THESIS FOR THE DEGREE OF LICENTIATE OF PHILOSOPHY

Exploring the Role of Customer Participation in Service Development

A study of energy services in Sweden

KAROLINA DRAKE AF HAGELSRUM

Department of Technology Management and Economics

CHALMERS UNIVERSITY OF TECHNOLOGY

Gothenburg, Sweden 2026

Exploring the Role of Customer Participation in Service Development
A study of energy services in Sweden
KAROLINA DRAKE AF HAGELSRUM

Acknowledgements, dedications, and similar personal statements in this thesis reflect the author's own views.

Department of Technology Management and Economics
Chalmers University of Technology
SE-412 96 Gothenburg
Sweden
Telephone + 46 (0)31-772 1000

Cover:
[The illustration symbolizes the abstract roles of customers and providers. Art by Birgitta Drake af Hagelsrum]

Printed by Chalmers digitaltryck
Gothenburg, Sweden 2026

Exploring the Role of Customer Participation in Service Development
A study of energy services in Sweden

KAROLINA DRAKE AF HAGELSRUM
Department of Technology Management and Economics
Chalmers University of Technology

ABSTRACT

This thesis examines the role of customer participation in service development and the implications for management within the empirical context of the Swedish energy sector. As services expand and firms pursue servitization and digital innovation, customer participation becomes central yet challenging to manage. Recent studies have shown that excessive or misaligned customer participation may have negative consequences such as reduced efficiency. Service-dominant logic provides a useful perspective for studying participation, as it frames customers as active co-creators of value in use rather than treating them as passive recipients. Despite growing interest in customer co-creation and the possibilities of advancing service innovation and development through new technology, there is limited empirical evidence of how to balance participation across basic and advanced service offerings. There is a need to examine how co-creation strategies such as technology-enabled participation influence service innovation, and development outcomes, particularly in the energy sector. For energy companies, there is a need to improve energy efficiency and societal value while maintaining a profitable business model, a challenge which requires further research. As the sector faces growing complexity, volatile energy prices, rapid technological change, and climate change, interest in energy services has increased among both customers and providers. In addition, by focusing on a traditional service industry, the study generates contextual insights into participation and service development, a topic which remains underexplored.

This licentiate thesis adopts a qualitative approach to explore customer participation in service development. Based on the Swedish energy industry, empirical findings demonstrate how customer participation across various service types differ and how they shape service advancement and service designs. The results offer insight into how to manage different trade-offs between competing factors concerning participation and service advancement. This can be particularly useful for understanding how firms in traditional service industries can balance efficiency and effectiveness for various actors through improved and balanced service designs. This thesis integrates research in customer participation with studies of servitization and service modularity to bring forward new, multidisciplinary perspectives to address challenges and identify opportunities for service development and management. The results highlight the need for increased theoretical and practical understanding of the role of customer participation and the implications for service development and management.

Keywords: Service development, customer participation, servitization, service modularity, energy services

LIST OF APPENDED PAPERS

Paper I
Onufrey, K., Drake af Hagelsrum, K., Persson, M., Olilla, S. (2025). *Who is doing what? Exploring customer participation across service types*. Developed into a manuscript for journal submission.

Personal contribution: Main responsibility for data analysis and writing of the method section, part of the conceptualization, and writing of the paper.

Paper II
Drake af Hagelsrum, K., Onufrey, K., & Persson, M. (2025). *Customer co-creation strategies and implications for service development: Opportunities and challenges in advancing energy services*. Developed into a manuscript for journal submission. An earlier version of the paper was peer-reviewed and presented as a working paper at the European Operations Management Association (EurOMA) Conference, June 29 - July 3, 2024, Barcelona, Spain.

Personal contribution: Main author, main responsibility for data collection, analysis, conceptualization, and writing of the paper.

Paper III
Drake af Hagelsrum, K., Hsuan, J., Persson, M. (2025). *Conceptualizing standardization and customization in services.* Accepted conference paper in the proceedings of the European Operations Management Association (EurOMA) Conference, June 13 - 18, 2025, Milan, Italy.

Personal contribution: Main author, main responsibility for data collection, analysis, conceptualization, and writing of the paper.

ACKNOWLEDGEMENTS

First and foremost, I am grateful for the opportunity to be here, for the path that led me into research, and for the many people who, in different ways, made this journey possible.

Dear supervisors, I truly hope you understand how thankful I am for your guidance, encouragement, and patience throughout this process. Magnus, your patience is astonishing, your guidance is crucial and I think we make a good team. Thank you for letting me explore and grow as a researcher. Ksenia, you impress me both academically and personally. Your confidence is highly contagious. To my examiner Susanne, you are truly an inspiring person. Thank you for being part of my PhD journey. I am thankful to be a part of our supportive and creative research group and proud of the value we jointly co-create through our active participation. Thank you for giving me the chance to become a PhD student, for supporting me in the pursuit of an academic career and guiding me with care and consideration. I would also like to thank my co-author Juliana Hsuan for their her, insightful feedback, and collaboration. Your support goes beyond research.

Dear colleagues, solidarity. First, I want to thank all the colleagues I have met in recent years, both at Chalmers and elsewhere. I am truly grateful for the inspiration and motivation I have received. Seeing academics stay connected decades after they first met makes me feel very lucky to be part of this community. Second, I would like to thank my colleagues at the Innovation and R&D Management (IRDM) division. You are all kind, creative, intelligent, and fun to be around. Being part of this environment has been stimulating and rewarding, both professionally and personally. I am especially grateful for the friends I have met along the way, including Constantin, Nils, Lisa, Amanda, Daniel, David, Sofie, Christoffer, Dominika, Juan-Pablo, Linus, Stina, and many, many others.

Dear family and friends, I am deeply grateful for your unconditional love and constant support. I especially want to thank my father, Olof, for encouraging me to apply for this position, for driving me to the interview, and for even crossing countries to support me at conferences. Thank you for being the first person to explain energy services to me. I want to thank my family, including my mother Sofie, my sister Daniela, my brother Elias as well as Torgny, Eva, Andreas and many more. I especially want to thank my grandmother Gittan Drake af Hagelsrum for providing me with just the right the cover art. I also want to thank my friends Evelina, Alex, Cajsa, and Theo. You have always celebrated my successes, I am very grateful for your unwavering patience, encouragement, and reassurance, it means more than words can express. I would not be here without you.

Karolina Drake af Hagelsrum
Gothenburg, March 2026

TABLE OF CONTENTS

1. INTRODUCTION

This thesis aims to deepen the understanding of customer participation in service development and examines the implications for management in the context of energy services. The market for services is continuously expanding, making services ever more dominant as they represent a considerable part of the world economy. Service innovation and development of new or improved offerings benefiting customers involves increased provider performance but does not guarantee success (Storey et al., 2016). Service management is becoming essential due to the increasing importance of the service sector in many economies worldwide and the servitization of products (Andersen & Bering, 2022; Rabetino et al., 2017; Sklyar et al., 2025). A growing trend is for organizations to increasingly rely on customer participation in the value creation process (i.e., co-creation), which invokes both costs and benefits (Gligor & Maloni, 2021; Heidenreich et al., 2024; Sampson & Chase, 2022; Wilson et al., 2016). How to balance customer co-creation, also referred to as active customer participation, is a critical strategic decision for companies. Excessive customer participation can increase costs and inefficiency, whereas too little involvement may limit customization and value creation potential (Sampson & Chase, 2022).

Service-dominant logic (SDL), introduced by Vargo and Lusch (2004), provides a useful theoretical perspective for examining customer participation in service development, as it assumes that value is co-created in use, which challenges the traditional view of customers as passive recipients. From this perspective, customers are seen as active participants in service development. This assumption strengthens the argument for studying customer participation, as opportunities to create value increase while extending boundaries of operations. Organizations increasingly recognize customers as active collaborators in the business system, positioning participation or co-creation efforts as the next frontier in competitive strategy (Oertzen et al., 2018). Much of the existing literature assumes a simple linear relationship between value co-creation and performance, suggesting that more co-creation always leads to better outcomes. However, recent studies suggest that the optimal level of co-creation depends on individual customer characteristics such as the willingness to co-create, highlighting the need for service providers to adapt service design to meet customer requirements (Heidenreich et al., 2024). A growing body of research indicates that increased customer participation might lead to higher customer value, up to a certain maximum. Beyond that point, co-destruction of value might occur instead (Wu et al., 2022). Although customer participation can have negative consequences, existing literature provides limited empirical evidence on the appropriate level of co-creation required to create value (Gligor & Maloni, 2021).

In the past decades, technological advancements and digitalization have fundamentally changed service development and the ways customers can participate in value creation (Heidenreich et al., 2024). This introduces vast opportunities and complex challenges for service management, making technologically enabled co-creation strategies an important area for new research (Grewal, et al., 2025). Innovations in digital services are continuously and profoundly transforming the ways actors interact, access information, and conduct transactions. Such innovations often rely on business models that depend on continuous use, making active

customer participation even more critical (Heidenreich, et al., 2024). Increasingly, service activities have shifted to customers, particularly through digital technology (Heidenreich et al., 2024; Nie & Kosaka, 2016; Sampson & Chase, 2022), raising the question of when this approach is effective. Adapting service offerings to customer needs is a well-established approach (Bitner et al., 1997; Gligor & Maloni, 2021). However, better understanding is needed to determine how service activities should be appropriately divided between customers and service providers to better support successful service outcomes (Sampson & Chase, 2022). Although nearly all digital services require some degree of customer co-creation, service providers can shape the extent to which customers are involved in creating the service outcome (Heidenreich, et al., 2024). This shift expands the scope of co-creation and requires managers to balance strategic and operational challenges when determining how to engage various actors in technology-enabled participation that create value for all involved actors.

To better understand the rising importance of services and the role of customers in the service production process, a growing body of research has adopted SDL to analyze customer participation in the value co-creation process for both products and services (Gligor & Maloni, 2021). This thesis applies SDL to reveal complexities with servitization and integrated smart products. Servitization, i.e., business model innovation, integrates services and products into market offerings to increase value, address evolving customer needs, and strengthen competitive advantage (Andersen & Bering., 2022; Sklyar et al., 2025). Services are commonly categorized as basic or advanced, often linearly reflecting varying levels of value creation and customer effort (Sousa & da Silveira, 2016). Drawing on servitization literature, this study explores the complexity of customer participation across basic and advanced services, as the organization of participation in service advancement remains unclear, particularly in different sector contexts. Advancing offerings through servitization has gained relevance across many industries, including energy, and has become increasingly enabled through digital technologies (Kamalaldin, 2020). Technological advancements in cloud computing, IoT, AI and smart products (with servitization trends) have transformed markets and hierarchical relationships, introducing new layers of complexity and implications for traditional sectors to create and capture economic value (Appio et al, 2021). Digital technologies and rising complexity are reshaping how firms organize and develop products, services, and processes, demanding further research on their implications in innovation management (Grewal et al., 2025). Despite growing interest, “studies of modularization in the servitization context remain scant" (Rajala et al., 2019, p. 634). Thus, there is a need for more research on how modularity can be leveraged to manage complexity in service systems, diverse customer needs, and service processes involving customers. Service modularity provides a framework for managing integrated offerings without sacrificing standardization benefits, which can address challenges concerning both customer participation and service development.

In service industries such as the energy sector, customers often lack knowledge or interest (Kindström et al., 2017). Here, the question of balancing trade-offs with customer participation becomes increasingly important (Sampson & Chase, 2022), as misaligned participation could undermine service outcomes. This is amplified by the organizational and societal implications

of adopting digital technologies (Athaide et al., 2024) and digital service innovations (Heidenreich et al., 2024), such as digital self-service technology and platforms (Nie and Kosaka, 2016) and smart energy technologies supported by connected infrastructure (Gonçalves and Patrício, 2022). In this context, service innovations may require new approaches to achieve both societal and economic goals. Achieving a net-zero carbon economy requires a fundamental transformation of the traditional carbon-intensive electricity system (IEA, 2020). Limited customer knowledge, interest, and trust in energy services remain major barriers for service development and innovation efforts (Gonçalves and Patrício, 2022; Kindström et al., 2017). Similarly, exceeding an optimal level of participation in digital services undermines service outcomes, especially in more complex innovations (Heidenreich et al., 2024). There is a need to research how different service types are related to service innovation (Storey et al., 2016) and interrelated with customer participation (Barrett et al., 2024). These challenges highlight the need to understand how co-creation strategies enabled by technology shape trust, loyalty, and innovation outcomes (Grewal et al., 2025), which is particularly pressing in the energy sector (Poblete and Halldórsson, 2023).

Key success factors for "service innovations, the development of new or enhanced" offerings, are often contingent on the sector context and should be approached differently for service firms in, e.g., explicit services industries, such as banking, insurance, telecommunications, and (energy) utilities (Storey et al., 2016). The energy sector is a service industry currently moving toward a service-centric approach, increasingly advancing services by including, e.g., smart energy technologies and integrated product-service solutions to increase energy-efficiency (Gonçalves & Patrício, 2022; Kindström et al., 2017). As it allows for real-time data collection, interactive feedback, and much more, it also opens the potential for new forms of value co-creation with customers (Gonçalves & Patrício, 2022). Previous studies have also highlighted customer participation as a key driver for scaling up energy service development (Andersson & Adilipour, 2013). However, it remains unclear how customers should be involved in energy service offerings, and how to manage service development that incorporates customer participation. Is more co-creation always better? This thesis addresses this knowledge gap by exploring customer participation and service development management in energy services. This is discussed in relation to both business-to-business (B2B) and business-to-consumer (B2C) contexts.

1.1. AIMS AND RESEARCH QUESTIONS

Against this background, this thesis aims to increase the understanding of the role that customer participation plays in service development and the implications for management by answering the following research questions:

RQ1. How is customer participation interrelated with service types?

RQ2. Why and how can firms balance customer participation in services?

RQ3. How can modularity be used to manage customer participation?

The thesis adopts a qualitative approach to address these questions by exploring participation across various service offerings of firms in the Swedish energy industry. In this thesis, each study contributes with different perspectives on this topic. Together, they clarify the role of customer participation, how to manage it in service offerings, and its implications for service development. The sector serves as a suitable context, as it represents a traditional services industry that is currently undergoing substantial change. The need for new and improved service development and customer strategies emerges in response to market growth, technological advancements, and demands to create societal (i.e., environmental) value. This requires more nuanced and in-depth understanding, particularly in the chosen context.

1.2. STRUCTURE OF THE THESIS

The present study is designed as a compilation thesis, which includes the kappa and three appended papers. The following sections guide the reader through the theoretical foundations, methodological approaches, summary of appended papers, discussion, and conclusions. The second chapter, theoretical framework, reviews prior research on customer participation and service development and integrates relevant literature in a combined framework. The thesis adopts a management perspective to examine customer participation in service development. The third chapter, research methods, describes the study context, the research design, and data collection and analysis. This chosen approach allows for a deeper reflection on research quality and ethics. The fourth chapter, a summary of the appended papers, outlines the empirical and key findings of the individual papers, demonstrating their contribution to the overall aim of the thesis. The fifth chapter, discussion, integrates the findings in relation to the purpose and addresses each research question. Finally, the sixth chapter, conclusions, implications and future research, summarizes the thesis and presents the theoretical and managerial contributions as well as its limitations and directions for future research.

2. THEORETICAL FRAMEWORK

Building on the aim of the thesis, the theoretical framework draws upon service development literature, particularly on customer participation, to address how customer involvement and subsequent service development can be managed (RQ1-3). First, previous research on the role of customer participation in services is reviewed in Section 2.1, drawing primarily on the perspective of service-dominant logic. Subsequently, service development and related technological advances are discussed within the broader theoretical fields of service innovation management and operations management in Section 2.2. This section focuses on servitization, service modularity, and energy research to address how service development can be managed. Finally, a summary of the theoretical framework and an overview of the gaps in the literature is provided in Section 2.3.

2.1. CUSTOMER PARTICIPATION IN SERVICES

This section reviews the prior research describing customer participation "modes" in service production (Meuter & Bitner, 1998; Sampson & Chase, 2022) and customer co-creation, meaning active (or passive) participation by the end-customer in realizing the value proposition (Falcke, et al., 2024, Gligor and Maloni, 2021, Heidenreich, et al., 2024). This is discussed in relation to various services offerings, participation strategies, contextual importance, and digital solutions (e.g., digital self-service).

Early work by Meuter and Bitner (1998) categorized participation in service production into three types (firm, joint, and customer production) according to the degree of customer participation (low to high). In a firm or customer production, actors work more independently to produce the service, whereas in a joint production both parties collaborate. These distinctions inform service management research, such as service modularity (Carlborg & Kindström, 2014), servitization (Sampson & Chase, 2022) and subsequent work within service marketing research (Wilson et al., 2016; Dong et al., 2015). Customer participation is commonly understood as passive (low) or active (high) across marketing and operations management in connection with more standardized or customized offerings. Service marketing research stresses that firms should continuously identify and assess trade-offs between competing factors to determine the optimal amount of involvement in a production process (e.g., standardized, customized, self-service, joint co-production) to stay competitive. However, empirical research on how firms position offerings along service production types across industries and customer segments is limited (Sampson & Chase, 2022).

Prior research lacks a clear customer perspective on how context (such as type of industry) shapes participation (Rintamäki & Saarijärvi, 2021). Interest, willingness, ability, and knowledge are commonly used to describe prerequisites for participating in most types of services. In traditional contexts like the energy sector, limited customer interest and knowledge pose challenges for service development (Kindström et al., 2017). Technological advancements are reshaping provider–customer interactions, which can have different implications depending on context (e.g., firm, customer, industry, environment) and require further examination (Appio et al., 2021). Furthermore, recent studies suggest that assumptions about customer participation

do not apply equally across all service contexts, particularly between hedonic and utilitarian services (Barrett et al., 2024). From the perspective of service innovation and development, more work is needed on how firms can segment customers based on their preferences for interaction and participation, and how strategies should adapt as markets and technologies evolve, especially in traditional sectors (Storey et al., 2016).

Developed primarily by marketing scholars, service-dominant logic has shifted the view of participation and implies that the customer is always a co-creator of value (Vargo and Lusch, 2004). The view of customers has shifted from productivity resources to active collaborators, with co-creation efforts emerging as a key competitive strategy (Oertzen et al., 2018). Providers increasingly rely on customer participation in the value creation process (i.e., co-creation) to generate value and subsequent competitive differentiation (Gligor and Maloni, 2021). Value co-creation refers to end-users (across B2C and B2B contexts) participating in creating value with the producer by "directly and/or indirectly collaborating across different stages of production and consumption" (Gligor and Maloni, 2021). In accordance with SDL (Lusch, 2004; Oertzen et al., 2018), customer participation in service provision, consumption, and delivery continues to gain significance (Heidenreich et al., 2024). In the co-creation of services, participation typically acts as a prerequisite to co-creation, while co-producing, is a specific co-creation form (Oertzen, et al., 2018) and a dimension of co-creation (Gligor and Maloni, 2021). However, the various definitions of co-creation are not the object of study but rather the strategic implications of customer participation in producing the service outcome (cf. Sampson & Chase, 2022). Typically, "Customer participation is defined as the degree to which a customer contributes effort, preference, knowledge, or other inputs to service production and delivery" in marketing (Dong et al., 2015:726) and service research (Sampson & Chase, 2022:123). This thesis focuses on participation in service provision and consumption, meaning customer co-creation during later stages of the service process (Grönroos, 2011). Research on service innovation using co-creation and SDL (Lusch and Nambisan, 2015), underscores the role of co-creation in service innovation (Randhawa et al., 2018). While customer participation can enhance value, excessive involvement may instead lead to value destruction. This sets the stage for a closer examination of customer participation.

2.2. SERVICE DEVELOPMENT MANAGEMENT

The next section reviews servitization, service modularity, and energy services research, responding to calls for a more contextual understanding of service development in relation to customer participation. First, Section 2.2.1 elaborates on what is already known about servitization efforts while addressing the complexity of technological advancements. After that, it expounds on service modularity and customization and the factors that are found to influence the design and prevalence of different service offerings and participation types. Finally, energy service research is introduced to clarify the current state of research more specifically. Growing attention has been given to contextual factors of service offerings, particularly digital services, yet traditional or infrastructural services industries remain underexplored.

2.2.1. Servitization

Servitization has emerged as a central strategy for firms aiming to move beyond traditional product-focused or provisional operations by incorporating additional services that meet changing customer needs and strengthen their competitive position (Baines et al., 2008; Sklyar et al., 2025; Sousa & da Silveira, 2017). Increasing customer value by integrating services into extended market offerings (Andersen & Bering, 2022) is a trend increasingly enabled by digital technologies (Sklyar et al., 2025). More recently, servitization has extended beyond adding services to products and requires an organizational reorientation supported by appropriate structures, service-oriented values, and information sharing within a more integrated operations strategy (Andersen & Bering, 2022). This approach has gained relevance across industries, including the electricity sector (Rabetino et al., 2025), and is framed as service-based strategies that addresses evolving customer needs while enhancing competitive advantage (Andersen & Bering., 2022; Sklyar et al., 2025; Sousa & da Silveira, 2016). Notably, diverse sectors have different operating environments that shape their approach to servitization (Sousa & da Silveira, 2017). Although prior research indicates that advancing servitization efforts requires deeper customer insights, co-creation, and performance improvements (Sklyar et al., 2025), more research about the customers role is needed.

Different types of services

In line with this perspective, there are several classifications of service types, ranging from simpler to advanced (Jovanovic et al., 2019). One of the best-known classifications was created by Baines and Lightfoot (2013), who describe basic, intermediate, and advanced services. The objective is to build revenue from services in the form of (1) basic services like spare parts, (2) intermediate services like repairs and maintenance, and (3) advanced services like customer support agreements, outcome contracts, etc. Building on recent literature, this research adopts a value-based perspective of servitization strategies. Servitization strategies are largely shaped by the types of services that companies offer, particularly through the form of value co-creation with customers. Some researchers have included this as a distinguishing factor between basic (low participation) and advanced services (high participation) (Sousa & da Silveira, 2017). Others, such as Baines and Lightfoot (2013), argue that customers take on primary responsibility for basic services while providers take more accountability for the advanced services, highlighting the distinction between customer interaction and responsibility.

In this thesis, servitization strategies are characterized based on two types of services, basic and advanced offerings (Sousa and da Silveira, 2016). By categorizing in this way, customer activities are considered separately to highlight opportunities and disadvantages with certain types of participation. Basic offerings aim to maintain basic products (or services) functioning efficiently and effectively with limited connection to how customers create value since interaction is minimal. Advanced offerings involve co-creating value beyond basic functionality by adapting the offering to increase customer value. Corresponding with prior research, in this thesis basic offerings broadly represent product-oriented services and advanced offerings indicate result-oriented services (Andersen & Bering., 2022; Baines & Lightfoot, 2013; Sousa & da Silveira, 2016). Advanced offerings also relate to the adaptation of the

product use to the customer's unique needs, usage situations, and behaviors (Andersen & Bering, 2022). They can consist of basic and advanced product/service offerings, bundled to address customer needs (Sousa & da Silveira, 2016), aligning with how advanced energy services are evaluated (Kindström et al., 2017; Poblete & Halldórsson, 2023).

Digitalization and its effects on service participation

Digitalisation drives servitization but creates trade-offs in terms of customer participation, particularly when providers aim to stay cost competitive by allowing customers to adapt and operate service activities through digital services (Sampson & Chase, 2022). Digital technologies have also increasingly integrated the line between basic and advanced services. Basic services can work as a platform for providing advanced services and play an offensive role for improving service-based competitive strategies (Sousa & da Silveira, 2017). Identifying the opportunities and drawbacks in customer co-creation in basic and advanced services while determining beneficial approaches (e.g., relying on customers or providers to perform service activities or not) can be crucial for a successful service strategy (Sampson & Chase, 2022). Digital services leverage and integrate digital technologies to deliver value that is real-time, data-driven, and scalable instead of relying on human interaction and manual processes to meet customer needs (Sklylar et al., 2024). This is possible using digital platforms, which can automate multiple service tasks, facilitate and scale self-service solutions, and enable customized services through the integration of actor contributions (e.g., customer participation) and diverse resources. Digital services can also be designed to include high levels of customer participation (Heidenreich et al., 2024). Due to technological advancements and possibilities to involve customers, it is important to understand how customer co-creation should be managed in this context. Finding a balance between the concepts and levels of participation is crucial in sectors undergoing big transformations i.e., the energy sector (Singh et al., 2025). Prior research stresses that deeper customer insights, co-creation, and performance improvements become increasingly crucial as firms advance in their servitization efforts across industries (Rabetino et al., 2021; Sklyar et al., 2025).

2.2.2. Service modularity

In service design and development management, standardization and customization are viewed as distinct service production strategies. Different process elements can be structured for operational efficiency or tailored to specific customer needs (Sampson & Chase, 2022). Standardized processes prioritize efficiency, consistency, and repeatability, often following a fixed sequences of steps to deliver uniform outputs (Carlborg & Kindström, 2014). Customized processes, in contrast, are designed to accommodate specific customer requirements, allowing variation and adaptation at different stages (Ding & Keh, 2016). In practice, any given service process is likely to combine both types; some components are standardized to ensure efficiency and reliability, while others are customized to meet individual customer needs (Wilson et al., 2016).

Existing servitization research, also described as service strategies, has largely overlooked modularization in complex industrial services, limiting understanding of how modular designs

can support both operational efficiency and effectiveness when addressing diverse customer needs. Empirical research has shown that servitization does not end with product-integrated solutions but advances toward modular solutions to enhance resource efficiency (Rajala et al., 2019). Service modularity has been described as a balanced, strategic approach for managing the complexity of service systems by decomposing them into simpler, standardized modules that can be flexibly configured to address varying customer needs (Carlborg & Kindström, 2014; Mattos et al., 2021). Standardization is often described as streamlining processes to improve efficiency and profitability, and modularization as driving cost-efficient customization by using reusable, standardized components (Voss and Hsuan, 2009). Service modularity has been defined as "the usage of reusable process steps that can be combined (mixed and matched) to accomplish flexibility and customization for different customers or situations in service implementation" (Bask et al., 2010, p. 368).

This thesis will apply logic to customer participation to explore suitable levels of participation in service production and relevant trade-offs in a traditional service sector. This offers several advantages. Most research on the concepts of standardization and customization focuses on product-centered industries or services for which there is a high customer willingness to participate. Balancing these concepts is often discussed in relation to customer participation and revolves increasingly around customers' active use of digital self-services (Heidenreich et al., 2024; Nie and Kosaka, 2016; Wilson et al., 2016). This can make service modularity a useful concept to introduce into the literature, as digital self-services are described as providing both cost-efficiency and self-customization. In utilitarian services, such as energy services, customers typically have a low willingness to participate (Barrett et al., 2024; Wilson et al., 2016); hence, customization can be contradictory. The trade-offs between customization (higher customer control and potential satisfaction), and standardization i.e., efficiency (lower operating costs) also concern the amount of expertise and/or specialized equipment needed (reducing or increasing economies of scale). However, there is limited guidance on how firms can effectively balance complex competing priorities (Sampson & Chase, 2022). Through modular service designs, varying participation levels and contextual requirements could be more flexibly accommodated.

2.2.3. Energy services

Like the servitization strategies characterized as basic or advanced offerings, energy services have been categorized in a similar way. The general classification of services described earlier is also reflected in energy service typologies. Basic energy services typically involve low customer participation, as providers and customers operate largely independently due to the passive transfer of value and the short-term nature of their interactions. Advanced services often require higher customer participation, as they directly affect customers' processes and demand collaboration (Kindström & Ottosson, 2016; Kindström et al., 2017; Poblete & Halldórsson, 2023). With current technological advancements, smart energy technologies are increasingly implemented and often aimed to be leveraged through the development of new services that enable customers to co-create value (Gonçalves and Patrício, 2022). The energy transition requires novel institutions, policies, and, presumably, changes in consumer behavior (Falcke et

al., 2024). Therefore, this thesis underscores the need to account for the multiple implications of innovation management efforts (Grewal et al., 2025). Balancing trade-offs between operational efficiency and societal outcomes is essential for innovations to succeed at both organizational and societal levels in the energy sector. Energy firms must increase efficiency, maintain profitable business models (Falcke et al., 2024), shape the extent to which customers are involved in the service outcome (Gligor & Maloni, 2021), and adapt service offerings accordingly (Heidenreich et al., 2024; Poblete & Halldórsson, 2023). All of this requires further examination.

The concept of servitization is spreading in the energy sector to broaden access to advanced energy solutions. Energy utilities are increasingly offering product-service solutions and digital solutions to complement their traditional core products. In the energy sector, advanced energy service solutions strengthen and create environmental, economic, and customer value by transforming traditional production through digital tools and collaborative strategies (Rabetino et al., 2025). Improving such climate-benign innovations may enable firms to fulfill customer expectations and build a competitive advantage (Falcke et al., 2024). In the energy sector, service development has significant potential to support both a sustainable energy system and increased profitability for energy companies (Kindström et al., 2015). However, moving from a traditional business model to a service-based approach has proven challenging (Gonçalves & Patrício, 2022; Kindström et al., 2017). Broader and more diverse studies are required to address challenges with profitable servitization (Andersen & Bering, 2023; Rabetino et al., 2017). In general, the challenges involved in evolving from a simpler or basic service portfolio to a more advanced one has recently become more apparent in the servitization literature (Sjödin et al., 2020) but is particularly evident in the energy sector (Singh et al., 2025).

2.3. INTEGRATION OF THEORETICAL PERSPECTIVES

The presented literature streams contribute different perspectives on how to manage the role of customer participation in service development and management, particularly in traditional service industries like the energy sector. The following section addresses theoretical perspectives; these are summarized in Figure 1.

Customer participation: Much prior research in service marketing and management has examined customer interaction (how close firms are to customers) and customer participation (how much customers are involved in production) separately, rather than jointly (Sampson & Chase, 2022). Such studies lack contextual insights and often study similar contexts, i.e., service industries. There is a lack of understanding of participation in different types of services and contexts, particularly utilitarian, explicit, traditional, and infrastructural service industries (i.e., energy, banking, insurance, telecommunications), which commonly have low customer interest (Athaide et al., 2024; Storey et al., 2016; Wilson et al., 2016). In addition, the role of participation or co-creation strategies in technology-enabled services under various conditions is necessary for a nuanced understanding (Athaide et al., 2024; Grewal et al., 2025; Heidenreich et al., 2024). Research on customer participation provides a practical perspective for servitization and service modularity, as it helps manage customer and provider activities within

service offerings. There is a need for studies that examine the interplay and trade-offs between these elements, particularly in relation to servitization and technology-enabled participation. To benefit from technological advancements, key service strategies should be built upon existing knowledge of service innovation and management. To address concerns regarding customer participation, this study draws on research in servitization, service modularity, and energy services to gain a more comprehensive understanding.

Servitization: Customer participation has been increasingly recognized as a critical element in service development and delivery. Existing literature often implicitly links modes of customer participation to specific service types. For example, basic services are typically associated with limited customer involvement, while more advanced or complex services are assumed to require higher levels of participation (see Tables 1 and 2). This perspective suggests a general expectation that increasingly advancing services correspond directly to increasing customer involvement. However, service offerings are often more nuanced. Many services combine both basic and advanced components (Bitner et al., 1997; Kindström et al., 2017; Poblete & Halldórsson, 2023), indicating that the relationship between service type and participation mode is non-linear. Despite this complexity, prior research has rarely examined customer participation and service type as distinct dimensions of a service offering. Treating these as separate constructs is essential for understanding how providers can actively design, manage, and analyze customer participation in different services. Successfully advancing services requires leveraging scale and scope economies while delivering integrated product–service offerings that justify premium prices. Such a balance is difficult to achieve, as responding to customer needs demands costly investments, which often conflict with efficiencies gained through standardization (Andersen & Bering, 2023).

Service modularity: Service modularity is important, because it can offer a conceptual bridge between servitization efforts and the operational design of offerings. Understanding how to balance standardization and customization through service modularity is crucial, since different types of production processes offer distinct strategic advantages and disadvantages. Service modularity provides a valuable lens through which firms can offer customized services at scale without compromising efficiency. While servitization more clearly explains why firms move toward more service-oriented business models, service modularity can help clarify how these designs can be structured and balanced. Modularity can be used to address "how solution providers achieve and maintain an 'ideal' state of flexibility and efficiency for competitiveness in providing customized responses to complex customer needs" (Rajala et al., 2019:631). Following this perspective, the co-creation "sweet spot" in different types of services depends on trade-offs between competing factors. Service marketing literature emphasizes that positioning the production process is vital for competitiveness. This requires defining which activities fall under the provider's control, which are managed by the customer, and where their interactions overlap. Such insights can also advance modularity research where "a better understanding is necessary regarding customer preferences, customer interfaces, and mechanisms of collaboration and co-creation" (Mattos et al., 2021, p. 1023). Incorporating service modularity improves and complements the current understanding of customer

participation and servitization by holistically addressing the service design. Consequently this supports diverse participation levels and addresses contextual variations in service offerings and delivery.

Energy services: An improved understanding of how to adapt service design and strategies is beneficial, as they may not be universally applicable across different industries. Ideally, strategic decisions should balance the objectives between providers and customers while increasing efficiency, particularly in the energy sector (Poblete and Halldórsson 2023). Energy service research can clarify how sector context, technological advances, and utilitarian service characteristics shape customer participation and service development in a sector transitioning toward more advanced services. First, there is a lack of research examining the influence of sector context in service development. Traditional service industries (Wilson et al., 2016), or explicit services include industries such as banking, insurance, telecommunications, and utilities, which rely on explicit knowledge delivered through technology (Storey et al., 2016). For "utilitarian services such as electricity and banking" (Witell, 2025, p. 144), organizations should consider the core service characteristics and their main appeal to key customer segments. Second, there is a need to understand how to find a balance between environmental, financial, and customer goals. This has been difficult for energy companies that play a crucial role increasing energy efficiency in the electricity sector and mitigate climate change while needing to maintain profitable business models. Customers' lack of knowledge, interest, and trust is a barrier to implementing service innovations in the energy industry (Kindström et al., 2017). Third, the recent technological advances and the integration of servitized smart offerings have increased complexity in traditional sectors (Appio et al., 2021). Data-driven solutions (digital platforms, AI, self-service technology), smart products, and business models have gained relevance in many industries, including the electricity sector (Rabetino et al., 2021; Singh et al., 2025). Co-creation strategies (Grewal et al., 2025) and servitization strategies (Sousa & da Silveira, 2017) impacted by such technologies represent an avenue for further research. This is particularly relevant for the energy sector, calling for research in both of these areas (Gonçalves & Patrício, 2022; Singh et al., 2025). The gap concerns the absence of systematic knowledge regarding how these factors jointly influence participation and the design of advanced energy services.

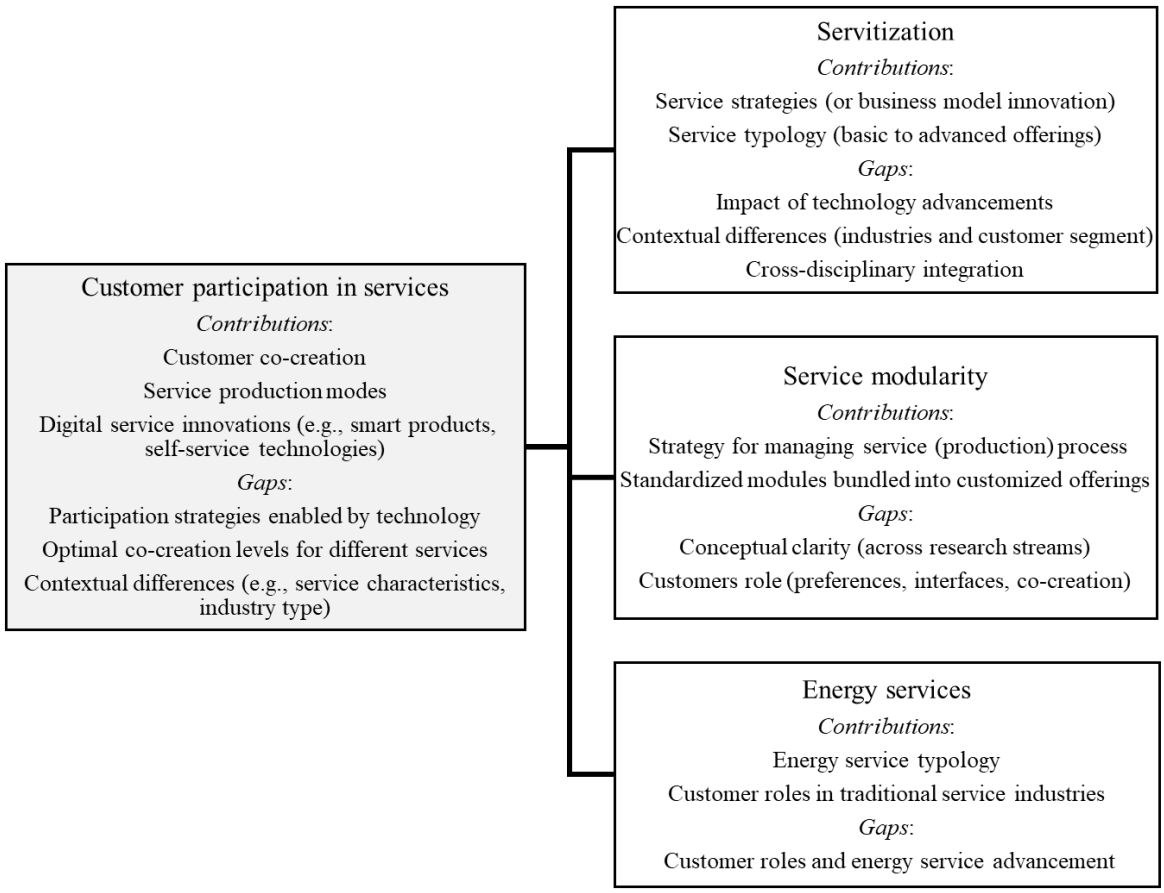


Figure 1. Contributions and gaps of the chosen research streams in the theoretical framework (own illustration).

3. RESEARCH METHODS

Chapter 3 outlines the rationale for adopting a qualitative research approach and details the methodological choices underlying the two empirical studies that constitute the foundation of this thesis. It further elaborates on the case selection, research design, data collection, and analysis procedures, providing a transparent account of the overall research process. The chapter concludes with a critical reflection on the methodological decisions made.

3.1. STUDY CONTEXT

This thesis aims at examining customer participation in service development by using the empirical context of traditional services, specifically energy services. As described in the introduction, energy research is crucial for improving environmental sustainability. The findings may be generalizable beyond the energy sector, as similar challenges exist in other traditional service industries. The traditional service sector, particularly the energy sector, is relevant as the study context for multiple reasons. These industries rely on large-scale infrastructure, operate under regulatory constraints, and are in general characterized by low levels of customer participation, interest, and knowledge. This is a typical pattern not only of the energy sector but also for most traditional service industries. Energy service industries offer a strong example of a traditional service industry, because they share core characteristics with other established, utility-like sectors, such as banking, insurance, and telecommunications. Thus, the energy sector acts as a representative case for studying how customer participation can be managed in traditional service settings.

The geographical context of Sweden was chosen for several reasons. The Swedish energy industry has recently shown increased provider engagement in developing advanced services, reflecting a growing diversity of service types. In response to the deregulation of the Swedish electricity market in 1996, many actors have entered the market to produce renewable electricity and offer supporting services (Bergek, 2020; Bergek et al., 2013). Sweden differs from many other countries in that its electricity production is largely fossil-free, with a target of reaching 100 percent renewable electricity by 2040 (IEA, 2019). In addition, Sweden offers favorable conditions for empirical examination, including accessible firm-level data and an energy market that increasingly employs digital and advanced service-oriented solutions (Kindström et al., 2017).

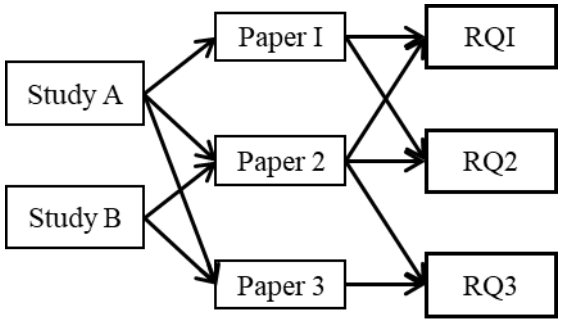
The research context primarily comprises B2C and B2B settings that are comparable in terms of services offered (Gligor & Maloni, 2021). Except for the rudimentary electricity-supply contracts, this thesis is mostly concerned with the additional energy services offered by energy companies, typically revolving around electricity supplies. Examples of such value-added services could be installing solar panels, digital services and platforms for self-service, energy portfolio management, and many more.

3.2. RESEARCH DESIGN

The research approach in this thesis is exploratory and qualitative, since the transformation toward service-based and customer-centric business strategies in the energy sector remains

relatively unexplored (Köhler et al., 2019), especially in relation to how customer participation is organized across different service types. A case study approach is particularly suited for investigating complex, context-dependent processes (Yin, 2009). The overall aim and research questions are addressed through two studies, one secondary data analysis (Study A) and an embedded case study using semi-structured interviews (Study B). The analysis approach follows a within-case and cross-case logic (Eisenhardt, 2021), although the studied phenomenon varies depending on the paper. Detailed descriptions for each of the studies are presented below and an overview is depicted in Figure 1.

Figure 1. Overview of each study, papers, and research questions



Study A advances a provider perspective on customer participation and service types across various energy service offerings by developing and testing an analytical framework incorporating both service type and participation level. Data were collected through web scraping of 127 energy providers' official websites, which were structured using text mining techniques. Employing these analytical techniques builds a dataset from unstructured text and is an established practice in the social sciences (Appio et al., 2024). The dataset was qualitatively analyzed through a template analysis, i.e., a type of thematic analysis. This involved extensive manual coding, inductive and deductive coding criteria, and textual interpretation to link empirical patterns to theoretical concepts. Recent studies have highlighted the benefits of novel hybrid approaches, i.e., combining quantitative methods for data collection and structuring with qualitative techniques for in-depth analysis (Cavallo, 2017; Guzman & Li, 2023; Oyebode et al., 2020; Shoufan, 2023). This hybrid approach was employed to ensure both systematic coverage and analytical depth. This method enabled a comprehensive and trustworthy analysis of how different types of energy services relate to varying levels of customer participation. Study A resulted in Paper I and partially contributed to Paper II.

Study B followed an exploratory, qualitative approach by applying an embedded case study design (Yin, 2003) in the empirical context of 23 Scandinavian electric utilities chosen using purposive sampling informed by Study A. Thereafter, a thematic analysis (Nowell et al., 2017) and a comparative multiple case analysis (Eisenhardt, 1989) were conducted to capture and synthesize differing company perspectives on the overall case of co-creation activities across service types. The methods used provided a systematic approach to this within- and cross-case examination of customer co-creation practices across various services strengthening the trustworthiness of the study. A case study design was chosen, because it is particularly suited

for exploring new phenomena, as it allows for the building of new knowledge (Easton, 2010; Eisenhardt, 1989). Thematic analysis enabled systematic iteration among the literature, data, and codes, while the multiple case analysis ensured depth. Study B resulted in Paper II.

The findings from Study A and Study B were synthesized and reinterpreted based on their contributions to customer participation in service development and the implications for management. Previous findings were consolidated and assessed based on how they could advance the understanding of service modularity. Through an exploratory case study approach, literature analysis and empirical data were leveraged to examine how the concepts manifested in different service contexts and theoretical concepts, and further develop a conceptual framework. Existing literature was reviewed to identify a comprehensive categorization of service standardization and customization strategies from both an operations management and service marketing perspective. This guided the thematic analysis of themes and patterns in both publicly available secondary data (websites) and interview data (with managers) using energy services and companies as an empirical example. Standardization and customization strategies were analyzed from a dataset of more than 100 (n = 127) scraped energy company websites using text mining techniques in NVivo software and compared to interviews with small, medium, and large energy companies. This synthesized analysis resulted in Paper III.

Table 2. Overview of methodology in each paper

	Paper I	**Paper II**	**Paper III**
Study objects	Service offerings described on websites of energy firms operating on the Swedish "electricity trading" market.	Selected Swedish energy firms operating on the Swedish "electricity trading" market.	Service modularity in traditional service industries, i.e., the energy industry.
Data sources	Downloaded/scraped publicly available websites of 127 Swedish energy firms; data sample identified using the Retriever Business database of all Swedish companies.	23 semi-structured interviews with service development, sales, marketing managers of the selected energy firms and their scraped websites.	Prior literature, secondary data from energy websites. Additionally, 10 selected complementary purposively chosen interviews from 3 types of energy company.
Data analysis overview	Categorization of basic and advanced service types from servitization research and participation modes using coding criteria aligned with prior literature.	Categorization of customer co-creation in services based on dimensions from servitization and co-creation literature.	Synthesize and compare themes and patterns of empirical data with concepts from service marketing and operations management literature.
Methods	Hybrid approach of scraping (collecting) and text-mining (structuring) secondary data. Template analysis in an iterative process using within and cross-case logic	Thematic analysis combined with a multiple case analysis of semi-structured interviews and scraped website data using within-case and cross-case logic.	Thematic analysis enabling iteration among prior literature, scraped website data, and interviews using within-case and cross-case logic.

3.3. STUDY A

A document study is well suited for this purpose, because it allows for systematic analysis of existing, publicly available information on energy service offerings, capturing both breadth and detail across multiple providers. It provides an efficient way to examine service types and customer participation without the constraints of direct observation or interviews, while enabling comparisons across a wide range of cases. All empirical data for the service and participation dimensions were sourced from the description of marketed service offerings

published on the providers' official web sites. Therefore, the documents reflect how providers officially present and structure their services.

Section 3.3 highlights the data collection for Study A. To gain a comprehensive view of energy service offerings in Sweden, publicly available websites of energy companies were used as the data source. The data choice was motivated by three reasons: (1) Websites reflected the provider's perspective on service offerings, including intended customer participation; (2) Publicly available sites allowed for a time-efficient, broad, holistic overview of Swedish energy services; and (3) The detailed service descriptions enabled identification and analysis of key patterns of customer participation. The sample for this study comprised services from energy companies within the Swedish sector. Study A employed a similar sample selection approach as Dong et al. (2024) to develop a list of relevant energy companies. The exclusion criteria were established to filter companies selling electricity. Using the Retriever Business database and SNI code 35140 ("Electricity trading"), 256 companies were identified, 249 of which were active. After web scraping and cleaning, the final dataset consisted of 127 company websites.

After data had been collected through web scraping, text mining techniques were applied to structure and create a dataset from unstructured textual website content (Appio et al., 2024). The dataset was analyzed using a template analysis with extensive manual coding. Data analysis was guided by concepts from prior literature incorporated as coding criteria. To ensure methodological rigor, the coding process followed established procedural steps in relation to theoretical concepts (Saunders et al., 2009). Throughout the process, NVivo software was used to organize and analyze the large dataset of extracted textual data. The iterative coding process included audit trails (recording data, notes, and cross-referencing), case summaries, team consensus, coding frameworks, and diagramming; these were applied to establish trustworthiness at each stage of the analysis (Nowell et al., 2017). Furthermore, to support parallel deductive coding (King & Brooks, 2016), the required participation level and service type for each identified service were documented separately and integrated into the analysis. To ensure a systematic analysis (Nowell et al., 2017), thick descriptions of each service, the providing energy company, and recurring patterns (e.g., partnering firms, terms for describing services, discontinued offerings) were documented in Excel to capture key features, enabling the exploration of additional insights.

3.4. STUDY B

Given that there has been minimal research on the role of customer participation strategies in traditional service industries, a qualitative design was deemed suitable. In an embedded case-study, rich data can be collected through interviews, observations, and secondary data (or a combination thereof) to conduct in-depth analyses (Siggelkow, 2007; Yin, 1994). Following the initial web scraping of the 127 providers, purposive sampling identified 23 information-rich cases (C1–C23) for an embedded case study, based on service design diversity, customer participation mechanisms, and relevance to the research aim. The firms ranged from small (under 50 employees) to medium (50-250 employees) and large (over 250 employees). This

strategy ensured both breadth in the initial mapping of the sector and depth in the subsequent analysis of selected cases.

Data collection for the embedded case study consisted of interviews with representatives from all selected energy companies. Semi-structured interviews were conducted with energy company managers with expertise in the desired area of research. Data collection involved 23 semi-structured digital interviews with founders/managers of the selected firms. The interview was composed of closed and open questions and was guided by previous research. Each interview lasted around one hour and was recorded and transcribed. Energy managers served as the primary informants in the case study. Each of the selected companies designated a manager responsible for energy services, customer solutions, or related strategic roles. They were chosen because of their managerial responsibilities, which typically involved designing, implementing, and overseeing service offerings and/or customer-facing processes.

Table 2. Overview of selected firms and interviewees of Study B.

Firm	Interviewee(s)	Size
C1	Communications and Marketing Manager	Small
C2	Business Unit Manager	Medium
C3	Vice-Chair of the Board	Large
C4	Head of Business Development	Large
C5	Head of Front Office, Strategy and Trading	Small
C6	CEO	Small
C7	Communications and Marketing Manager	Small
C8	CEO	Small
C9	Chief Technology Officer (CTO)	Small
C10	CEO and CFO for all Multiple Units	Small
C11	Sales and Marketing Manager	Small
C12	Communications and Marketing Manager	Small
C13	Manager for CX and Digital Channels	Large
C14	CEO	Small
C15	Business Development Manager	Medium
C16	Head of Operations and Business Development	Small
C17	Sales and Marketing Manager	Small
C18	Sales and Marketing Manager	Small
C19	COO Chief Operating Officer	Small
C20	Digital Marketing Coordinator	Large
C21	COO Chief Operating Officer	Large
C22	Sales and Marketing Manager, Sales and Marketing Employee	Large
C23	Climate Coordination Manager	Large

The analysis focused on understanding the services offered, the types of services provided, and the related customer co-creation activities described on the websites, such as digital self-service options, personal contact with employees, and other activities. Following best practices in qualitative research (Eisenhardt, 1989), the data analysis was guided by two a priori constructs: basic and advanced service types from servitization literature and co-creation (in the dimensions of effort, information-sharing, and customization). These topics were empirically examined in

23 electric companies. The study combined a thematic analysis (Nowell et al., 2017) with a multiple case analysis (Eisenhardt, 1989), using a within-case and cross-case logic (Eisenhardt, 2021). This allowed for systematic analysis of co-creation activities across offerings and a cross-case comparison of their perceived implications across energy firms. Furthermore, the approach examined customers co-created service outcomes across digital and product-integrated offerings. It enabled an analysis of the opportunities and drawbacks of activities and offerings for customers, providers, and energy efficiency, informing future implications for service innovation and design. NVivo software was used to organize and analyze the extracted text, enabling systematic and nuanced exploration of the data.

The interview material clarified how firms develop service offerings, design participation requirements, and interpret co-creation in practice. It also revealed the organizational reasoning behind customer participation and service configurations and the integration of digital technologies. The managers' operational and strategic perspectives further explained how firms value different customer activities, interpret market demands, structure service offerings, and balance standardization and customization, while also helping validate the patterns identified during the web-based mapping. As the coding of customer activities relied on precise definitions, disagreements were rare and were quickly resolved in a single meeting with all authors.

3.5. REFLECTIONS ON THE METHODOLOGICAL CHOICES

To ensure value in qualitative research, the trustworthiness of the study in terms of credibility, transferability, dependability, and confirmability must be established (Lincoln & Guba, 1985). Credibility was addressed through careful selection of empirical sources for the literature review and the use of firm websites to identify service types and customer participation patterns. While websites may not provide full details, they offer sufficient information on key aspects, such as service offerings, participation modes, and the distribution of responsibilities between providers and customers, to support the analysis. Interviews with one representative per firm captured managerial perspectives on customer participation, which are relevant for understanding decision-making; however, this approach limits triangulation and introduces potential biases. Credibility was further strengthened through iterative feedback from industry experts, division seminars, research conferences, and peer-reviewed publication processes. In this study, dependability is understood as the consistency between data, analysis, and conclusions, whereas confirmability refers to the researcher's neutrality in interpreting the data (Korstjens & Moser, 2018). These were supported by a transparent account of the research process and the use of digital tools for data collection and analysis, such as recorded interviews and coding in NVivo. This made it possible to return to the original material during the analysis when needed.

The study follows research ethics principles, ensuring informed consent, confidentiality, and responsible handling of data. These considerations were applied throughout the research process, aligning with the focus on customer participation and the chosen methodology.

The findings are generalizable outside of the energy sector as the underlying mechanisms of participation in energy services are like those in other traditional industries. The sector exhibits low inherent customer interest, routine service encounters, and high reliance on digital self-services, conditions that also characterize many mature service contexts. The patterns identified regarding participation modes, the benefits of balanced participation, and the role of digital platforms are, therefore, not tied to idiosyncratic features of energy but reflect broader dynamics in established service sectors. As a result, insights on participation configurations, value creation, and service design can inform companies operating in other traditional industries facing comparable constraints and customer behaviors.

Reliability in Studies A and B was strengthened through a series of deliberate methodological choices. In Study A, the empirical material was validated by using several additional measures. For instance, the relevance of the selected keywords was assessed in accordance with previous empirical research and compared in the overall dataset (Cavallo, 2017) and additional text-mining techniques, such as Word Frequency Queries by depth value, were applied in NVivo. As a further quality assurance, several randomly selected website URLs were examined manually to assess which services were most prominently displayed and marketed visually, confirming alignment with the quantitative output. Additionally, complementary text mining techniques were applied to ensure the comprehensiveness of the analysis when necessary. In Study B, additional measures to validate the findings included manually examining the chosen companies' websites again to assure accuracy of the overall results. All interviews were recorded and stored to allow careful review and cross-checking of the data.

4. SUMMARY OF APPENDED PAPERS

Table 4 presents an overview of each paper, the status, and the addressed research questions. Both Paper I and Paper II have been developed into a manuscript for journal submission. Paper I was submitted to the International Journal of Operations & Production Management in November 2025. Paper II will be submitted to the Journal of Product Innovation Management. Paper III was presented at two conferences, the International EurOMA Service Operations Management Forum in March 2025 in Copenhagen, Denmark, and at the EurOMA conference in June 2025 in Milan, Italy. Each appended paper is summarized in the following Sections 4.1-4.3.

Table 4. Overview of appended papers, status, and addressed research questions.

Paper	**Title**	**Status**	**RQs**
I	Who is doing what? Exploring customer participation across service types.	Submitted to *International Journal of Operations & Production Management,* Nov 2025.	RQ1, RQ2
II	Customer co-creation strategies and implications for service development.	To be submitted to *Journal of Product Innovation Management*, Jan 2026.	RQ1-RQ3
III	Conceptualizing standardization and customization in services	Presented at the EurOMA 2025 conference, June 13-18, 2025, Milan, Italy.	RQ2-RQ3

4.1. PAPER I

In business operations, a fundamental strategic question for firms pursuing successful servitization is, "Who should be responsible for controlling different aspects of production—the provider, the customer, or both—and how much interaction is required" (Sampson and Chase, 2022, p. 137). This emphasizes key challenges regarding the preferred level of customer participation, the perspective from which it is managed, and how responsibilities can be efficiently allocated between providers and customers. Currently, operations management literature emphasizes the need for deeper insights into customer participation in services, particularly in relation to servitization efforts (Rabetino et al., 2017; Rabetino et al., 2021; Sampson & Chase, 2022). This paper contributes to that agenda by developing and testing an analytical framework that differentiates service categories based on both customer participation modes and service types.

Paper I develops an analytical framework for categorizing services, using participation mode and service type as two complementary but distinct dimensions. This is accomplished by combining literature on customer participation and servitization. The framework is applied to the Swedish energy industry and supports the identification and theorization of six service categories showing that any service type can be associated with any level of customer participation. The developed framework was applied to energy services through a template analysis of 127 Swedish energy company websites. By reviewing and analyzing 19,107 text segments describing service offerings and customer participation, the following six service categories were identified: basic and advanced services that were produced by 1) *customers* (the service provider relies on the customer to perform service-related activities with limited direct interaction with the provider); 2) *jointly* (the service provider and customer share the

work of performing service-related activities and interact directly to produce the service), and 3) *providers* (services that are almost entirely produced by the service provider with little direct customer interaction). These service categories differ in how various participation modes contribute to service development, challenging the traditional linear view. To contribute to advancing knowledge of customer participation in service production, this study is guided by two research questions: How are different aspects of service production divided between providers and customers in basic and advanced services? and What are the advantages and disadvantages of different service categories from a provider perspective?

Results from the website analysis show that Swedish energy companies, beyond the basic electricity-supply contract, offer a wide range of basic and advanced services with varying participation modes. The identified service categories were further evaluated based on, first, the division of responsibilities between providers and customers and, second, the advantages and disadvantages to the providers. Digital self-service platforms and different service configurations emerged as interconnected mechanisms that enabled a non-linear relationship between service type and participation mode. Across the six service categories, the analysis showed variations in how energy companies structured customer participation and distributed the workload when producing a service offering. The analysis identified six service categories that differed in service complexity, customer participation, and provider responsibilities. Overall, the findings demonstrated that both basic and advanced services can accommodate different participation modes. Digital self-service platforms and service configurations enable flexible responsibility distribution, challenging the assumption that service type dictates participation mode. Providers can strategically select participation approaches to maximize advantages and mitigate risks across service offerings.

Hence, the resulting two-dimensional framework combines the literature streams of customer participation and servitization, which is the main theoretical contribution of this study. The results show that basic and advanced service types are identified across both high and low levels of customer participation. The findings also highlight the importance of future research to maintain clear distinctions between customer participation and service type, as one does not automatically connect to the other, and vice versa.

Contribution to the thesis. The findings support the thesis aim by clarifying the role of customer participation in service development across basic and advanced services. The findings show that providers can strategically choose different participation modes to leverage the strengths and offset the limitations. By demonstrating that both basic and advanced services offer flexibility in how responsibilities are shared between providers and customers, the paper challenges established assumptions about the interdependence between service type and participation mode.

4.2. PAPER II

Paper II draws on the growing stream of research on co-creation strategies and servitization efforts to explore which types of customer co-creation activities are perceived as valuable by energy utilities. It also investigates which service activities these utilities aim to develop, and

which they perceive as most valuable. This paper addresses the call for research on optimal degrees of co-creation—the sweet spot—and aligns with prior findings that the ideal level of co-creation is context-specific rather than universal (Heidenreich et al., 2024). The electricity sector serves as the research setting, offering a critical and suitable context for examining service innovation and co-creation. Drawing on servitization literature (Rabetino et al., 2017), the study explores how service innovation can be organized in traditional service industries, with a focus on balancing customer co-creation and its implications for service design in energy services.

Overall, the paper considers co-creation strategies, service designs, and their implications for innovation within the traditional energy sector. Energy companies are increasingly moving beyond basic services—such as billing and commodity supply—toward advanced offerings. These include service subscription models, flexibility and trading options, energy management solutions, solar and microgrid systems, and software-driven energy solutions. However, limited customer knowledge, interest, and trust present barriers to service innovation (Gonçalves & Patrício, 2022; Kindström et al., 2017). Co-creation comprises three key elements: (1) customization, (2) effort, and (3) information sharing (Gligor & Maloni, 2021; Heidenreich et al., 2024). In this study, these elements serve as the foundational pillars of the analysis, guiding the examination of customer participation and co-creation activities. Findings further illustrate basic and advanced customer co-creation activities along with their associated opportunities and challenges. These dimensions are characterized by the value that managers identified for the firm, the perceived value for customers, and the perceived implications for energy efficiency. This paper views basic co-creation activities as a prerequisite or starting point for further advanced co-creation activities.

Basic co-creation includes simple self-service and lower interaction, enabling broad customer participation. While it helps providers build relationships, gather useful data, and deliver value on customers' behalf, its impact on advanced optimization is limited. Conversely, advanced co-creation suits motivated, capable customers and involves customization, deep interaction, and rich data sharing. Although this enables stronger service adaptation and system optimization, it is resource-intensive, appeals to fewer customers, and requires high customer trust. Analyzing these trade-offs results in a better understanding of how co-creation creates value for providers, customers, and society (climate). Building customer trust, increasing long-term co-creation, and enabling rich data collection can mitigate many of the challenges associated with customer co-creation and service advancement.

The findings also point to the significance of having the necessary resources and capabilities available for market actors to implement specific co-creation activities, highlighting an area where participation strategies can make a meaningful contribution. Strategically managing participation and service development requires contextual insights. Adapting service designs to sector-specific requirements can enable more effective service advancement, which the energy industry desperately needs.

Contribution to the thesis: Paper II proposes a portfolio of different co-creation activities, opportunities, strategies, and addresses the challenges associated with them. It also suggests service strategies for achieving the most suitable level of customer participation. In traditional service industries such as energy, the findings indicate: *More customer participation is not always better*. These insights contribute to the thesis aim by clarifying how different participation influence service development and how firms can manage participation strategically.

4.3. PAPER III

Paper III analyzes and evaluates service customization and standardization, using the energy industry as an empirical example. The aim of Paper III was to review literature on service standardization and customization and extend existing research on service modularity in traditional service industries, such as energy services. Understanding how these practices unfold in traditional, infrastructural services with utilitarian service characteristics (i.e., energy services) offers new insights for service modularity research. In particular, standardization and customization are often interpreted differently across fields, such as service marketing and operations management. Much of the existing research focuses on product-centric settings and services for which there is a high customer willingness to participate. However, energy services involve low-engagement customers for whom extensive customization may be counterintuitive. Customers' preferences for standardized or customized services depend on their utilitarian (or hedonic) consumption goals (Ding & Keh, 2016). Therefore, standardized services are preferred among customers who value efficiency and functionality. In addition, technological developments increasingly shift customization responsibilities to customers, while many literature streams implicitly promote greater customer participation. Striving for customization and encouraging customer participation is implied in many literature fields and empirical contexts (cf. Heidenreich et al., 2024; Coelho and Henseler, 2009), particularly in traditional service industries like energy (Kindström et al., 2017).

Findings from the literature show that many empirical contexts and examples from the p share similar traits. In particular, the empirical context used in service marketing literature often revolves around services where customers might have high interest, knowledge, or willingness to participate (such as hospitality). Although these examples are correct, they highlight overlapping and conflicting aspects of the concepts. This suggests underlying assumptions about standardized or customized service strategies, yet the importance of the theoretical framework lies in how to determine the concepts to better inform strategical decisions with contextual implications. It is important to determine these concepts to further understand their implications, for example, from the perspective of provider operational management or the customers' role in producing the service.

Paper III further develops the theoretical framework for standardized and customized services, across marketed offerings, service design, participation levels, and service types, to advance modularity research in new empirical settings. Paper III draws on both a literature review and empirical data from energy companies. Using the energy sector as an empirical example, the

paper examines how standardization, customization, and modularity manifest in energy services. Insights and examples from three energy service providers (interviews) and their marketed service offerings (found on their websites) were analyzed along the proposed framework. Subsequently, a framework of service standardization and customization of service offerings in operations management and service marketing literature was developed.

Contribution to the thesis: Findings highlight that service modularity can be a useful tool and strategy to achieve greater balance between service standardization and customization. It provides a theoretical framework fit to address issues apparent in this thesis. Furthermore, balancing trade-offs between the concepts can inform strategy practitioners in service industries the approach they should consider regarding service offerings and production. These findings support the thesis aim by demonstrating how modularity can be used to manage customer participation and service development.

5. DISCUSSION

This thesis explores customer participation in service development and the implications for management in the empirical context of energy services. In this section, the findings from all papers are synthesized in relation to the customer participation in service development in the studied context. Building on the three appended papers, this thesis generates insights into customer participation that advance the understanding of service development and implications for management. The discussion is structured around the following responses to the three research questions as stated in Section 1.1. First, I examine how customer participation is interrelated with service types; second, I explore why and how firms can balance customer participation in services; and finally, I demonstrate how modularity can be used to manage customer participation. This chapter addresses the research questions by synthesizing findings from the appended papers and discussing the insights in relation to the theoretical framework and the empirical context. Sections 5.1, 5.2., and 5.3 each address one research question.

5.1. CUSTOMER PARTICIPATION ACROSS SERVICE TYPES

In the following section RQ1 is examined. This thesis further investigates how insights from servitization strategies and technological advancements can inform development in traditional service industries, particularly the energy sector. This can further be used to explore the implications of adopting these approaches to improve service design and delivery of advanced services in general and advanced energy services in particular.

The call to consider new perspectives and theoretical rationales from management science to enable more diverse studies of servitization (Andersen & Bering, 2023; Rabetino et al., 2017), indicates that customer participation research can help guide the complexity of servitization. This thesis indicates some inconsistencies between how customer participation in services and servitization is understood theoretically, as discussed in Paper I. In general, the challenges associated with moving from basic to more advanced service portfolios have become increasingly evident in the servitization literature (Sjödin et al., 2020). In simple terms, servitization research provides approaches for developing service offerings that extend beyond traditional core offerings. This requires more extensive investment but with the purpose of meeting evolving customer needs and gaining competitive advantage. Much of this work either implicitly assumes that the desired outcome of such advancement is related to increased customer participation cf. (Sampson & Chase, 2022; Sousa & da Silveira, 2017), or the part customers should play in service production is unclear. Such assumptions or gaps may result in overlooking variations in customer capabilities, preferences, and value creation logic. This points to a gap in understanding how firms structure service offerings and delivery systems, a gap that research on customer participation can help address. This is particularly relevant if the aim is to stimulate value-creating customer participation (Paper II), align certain service production modes with increasingly advanced services (Paper I), or gain a competitive advantage, e.g., attract a new type of customer. The risk is that firms may overestimate the influence of certain participation in service development (e.g., advanced self-service apps) or misinterpret the impact that some participation types have on the market, as findings from Paper I and II suggest.

Paper I explores service production processes across service types. This is done by first developing and applying a two-dimensional framework that distinguishes service offerings by participation mode (customer-, joint-, and provider production) and service type (basic or advanced offerings). This study demonstrates how responsibilities are allocated between providers and customers by categorizing energy services and showing that both basic and advanced offerings can be provider-produced, jointly produced, or customer-produced. This demonstrates that participation mode and service type are not linearly related and clarifies the variety of offerings that emerge in servitization, including in which activities customers are expected to perform. Customer participation levels are mapped across different service types to show how frequently various offerings and participation modes occur in the energy sector. For instance, some energy companies provide complete solar solutions, i.e., advanced product-service solutions requiring joint participation, while customers seeking greater autonomy can purchase panels and microgeneration agreements separately and configure the same service independently. In the former, providers assume more responsibility than the latter, although offering product-service solutions in this form of bundled, configurational full-service offering is more costly. This illustrates which participation patterns are most frequent across basic and advanced services and demonstrates how participation tends to cluster around certain services. Therefore, it reveals both structural tendencies of the sector and overall patterns regarding the level of participation and different service types.

From a provider perspective, advanced service types are associated with several advantages. They enable new value propositions based on outcome- or performance-oriented services, increase opportunities for long-term customer value creation, create new revenue streams through service subscriptions or pay-for-use models, and attract investment interest, especially when combined with digital platforms or marketplace logic (Poblete & Halldórsson, 2023; Singh et al., 2022; Sousa & da Silveira, 2017). However, these services also introduce trade-offs. Paper II highlights how advanced services often require substantial provider competence, investments in technology and infrastructure, and sometimes collaboration with external partners to handle complexity and delivery. Regulatory and market risks, including policy uncertainty and varied customer needs, further complicate the implementation of advanced services. Thus, achieving balance when approaching servitization becomes a design challenge. Providers must assess whether potential long-term gains from advanced services justify the required investment and complexity, and how such service development will suit their customers.

In short, previous research has argued that low (or high) customer participation is linked to basic (or advanced) offerings (Sousa & da Silveira, 2017). This thesis categorizes service production into three types: firm, joint, and customer production, also reflecting low to high customer participation. Prior research has mainly focused on joint production, associated with higher interaction, costs and customer value, or customer production, typically self-service linked to cost savings and self-customization (Dong et al., 2015). This thesis considers instead a broader spectrum of participation and provides empirical support for a non-linear connection to service types and value. Using this perspective enables a nuanced but systematic approach

for managing service activities instead of opting for high customer participation. This is particularly useful when examining digital services, providing a structure for managing both the overall service design and its individual components. Advanced services require inherently more investments. Increasing customer participation is a tempting way to reduce costs; however success depends on customer interest and expertise, which are the primary drivers for using digital self-service (Gligor & Maloni, 2021). Paper II supports existing research arguing that developed service designs and marketing strategies should be aligned with customers willingness to invest effort, share information, and receive customized offerings (Heidenreich et al., 2024). While advanced services typically require more customer participation and customization, excessive customer responsibility or digital self-service can reduce perceived value when effort exceeds interest or competence. Effective servitization depends on aligning participation demands with customer motivation and trust, thus positioning providers as orchestrators. This thesis supports existing research arguing that digital services (self-service platforms) are key success factors for further development of servitization but are only utilized when customers voluntarily want to satisfy their interests (Nie & Kosaka, 2016). In total, advanced technology and advanced full-service solutions, including product-service offerings, are increasingly orchestrated by providers.

The shift toward servitization in the energy sector has led to a growing variety of advanced service offerings, often integrated with smart products, and driven by digitalization, platform business models, and new payment structures. These advanced offerings extend beyond basic services, such as billing, energy statistics, or commodity supply, to include flexibility and trading services, energy-efficiency management, solar or microgrid solutions, charging and battery services, and software-based energy solutions. Consistent with prior research, the thesis emphasizes the challenge of shifting from a traditional energy business model (i.e., producing, distributing, and selling electricity and heat) to a more service-based approach (Gonçalves & Patrício, 2022; Kindström et al., 2017; Poblete & Halldórsson, 2023). However, there is an inconsistency between how customer participation is understood theoretically in the literature and which types of customer activities empirically create value for firms. Service types are often characterized linearly, which links advanced offerings with high customer participation in relation to value creation (Sousa & da Silveira, 2017). Paper II demonstrates how various forms of customer participation can create value for both customers and firms and contribute to operational (energy) efficiency in a non-linear way. In general, these insights can contribute to a better understanding of how firms advance service offerings and manage trade-offs between societal (e.g., environmental) and financial objectives. Such insights are useful as transitioning business operations toward a service-oriented approach is inherently complicated.

In sum, customer participation and service type are not linearly coupled. Both basic and advanced services can involve varying participation levels, often enabled by advanced technology and bundled service configurations. To create greater value, firms can strategically configure customer participation across service types while developing increasingly advanced services.

5.2. BALANCING CUSTOMER PARTICIPATION

This section addresses RQ2 by examining why and how firms balance customer participation in services. There are different ways in which customer participation can be differentiated across service types; both previous research and empirical demonstrations examine how a balance can be achieved between them. This is discussed in relation to various services offerings, customer participation strategies, and digital solutions. Prior research explains how organizations can identify and balance participation types to reach a co-creation "sweet spot" (Heidenreich et al., 2024) while creating value for providers and customers across various services.

5.2.1. *THE "SWEET SPOT" OF CUSTOMER PARTICIPATION*

The forms of participation and service offerings identified in energy companies differ from the theoretical understanding of customer participation and service types and further develop this reasoning by exploring how different combinations create value in traditional service industries. Paper I demonstrates the development of an analytical framework that distinguishes participation modes and services types. In Paper II, this logic is extended by developing a framework that distinguishes different customer co-creation activities and service types. Through this differentiation, the thesis emphasizes important issues that have not been fully investigated in previous research. Paper II complements previous exploration by examining a set of purposely chosen energy companies and asking managers which forms of customer participation or customer co-creation activities generate value in different services. This value-based perspective identifies the types of customer participation that companies perceive as beneficial for themselves, customers, and (energy) efficiency. Paper II highlights the conditions under which participation becomes a resource rather than a burden and clarifies why firms encourage some types of participation while limiting others.

This thesis contributes to understanding the co-creation sweet spot by showing that customer participation varies along a continuum of basic to advanced activities, with differing levels of effort, information sharing, and customization. By using the SDL lens and co-creation, the effort, information sharing, and customization (Etgar, 2008; Yi & Gong, 2013) help conceptualize how participation varies across service levels and how these activities influence value creation. Increasing customer participation is often discussed as beneficial, although it can invoke both costs and benefits (Gligor & Maloni, 2021; Heidenreich et al., 2024; Sampson & Chase, 2022; Wilson et al., 2016). Instead, this thesis demonstrates that more participation is not always better and shows that value creation depends on aligning participation with customer competence, interest, and context. The findings from Paper II extend service-dominant logic by emphasizing balance rather than maximization of participation, highlighting that low effort, strategically simple participation supported by digital systems and trustworthy provider relationships optimizes outcomes. Paper II indicates that companies with low customer interest increasingly design services to match customers' preferred levels of participation. Paper III further indicates that such traditional, utilitarian services, i.e., energy services, benefit from designs requiring lower and simpler customer participation. This clarifies how providers can manage co-creation across service types to enhance efficiency, customer experience, and

overall value while avoiding overburdening customers. This nuance advances existing co-creation theory by emphasizing balance rather than maximization of participation.

Study B uses a value-based perspective on servitization strategies and customer participation, using energy as an empirical example. Adapting strategies to sector-specific conditions is crucial for successful service development but what that entails remains largely unclear for many traditional service industries. Advancing services is increasingly important in the transition toward a service-based approach. Servitization is increasingly relevant across sectors, including electricity (Rabetino et al., 2025), and is positioned as a service-based strategy that addresses changing customer needs and competitive advantage (Andersen & Bering., 2022; Sklyar et al., 2025; Sousa & da Silveira, 2016), yet it still lacks customer insight and multidisciplinary integration. Findings on energy-sector servitization contribute to understanding how to find the co-creation sweet spot by showing that advanced service offerings deliver significant value only when provider capabilities, customer participation, technological advancements, and institutional conditions are aligned. In other words, sector-specific conditions are particularly relevant for operationalizing servitization in traditional service industries. Managing these trade-offs is crucial for realizing the benefits of servitized services while avoiding challenges related to complexity, cost, and limited adoption.

A deeper understanding of how to balance customer participation can be achieved by integrating servitization research, customer participation as a production category, and co-creation within service-dominant logic. The thesis previously explored how participation differs across service types. Following this, Paper II emphasizes how firms can balance distinct forms of participation to support value creation for both providers and customers. Together, these perspectives provide a strong basis for understanding implications for service design. The sector-wide patterns identified in Paper I offer insight into commonalties, while the findings from Paper II explore which configurations create value and why. Combining both perspectives enables more informed decisions for creating new service designs. This can provide strategic guidance for service providers in determining when to encourage, streamline, or constrain customer participation across different service types. By iteratively examining participation configurations across service types and aligning them with contextual factors (such as industry type, regulations, customer motivation, and technological maturity), firms can determine participation levels that maximize value without undermining adoption or scalability.

5.2.2. *DIGITAL SELF-SERVICE AND CONTEXTUAL FACTORS*

Apart from examining the factors and implications affecting how firms can select, design, and adapt customer participation across different service types, this thesis also demonstrates how contextual factors related to industry characteristics and technology shape the prevalence of balanced customer participation. As research in this domain expands, strategies supporting strategic decisions should be developed to help companies decide which technologies to deploy. More importantly, it can help determine how the division of responsibilities between providers and customers can be efficiently configured and structured through technological advancements. Resource constraints require providers to selectively invest in service innovations and technological advancements that are most likely to yield substantial effects

(Athaide et al., 2024). Thus, this study emphasizes the importance of contextual factors, such as the nature of the firm, industry type, customer, and the environment in determining how participation strategies unfold technological capabilities.

From the perspective of servitization and participation in basic and advanced service types, digital services and advanced technology have arguably blurred the lines of service types (Sousa & da Silveira, 2017). Paper I identifies two interrelated mechanisms that enable variation in customer participation across basic and advanced services: digital self-service platforms and configurable service designs. Consistent with previous research (Kindström et al., 2017; Poblete and Halldórsson, 2023), digital platforms broaden the scope of offerings by integrating product-based solutions and a wide range of self-service options. The breadth of available activities allows customers to choose their level of participation, supporting customization (cf. Gonçalves and Patrício, 2022). This is significant, as limited customer knowledge and interest hinder energy service innovation and development (Kindström et al., 2017). Paper I illustrates how digital self-service can be adapted to different levels of customer interest and competence. For example, basic apps provide simple activities requiring minimal effort, while advanced apps require more effort and offer more complex and customizable features. Such platforms expand the scope of services and enable firms to tailor participation levels to different customer segments. These findings indicate that configurable, digital self-services allow providers to offer similar services at different participation levels, reaching a broader range of customers in an industry where engagement has traditionally been low. For example, new technology can facilitate automation, remote monitoring, and optimization that reduce the need for direct customer participation, while in other cases, it supports self-service, configurability, or self-customization, requiring greater customer input. Recent technological advances (e.g., cloud computing, IoT, AI, digital platforms) and the smartification of (servitized) products create changes in both markets and hierarchical relationships, complicating and challenging how traditional sectors create and capture value (Appio et al., 2021). From a value creation perspective, Paper II further stresses that providers strategically can use digital self-service platforms and bundled configurational services to facilitate low-effort participation for broad customer segments while supporting advanced co-creation for motivated users. Although advancing technologies may provide means for either low or high participation across basic and advanced services, the question remains: How can firms adapt participation and advance offerings using technology?

As previously mentioned, balanced forms and levels of customer participation indicated, “More is not always better.” Recent research has questioned core assumptions, emphasizing that assumptions about participation may not be generalizable across contexts (hedonic vs. utilitarian) (Barrett et al., 2024). Such research implies that the current understanding of how to foster customer participation may not apply in utilitarian contexts. When digital technologies are introduced, they interact with distinct value logic and customer expectations, arguably producing different outcomes. This thesis answers the call for greater attention to the boundaries of technology’s impact (Athaide et al., 2024). The influence of digital technologies may vary depending on context (e.g., the nature of the firm, the characteristics of the industry, the

structure of the platform, customers, and broader environmental conditions). Authors question, for example, whether "technology for buying utilitarian products may have different impacts than technology for buying hedonic products" (Athaide et al., 2024).

Utilitarian contexts, such as industries in telecommunications and financial and energy services, have received less attention in research (Barrett et al., 2024) but have been transformed by self-service technologies enabling customers the means to provide services for themselves in an attempt to stay cost competitive (Sampson & Chase, 2022). Both Paper I and Paper II indicate that energy companies are implementing self-service options and digital innovations such as apps and smart features to control consumption. Empirical findings from Paper II shows that both customers and providers prefer and value simple, rudimentary tasks to be done via digital self-service. However, further findings indicate that many companies still greatly value personal contact for more complex or advanced services and that more complex, customized self-service is underutilized. Companies underscored that personal contact enables customer trust and loyalty, using it to create long-term value co-creation and competitive advantage. Papers I and II indicate that balancing customer participation using digital services enables firms to remain cost-efficient while allowing customers to co-create value ensuring competitiveness as technologies, customer preferences, and industry conditions evolve. Contextual understanding of technology's impact is important for theory development, specifically for participation in services. It allows clearer specification of how digital technologies create value through increased or reduced participation and how they should reconfigure roles between providers and customers. Paper II indicates that smart technology enabling automation and low-effort participation is expensive to develop and offer but are crucial for energy firms, customer needs, and energy efficiency.

This thesis argues that participation is not universally desired, feasible, or value creating across service types, highlighting that the impact of digital technologies is context-specific. In addition, understanding boundary conditions helps distinguish between contexts where increased participation improves value co-creation and where it creates burden, risk, or inefficiency. The value of participation depends on contextual conditions, such as service complexity, customer competence, and the criticality of outcomes. This study extends theory on service innovation and service-dominant logic by clarifying the role of customer participation and customer co-creation in digital services and infrastructural services. Digital service innovations and self-service activities have transformed the market by introducing new ways for customers to participate in and customize their own services. Paper I implies that energy service providers that understand their customer segments, characteristics, and preferences, can strategically choose which customer activities should be performed and how, i.e., via personal interaction or digital self-service platforms. Papers I and II suggest that using digital self-service for simple tasks 1) enables customers to engage in activities that suit their ability, such as managing their bills and self-education, 2) provides simple ways to share needs with their providers, and 3) optimizes resources for the provider by shifting task execution to the customer.

The thesis explores how technological advancements, such as digital self-service, and contextual factors shape customer participation strategies. Thus, it underscores the limits of digital-enabled participation and the need to take service context into account when designing services. Service designs should be adapted to sector characteristics and customer needs instead of opting for increasing participation through complex digital self-service. In simple terms, the impact of digitalization depends on what the service is for and how providers and customers define and pursue value. The study focuses on a service context that has received limited research attention and increasingly requires advanced technology. This environment is highly regulated and characterized by diverse customer segments with limited ability or interest to participate. Taken together, these insights underline that technology-enabled service innovation cannot be understood without explicit attention to context.

In sum, more customer participation is not always better. Excessive or misaligned co-creation can reduce efficiency, adoption, and value, a challenge increasingly evident with digital self-services, particularly in the energy sector. Firms can balance participation by aligning it with customer interest, competence, and context, strategically allocating service activities to customers where it adds value while reducing effort for broad segments, ensuring value creation without overburdening customers or compromising efficiency.

5.3. MANAGING CUSTOMER PARTICIPATION THROUGH MODULARITY

Section 5.3.1 addresses RQ3, examining how service modularity can be used to manage customer participation, service customization, and standardization. Further exploration of how to manage customer co-creation strategies and service offerings detail how these concepts relate to customer needs and support the development of a balanced, modular approach that enhances efficiency and effectiveness. In particular, it shows how service modularity can be used to manage customer participation and service design, offering insights for traditional service industries to align customer needs with efficient, flexible, and balanced service delivery.

5.3.1. *MODULAR APPROACH TO PARTICIPATION IN SERVICES*

This part of the thesis brings together the two previous sections by addressing how modular service designs can be used to manage customer participation. Additionally, the thesis explores how such insights can be used to guide service advancement while providing a balance for customer participation; this is particularly relevant when managing complex, large-scale systems such as traditional service industries. Modular approaches have been identified in the empirical settings of energy services. Additionally, this approach answers the call for more empirical research on this matter (Rajala et al., 2019).

Findings from Papers II and III advance modularity research by extending its application to customer participation, which can be understood as “modular participation.” Applying modularity to customer participation offers several advantages. While prior studies conceptualize modularity as a way to decompose services into standardized components to manage complexity and support customization, this thesis shows how the same logic can structure the division of labor between customers and providers. Routine activities can be assigned to customers with minimal effort, while providers retain responsibility for activities

requiring specialized knowledge or higher customization. In doing so, the thesis confirms and extends prior research by demonstrating how modular service design supports a balance between standardization and customization, particularly in contexts characterized by low customer interest.

In the empirical context of energy services, Paper II indicates that providers perceive that simple, standardized customer activities, such as simple digital self-service activities, paying bills, or sharing data and preferences via apps, generate more value when performed by customers, whereas providers can create greater value when they design, bundle, and orchestrate offerings and customize solutions. Basic customer activities were perceived as more valuable by providers, such as tasks aligned with customers' abilities, sharing relevant information in straightforward ways, and reducing the provider's workload by taking on rudimentary service activities. As previously discussed, this is increasingly possible due to digital services. Self-service platforms allow customers to engage in simple service activities, while providers can orchestrate more complex, advanced service offerings. Paper II demonstrates that providers reported that most customers do not want to be responsible for orchestrating, bundling, customizing, or participating in advanced services. Considering operational efficiency and low willingness to participate is critical for successful service design.

A competence-based allocation of service activities could ensure that tasks are carried out by the best suited actor, balancing efficiency and effectiveness. This approach enables differentiated customization, accommodates varying degrees of customer participation and interaction, and supports strategic goals, such as customer satisfaction, operational efficiency, and competitive advantage. Providers can design coherent bundles of service modules and customers can select preferred levels of participation. Modularizing participation makes customization more feasible without increasing system complexity. This is particularly relevant for traditional service industries where customization requiring extensive customer participation is challenging due to low customer interest, limited knowledge, or operational constraints. A competence-based modular approach enables service activities to be divided into distinct modules and allocated to either customers or providers depending on who is best suited to the task. This allows providers to offer a broader range of service configurations, as a modular approach could establish participation levels, and avoid exclusive reliance on high customer participation.

Applying modularity to customer participation and considering the context of energy services illustrates how to balance participation and trade-offs with standardization and customization. Traditional service industries are characterized by complex and costly service offerings, such as energy services, where extensive customization and high levels of customer participation are often impractical. In such contexts, providers must balance standardization and customization by carefully organizing service types and aligning them according to appropriate levels of customer participation. Through modularity, simpler and standardized services can be designed to involve customers in efficient and adapted ways, while more advanced and complex services are orchestrated by providers, ultimately enabling advanced service offerings without requiring uniformly high customer participation. Servitization efforts can guide service advancements,

but managing highly complex service systems requires balance, and modular approaches can contribute to this goal. Digital services, particularly platforms and self-service technologies, play a central role in this process by supporting modular service designs that structure participation and facilitate efficient coordination between customers and providers.

5.3.2. *STANDARDIZATION AND CUSTOMIZATION IN SERVICES*

Findings from Paper III indicate a theoretical discrepancy between standardization and customization in the operations management literature and the service marketing literature. The overlapping concepts stem from drawing on different assumptions, empirical contexts, and perspectives. These differences produce conflicting definitions and highlight the need for conceptual alignment to enable coherent strategic guidance. This is increasingly important, as recent technological advancements introduce more complex and integrated offerings. As service industries move beyond traditional approaches, research must reconsider how standardization and customization are understood. Operations management and service modularity studies call for the need to explore customer preferences, collaboration, customization, and diverse service contexts (De Mattos et al., 2021).

A conceptual framework of service standardization and customization was developed in Paper III. It shows how the concepts differ in operations management and marketing literature to broaden theory and support industrial application. This extends prior understanding by clarifying how these concepts can be defined, connected to customer needs, and balanced to support both operational efficiency and customer satisfaction. The conceptualization offers practical guidance for designing context-specific, customer-adapted service offerings while advancing service modularity research by extending its application. Paper III stresses the strategic use of modularity to understand the concepts, underscoring the need to align customization complexity with customers' willingness to participate. Such considerations become central when managing both operational and marketing strategies.

Paper III contributes to guiding the strategic use of these concepts in service innovation and management in several ways. First, introducing service modularity into service marketing literature can provide a useful lens for offering customized services at scale without sacrificing efficiency. Service modularity offers a structured approach to support effective design in increasingly complex service systems. Second, while operations management provides an effective means for understanding service production and delivery, service marketing contributes to valuable insights into customer-provider relationships and service delivery systems, such as digital self-service tools. Service marketing literature calls for research on new contexts and varying effects on standardization and customization for service types (Heidenreich et al., 2024), illustrating the need for this kind of research. Third, both fields emphasize the need to balance standardization and customization (and related aspects) in response to technological advances and new contexts. Different service types and participation levels may require modular strategies. Modularity can act as an overall service strategy for effectively balancing the concepts while leveraging resources and competencies from both customers and providers (Carlborg & Kindström, 2014; Rajala et al., 2019). Understanding

modularity clarifies how to design and improve service systems, particularly as technology reshapes provider–customer interactions across contexts.

Integrating different service literature clarifies how to standardize and customize services while finding the balance between them. While operations management and marketing literature provide a strong foundation for service strategies and customer participation, multidisciplinary perspectives are needed to address new challenges arising from technological advancements. This is particularly true when these concepts are implemented in new sectors, such as the energy industry. Consequently, service modularity serves as an effective method to achieve greater balance between these concepts in both literatures.

In sum, modularity can be used to manage customer participation by structuring services into modules and allocating tasks to the actor best suited for each. It balances standardization and customization, enables flexible service configurations, and supports efficient co-creation. This approach lets customers engage according to their preferences while providers retain control over critical or advanced functions, enabling providers to orchestrate complex services and deliver cost-efficient customization as customers handle simpler tasks.

6. CONCLUSIONS, IMPLICATIONS, AND FUTURE RESEARCH

6.1. CONCLUSIONS

The aim of this thesis was to increase the understanding of customer participation in service development and management. The study addresses three research questions: RQ1) How is customer participation interrelated with service types? RQ2) Why and how can firms balance customer participation in services? and RQ3) How can modularity be used to manage customer participation?

The present research further show how firms can manage varying customer participation requirements, respond to technological shifts, and design offerings that remain operationally efficient while creating value and competitive advantage. It draws on servitization, service modularity, and energy services research to advance understanding of customer participation and service development. The research focuses on energy companies while illustrating how the insights can apply to traditional industries. The thesis discusses the theoretical implications of the synthesized findings and their relation to the empirical context.

This thesis offers several contributions. First, based on the findings it can be concluded that customer participation in services can take different forms than previously described in research. This study increases understanding of how customer participation is interrelated with service types. It shows how different forms of customer participation create value across basic and advanced services, revealing a non-linear relationship through sector-wide patterns. By integrating research on servitization and customer participation, a two-dimensional analytical framework for categorizing services was developed, showing that any service type can be associated with any level of customer participation. This challenges the prevailing assumption that basic services involve low participation and advanced services high participation (Sousa

and da Silveira, 2017; Dong et al., 2015; Baines and Lightfoot, 2013). The findings indicate that providers can choose participation modes to enhance service advantages and mitigate disadvantages. This thesis contributes to the understanding of how servitization can be operationalized and which factors influence its success across different contexts. The thesis expands the current literature on customer participation and servitization by offering a framework for categorizing services and outlining the benefits and drawbacks of each category.

Second, building on this foundation, further investigation shows how customer participation contributes to value creation across basic and advanced services. This study stresses how and why a balance between different participation forms can be achieved rather than opting for increasing customer participation. It further contributes by highlighting how firms can balance customer participation in services. The thesis explores when and how customer participation supports, rather than constraints, value creation in effort, information-sharing, and customization. In traditional service industries with low customer interest, the findings show that higher levels of customer participation do not automatically increase value, challenging such assumptions in previous literature (e.g., Heidenreich et al., 2024). The most appropriate level of co-creation (the sweet spot) depends on the service context. In the empirical context of energy, this occurs when customer effort remains low, provider responsibility for service complexity is retained, and simple digital tools support, not replace, relational interactions to build customer trust. When customer responsibility exceeds customer motivation, interest, or competence, perceived value, and adoption decline. By adopting a value-based servitization perspective, the shift from basic to advanced services reflects a transition toward result-oriented, customer-centric, value creation where customer trust and balanced participation is needed. This can improve firms' ability to balance operational efficiency with effectiveness in serving diverse customer needs. Instead of opting for increased participation, providers should strategically orchestrate participation rather than transfer responsibility to customers. This is particularly important considering that technological advancements increase the complexity of co-creation and service designs.

Third, the thesis demonstrates how modular service design structures customer participation levels and balances customization and standardization. It advances modularity research by extending its application to customer participation and service development in traditional, infrastructural service industries as with the energy industry. Through a value-based perspective, the thesis contributes to current research by showing how modular approaches allow providers to 1) configure similar services and deliver full-service offerings in a more balanced, flexible manner, and 2) create value by allocating co-creation activities across various service types suitable for both customers and providers. This enables a balance between operational efficiency and standardization, as well as customization and increased customer satisfaction. It further balances other strategic goals, such as financial and societal/environmental objectives. Standardizing selected processes while allowing flexibility in others supports a balanced, modular approach that maintains cost-efficient customization. This thesis responds to calls for empirical evidence of how modularity unfolds in complex service-based industries, where inherent issues can be managed through modularity (Rajala et

al., 2019). While empirical studies integrating servitization and modularity in complex service-based industries remain limited, this thesis bridges these perspectives by examining how modularization unfolds within in the empirical context of energy.

Furthermore, this thesis specifically clarifies how customization in energy services can be supported through the combined use of self-service and modularization. This is particularly relevant in energy service research, which concerns how firms can design service development strategies that enhance energy efficiency while strengthening their competitive position. It advances theoretical understanding by clarifying how customization in the energy sector is supported through the combined use of self-service and modularization, therefore, contributing to research on customer participation in digital services (Heidenreich et al., 2024; Nie & Kosaka, 2016; Sampson & Chase, 2022), servitization, and service modularity (Rajala et al., 2019). Servitization efforts coupled with modularity enable firms to offer similar services in multiple configurations, supporting varying levels of customer participation across both basic and advanced offerings. This thesis also extends the scope of service modularity and provides a necessary framework for managing servitization efforts and achieving scalable customization in industries where such flexibility has previously been overlooked. This thesis extends modularity research to customer participation or "modular participation." Modularity not only structures service components but also constructs a division of labor between customers and providers. This thesis, therefore, demonstrates how modular design principles can manage service designs and balance participation.

Overall, this thesis shows that more customer participation is not always better. To create greater value, firms can strategically configure customer participation across service types while developing increasingly advanced services. Modularity can be used to manage customer participation and servitization efforts. The thesis adds a more nuanced understanding of when and how servitization efforts linked to customer participation generate value, particularly in energy research. Allowing providers to strategically balance participation can improve how to manage different trade-offs (efficiency, satisfaction, financial outcomes) and create value for customers, providers, and operations. This thesis contributes by integrating customer participation and service development research, adding nuance to the current understanding. In sum, the thesis contributes to theoretical understanding of the role of customer participation in service development and implications for management.

6.2. PRACTICAL IMPLICATIONS

Several implications for management practice have been put forward, increasing the scope of co-creation, requiring managers to balance strategic and operational challenges in designing effective, technology-enabled participation models. Challenges and opportunities surface when service managers must handle operational and strategic issues and balance how to engage actors to co-create value for the benefit of all involved.

Practical implications include recognizing that customer participation is not inherently beneficial; value is created when participation demands align with customer interest and the complexity of the service. Firms should differentiate participation and co-creation activities

across service types and adjust levels for basic versus advanced offerings to optimize efficiency and customer satisfaction. Digital self-service platforms enable this calibration by supporting low-effort participation for broad segments and advanced co-creation for motivated users, while also facilitating information sharing, customization, and workload reduction. Contextual factors, including firm size, customer characteristics, industry conditions, and technological capabilities, influence outcomes, meaning that the same digital solution can yield varying results in different settings. Managers should strategically structure participation to enhance value, optimize resources, and guide service development, ensuring that standardized activities align with customer abilities and that advanced co-creation is targeted to capable segments. By balancing involvement rather than maximizing it, firms can improve service delivery, customer experience, and competitiveness in traditional industries where engagement is typically low.

Managers in companies transitioning toward servitization can benefit from considering service type and customer participation (i.e., provider-led, joint, or customer-led service production). By doing so, they can adopt more varied and flexible approaches to developing services, adapting strategies to better match different service characteristics and participation modes. This perspective allows firms to advance services while maintaining flexibility in design and delivery. Managers in traditional service industries should strategically align customer participation with service type, customer capability, and interest. Basic services benefit from joint or customer-led participation to increase loyalty, while advanced services require sufficient provider competence, technology, and support to manage complexity without overburdening customers. Servitization involves balancing long-term values, efficiency, and costs, while advanced services offer new revenue and differentiation if well implemented. Energy services illustrate these challenges, and the findings are applicable to other traditional sectors, guiding the design of participation, digital engagement, and service offerings to optimize value creation and adoption. Therefore, the present study provides actionable guidance for service design and innovation.

Overall, firms are encouraged to identify and balance valued forms of participation by systematically separating service type from service activities and evaluating their effects on value creation for customers, providers, and operations. These insights have a great potential for generalizability to other traditional service sectors with similar characteristics, such as banking, insurance, or telecommunications. Managers in these industries can use these principles to structure customer participation strategically, leverage digital tools for low-effort engagement, and balance efficiency, service innovation efforts, and value creation when designing both basic and advanced services. The thesis highlights which services are viable under current industry conditions and how delivery choices affect scalability, customer participation, and operational efficiency, supporting more informed service development and investment decisions for service providers.

Regarding service modularity, the thesis provides guidance on designing and managing trade-offs between standardized and customized strategies and offerings, particularly in traditional service industries such as energy. In the case of energy companies, the findings indicate that service designs should follow a modular approach, which prioritizes combinatorial

customization over increased customization. This provides an opportunity for managers to use modular designs to standardize core service elements while offering customizable modules that address diverse customer needs, enabling cost-efficient and scalable service delivery in traditional service industries. This is particularly the case for sectors that must balance financial and societal imperatives such as energy. Therefore, this thesis extends modularity to traditional, infrastructural service industries.

This study addresses the need for research to help identify specific customer modules (Carlborg & Kindström, 2014). It contributes initial steps toward frameworks and guidelines that support managers in determining which resources and competencies are suitable for customer participation. Using a modular approach, managers are advised to adopt a competence-based allocation of service activities, assigning tasks to the best-suited actor, customer, or provider. This approach helps balance efficiency, customer satisfaction, and strategic objectives, such as financial performance and sustainability. By aligning service design with customers' preferred participation levels and capabilities, managers can implement strategies that accommodate without overburdening either customers or providers, ultimately enhancing service effectiveness and competitive advantage.

6.3. LIMITATIONS AND FUTURE RESEARCH

Customer participation can be differentiated across service types, as evidenced by both prior research and by energy company practices. The study further examines strategies for balancing these different types of participation. Drawing on operations and service management literature, the findings suggest that organizations can identify a participation "sweet spot" that creates value for both providers and customers across varied services in traditional service industries.

Several limitations should be acknowledged. First, the study is context-specific, with data primarily drawn from Swedish energy companies, which may limit the generalizability of the findings to other national or regulatory frameworks. However, this focus provides detailed insights relevant to other markets with similar structures, offering transferable patterns rather than exact prescriptions. Second, while the study integrates insights from prior literature and managerial perspectives, the reliance on interviews and existing datasets may introduce biases related to participant perceptions. This is mitigated by triangulating perspectives across managers and literature, reducing the risk of systematic distortion. Third, the focus on customer participation and service offerings emphasizes strategic and organizational factors, potentially overlooking broader technical, social, or policy-related constraints. Nevertheless, this focus is justified because strategic and organizational factors directly shape how services are designed, delivered, and experienced. While other constraints can influence service development, they operate largely as boundary conditions, whereas organizational decisions determine the actual implementation and management of customer participation. Despite these limitations, the findings offer valuable guidance for both theory and practice, highlighting how organizations can balance participation types and structure collaboration to advance sustainable, customer-adapted energy services.

Building on these insights, several avenues for future research emerge. One promising area involves cross-sector collaboration in the real estate and construction sector, which is a major contributor to Sweden's greenhouse gas emissions and energy consumption. Achieving national sustainability goals will require innovative, customer-adapted energy services, developed through early and effective collaboration between energy companies, construction firms, and property owners. Understanding how these collaborations can be structured presents opportunities to extend current research on service development and customer participation beyond the energy sector alone. Future research could explore how multiple actors contribute to the development of innovative energy services and how their collaboration can be structured to support customer-adapted, energy-efficient solutions. For example, studies could examine interactions between energy companies, construction firms, and property owners in real estate projects, identifying how responsibilities, knowledge, and decision-making are shared. Comparative studies across different types of projects or regions could reveal how actor roles, coordination mechanisms, and institutional contexts influence the effectiveness of collaborative service development. Explorative case studies could provide valuable insights; however, moving forward, it would be particularly relevant to focus on real estate projects where collaboration between energy providers and decision-makers is further examined. Semi-structured interviews with these stakeholders, combined with existing interview data and web analyses, would enable researchers to identify challenges, best practices, and patterns in cross-sector collaboration. Thematic analysis, manual coding, and text-mining techniques could rigorously connect empirical observations to existing literature and analytical frameworks.

In terms of potential avenues for my remaining PhD studies, I am currently considering exploring this topic further. Such research is expected to contribute both theoretically and practically. Theoretically, it would expand understanding of how collaboration can be structured in traditional service industries, integrating insights from service marketing, operations management, and energy research. Practically, it could generate actionable guidance for practitioners on organizing cross-sector collaboration to develop innovative, customer-adapted energy services, including recommendations for technical platforms and digital solutions necessary to support advanced service offerings.

REFERENCES

Andersen, T. J., & Bering, S. (2022). Integrating distribution, sales and services in manufacturing: a comparative case study. *International Journal of Operations & Production Management*, *43*(10). https://doi.org/10.1108/IJOPM-03-2022-0198

Andersen, T. J., & Bering, S. (2023). Integrating distribution, sales and services in manufacturing: a comparative case study. *International Journal of Operations & Production Management*, *43*(10), 1489-1519.

Appio, F. P., Frattini, F., Petruzzelli, A. M., & Neirotti, P. (2021). Digital transformation and innovation management: A synthesis of existing research and an agenda for future studies. *Journal of Product Innovation Management*, *38*(1), 4-20.

Athaide, G. A., Jeon, J., Raj, S., Sivakumar, K., & Xiong, G. (2024). Marketing innovations and digital technologies: A systematic review, proposed framework, and future research agenda. *Journal of Product Innovation Management*.

Baines, T., Lightfoot, H., Peppard, J., Johnson, M., Tiwari, A., Shehab, E., & Swink, M. (2008). Towards an operations strategy for product-centric servitization. *International Journal of Operations & Production Management*, *29*(5), 494-519.

Barrett, J. A. M., Jaakkola, E., Heller, J., & Brüggen, E. C. (2024). Customer Engagement in Utilitarian vs. Hedonic Service Contexts. *Journal of Service Research*, 10946705241242901.

Bergek, A. (2020). Diffusion intermediaries: A taxonomy based on renewable electricity technology in Sweden. *Environmental Innovation and Societal Transitions*, *36*, 378-392.

Bergek, A., Mignon, I., & Sundberg, G. (2013). Who invests in renewable electricity production? Empirical evidence and suggestions for further research. *Energy Policy*, *56*, 568-581.

Carlborg, P., & Kindström, D. (2014). Service process modularization and modular strategies. *Journal of business & industrial marketing*, *29*(4). https://doi.org/10.1108/JBIM-08-2013-0170

Cavallo, A. (2017). Are Online and Offline Prices Similar? Evidence from Large Multi-Channel Retailers. *American Economic Review*, *107*(1), 283-303. https://doi.org/10.1257/aer.20160542

Ding, Y., & Keh, H. T. (2016). A re-examination of service standardization versus customization from the consumer's perspective. *Journal of Services Marketing*, *30*(1), 16-28.

Dong, B., Sivakumar, K., Evans, K. R., & Zou, S. (2015). Effect of customer participation on service outcomes: The moderating role of participation readiness. *Journal of Service Research, 18*(2), 160–176.

Easton, G. (2010). Critical realism in case study research. *Industrial marketing management*, *39*(1), 118-128.
Eisenhardt, K. (1989). Building theories from case study research. *Academy of management review*, *14*(4), 532-550.
Eisenhardt, K. M. (2021). What is the Eisenhardt Method, really? *Strategic Organization*, *19*(1). https://doi.org/10.1177/1476127020982866
Falcke, L., Zobel, A. K., & Comello, S. D. (2024). How firms realign to tackle the grand challenge of climate change: An innovation ecosystems perspective. *Journal of Product Innovation Management*, *41*(2), 403-427. https://doi.org/10.1111/jpim.12687
Gligor, D. M., & Maloni, M. J. (2021). More is not always better: The impact of value co-creation fit on B2B and B2C customer satisfaction. *Journal of Business Logistics*, *43*(2). https://doi.org/10.1111/jbl.12278
Gonçalves, L., & Patrício, L. (2022). From smart technologies to value cocreation and customer engagement with smart energy services. *Energy Policy*, *170*, 113249.
Grewal, D., Kopalle, P. K., & Mahr, D. (2025). A Brave New World: The Impact of Technology on Innovation Management. *Journal of Product Innovation Management*, *42*(5). https://doi.org/10.1111/jpim.70000
Heidenreich, S., Jordanow, S., Kraemer, T., & Obschonka, M. (2024). Together forever? How customer co-creation affects the adoption of digital service innovations over time. *Journal of Product Innovation Management*.
IEA. (2019). *Energy Policies of IEA Countries: Sweden 2019 Review*.
IEA. (2020). World Energy Outlook. *Paris: International Energy Agency*.
Kamalaldin, A., Linde, L., Sjödin, D. and Parida, V., . (2020). Transforming provider-customer relationships in digital servitization: A relational view on digitalization. *Industrial Marketing Management*, *89*, pp.306-325.
Kindström, D., Ottosson, M., & Thollander, P. (2017). Driving forces for and barriers to providing energy services—a study of local and regional energy companies in Sweden. *Energy Efficiency*, *10*(1), 21-39.
Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, *24*(1), 120-124.
Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. sage.
Lusch, S. V. R. (2004). Evolving to a New Dominant Logic for Marketing. *Journal of marketing*, *68*(1). https://doi.org/10.1509/jmkg.68.1.1.24036
Mattos, C. S. d., Fettermann, D. C., & Cauchick-Miguel, P. A. (2021). Service modularity: literature overview of concepts, effects, enablers, and methods. *The Service Industries Journal*, *41*(15-16). https://doi.org/10.1080/02642069.2019.1572117

Meuter, M. L., & Bitner, M. J. (1998). Self-service technologies: extending service frameworks and identifying issues for research. American marketing association. Conference proceedings,

Nie, Y., & Kosaka, M. (2016). Customer self-service platform: the next practice for servitization of manufacturing. *International Journal of Services and Operations Management*, *25*(2), 259-273.

Oertzen, A.-S., Odekerken-Schröder, G., Brax, S. A., & Mager, B. (2018). Co-creating services—conceptual clarification, forms and outcomes. *Journal of Service Management*, *29*(4). https://doi.org/10.1108/JOSM-03-2017-0067

Poblete, L., & Halldórsson, Á. (2023). Sourcing energy services in business-to-business contexts: practices among end-customers. *Energy Efficiency*, *16*(3), 10.

Rabetino, R., Harmsen, W., Kohtamäki, M., & Sihvonen, J. (2017). Structuring servitization-related research. *International Journal of Operations & Production Management*, *38*(2). https://doi.org/10.1108/IJOPM-03-2017-0175

Rabetino, R., Kohtamäki, M., Kowalkowski, C., Baines, T. S., & Sousa, R. (2021). Guest editorialServitization 2.0: evaluating and advancing servitization-related research through novel conceptual and methodological perspectives. *International Journal of Operations & Production Management*, *41*(5). https://doi.org/10.1108/IJOPM-05-2021-840

Rajala, R., Brax, S. A., Virtanen, A., & Salonen, A. (2019). The next phase in servitization: transforming integrated solutions into modular solutions. *International Journal of Operations & Production Management*, *39*(5). https://doi.org/10.1108/IJOPM-04-2018-0195

Rintamäki, T., & Saarijärvi, H. (2021). An integrative framework for managing customer value propositions. *Journal of Business Research*, *134*. https://doi.org/10.1016/j.jbusres.2021.05.030

Sampson, S. E., & Chase, R. B. (2022). Optimizing customer involvement: how close should you be to your customers? *California Management Review*, *65*(1), 119-146.

Shoufan, Abdulhadi. (2023). Exploring Students' Perceptions of ChatGPT: Thematic Analysis and Follow-Up Survey. IEEE Access. 10.1109/ACCESS.2023.3268224.

Singh, M., Jiao, J., Klobasa, M., & Frietsch, R. (2022). Servitization of Energy Sector: Emerging Service Business Models and Startup's Participation. *Energies*, *15*(7), 2705.

Singh, M., Kesselring, A., Klobasa, M., Quaresma, N., & Almeida, A. D. (2025). Servitization of demand-side energy services: Perspective and

insights from energy service providers. *Energy Strategy Reviews*, *61*. https://doi.org/10.1016/j.esr.2025.101845

Sklyar, A., Sörhammar, D., Kowalkowski, C., & Tronvoll, B. (2025). Digital service orientation: unlocking servitization in service operations and service sales. *International Journal of Operations & Production Management*, *45*(13). https://doi.org/10.1108/IJOPM-08-2024-0710

Sousa, R., & da Silveira, G. J. (2017). Capability antecedents and performance outcomes of servitization: Differences between basic and advanced services. *International Journal of Operations & Production Management*, *37*(4), 444-467.

Storey, C., Cankurtaran, P., Papastathopoulou, P., & Hultink, E. J. (2016). Success Factors for Service Innovation: A Meta-Analysis. *Journal of Product Innovation Management*, *33*(5). https://doi.org/10.1111/jpim.12307

Wilson, A., Zeithaml, V., Bitner, M. J., & Gremler, D. (2016). *EBOOK: Services Marketing: Integrating customer focus across the firm*. McGraw Hill.

Witell, L. (2025). *Service Innovation and Management*. https://doi.org/10.1007/978-3-031-76560-5

Yin, R.K. (2003) Case Study Research: Design and Methods. 3rd Edition, Sage, Thousand Oaks.