambitions in servitization, we observed similar results between the case-companies' interviewees regarding why it was difficult to become more service-focused. One of the recurring topics in the interviews were a lack of experience in order to servitize. Like for instance; while developing new service-related aspects that had never been done before, a lack of experience caused a tension.

"You must do things in which you are not experienced. And because of that you might not do things right, or you forget things that you found out are important in a later stage." (Team Proposition Lead, SecureCo)

The above citations shows that a lack of experience hinders the servitization transition. Another interviewee of LabTech builds further on a lack of experience, as it not only just leads to doing wrong things or forgetting things which are caused by a lack of experience.

"There are many people who have a lot of experience with products, and a lot less people who have experience with service. And that makes it hard to do things differently." (Sr. Global Service Manager, LabTech)

The lack of experience makes it hard for organizations to do things different than they have done before. At last, the lack of experience also hinders the actual development of new service-aspects, says another interviewee of BakeCo.

"It is things that you must develop, like frameworks or service contracts, because we don't have such things in place yet. (...) For example. To set up a preventative program, we get that question a lot for existing production lines. Only, our calculations are not made for such things." (Service-Sales Manager, BakeCo)

In summary, these examples highlight the tension of a lack of experience in organizations while trying to become more servitized. From doing the wrong things or forgetting important things, to changing to do things differently or developing new service aspects. A lack of experience caused a tension during servitization.

Capacity Constraints

Besides the lack of experience, interviewees often pointed out a related area, capacity restraints. At every organization, the capacity available caused a tension. In order to transition in servitization, organizations need to make resources and time available in order to develop new services and adjust to the servitization-style of doing business. A first example of BakeCo, points out that in order to grow, enough workers need to be available to carry out new services. But that may be harder than it actually seems and is not something that can be solved in a short period of time.

"Our service-department wants to grow, but in order to do that, we need people to do the work. I need those people. To be able to staff emergency services, to be able to carry out new projects. That is one of the biggest challenges I face." (Team Lead E&A Services, BakeCo)

During this interview, we observed that a low availability of resources was already damaging the current way of delivering services, but also on developing and staffing new services. The interviewee did not see the capacity constraint as a temporary problem that could be solved. It was rather a tension in which a choice needed to be made one what to prioritize on.

“To make one thing possible, we must cut back on the level of service that another customer is used to. And that is how we’re always kind of messing around with everything. And that is really because of our shortage of staff.” (Team Lead E&A Services, BakeCo)

This tension of having to prioritize what on how to allocate time and resources, was found at SecureCo as well. When talking about tensions on the developing their new SaaS-solution, the interviewee saw that the organization struggled with what to prioritize when innovating.

“It is a challenge for us. We only have one hardware team. And now they have to innovate in multiple solutions” (Technical Lead, SecureCo)

This example shows that organizations want to transition into servitization, but face rather unresolvable problems, leading to prioritizing issues between allocating resources to either products or services.

Interpretation of paradox

The interplay between the servitization ambition and lack of experience and capacity creates a paradox that organizations face during the process of servitization. This paradox, which is a seemingly contradiction between two elements (Klokgieters, 2020), emerged at all three case-companies.

The paradox arises from the interplay between the ambition to adopt a more service-oriented approach and the limitations of experience and capacity within these organizations. Firms often face the necessity to prioritize between conducting their daily businesses and innovating in new service offerings. For example, BakeCo’s ambition to provide proactive service solutions is constrained by limitations such as staff availability and the need for significant training and development. Furthermore, resource allocation becomes an important issue as firms struggle to balance investments between sustaining and upgrading current products and developing new service capabilities, as shown in the example of SecureCo.

This identified paradox was also shown to an experienced innovation consultant, experienced with handling complex innovation issues by approaching them as paradoxes. The expert sees this paradox as a misfit between strategy and tactics.

“It seems a misalignment between strategy and tactics. Servitization ambition is part of the strategic

level, while experience and capacity lays at tactical level.” (Innovation Consultant)

This paradox has implications for organizations as it hinders performance in their transition towards servitization. The tension between servitization ambition and lack of experience and capacity leads to suboptimal execution of servitization and prevents organizations to fully benefit from a service-dominant logic.

4.1.2 Time-2-Market Product VS Time-2-Market Product-Service

This section delves into the second identified paradox, which focuses on the interplay between the time-to-market for products and the time-to-market for product-services. We explain each element of the paradox and then move on to interpret the paradoxical relationship between the elements.

Time-to-Market Products

The second observation we made during the interviews was about the tension surrounding the time-to-market (TTM) for products and product-services. TTM is the elapsed time between the definition of a product or service and its availability (Vesey, 1991). Discussions about the difficulties in transitioning to servitization emphasized that there were different TTMs for products and product-services. This caused tensions between engineering and service departments.

During servitization, companies shift from selling products with supplementary services to offering solutions with advanced services (Kothamäki et al., 2019). This essentially means that, first, they no longer just sell a product but combinations of products and services (Vandermerwe & Rada, 1988). Second, it means that companies must innovate in services to achieve advanced services (Baines et al., 2024).

During the interviews, we heard that service departments initially wanted to innovate in services themselves but reached a point where they could not proceed further.

“At a certain moment of maturing, we really came to the point where things are not designed well for service.” (Sr. Financial Controller, LabTech)

This makes sense. To continue innovating in services, products must be equipped with serviceable features necessary to offer solutions to

customers and better support them (Baines et al., 2024). To equip products with these features, we were told during the interviews that engineering is responsible for product development in many organizations. Because of that, service departments encounter tensions.

Organizations like LabTech, BakeCo, and SecureCo have historically focused primarily on product development. However, the introduction of the servitization transition brought new expectations for product development at the case-companies. During the observations, it became clear that engineering departments mainly focus on shortening the TTM for products, as the market demands this from them as suppliers of goods.

"If you think of the R&D department, they are building something based on the market, but not the service requirements." (Sr. Financial Controller, LabTech)

Based on these findings, we asked another interviewee whether it was difficult to get the engineering department to develop products that are better usable for service development. The response highlighted that the shift towards servitization created tensions between engineering and service departments: Engineering teams focus on product development and often overlook service aspects.

"You see that the engineering department likes technology and making products. But they do not have an eye on the recurring elements of services." (Sr. Global Service Manager, LabTech)

This finding shows that there is a significant challenge in achieving shared servitization goals within different parts of organizations. Finally, we found that engineering and service departments were often in conflict over whether or not to develop certain service items in current products. An interviewee mentioned that engineering departments often sacrifice serviceability to shorten the time-to-market for a product.

"Often the service requirements are on the table, but they still reject it because R&D doesn't have a budget or time since time-to-market is so crucial." (Sr. Financial Controller, LabTech)

This quote illustrates that organizations, particularly LabTech, struggle with successfully transitioning to servitization. This struggle

originates from a misalignment in strategy within different departments, leading to product designs that lack the necessary serviceability elements for easier maintenance, repair, and service innovations. These elements are essential for creating a long-term competitive advantage by enabling efficient service delivery and the development of new services (Srivastava et al., 2013). This brings us to the other side of the paradox.

Time-to-Market Product-Services

The tension between maintaining a short TTM for products and the TTM for innovating in product-service combinations has implications for organizations. Market pressure demands quick product launches, but there is a conflicting need to maintain the organization's long-term reputation:

"A continuing struggle is to keep a short time-to-market so we can launch products as fast as possible. But we also know that we have a certain reputation to uphold." (Market Group Director, SecureCo)

This finding shows that there is a complex interplay between the short-term goal of product development and the long-term goal of organizations' servitization ambition. The development of product-services requires a longer timeline than just products. Studies like those by Kindström & Kowalkowski (2015) have already mentioned that to servitize, service-related processes need to be redesigned to integrate advanced services. Additionally, Martinez et al. (2010) already discovered that aligning product and service processes can be quite challenging.

Besides literature that shows relating challenges, we found that the TTM for products often differs from the TTM for product-services, which ultimately results in an inability to sell services during the purchasing phase of the product. To be able to offer a solution to a customer, both the product and services must be deliverable. A delay in the availability of the desired services causes a disconnect where services cannot be bundled with the product at the point of sale. We see this at BakeCo, an interviewee there mentioned:

"At the engineering department, they must make the calculations for the new production lines. Only then can we sell services along with it. That is currently not possible." (Services Sales Manager, BakeCo)

Furthermore, the approach of service departments, which often emphasizes thorough, reliable, and safe development practices, complicates the process. This contrasts with the engineering departments that try to work faster:

"It is in our culture to develop things properly, reliably, and safely. And because of that, it's against our nature to finish things quicker." (Market Director, SecureCo)

The complexity of these conflicting elements shows the tension between the product development timelines and the product-service development timelines. Understanding this paradox is therefore crucial.

Interpretation paradox

The interplay between the TTM for products and the TTM for product-services creates a paradox that organizations face during the servitization process. This paradox emerged in all three case companies, with LabTech being most closely linked to it.

The paradox arises from two seemingly conflicting demands during servitization. On one hand, there is a focus on a short TTM for products due to market demands. This demand emerged from the status quo, as it has always been the way of doing of these historically product-focused firms. On the other hand, developing product-services by adding in serviceable elements to products will lengthen the TTM. This demand emerged from the servitization strategy and causes a paradox to rise in the TTM between products and product-services. When this paradox was presented to the innovation consultant, an explanation from a financial-economical perspective followed.

This paradox emerges because parts of the organization wished a quick product launch, resulting in having to spend less time and resources. This reduces the risk of not reaching the break-even point of a product. Conversely, product-service developments involve higher investment and a longer TTM. In the long term, this often leads to a larger market share and the achievement of more value in terms of money and customer-satisfaction.

The paradox lies between strategic ambition and tactics of organizations. With that we mean that there seems to be an overarching strategic

ambition to servitize within the organizations. However, it appears that at the operational grounds, the execution of this strategy is not followed.

This paradox has significant implications for organizations. The tension between the TTM for products and the TTM for services leads to frustrations between departments. Engineering departments feel pressured to maintain the same product development speed due to market demands while also now having to consider the service-aspects for product-service integration. Additionally, service departments emphasize the need for thorough development practices to ensure long-term service quality and reliability within these engineering departments.

As a result, organizations struggle to balance immediate market competitiveness with long-term servitization goals. The inability to properly align the TTM for products and product-services prevents companies from effectively bundling services with products at the point of sale. This misalignment not only hinders short-term product sales but also affects the long-term development and delivery of services.

4.1.3 Separating service and product VS Integrating service and product

This section delves into the third identified paradox between the interplay of the separating service and product VS integrating service and product. It explains each element of the paradox and then moves on to interpret the paradoxical relationship of the elements.

Separating service and product

One of the observations that we made during the interviews was about a tension relating the organizational structure of product and service departments. During servitization, organizations shift from selling standardized products with add-on services to offering solutions with advanced services (Kothamäki et al., 2020). The way organizations try to do this, cause tensions internally. We found that there are interviewees that are in favour of integrating product and service departments to better servitize, and there are interviewees that in favour of separating product and service departments to better servitize.

The tension between these two seemingly opposing elements occurs at different companies

within our case-samples. For instance, SecureCo experienced this tension while developing their SaaS solution within their existing product organization. The introduction of the new SaaS solution led to the emergence of multiple 'camps' within the same product-team, as they now had to manage innovating and offering multiple solutions. A sales consultant from SecureCo described the situation:

"If you look at us in the past as a product organization, we ended up with a sort of two-camp scenario, fighting each other in the same market. (...) Initially, you can say that [SaaS-solution] caused some friction." (Sales Consultant, SecureCo)

This quote illustrates how multiple teams within the same department were competing with each other in the same market for the same customers. Another interviewee saw the same and found the integrated departments to be an inefficient approach:

"We currently have one sales team for [product X], [product Y], [SaaS solution]. People working in that team have the same customers because those customers can take multiple solutions. That is very inefficient." (Sales Consultant, SecureCo)

As a result, SecureCo decided to separate its SaaS development department from its product department to mitigate this inefficiency. We observed that this tension was not unique to SecureCo. BakeCo is also an example of a company that wished to separate service from products.

"It a deliberate choice to first develop service maturity in our business units. (...) We might split Service in a later phase, but we feel: The more advanced the service, the more need there is to split it as a separate business." (Managing Director Service, BakeCo)

We found that these findings highlight one side of the paradox concerning the integration VS separation of product and service departments. There is a desire to separate these departments originates from the need to reduce internal competition and inefficiencies. By separating departments, organizations try to ensure that each team can focus on their specific objectives without overlapping conflicts.

Integrating service and product

This brings us to the other side of the paradox. In the example of SecureCo in the previous section, interviewees told that the introduction of the SaaS-solution caused the organization to develop a

separate service department. In later stages of the interviews, we discovered that though the movement was made to separate service and products, SecureCo recently decided to make a movement back to integrating product and services.

"We are currently making a movement to go back. As we're now going to the market with three propositions, we need to be one SecureCo. So, we decided to integrate businesses once more." (Business Controller, SecureCo)

When we asked why they decided to change back, interviewees of SecureCo answered that this idea of integrating came as a result of wanting to provide solutions to customers instead of selling different types of products as they currently did.

"We are now trying to organise to market segments instead of different types of our products." (Business Controller, SecureCo)

This example shows that organizations are still struggling to choose the best option between separating and integrating product and service.

Another firm that aims to integrate product and service departments to mitigate tensions while servitizing is LabTech. Historically, LabTech has kept its product and service departments separate, even separating them into different business units. This setup led to customer confusion, as one interviewee described:

"In the past it really used to be a case that there were like 2 salespeople coming to 1 customer with these two offerings. One for the product and one for the service. That was really confusing for the customer" (Sr. Financial Controller, LabTech)

The confusion emerged as customers were presented with two different faces of the same organization. Consequently, LabTech is attempting to integrate its product and service departments in the sale of their value propositions. This issue was presented to the global service manager of LabTech. In response to how they could address this challenge, the following was explained:

"I am working with my commercial counterpart, the commercial VP, to start a project to resolve the tension between product and service. What you definitely want is to present one face and one story to the customer. It cannot be that the product commercial tells one thing, and the service representative tells something else. Because that, I think, is the most damaging situation," (Sr. Global Service Manager, LabTech)

To achieve this, one interviewee indicated that solutions should be offered instead of separately selling products and services. And as servitization is about offering solutions rather than selling products and services, the structure should also be integrated.

"I think it's very important for us to move towards that direction where the service and the product are tied together, and we no longer think of it in terms of product or service." (Sr. Digital Service Manager, LabTech)

We found that these findings highlight the other side of the paradox concerning the integration VS separation of product and service departments. While we previously found interviewees showing a desire to separate these departments originating from the need to reduce internal competition and inefficiencies. We also found that interviewees wish to integrate product and service departments. We even found that SecureCo has already tried both options by first separating and now integrating product and service departments. By integrating departments, organizations try to stimulate collaboration so solutions can better be offered towards customers.

Interpretation of paradox

There is a seeming choice that organizations need to make when deciding whether to integrate or to separate products and services when servitizing. This paradox emerged in all three case companies.

The paradox arises from a need to change the existing organizational structure to effectively transition towards servitization. We see that firms feel like they have two options to rightly structure their organization. On the one side, there is a need to integrate product and service department as servitization is about offering solutions. To offer solutions it is easier to offer product-service combinations when these departments are bundled. On the other side, there is a need to separate product and service departments. This is because when a firm wants to start with servitization, products and services need to be separated to be able to properly develop each portfolio to come to a point where you can offer product-service combinations. This tension between integrating and separating is a paradox as there is not one choice that is preferred over the other. When we spoke to the innovation experts, he explained there is no best choice, and it seems to be a timing issue.

That makes sense when we looked at the data. Each case companies had different starting points when

they decided to servitize, which caused different demands for how the organizational structure should change. For example, SecureCo did not have a service department and so their first move was to develop a separate service department. Later on, when they wanted to offer solutions, they moved back to an integrated product and service department. BakeCo already had a service department, and they chose to keep it this way until their service-portfolio becomes more advanced. LabTech also already had a service department, and they aim to integrate product and service departments.

This paradox has implications for organizations. The tension between integrating or separating product and services leads to frustrations among employees. Employees can feel a clash between their own colleagues as a result of having products and services integrated or feel that collaboration with other departments can be hard as the products and services are separated. We find that organizations struggle to find a synthesis that brings out the best of both worlds. The lack of finding a right balance between the conflicting demands leads to frustrations, especially among employees.

4.2 Coping-mechanisms by managers

By definition, paradoxes cannot be resolved, and companies must therefore cope with them. During our interviews we have asked interviewees about their vision on coping with the tensions that they earlier mentioned during these interviewees. Through the three-step coding we identified several themes about ways that managers tried to cope with tensions play during their transition in servitization.

4.2.1 Operational measures

One of the first ways managers tried to deal with tensions experienced during servitization was by taking measures at the operational level within the organization.

One of these measures was standardization. Standardization is a strategic approach aimed at achieving consistency within processes to improve service delivery and optimize costs (Goel et al., 2023). With standardization, managers tried to get rid of tensions relating innovation of product-services and achieving servitization ambitions with a lack of capabilities.

For example, BakeCo are working on expanding their service. They aim to do this by standardizing

processes to make their products better serviceable:

"But we need to find a way to standardize, uh, service process, maintenance process, the process that allows us to grow. If products are more serviceable, service itself will be more efficient." (Service Sales Manager, BakeCo)

Making products better serviceable is not just a way for BakeCo to reduce tensions around the TTM of product-services. LabTech is also a case company that likes to apply this coping-mechanism to better deal with tensions.

"I think the organization really needs to go right back to the design phase and, with servitization in mind, create the design of products to be suitable for services." (Financial Controller, LabTech)

In addition to these measures, an interviewee from BakeCo adds that they try to tackle tensions by making agreements on how priorities should be set.

"We must set strict terms to clarify how we wish to prioritize. We can clarify this by setting better clearer frames in which we work: From what order-size, what X-value, what time is it going to take for service." (Team Lead E&A Service, BakeCo)

By better prioritizing, BakeCo tries to increase efficiency by streamlining their decision-making process and through that eliminate friction between product and service, which arises from the separated setup of departments at BakeCo.

4.2.2 Management support

Another coping-mechanism mentioned by managers was seeking management support to help with the transition in servitization. Especially for LabTech, this was an important coping-mechanism. LabTech is a firm with multiple divisions across their organization. Therefore, not all divisions and business units are tied to the same servitization strategy leading to struggle within the organization to make progress in servitization.

The goal of receiving management support for interviewees is to reduce tensions between departments or business units, leading to a better transition in servitization. This was also mentioned by an interviewee of LabTech.

"We try to get management support. I've got a division president, which is an advocate of servitization. And together with his boss, they are setting certain measures to get everyone to go this way." (Senior Director Global Service, LabTech)

The above quote illustrates the importance of management support. By receiving support, departments and business units are pushed to move in certain directions. This helps to reduce tensions by aligning everyone's efforts.

Also, at BakeCo they feel that receiving management support is very important for further development in servitization. To get other departments to be involved in servitization, the ambition must be spread organization-wide, as explained by an interviewee.

"We must press to the management to tell the organization that we are very important. Show the organization what margin and profit we make here. Because product-sales will decrease, but services will stay steady." (Field Service Manager, BakeCo)

Obtaining management support can be challenging as revealed in an interview. From a business economics standpoint, management are only inclined to make investments when they have a clear picture of the expected outcome. This became evident from the interviews:

"We are really trying to bring these business cases on the table. So, with solid data showing the return on investment that can justify that these investments will pay off." (Financial Controller, LabTech)

Managers are trying to find ways to receive management support. With this management support, they aim to deal with the tensions they encounter during their ambition to servitize. This coping-mechanism is particularly used for the paradox of TTM for products versus TTM for product-service. This is because they seek management support to prioritize the development of product-service over products.

4.2.3 Change Management

Another coping-mechanism mentioned is change management. Change management is defined as a comprehensive set of tasks, measures, and activities aimed at implementing far-reaching organizational changes (Alrashidi, 2018).

Using change management as a coping-mechanism for tensions in servitization is not a new finding. The study by Chaudhary et al. (2022) previously discussed using change management for alignment of culture, creating new management structures to meet challenges, and implementing flexible working hours.

During our interviews, we identified several additional aspects of change management that may help in dealing with tensions during servitization.

For instance, at BakeCo, where they focus on the Pareto principle, also known as the 80-20 rule.

"If you want to engage in servitization, you must talk in terms of 80 and 20%. 80 is focused on daily operations and 20 on innovation. That 20% is divided into 15% evolution and 5% revolution." (Global IT Director, BakeCo)

As can be read, BakeCo uses the Pareto principle to bring more focus to their servitization ambition and thereby reduce tensions.

SecureCo, in terms of change management, focuses on rebuilding modular blocks to utilize innovations sustainably.

"During the investments that we currently make, we aim to structure it so [product Y] also has a use for it. We want to remove features of [Product X] and rebuild it in a modular way." (Business Controller, SecureCo)

With this modular approach, they aim to reduce tensions related to the TTM for product-services. Modular blocks in their product ensure better serviceability, allowing product-services to be developed more effectively.

Finally, LabTech also tries to use change management tools to reduce tensions, as noted in several interviews. For example, the ADKAR method is mentioned:

"One of the change management tools is called ADKAR. These are phases that when you want to make a change, you need to follow. That is a proper method." (Financial Controller, LabTech)

ADKAR is an acronym that stands for Awareness, Desire, Knowledge, Ability, and Reinforcement. It is a change management tool developed by Jeff Hiatt in 2006 and is used as a coaching instrument to help employees navigate change processes within organizations (Hiatt, 2006).

Change management tools, like ADKAR, are mentioned in our case-sample as a coping-mechanism to reduce tensions during servitization.

4.2.4 Strategy work and Communication

The fourth coping-mechanism to reduce tensions during servitization related to strategy work and communication. Many managers mentioned during the questions about coping-mechanisms that there needed to be an organization wide clear strategy and transparent communication with

everyone to reduce frictions during the organizational change caused by servitization.

A Senior Digital Service Manager at LabTech emphasized the importance of setting clear milestones by creating a communication plan. He stated that it is essential to communicate step-by-step how the transition will unfold.

"Set clear milestones in a communication plan about how you're going to move that business along. That is very important." (Sr. Digital Service Manager, LabTech)

In this communication plan, the interviewee was even more specific. Several aspects were mentioned that could help reduce tensions.

"Regular communication, transparency and openness about where you are and recognizing if you fail in a particular area. Be upfront about what lessons you have learned and how you're going to change that." (Sr. Digital Service Manager, LabTech)

Another interviewee from LabTech also mentioned communication as a tool to reduce tensions. Communication can be used to align everyone and ensure they are working towards the same goals.

"I was participating in a global commercial meeting and that was about winning together. It is a nice marketing phrase, but it is the truth." (Service Sales Manager, LabTech)

This coping-mechanism was also previously mentioned by an interviewee from BakeCo, who wanted their management to communicate about the service department to align everyone and ensure they are all working towards the same goals.

4.2.5 Cross-Industry Learning

The final coping-mechanism mentioned for reducing tensions during servitization was cross-industry learning. This involves firms learning from businesses in other industries that are moving in similar directions or have done so in the past. The essence of this approach is that a company does not have to figure everything out on its own. Specifically, the lack of knowledge and experience, which was previously identified as one of the tensions in servitization in this research, can be mitigated by learning from other industries.

BakeCo is a big proponent of learning from other industries. For example, they look at how the aviation sector handles IT-related service developments.

"We need to look at other industries. Like looking at the aviation industry. For example, they increased the sharing of data by anonymising information or development of data-diodes." (Global IT-Director, BakeCo)

We also found that BakeCo learns from other industries by hiring personnel with experience in servitization from different sectors. For example, they hired a service sales manager with experience in the elevator industry to help them develop their service-portfolio.

SecureCo also tries to learn from other industries. They have the advantage of being able to look within their own organization. SecureCo's organization consists of various divisions that focus on different markets with different products. For instance, in developing their SaaS solution, they were able to gain insights by learning from another division.

"[Another division] is a division that started with a SaaS-proposition, so they have a big knowledge lead which we are eager to use to improve our knowledge and experience. This way we have less to figure out on our own." (Business Controller, SecureCo)

Cross-industry learning reduces tensions that arise during servitization. Specifically, the lack of capabilities can be mitigated by leveraging existing experiences from other industries.

4.3 Adapting coping-mechanisms to evolving paradoxical tensions

In this sub-chapter we present the findings of evaluating the practical outcomes of the coping-mechanisms that have been used by managers to cope with the identified paradoxes during this study. Next to that, this sub-chapter is used to present additional findings by an in-depth interview with assistance of a service-consultant, experienced in servitization strategies to interview an innovation-consultant, expert in paradoxes and writer of the book "Innovation Paradoxes" (Klokgieters, 2020). Through discussing servitization, paradoxes and coping-mechanisms, we gathered relevant information that answer the last sub-question in this study: *"How firms can adapt coping-mechanisms to evolving paradoxical tensions."*

This sub-chapter has been divided into the practical evaluation of the coping-mechanisms employed by managers and the three paradoxes to present our additional findings to adapt coping-mechanisms to evolving paradoxical tensions.

This sub-chapter has been divided into a section containing the practical evaluation of the coping-mechanisms employed by managers and a section to present our additional findings of how managers can adapt coping-mechanisms to evolving paradoxical tensions.

4.3.1 Practical evaluation of coping-mechanisms by managers

When evaluating how managers made sense of servitization tensions, several key conclusions emerged. One of the main findings was that managers often do not perceive these tensions as paradoxes. Instead, they tend to view them as standalone problems or dilemmas, which influences their approach to managing these tensions.

When tensions are seen as problems, managers typically seek specific solutions to address them as we already found in literature (Nickles, 1981). For instance, in our interviews, when asked about the main tensions encountered during the servitization process, many interviewees described various issues such as staff constraints or inter-departmental conflicts. These responses led to discussions focused on finding immediate solutions to these issues, rather than exploring ways to cope with the underlying tensions. An example of this is the strategy of improving efficiency through standardization. While this may temporarily address a lack of capabilities, it might not serve as a sustainable coping mechanism. As the service offering grows, the organization is likely to face the same capability issues again.

Similarly, when tensions are perceived as dilemmas, such as the TTM paradox between products and product-services, managers tend to approach them as situations requiring a choice between two distinct options (Smith, 2014). At LabTech, for example, different interviewees viewed this tension as a dilemma, where they felt that the R&D department had to choose either to focus on product-only development for a quicker launch or on product-service development, which would take longer. In response, coping mechanisms were often framed as the service department seeking higher management support to decide on whether to prioritize one option over the other, rather than finding a way to manage the tension between the two.

4.3.2 Adapting coping-mechanisms to evolving paradoxical tensions

For each paradox, we observed that servitization tensions showed familiarity with the field of

innovation. This makes sense as servitization is for a large portion about innovating in the form of service-innovation and moving from selling products with supplementary services to offering solutions with advanced services (Kothamäki et al., 2019). Therefore, we decided to conduct an additional in-depth interview with assistance of a service-consultant, experienced in servitization strategies to interview an innovation-consultant, expert in paradoxes and writer of the book "Innovation Paradoxes" (Klokgieters, 2020).

Through discussing servitization, paradoxes and coping-mechanisms, we gathered relevant information that answer the last sub-question. In our interview we presented all identified paradoxes and engaged discussion to view how managers can better adapt coping-mechanisms to evolving paradoxical tensions.

Finding the origin of paradoxical tensions

To adapt coping-mechanisms the first step lies in understanding that organizations must recognise and acknowledge paradoxical tensions.

"It is art to identify different paradoxes and to recognise and acknowledge the different perspectives of paradoxes" (Innovation-Expert).

As we mentioned in the previous section, managers are not likely to see tensions as paradoxes, but rather see them like problems or dilemmas. This leads to different approaches that managers try to deal with this. When we presented this finding to the innovation expert, we came into a discussion about how paradoxes often occur.

The example that was used was the paradox of servitization ambition versus lack of capabilities. We were told that tensions in organizations often occur due to a misalignment between two dimensions at organizations. To give a little context, the expert referred to a model by Klokgieters (2014) which shows four types of dimensions at organizations: innovation context, innovation strategy, innovation operating model, and innovation execution. The innovation context involves gaining an overview of relevant trends and developments to see how possible scenarios may influence the playing field. The innovation strategy relates to the deliberate choice of where, how, and when to enter the playing field. It is the rationale for how the enterprise creates, delivers, and appropriates value (Klokgieters, 2020). The innovation operating model is the way that an organization organizes its assets and capabilities to provide new value propositions. Lastly, the

innovation execution relates to the implementation of detailed choices based on the guidelines of the operating model (Klokgieters, 2020).

The tension between servitization ambition and lack of capabilities suggest a misalignment between the dimension of strategy and tactics, according to the interviewee. Tactics is the combination of operating model and execution dimension. The expert told that servitization ambition is an aspect that part of the strategic dimension, while having a lack of capabilities is part of at the tactical dimensions of organizations. The expert told that from his experience, the misalignment often originates from a lack of understanding the implications of strategy.

"The development of making strategic choices and the experience of tensions has a lot to do with language. Most people do not understand the implications of strategic choices." (Innovation-Expert)

This means that the way strategy is translated into an operating model and execution is not properly thought out or performed, resulting in friction. This misalignment between strategy and tactics was also identified in the paradox of TTM for products versus TTM for product-services. The innovation-expert stated that this paradox lies between the short-term versus long-term perspective on innovation which was earlier discussed in subchapter 4.1.2. At our case-companies, these perspectives clash and led to frictions between R&D departments and service departments. The servitization strategy is for all case-companies clear, but at the tactical dimension different executions are being followed.

Recognizing and acknowledging paradoxes is key for organizations to adapt their coping mechanisms effectively. By understanding the root causes of tensions, organizations can develop better approaches that address both short-term and long-term goals. This understanding helps managers move further than just solving problems or choosing between option A or B, allowing them to find ways to balance conflicting demands.

Finding Syntheses

This brings us to the next step. Finding synthesis between the seemingly conflicting demands. The way that organizations can adapt coping-mechanisms to deal with servitization paradoxes falls down to two options: finding a synthesis between two demanding conflicts, like for example strategy and tactics, or polarizing these demands.

“The choice to cope comes down to two choices: Synthesis or polarisation. Most often, synthesis is the best choice, though not always. But building a bridge between these demands is extra strong.” (Innovation-Expert)

In our interview, it came forward that in order to cope with paradoxes, it is preferred to find a synthesis between two seemingly conflicting demands. This is because taking the best out of both worlds, often leads to both parties being satisfied.

We take for example the TTM-paradox between products and product-services. As explained, the innovation-expert implied that this paradox emerged due to a misalignment between strategy and tactics. The servitization strategy is for all case-companies clear, but at the tactical dimension, different executions are being followed, leading to tensions within the organization. The advice by the innovation-expert was therefore again to find a synthesis by aligning strategy and tactics. During the interview it became clear that there were two main ways to find a synthesis.

The first one relates to the discussion whether to invest or not invest in product-services. It was suggested that organizations should facilitate discussions by using tools *“like the S-curve” (Innovation Expert)* to address risks and investments to gain expectations on the short- and long-term gains for each option and the implication of strategic choices for the organization and implementation. Secondly, after aligning strategy and tactics, there lies more advice in the interview relating to the development of products and services. Not all services need to be developed in parallel of the product, which means that a discussion could be facilitated to make deliberate decisions where and when to launch a product and service. This can enable quick launches for products and develop certain add-on services for a later moment.

4.4 Interpretation of findings

After investigating paradoxical tensions that KIBs face during the servitization innovation process, it is important to interpret these findings together. This study can be divided into three interconnected areas: the three paradoxical tensions firms face during servitization, the five coping-mechanisms that managers use to tackle these tensions, and the two approaches that help better adapt coping mechanisms to these paradoxical tensions.

First of all, we identified three paradoxical tensions that emerge due to two seemingly conflicting demands. Servitization ambition versus lack of capabilities, TTM for products versus TTM for product-services, and separating versus integrating product and services. We found that the servitization ambition and TTM paradox both originate from a misalignment between strategy and tactics. The separation versus integration paradox originates from the challenge of structuring the organization to most effectively supporting servitization.

Secondly, we found that managers try to cope with these paradoxical tensions in five different ways. Efficiency measures, management support, change management, cross-industry learning, and strategy work & communication. We found that managers often do not perceive these tensions as paradoxes. Instead, they tend to view them as standalone problems or dilemmas, which influences their approach to managing these tensions.

This finding led us to conducting an additional in-depth interview with an innovation-consultant, expert in paradoxes and writer of the book *“Innovation Paradoxes” (Klokgieters, 2020)*. There, we discovered two key approaches that firms can use to more effectively adapt coping mechanisms to servitization paradoxes.

Firstly, firms can effectively adapt coping-mechanisms to servitization paradoxes by first recognizing and acknowledging the underlying tensions, such as between strategy and tactics. By understanding the root causes of these tensions, organizations can develop better approaches that address both short-term and long-term goals. Next, firms can adapt coping-mechanisms by either finding a synthesis or polarizing the demands. The preferred method is often to find a synthesis between the seemingly conflicting demands, like aligning strategy with tactical execution.

The interpretation of these findings has been integrated into the theoretical framework presented in Chapter Two (the theory chapter). This framework has been enhanced by adding the identified paradoxical tensions and coping mechanisms discovered in this study. Additionally, a new section has been included to the framework to explain how the two identified approaches can assist in better adapting coping mechanisms to effectively manage paradoxical tensions. This framework is illustrated in Figure III.

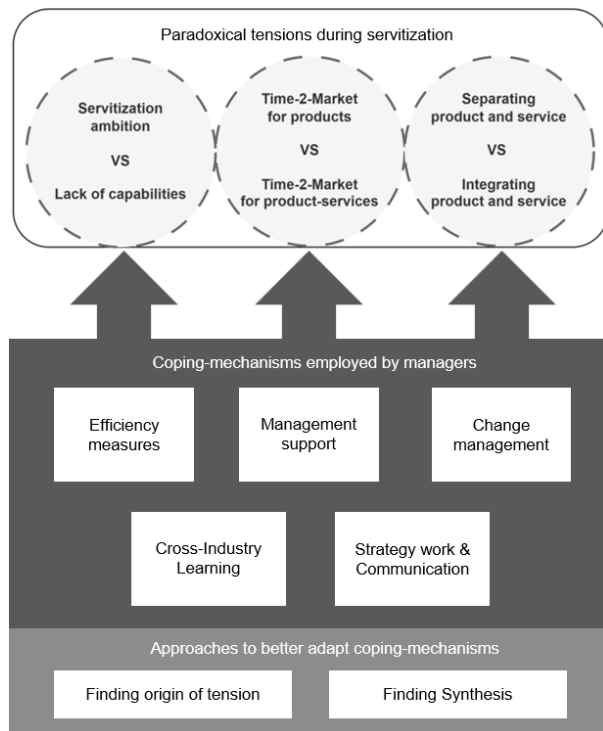


Figure III Enhanced framework presenting the identified paradoxical tensions, coping-mechanisms and adaptation-approaches.

IV. Discussion

The findings of this study explore the complexities of managing servitization tensions by investigating paradoxical tensions that KIBs face during the servitization innovation process. In this study, we explored managerial perceptions of these tensions and coping-mechanisms. This paper aims to answer the following question: “How do managers of Knowledge Intensive Businesses cope with paradoxical tensions while servitizing?” Based on our findings, we found three paradoxical tensions at the case-companies, being: 1) Servitization ambition versus lack of capabilities; 2) TTM for products versus TTM for product-services; and 3) Separating versus integrating product and service. We found that the servitization ambition and TTM paradox both originate from a misalignment between strategy and tactics. The separation versus integration paradox originates from the challenge of structuring the organization to most effectively supporting servitization.

We found that managers try to cope with these tensions in five different ways. Each coping-mechanism is used for either one or more paradoxes. First of all, managers try to adapt operational measures, like standardization and making agreements what and how to prioritize conflicting demands. We found that this coping-

mechanism was employed to help with the servitization ambition paradox by becoming more efficient with the available capabilities. Also, by prioritizing conflicting demands managers tried to streamline their decision-making which reduced the friction felt due to the separating versus integrating paradox.

Secondly, managers seek management support to help the transition in servitization. By gaining management support, managers aimed to reduce tensions with other departments and business units that perform different strategy executions. We found that this coping-mechanism was used to cope with the separating vs integrating paradox and the TTM-paradox.

Thirdly, change management was found to be a coping-mechanism used by managers. We identified that managers use several change management tools to deal with tensions during servitization. The main tools used were the Pareto-principle to better divide assets and resources for daily operations and servitization innovation, focussing on modular development to innovate more sustainable and the ADKAR-method was used to help employees navigate during change processes within organizations (Hiatt, 2006). We identified that this coping-mechanism was mainly used to cope with servitization ambition paradox and TTM-paradox.

The fourth coping-mechanism used by managers was working on developing clearer organization-wide strategies and improving communication. This coping-mechanism was used to reduce clashed among departments by aligning everyone to work towards the same goals. Therefore, this coping-mechanism was mainly used for the separating vs integrating paradox.

At last, cross-industry learning was mentioned as a coping-mechanism used by managers. Cross industry learning improves the servitization capabilities of firms, which lead to less tensions. Therefore, this coping-mechanism was solely used to reduce servitization ambition paradox.

Additionally, we discovered two key approaches that firms can use to more effectively adapt coping mechanisms to servitization paradoxes. The first approach is for firms to identify the root causes of tensions, as these are often paradoxical in nature rather than simply tensions by looking at them as problems or dilemmas. By understanding these root causes, organizations can develop better coping mechanisms that address both short- and long-term goals.

The second approach involves adapting coping mechanisms by either finding a synthesis or polarizing the demands. While firms can choose to polarize, the preferred method is often to find a synthesis between the seemingly conflicting demands, such as aligning strategy with tactical execution. By combining these two approaches organizations can develop more effective coping mechanisms that contribute to reaching servitization goals.

The findings of this study show that our case-companies struggle with tensions during servitization. This is in line with our expectations that was set during the literature review. We found it was moderately easy to discuss what tensions occurred during servitization, though it was much harder to identify paradoxical tensions during these interviews. We found that managers often see and explain tensions as problems or dilemmas and not often identify them in a complex form as a paradox. This was an unexpected finding and had an effect on the coping-mechanisms that were employed on these tensions by managers.

As we know, tensions can be approached as either a problem, dilemma, dialectic or paradox. Problems require immediate solutions (Nickles, 1981) and dilemmas require an “either-or” decision (Smith, 2014). This was seen back in the findings. Sometimes temporary solutions like improving efficiency through standardization were mentioned or letting management deciding on either product or product-service innovation were mentioned.

Next to these unexpected findings, we saw some overlap with existing coping-mechanism literature on servitization and our findings. For example, change management was identified as a coping-mechanism in our study. This was also found by Chaudhary et al. (2022) in their study on servitization paradoxes.

5.1. Theoretical implications

In today's world servitization is seen as a global trend to stay competitive in the current business environment (Fang, Palmatier & Steenkamp, 2008). However, as firms progress in servitization, they often encounter tensions (Kothamäki et al., 2020; Chaudhary et al., 2022). Research suggests that managers often fail to understand the implications of tensions at organizational levels (Dmitrijeva et al., 2022) and lack managerial practices needed to cope with tensions across different levels (Raja et al., 2022). Therefore, there is still an unexplored gap on tensions and coping-

mechanisms inherent in the servitization transformation among manufactures (Kothamäki et al., 2020). In there, our findings have multiple implications for the servitization literature.

Firstly, this study adds to the literature on servitization paradoxes (e.g. Chaudhary et al., 2022; Kothamäki et al., 2020) by proposing three paradoxes that emerge during servitization which expands the range of paradoxical tensions that research can draw on to theorise upon the competing demands servitization creates within organizations. We identified two novel paradoxical tensions. First one being the servitization ambition versus lack of capabilities paradox which builds new theory on servitization paradox literature, as it shows that there is a continuing conflict between wanting to servitize but not knowing how to or being able to servitize due to lacking capabilities. The identification of this paradox shows implies a need to find the right balance to set an ambition and to find ways to gradually develop towards that ambition.

Moreover, the paradox of TTM for products versus TTM for product-services also builds new theory to servitization paradox literature. This paradox shows that there is a continuing conflict between the seeming demands of quickly developing new products and slowly developing new product-service combinations. Identifying this paradox is important, because it challenges traditional assumptions that a faster TTM is always preferable. Instead, it suggests that the pace of innovation should be carefully balanced to optimize both product and service.

At last, we found that one of our identified paradoxes partly overlap with existing literature as we also identified a paradoxical tension between integrating and separating product and service during servitization. This overlaps with the work by Kothamäki et al. (2020). We contribute to this study by strengthening the validity of this tension in different contexts.

Secondly, our study contributes to the study of Raja et al. (2022) by adding literature on managerial practices on servitization tensions on different levels. We contribute by uncovering insights into managing the complexities inherent in the servitization transition, thereby aiding in better decision-making and strategic planning. By identifying four novel coping-mechanisms and one existing coping-mechanism, these findings both build new theory and validate existing literature for servitization literature. Moreover, these

findings fill a gap in literature on coping-mechanisms for tensions inherent in servitization transformations among manufacturers (Kothamäki et al., 2020).

Our third contribution is to literature on managerial perceptions on servitization tensions. Research by Dmitrijeva et al. (2022) suggests that managers often fail to understand the implications of tensions at organizational levels. We contribute to this literature by uncovering why managers often fail to understand the implications of these servitization tensions. Managers often perceive tensions as either problems or dilemmas, rather than perceiving them as paradoxes. This leads to failing to understand the implications of these tensions.

By uncovering that managers often lack to perceive tensions as paradoxes, we make our last contribution to servitization coping-literature (e.g. Chaudhary et al., 2022; Kothamäki et al., 2020) by revealing two approaches that managers can use to better adapt coping-mechanisms to deal with servitization tensions. Although they are not actual coping-mechanisms, these insights have proven themselves to be successful approaches in the innovation field to better adapt coping-mechanisms. By revealing these approaches, the study contributes by adding two novel approaches into effective management of servitization tensions for managers that aim to achieve strong performance outcomes from their servitizing efforts.

5.2. Managerial Implications

Our findings have multiple managerial implications for organizations transitioning towards servitization. Firstly, our findings empathize that when managers implement a servitization strategy, there are several paradoxical tensions that organizations may encounter when trying to servitize. As paradoxes in servitization persist, this study suggests that managers should look for sustainable coping-mechanisms rather than finding short-term solutions or searching for 'either-or' solutions. Identifying and coping with paradoxes is vital to successfully transition towards servitization.

Secondly, our findings identify five coping-mechanisms that managers from our case-companies use to tackle tensions during servitization. These coping-mechanisms are implementing operational measures, seeking management support, applying change management techniques, developing clearer

strategies and communication plans and making use of cross-industry learning. The identified practices provide valuable insights into how others have dealt with similar tensions during servitization and further encourages cross-industry learning on servitization tensions. Although these identified coping-mechanisms will not necessarily fit in all contexts, they do provide insights for organizations that are considering how to cope with these or similar paradoxical tensions. Therefore, this study provides comfort for managers seeking to balance the pressures of tensions emerging from the paradoxes.

Lastly, our final managerial implication is the identification of two approaches that managers can use to better adapt coping mechanisms for handling servitization tensions. These approaches, which have been successful in the field of innovation, also show promise in the context of servitization due to the significant overlap between these two areas. By applying these approaches, managers can gain valuable insights into how to more effectively manage servitization tensions, ultimately improving their ability to achieve strong performance outcomes from their servitization efforts.

5.3. Limitations and Future Research

This study explores the complexities of managing servitization tensions by investigating paradoxical tensions that KIBs face during the servitization innovation process. While this research aims to uncover valuable insights into this topic, it is important to acknowledge potential limitations that could impact the results and present opportunities for further research.

Firstly, generalizability is one of the main limitations for case studies. As this research is focused on three different case-companies from three different industries, the findings of this multi-case study can only be applied to a certain extent within similar organizations and industries. Therefore, future research could investigate paradoxical tensions during servitization and coping-mechanisms in other contexts.

Secondly, the exploratory research design limited the formulation of specific and focused interview questions before engaging with the case study. This limitation affects the strength of our conclusions, which will need validation through a deductive research design. For example, future research could assess validation in different contexts.

Thirdly, this study was performed at KIBs, which differ from traditional servitization studies which focus on manufacturing firms (e.g. Kothamäki et al., 2020; Dmitrijeva et al., 2022). Therefore, the focus on KIBs could limit the applicability of the findings to traditional manufacturing firms. KIBs rely heavily on knowledge and client interaction (Muller & Zenker, 2001), leading to different servitization challenges compared to manufacturing firms, where physical products and production processes are central.

Finally, this study identified two approaches that managers can use to better adapt coping mechanisms for handling servitization tensions. While these approaches have proven successful in the field of innovation, they have not yet been validated in a servitization context. As a result, their applicability to servitization remains uncertain and requires further investigation. Future research should explore real-world examples within servitization to better validate and refine these approaches.

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Appendix A

Interview guide - EN

My name is Jean Paul van de Kamp, and I am studying at the University of Twente in Enschede. I am pursuing an MSc in Business Administration with a focus on strategic marketing and servitization. My research is about coping with tensions within servitization. By servitization, I mean organizations that are transitioning from standard products with add-ons to bundled personalized products with advanced services. During this process, companies encounter various tensions.

I believe it is very insightful to understand the tensions faced by organizations that are moving towards servitization. Ultimately, the goal is to develop different perspectives on how to manage these tensions, so that organizations can learn from each other and make better decisions regarding servitization.

“How do managers of knowledge-intensive businesses cope with paradoxical tensions during servitization?”

The aim of this interview is to gain your perspective on how [company] is engaged with servitization, the tensions you experience while servitizing, and how you think [company] can best handle these tensions.

Confidentiality

I want to emphasize that the information shared during our interviews will be treated with strict confidentiality. Your privacy is important, and all individual responses will be anonymized. No personally identifiable information will be disclosed in any form of publication resulting from this research. It will remain between you, me, and the evaluating examiners at the University of Twente. If you have any questions or concerns about confidentiality or the research process, please do not hesitate to contact me at: jeanpaulvandekamp@outlook.com.

A.1. Introduction

1. Could you briefly tell me about your position within [company]?
 - a. Job title, role, what do you do within [company]?
 - b. How long have you been doing this?

A.2. Servitization

Servitization is a phenomenon where companies move away from selling standard products and additional services and focus on selling integrated products with advanced services (Kothamäki et al., 2020).

2. Are you familiar with the term servitization?
 - a. How do you perceive servitization?
 - b. How does servitization relate to [company]?

3. Do you recognize that [company] is engaged in servitization?
 - a. What are you doing in terms of servitization?
 - i. Past: What steps have you already taken?
 - ii. Present & Future: What steps are you currently taking and what steps do you plan to take?
 - b. How does servitization fit into this?

4. What is the difference between how you are doing it now and how you want to do it?
 - a. What is your role in these steps?

5. What is, in your view, the difference between selling standard products with additional services and personalized products with advanced services?

A.3. Tensions

6. Is it difficult to become more service-focused?
 - a. In parts of the company?
 - b. What makes it difficult?
 - c. Internally or externally?

7. What is challenging about selling your products and services as a combined offering?

8. Do you find servitization difficult?
 - a. What do you find difficult about it?
 - b. Why do you find this difficult?
 - c. Where do you experience tension within the company?

9. What do you find challenging about selling products and services at [company]?
 - a. Why is this challenging?

10. What do you encounter most within your department during servitization?
 - a. Why is this a tension for you?
 - b. Do you find this frustrating?

11. [Contact person] / [another interviewee] also mentioned several tensions they believe exist within [company]. For example, [tension X], do you recognize this as a tension in servitization?
 - a. Why do you recognize it?
 - b. Is this a relevant problem for you?

A.4. Coping-mechanisms

12. What have you learned from being involved in servitization?

13. Earlier in this interview, you mentioned several tensions. [Repeat tension X], how could [company] deal with this tension?
 - a. Why do you think this solution could help?
 - b. How should [company] implement this solution?
 - c. What impact will your solution have on [company]?

14. Repeat question 13 with the remaining mentioned tensions.

A.5. Conclusion

15. Have I forgotten to ask you any questions?

16. Do you have any questions?