# MANAGING SERVICE INNOVATION: HOW FIRMS CAN BENEFIT FROM NEW SERVICES

**DISSERTATION**

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# PREFACE

Service innovation has increasingly gained acknowledgement to contribute to economic growth and well-being. Despite this increased relevance in practice, service innovation is a developing research field. To advance literature on service innovation, I analyze with a qualitative study how firms manage service innovation activities in their organization differently. In addition, I evaluate the influence of top management commitment and corporate service innovativeness on service innovation capabilities of a firm and their implications for firm-level performance by conducting a quantitative study.

This dissertation would not have been possible without the supervision of Prof. Dr. Ulrich Lichtenthaler. He set the foundation for the research topic of this work and supported me in the early phases of my dissertation. I owe sincere and earnest thankfulness to Prof. Dr. Jörn Hendrich Block who placed trust in me and was willing to supervise me in the finalization of the dissertation. He gave me invaluable advice on how to improve the quality of the work. In addition, I would like to thank Prof. Dr. Katrin Muehlfeld who acted as second assessor of this work. Of course, all errors and omissions are mine.

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| | |
|---|---|
| ATM | Automatic teller machine |
| AVE | Average value extracted |
| B2B | Business-to-business |
| C2C | Consumer-to-consumer |
| CB-SEM | Covariance-based structural equation modeling |
| CeBIT | Centrum für Büroautomation, Informationstechnologie und Telekommunikation (fair for information technologies) |
| CEO | Chief executive officer |
| CFA | Confirmatory factor analysis |
| CFI | Comparative fit indes |
| CFO | Chief financial officer |
| CIS | Community innovation survey |
| COO | Chief operations officer |
| CR | Composite reliability |
| DNA | Deoxyribonucleic acid |
| E.g. | Exempli gratia (for example) |
| EFA | Exploratory factor analysis |
| ESI | Early Simultaneous Involvement |
| Et al. | Et alii (and others) |
| EU | European Union |
| GB | Great Britain |
| GDP | Gross domestic product |
| I.e. | Id est (that is) |
| IFI | Incremental fit indes |
| IT | Information technology |
| KIBS | Knowledge-intensive business service |
| KPI | Key performance indicator |
| NPD | New product development |
| NSD | New service development |

| | |
|---|---|
| OECD | The Organisation for Economic Co-operation and Development |
| OLS | Ordinary least squares |
| p./pp. | Page/s |
| PC | Personal computer |
| PLS-SEM | Partial least squares structural equation modeling |
| PSS | Product-service systems |
| R&D | Research and development |
| RMSEA | Root-mean-square error of approximation |
| ROI | Return on investment |
| SD | Standard deviation |
| SME | Small and medium-sized enterprise |
| SRMR | Standardized root mean square residual |
| TLI | Tucker Lewis indes |
| TRIZ | Theory of inventive problem solving |
| UK | United Kingdom |
| U.S. | United States |
| WTO | World Trade Organization |

## ZUSAMMENFASSUNG

Der tertiäre Sektor prägt die heutigen Wirtschaftssektoren mit einem Anteil von über zwei Drittel des Bruttoinlandsprodukts (BIPs) in den entwickelten Ländern. Neben dem Dienstleistungssektor gewinnen Dienstleistungen auch vermehrt in traditionell produktorientierten Branchen an Bedeutung. Dies lässt sich zum einen darauf zurückführen, dass Dienstleistungen ein wichtiges unterstützendes Mittel darstellen, zum anderen aber auch auf die Chance durch die Integration von Produkten und Dienstleistungen neue Angebote für den Kunden zu entwickeln, die Mehrwert stiften. Da sich Dienstleistungen für Unternehmen zunehmend als eine Möglichkeit etablieren, sich vom Wettbewerb abzugrenzen, stellen Innovationen in Dienstleistungen ein neues Mittel zum Erfolg für Unternehmen dar. Zum Beispiel hat der Wechsel von Produktverkauf (Besitz einer CD) zu einer reinen Dienstleistung (Bezahlung für die Verwendung von digitaler Musik) einige Unternehmen wie Apple oder auch Start-ups wie Spotify zum Erfolg geführt und für grundlegende Veränderungen in der Musikbranche gesorgt.

Wie in der Praxis hat das Konzept der Dienstleistungsinnovation auch in der Wissenschaft großes Interesse gewonnen. Da sich aber im Vergleich zur Literatur über die Organisation von Produktinnovation, das Forschungsfeld der Organisation von Dienstleistungsinnovation noch in der Entwicklung befindet, existieren einige Lücken über das Verständnis davon, wie Unternehmen von Dienstleistungsinnovationen profitieren können. Dementsprechend ist das Ziel der vorliegenden Dissertation, Erklärungen für eine erfolgreiche Entwicklung neuer Dienstleistungen anzubieten. Zwei übergeordnete Forschungsfragen begleiten den Leser durch diese Arbeit: 1.) Wie und warum organisieren Unternehmen ihre Aktivitäten im Bereich von Dienstleistungsinnovation unterschiedlich? 2.) Welchen Einfluss haben das Engagement der obersten Führungsebene und die innovative Ausrichtung des Unternehmens auf die dienstleistungsbezogenen Innovationsfähigkeiten eines Unternehmens und was sind deren Implikationen für den Unternehmenserfolg?

Nach einer Einführung in die Dissertation wird ein Überblick über den aktuellen Stand der Literatur gegeben. Hierbei wird eine Definition von Dienstleistungsinnovation hergeleitet und die Implikationen für die Organisation von Dienstleistungsinnovation vorgestellt, die sich aus den besonderen Eigenschaften von Dienstleistungen ergeben. Es werden die Haupterkenntnisse aus der Literatur integriert und hieraus eine Forschungsagenda abgeleitet.

Um die erste Forschungsfrage zu beantworten, wurde eine qualitative Untersuchung durchgeführt, die vorwiegend auf 22 semi-strukturierten Interviews mit 15 Unternehmen in vier Branchen basiert. Aus den Gesprächen mit den Unternehmen lassen sich drei verschiedene Organisationsformen von Innovatoren, die sich bezüglich der folgenden Dimensionen ableiten: Wichtigkeit von Dienstleistungsinnovation, Verantwortlichkeiten in Dienstleistungsinnovation, Systematisierung des Neudienstleistungsentwicklungsprozesses. Die Wahl der Organisationsform scheint von der strategischen Wichtigkeit von Dienstleistungsinnovation abhängig zu sein.

Um die zweite Forschungsfrage zu ergründen, wird eine quantitative Fragebogenstudie in vier Branchen vorgestellt. Die aus der Studie gewonnenen Daten werden verwendet, um das entwickelte theoretische Modell auf ihre Aussagekraft hin zu prüfen. Dieses Modell beschreibt, dass ein erhöhtes Engagement der obersten Führungsebene und eine innovativere Ausrichtung eines Unternehmens sich positiv auf die dienstleistungsbezogenen Innovationsfähigkeiten eines Unternehmens auswirken. Des Weiteren wird argumentiert, dass mit diesen verbesserten Innovationsfähigkeiten der Unternehmenserfolg erhöht wird, welches sich in der Form von verbessertem Markterfolg, erhöhtem Wettbewerbsvorteil und gesteigerter Effizienz manifestiert. Die Ergebnisse der Studie, welche sich auf Analysen von Strukturgleichungsmodellen und Regressionen berufen, bestätigen vorwiegend diese vermuteten Zusammenhänge.

Die Dissertation schließt mit einer Zusammenfassung der gewonnen Haupterkenntnisse. Diese Dissertation trägt zu dem Forschungsgebiet des Innovationsmanagements bei, indem nachgewiesen wird, dass ein systematischer und somit professioneller Ansatz zur Organisation von Dienstleistungsinnovation innerhalb von Unternehmen zum Unternehmenserfolg beiträgt. Hinsichtlich der Dienstleistungsforschung wird zum Verständnis über die Wichtigkeit und Auswirkungen von Innovationsfähigkeit von Unternehmen beigetragen, da sich mit dieser insbesondere der Markterfolg und die Wettbewerbsfähigkeit verbessern. Schließlich leistet diese Arbeit einen Beitrag zur Forschung an der Unternehmensgestaltung, da die Untersuchungen gezeigt haben, dass Unternehmen, die strategische Zielsetzungen mit Dienstleistungsinnovationen verfolgen, diese mit einer entsprechenden organisationalen Einbettung besser erreichen werden.

Für die Unternehmensführung und für die Innovationmanager im Unternehmen bedeuten die Ergebnisse, dass sie die Relevanz von Innovationen für Dienstleistung kritisch evaluieren sollten. Je mehr die Unternehmensstrategie Innovationen beinhaltet, desto

professioneller sollten die Führungskräfte die Entwicklung von neuen Dienstleistungen verfolgen. Entgegen der bisherigen Beobachtungen bedeutet dies ein klare Einführung von Verantwortlichkeiten (z.B. Projekt-Teams, eigene Innovationsabteilungen) und das Aufsetzen von kontrollierten Prozessen; wobei von einer einschränkenden Überformalisierung abgesehen werden sollte. Zudem sollte die Führungsebene klar die strategische Wichtigkeit von Dienstleistungsinnovationen kommunizieren, sich aktiv einbringen und die erforderlichen Ressourcen zur Verfügung stellen. Bei der Erarbeitung dieser Dissertation hat sich herausgestellt, dass innovative Dienstleistungen zumeist nicht durch spontane Ideen zum Unternehmenserfolg beitragen. Möchten Unternehmen das Potenzial von Innovationen ausschöpfen, sollten sie ähnlich professionell wie im Produktbereich organisiert werden.

# 1. INTRODUCTION TO THE DISSERTATION

## 1.1. Relevance of Services and Service Innovation

The prevalence of services in today's business and society is indisputable. The developed economies are mainly driven by the tertiary sector, often with a share of over 70 % of the gross domestic product (GDP) (The World Bank, 2014).[1] In addition, services were one of the main driving forces to create employment. In the European Union (EU), employment in services showed a growth rate of almost 20 % in the period of 1995-2007 (European Commission, 2009), which was above the growth rate of total employment. The identified reasons for this increase are, for example, the raise of income levels in high income countries (e.g. Luxembourg, Netherlands, Sweden, or Denmark), implemented outsourcing opportunities, or the integration of products and services (European Commission, 2009). With respect to services' relevance in world trade, a study by The Organisation for Economic Co-operation and Development (OECD) and the World Trade Organization (WTO) found that with over 50 % of the total exports services heavily contribute to economic value generation in countries like the United States (U.S.), Great Britain (GB), France, Germany, and Italy; in China, almost one third of total exports were represented by services (OECD, 2013). Furthermore, manufacturing industries increasingly benefit from services that support their business. As a result of their study, Nordås and Kim (2013) emphasize that the quality of key services, such as transport, finance, telecommunications, electricity, and education, positively influences the competitiveness of manufacturing firms.[2] Hence, services are a major driver for national economic wealth in both developed and developing countries.

The change of markets and industries is predominantly rooted in the high level of dynamism in the environment. Customer needs change rapidly, new technologies are developed, and many other factors provoke varying market conditions and demand for effective action from the firms (Teece, 2007). Against this backdrop, the continuous introduction of innovations is appreciated as a promising attempt to achieve competitive advantage and sustained success (Peteraf et al., 2013). A clear definition of innovation in research and practice

[1] For example, in 2013, Brazil had a share of 69 %, China 46 %, Germany 68 %, France 78 %, India 57 %, Russian Federation 60 %, United Kingdom 79 %, and United States 78 % (in 2012).

[2] In this study, a varying impact of service quality on manufacturers' competitiveness was detected depending on the level of income in the respective countries and the level of technology in the manufacturing sectors.

has remained challenging (Garcia and Calantone, 2002). Hauschildt and Salomo (2007) have tried to reduce this ambiguity by offering a relatively focused definition which they base on definitions proposed in past research. In their understanding, "innovations are all products or procedures which are introduced for the first time within the firm of interest" (p. 26). Since the focus of the present work lies on services, I adjust this definition of innovation to the context of services and incorporate the experiential character of services (e.g. den Hertog et al., 2010). Moreover, the market entry of a new service is often considered as a prerequisite to represent an innovation and not just an invention (e.g. Roberts, 1987; Teece, 1986). Therefore, in this work, service innovation is defined as follows.[3,4]

**Definition**

Service innovation is a new service experience placed in the market.

Innovating in services has received growing attention in recent years and contributes to economic growth and well-being (European Commission, 2014). Service innovation importance becomes especially evident by considering the music industry as an example. In 2001, Apple's iPod was introduced which would not entail such a value added without the advantage of the digital music service offered via iTunes (Apple, 2015). This innovation severely shaped the market, as customers received access to thousands of songs to a relatively cheap price. Nowadays, customers are able to store their music digitally and have access to it through several other devices, such as smart phones, personal computers (PCs), laptops, tablet PC, etc. As a further change in the music market, some start-ups have recently emerged that apply a different business model. For example, Spotify has become one of the major market player next to Apple (IFPI, 2014). This firm sells a digital music service that provides customers with access to – not ownership of – a broad range of songs. The music service and thus the experience of it has been considerably changed.

A further example is the case of Amazon.com. The firm started off in 1995 as an online book seller and, ever since, has successfully transformed to an extended service provider that offers web services, such as website and infrastructure usage (Chesbrough, 2011). Amazon.com

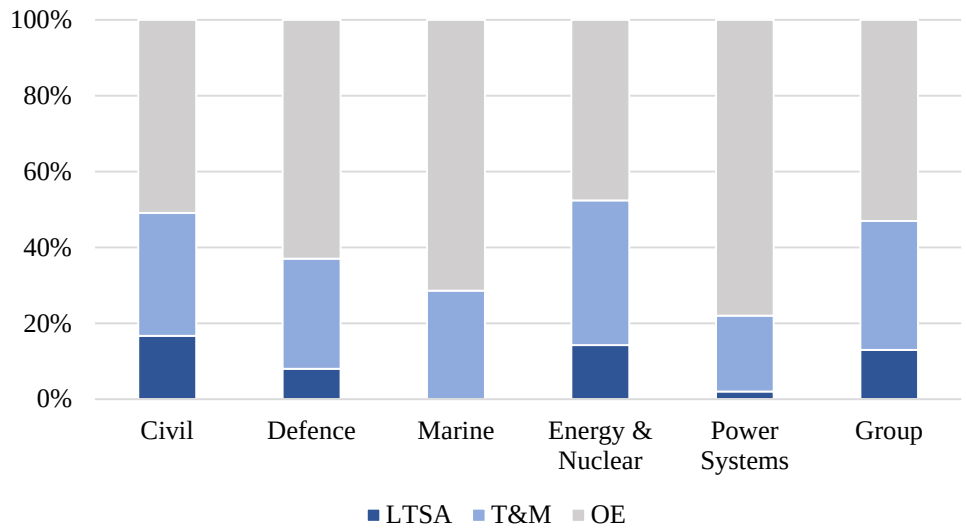
[3] In Section 2.1.1., this suggested definition of service innovation is systematically derived from prior research on service innovation and product innovation.
[4] In this work, the terms service innovation and new services are used synonymously.

was able to raise its generated net sales from $2,762 Million in the year 2000 to $74,452 Million in 2013 and to attain one of the leading competitive positions in its markets (Amazon.com, 2000; Amazon.com, 2013).

Successful service innovations can lead to improved performance (Aas and Pedersen, 2011; den Hertog et al., 2011; Mansury and Love, 2008) and gained competitive edge (Salunke et al., 2011). Firms across both the service and manufacturing industries are well aware of these opportunities associated with services and adjust their strategies accordingly. As indicated, a promising approach might be to extend a firm's portfolio by integrating services and providing solutions rather than pure products (Ettlie and Rosenthal, 2012; Neu and Brown, 2005; Nordin et al., 2011; Visnjic Kastalli et al., 2013). A popular example of a transformation towards services is the firm IBM. In 1992, 30 % of IBM's revenues were generated by maintenance services, financing and other services; two decades later this proportion has soared to 60 % (IBM, 1994; IBM, 2013). In addition, income generation from hardware also includes leasing system servers and storage solutions, and IBM offers installation services for its more complex hardware products. Thus, revenues derived from the category hardware partially stem from product-related services (IBM, 2013). IBM is no hardware seller anymore; instead, IBM's portfolio includes a broad range of information technology as well as business products, solutions, and services.

Another example is Rolls-Royce which similarly understands itself as an integrated solutions provider (Rolls-Royce plc, 2014b), not as a product seller anymore. While in 1981 the share of aftermarket services was about 20 %, it increased to up to 50 % of Rolls-Royce's group revenues by 2011 (The Economist, 2009). In addition to that, the firm included value-added services, such as integrated data management, and changed its business model of selling engines to selling the usage of them (per-per use pricing).

**Figure 1-1. Rolls-Royce Revenues Share of Services**




**Notes:** Source: Rolls-Royce plc (2014a); LTSA: long-term service agreement; T&M: time and materials; OE: original equipment.[5]

Figure 1-1 illustrates the revenue shares in 2013 of the firm's value-added services (long-term service agreement), support services (time and materials), and products (original equipment) in the different segments. As a consequence, the ubiquitous dynamic environments do not exclusively require technically and technologically driven innovative ideas; similarly, services and solutions need to keep up with future developments. In response to the transformation from emphasizing physical products to focusing on services IBM as well as Rolls-Royce needed to adapt their organization and processes (Balgobin and Pandit, 2001; Lusch et al., 2008). Consequently, both faced the critical question: In what way is innovation in services similar or dissimilar to traditional product innovation?

The rationale behind this question lies in the different characteristics of services and products. It is argued that these existing differences have implications for innovation management (de Vries, 2006). In the following section, I will briefly introduce the main specificities of services in comparison to products.[6]

[5] Statements by Rolls-Royce regarding this figure: "Growing installed base of products with useful lives of > 25 years results in stable, long-term annuity of services revenue = 47 % FY13 Group revenue; Rolls-Royce as OEM is best placed to own and manage life-cycle product costs leading to improved cost efficiencies in LTSAs and reduced customer disruption; opportunity to replicate successful Civil Aerospace model in other segments."

[6] Section 2.1.2. provides a more detailed background on the differences between services and products and the resulting implications for innovation management.

## 1.2. Differences between Services and Products

In the innovation management field, past research has particularly highlighted the following four characteristics of services as specific challenges for service innovation in comparison to product innovation: intangibility, simultaneity, heterogeneity, and perishability (e.g. de Brentani, 1989; Jaw et al., 2010).

The first critical feature, services' intangibility, refers to the fact that, different to physical goods, services are not touchable, which impedes their value assessment prior to consumption (Easingwood, 1986). Customers need to be supported to understand the value added which is offered with the new service (de Brentani, 1989). In addition, the protection of such innovative services has appeared to be a distinctively challenging task (Arundel et al., 2007; Berg and Einspruch, 2009; Tether and Massini, 2007).

The second characteristic of services is simultaneity, which relates to the production and consumption of a service at the same time (Cowell, 1988). Thus, the boundaries of the 'producing' firm and the consuming customer are blurred. Therefore, research on service innovation emphasizes the outstanding role of front-line personnel (Lages and Piercy, 2012; Melton and Hartline, 2010; Sørensen et al., 2013) and customer involvement (Ettlie and Rosenthal, 2012; Michel et al., 2008; Zomerdijk and Voss, 2011). The exchange between different departments within a firm is similarly intense to address the customer needs effectively (Antonacopoulou and Konstantinou, 2008; Edgett and Parkinson, 1994).

The third feature of services, heterogeneity, points to customers' evaluation of a service in dependence of the time, employee, and customer in place (Jaw et al., 2010). This aspect refers to the circumstance that the customer's perception of the consumed service highly depends on the individual situation. This resulting variation is considered as challenge to remain a certain level of quality (de Brentani, 1989) and to reduce customer uncertainty (Jaw et al., 2010; Maister and Lovelock, 1982). Then again, the opportunity to customize services can be beneficial to meet individual customer needs (de Brentani, 1989).

The final important characteristic of services is their perishability. Other than products, services cannot be produced and stored in advance (Johne and Storey, 1998). This limits a firm's ability to respond to changes in the market. It additionally questions the achievement of certain efficiency levels, which in turn raises suggestions to industrialize processes to some extent for the purpose of cost reduction (Jaw et al., 2010; Levitt, 1976).

## 1.3. Research Questions

In contrast to the good understanding of successful new product development processes (Brown and Eisenhardt, 1995; Ernst, 2002), service innovation is a developing research field (Hurmelinna-Laukkanen and Ritala, 2010; Papastathopoulou and Hultink, 2012). As a consequence, many research opportunities exist to clarify the concept of service innovation with its antecedents and consequences. This dissertation has the aim to take advantage of these opportunities and to contribute to a better understanding of how firms can benefit from new services. To pursue this challenging aspiration, two main research questions will be addressed. Firstly, how and why do firms manage service innovation activities in their organization differently? Secondly, what influence do top management commitment and corporate service innovativeness have on service innovation capabilities of a firm and what are the implications for firm-level performance?

**Research question 1.** The first question refers to the introduction and establishment of service innovation management within a firm. As one result of their effort to identify research priorities for the science of service, Ostrom et al. (2010) call for supporting organizations to "*find new or improved ways to generate, prioritize, and manage service innovation from idea generation through the end of the development life cycle […][and][…] optimize the relationship between organization design and service innovation*" (p.15). In this expressed demand they make clear that there is a lack of understanding with respect to two aspects: first, the impact of the systematization of the new service development process on the success of new services, and, second, how organizational structures can support these processes.

Past research indicates that many service firms rely on softer factors, such as human resources and less formalized processes, instead of implementing a well-defined new service development process (e.g. Ettlie and Rosenthal, 2011). This difference to product innovation has been attributed to the distinct service characteristics that cause ambiguous service innovation procedures (Abreu et al., 2010; Zeithaml et al., 1985). The result is a complicated measurement of service innovation activities (Jensen and Warren, 2001) and hindrance to identify promising management concepts. This unclear picture of service innovation activities obscures the importance of organizational alignment in procedural and structural terms. As de Brentani (1989) found, formalized processes are important to both product and service development processes; however, services require special managerial acknowledgement due to their specificities (Coombs et al., 2000; Drejer, 2004).

To approach these research opportunities, I respond to the question how firms manage service innovation activities in their organization. For this, I try to identify by whom and how (systematic) service innovations are generated. The final aim is to understand why firms might implement their innovative aspirations regarding services differently.

**Research question 2.** The second research question relates to the effectiveness of managing service innovation. Barczak (2012) points out that the question remains unresolved "*whether or not what we know about product development and innovation applies readily to services and hybrid offerings*" (p. 355). Therefore, the aim of this dissertation is to contribute to a better understanding on relevant antecedents and consequences of managing service innovation.

With respect to important antecedents, de Brentani (2001) identified the crucial role of top managers for building an innovation culture and concludes that they are the beginning of successful service innovations. Despite these insights, decision makers' actual role in innovation has predominantly been addressed in product innovation research (Cooper et al., 2004b; Holahan et al., 2014) and less acknowledged in service innovation research. Another influencing factor is the scope of service innovation activities. Research on innovative services has frequently focused on the degree of innovativeness of new services (Forsman, 2011; e.g. Holahan et al., 2014; Ordanini and Parasuraman, 2011; Perks et al., 2012), while the impact of a firm's service innovativeness has been predominantly neglected. Hence, there is a need to improve the understanding on the impact of the degree of a firm's engagement in service innovation activities. In addition, researchers have identified a considerable gap in research on the impact of service innovation on firm-level performance (den Hertog et al., 2011; Evangelista and Vezzani, 2010). More specifically, it is unclear how the influence of service innovation might differ among different firm-level performance measures. I apply a dynamic capabilities point of view, since this theoretical lens emphasizes the value of increased capabilities to generate innovations (Eisenhardt and Martin, 2000; Peteraf et al., 2013).

Therefore, the goal is to respond to these questions and identify the relationship of top management commitment and corporate service innovativeness with service innovation capabilities and the resulting consequences for firm-level performance.

**Contribution to literature.** With this dissertation I contribute to innovation management research, to service research, and to organizational design research. Regarding innovation management research, I find that a systematic approach to service innovation, i.e. the organizational implementation of responsibilities and the determination of new service

development processes, is considered very effective to introduce promising new services to the market. In addition, I quantitatively illustrate that firms can advance their service innovation capabilities if top managers show more commitment and the firm shows increased corporate service innovativeness. I further provide evidence for the value a firm can derive from such established service innovation capabilities for improving firm success.

As for the contribution to service research, I find reason to believe that the way firms manage and organize their service innovation activities depends on the strategic relevance attributed to innovative services. If service innovation is part of the corporate strategy then I find a very professional approach towards managing service innovation. In addition to this finding, I further detail the complex relationship of service innovation capabilities with its antecedents and consequences by distinguishing between antecedents and their effect on the success in generating service innovation and, as result of these increased service innovation capabilities, the impact on success from an overall firm perspective. Hence, I identify an importance for firms to professionally approach the management of service innovation. Specifically, this dissertation reveals the relative impact of service innovation capabilities on each of the firm-level performance indicators with efficiency being influenced less by increased service innovation capabilities than market performance and competitive advantage.

Finally, I contribute to organization design research, since this dissertation sheds light on the dependency between the relevance of service innovation in the corporate strategy and the choice of organization design. I was able to find arguments for the assumption that in the case of strategic importance of service innovation, firms do establish organizational structures and responsibilities (e.g. innovation project teams, innovation departments) to encourage innovative thinking and provide the required resources for the successful development of service innovations.

## 1.4. Structure of the Dissertation

The structure of the dissertation follows the research questions introduced above (Section 1.3.). Before approaching these research questions, it is necessary to understand the development and the status quo of literature regarding both conceptual and empirical achievements. What shared understanding about the conceptualization of service innovation does exist? What theoretical underpinnings are applied? What main antecedents and consequences have been so far empirically supported? To provide an overview of the service innovation management field, **Chapter 2** includes the theoretical background of service

innovation management, a systematic literature review, and the resulting research agenda. More precisely, a definition of service innovation is derived, and by reflecting on the differences between services and products, which are addressed in literature, I point to the respective implications for service innovation management research. As for the literature review, the applied method of key word search is described which led to a final sample of 211 relevant published articles. The findings of the review reveal the accelerated development of service innovation management literature in recent years and the lack of underlying theories in past research. Moreover, I develop a conceptual framework based on the main findings regarding antecedents and consequences of service innovation. This integration of the findings in past research provides a very concise overview of the existing insights into service innovation management. After that, the resulting research agenda includes recommendations on how to advance the conceptual understanding of service innovation, on promising research topics, and on more rigor in methodological choices. Finally, I conclude the findings, which leads to my own research agenda of this dissertation.

**Chapter 3** covers the study which addresses the question of how and why firms manage service innovation activities in their organization differently. To respond to this question, I chose a qualitative empirical approach based on 22 semi-structured interviews with 15 firms in four industry sectors and additional secondary data. The reason to decide for such a method was that the understanding of managing service innovation from a process and organizational structure perspective is relatively small. After introducing the theoretical background on managing service innovation, I describe the procedure of data collection and analysis. The findings from the interviews reveal three organizational forms of managing service innovation, which differ with regard to the identified dimensions of corporate service innovation relevance, the implementation of service innovation responsibilities, and the systematization of new service development. By integrating the findings, I highlight that the choice of implemented responsibilities and the degree of systematization of the new service development process seem to strongly depend on the strategic relevance accounted to service innovation. The chapter is closed by discussing theoretical as well as practical implications of the findings and directs to limitations and promising future research.

**Chapter 4** includes the quantitative study. Deploying a dynamic capabilities perspective, this chapter underlines the importance of service innovation capabilities and is structured as follows. First, I introduce the research question and the respective theoretical framework that guides through the subsequent sections. This theoretical framework proposes a

positive relationship of top management commitment and corporate service innovativeness with service innovation capabilities, and a positive relationship between service innovation capabilities and the firm-level performance indicators market performance, competitive advantage, and efficiency. Second, I present the study and the analyses applied to the data. I conducted a survey-based study, as the method is acknowledged in capabilities and innovation research (e.g. Danneels, 2008; Moorman and Miner, 1997; Storey and Kahn, 2010). The study consisted of double respondents from 87 firms from the sectors construction, financial services, IT services, and logistics. I applied partial least squares structural equation modeling (PLS-SEM) and further robustness checks. Then I continue with the focus on the antecedents proposed in the theoretical framework. After deriving the hypotheses on the role of top management and corporate service innovativeness on service innovation capabilities, the results of the main analyses and robustness checks are presented and discussed. The results support the positive influence of top management commitment and corporate innovativeness on service innovation capabilities. The section on antecedents ends with a discussion on the implications for research and practice and addresses limitations and future research opportunities. Subsequently, I introduce the consequences of service innovation capabilities. This section has a similar setup as the antecedents section, as I derive the corresponding hypotheses on firm-level performance effects and present and discuss the findings of the statistical analyses. The results reveal that service innovation capabilities, indeed, positively influence the firm-performance level, yet to differing extent. The performance indicator efficiency is less influenced by service innovation capabilities than market performance and competitive advantage. The section on consequences ends by discussing theoretical implications and implications in practices and points to limitations and suggestions for future research.

Finally, **Chapter 5** summarizes the findings of the dissertation. I synthesize the theoretical implications of this work and emphasize the contribution it makes to the distinct research fields. In addition, I illustrate what top managers and innovation managers who either are already involved in service innovation or who are going to increasingly consider service innovation can learn from its findings. An outlook for future research on service innovation management concludes this dissertation.

# 2. SERVICE INNOVATION MANAGEMENT: REVIEW OF PAST RESEARCH AND RESEARCH AGENDA

This chapter includes the systematic review and integration of service innovation management regarding both conceptual and empirical advancements in literature. In Section 2.1. I derive a definition of service innovation and provide an introduction to the implications for innovation management research which result from the differences between services and products. Section 2.2. describes the applied method of the literature review, the general development of service innovation management literature, and the use of underlying theories in past research. In addition, by developing a conceptual framework, I delineate the main findings regarding the antecedents and consequences of service innovation. The resulting research agenda is presented in Section 2.3., which suggests to advance the conceptualization of service innovation, presents existing research gaps, and addresses the need to enhance the methods used in empirical investigations. In Section 2.4. I conclude on the main contributions made to literature and, finally, present the two research questions which are subject to investigation in Chapter 3 and Chapter 4.

## 2.1. Theoretical Background

For over four decades the analysis on the antecedents and consequences of product innovation management has dominated innovation management literature (Papastathopoulou and Hultink, 2012). However, as services have experienced increased economical and societal importance, the attention towards service innovation has received a new quality. The origin of service innovation management literature lies in the early 1980s (Zeithaml, 1981). Since then, the analysis of service innovation management has yielded three kinds of assumed relationships between the research fields of service innovation management and product innovation management, predominantly known as assimilation, demarcation, and synthesis (Coombs et al., 2000). After reflecting the conceptual understanding of service innovation in past research and deriving a definition of service innovation (Section 2.1.1.), the change in innovation management research is addressed which is caused by the identified different characteristics that services and products possess (Section 2.1.2.). For this purpose, I depict the shift from directly applying findings from product innovation management research to the service context (assimilation) to deliberately focusing on the specificities of services (demarcation). The section

is closed by describing the attempts in past research to integrate the two research fields of service innovation management and product innovation management (synthesis).

### 2.1.1. Definition of Service Innovation

**Definition of service innovation in past research.** Although research has begun to address service innovation over decades ago, service innovation can be described as a developing field (Papastathopoulou and Hultink, 2012). The comparative novelty of it might serve as an explanation of why a broadly accepted conceptual understanding of service innovation is still missing. To analyze the existing definitions of service innovation, I distinguish four different approaches to conceptualizing service innovation, namely substitution, transmission, comprehension, and explication. Substitution reflects the usage of service development or new service development as a synonym for service innovation without further explanation. Transmission relates to the direct application of existing definitions of innovation in general, i.e. definitions in the product innovation literature, to service innovation. The third notion – comprehension – comprises the description of the types and modes of service innovation, such as incremental versus radical service innovation. Finally, explication relates to the suggestion of a pure service innovation definition.

The first notion is furthest from a true service innovation definition, whereas the fourth is the nearest to an actual service innovation definition. This categorization of service definitions allows a systematic analysis of the conceptualization of service innovation in past research. With respect to substitution, authors attribute their attention primarily to the more operational aspects of service innovation. For instance, Ching-Chow (2007) explicates the new service development as the process of developing new service offerings which consists of stages from idea generation to launch. However, what conceptually constitutes a resulting service innovation is not further discussed. Similarly, Lin and Hsieh (2014) focus on the process that creates service innovation and analyze the service innovation system which influences the sustainability of new services. Service innovation as a construct is not conceptualized or explained in more detail. Table 2-1 presents the definitions of service innovation in the category of substitution.

**Table 2-1. Definition of Service Innovation: Low Degree (Substitution)**

| References | Definition in Past Research |
|---|---|
| Ching-Chow (2007) | *"The benefits that accrue from providing new services include […]. Although there is a broad range of models, methods, and tools for the development of goods, the development of services has received little attention in the literature. […] New service development is the 'overall process of developing new service offerings […]"* (pp. 636-367). |
| Jaw et al. (2010) | *"Innovation can be identified as (1) innovation output (new product success, time to market, and amount of new service), and (2) innovation input (research and development investments and efforts in innovation)"* (p. 266). |
| Junquera et al. (2008) | *"The concept of a new service defines not just the how and the what of the service design, but also assures that both are mutually integrated*" (pp. 1031-1032). |
| Lin and Hsieh (2014) | *"New service development (NSD) is the process of creating new services to fulfill target customers' needs. It is essential that an NSD project team cooperate across organizational boundaries and various disciplines to achieve the sustainability goal of an NSD project. This study adopted Activity Theory to understand dynamics of complex service innovation system"* (p. 113). |
| Messeni Petruzzelli and Savino (2014) | *"Innovation is a process of search and recombination of existing components"* (p. 224). |
| Therrien et al. (2011) | *"Innovation is a complex process related to changes in production functions and processes whereby firms seek to acquire and build upon their distinctive technological competence, understood as the set of resources a firm possesses and the way in which these are transformed by innovative capabilities […]"* (p. 656). |
| Vermeulen (2001) | *"In our study we define an innovation as a new product, process, distribution method, or a new combination of existing products (or product components), processes or distribution methods, perceived as new by the organisational unit concerned"* (p. 80). |

The second group, i.e. transmission, refers to those authors who do not focus on the distinctiveness between service and product innovation; instead, they consider a definition of service and product innovation as similar (e.g. Pires et al., 2008). With this perspective, Drejer, an advocate of synthesizing product innovation and service innovation management, claims that the traditional Schumpeterian view on innovation is similarly applicable to the service context (Drejer, 2004). Thus, she stresses the value of considering the economic impact of innovation which is equally induced by new services. This transmission is underlined by the propensity to conduct studies in both sectors manufacturing and service (Forsman, 2011). Table 2-2 provides an overview of the service innovation definitions in the category of transmission.

**Table 2-2. Definition of Service Innovation: Moderately Low Degree (Transmission)**

| References | Definition in Past Research |
|---|---|
| Chen et al. (2009) | *"We follow the traditional innovation definition of Thompson (1965), defining it as the generation, acceptance, and implementation of new processes, products, or services for the first time within an organization setting"* (p. 39). |
| Drejer (2004) | *"The reason for putting such emphasis on Schumpeter's notion of innovation in the present context is that innovation is defined as an economic concept through the economic meaning that Schumpeter attaches to innovation in relation to economic development"* (p. 557). *"The contribution from the new innovation concepts launched in relation to the service studies lies in the attention they direct toward the multiplicity of ways through which innovations can be carried out (i.e. different characteristics of innovation processes). This is hardly unique for services though"* (p. 559). |
| Forsman (2011) | *"For the purpose of this paper, innovation has been defined as the generation and implementation of new or improved processes, services, products, production methods or single actions aimed at increasing the competitiveness of an enterprise"* (p. 739). |
| Gallouj and Weinstein (1997) | *"If the representation of the product (good or service) outlined above is accepted, innovation can be defined as any change affecting one or more terms of one or more vectors of characteristics (of whatever kind - technical, service or competence)"* (p. 547). |
| Leiponen (2006) | *"Innovation – generation of novel combinations from existing knowledge – is a key process that underlies the creation of these kinds of unique capabilities to support sustainable advantage"* (p. 239). |
| Lyons et al. (2007) | *"We define innovation broadly as the combination of creativity and implementation"* (p. 174). |
| Mattsson et al. (2005) | *"We employ a broad definition of innovation comprising technical as well as social innovations. […] Innovation may refer to the process of change or the results of the change process, such as the new product, service, organization or the like"* (p. 357). |
| Michel et al. (2008) | *"All innovation, whether a service process or a tangible product, should be viewed as a service-logic innovation. This challenge to traditional, attribute based views of innovation stems from the understanding that any innovation (or change) in product or process requires changes in customer thinking, participation, and capabilities to create and realize value"* (p. 49). |
| Pires et al. (2008) | *"For us innovation may refer to the introduction of a product or service that is only new for the firm that introduces it"* (p. 1345). |

Authors enhancing comprehension often do not attempt to define service innovation; rather types and modes of service innovations are subject to their discussion (e.g. Djellal and Gallouj, 2007). More precisely, works like the one of Gustafsson et al. (2012) have the underlying understanding of service innovation to include radical innovation, improvement innovation, incremental innovation, ad hoc innovation, recombinative innovation, and formalization innovation (see also Drejer, 2004; Gallouj and Weinstein, 1997). An analysis is often pursued to stress the incremental character of services or to show what implications the different levels of innovativeness have (Chan et al., 1998). Another perspective is to focus on

an extended understanding of innovation. For example, Roberts and Amit (2003) describe that within their work they understand new products and new processes not only as organizational processes, but as a firm's overall record of innovative activity. A final definition of service innovation is not provided. In Table 2-3 the definitions of service innovation in the category of comprehension are summarized.

**Table 2-3. Definition of Service Innovation: Moderately High Degree (Comprehension)**

| References | Definition in Past Research |
|---|---|
| Cheng and Krumwiede (2012) | *"Specifically, the way for service innovation to contribute to new service performance is through new benefits to existing customers, creation of new markets through an incremental addition of existing service values, or radical creation of brand new service values […] To sum up, incremental service innovation describes a new value creation through the incremental addition of existing values, while radical service innovation creates brand new values through innovative concepts"* (p. 488). |
| de Brentani (2001) | *"Innovation involves the creation of a new product, service or process. "New" products can be viewed in terms of their degree of newness, ranging from a totally new, or discontinuous, innovation to a product involving simple line extensions or minor adaptations/adjustments that are of an evolutionary, or incremental, nature. [In the analysis presented in the current article we distinguish] among four types of innovations, based on the degree to which the new product provides unique benefits to customers and on the extent to which new or expanded technology is used to create these benefits"* (pp. 169-170). |
| Gustafsson et al. (2012) | *"An innovation is often manifested as a change in the competences of the company, the competences of the customer, the prerequisites of the offering, or what the customer co-creates. Both of these conceptualizations of service innovation […] adopt the role and value-creational processes of the customer as the focus of attention. Consequently, the key to succeeding with service and product development should be identifying and understanding the value-creational processes"* (p. 313). |
| Leiponen (2005) | *"Service innovation involves changes in the process of delivering existing services or the development of completely new kinds of services"* (p. 186). |
| Roberts and Amit (2003) | *"Hereafter, a firm's innovative activity comprises all of the new-to-the-firm strategic attributes, and all modifications to its existing attributes"* (p. 108). |
| Salunke et al. (2011) | *"Based on this discussion, we conceptualize service innovation as the extent to which new knowledge is integrated by the firm into service offerings, which directly or indirectly results in value for the firm and its customers/clients. This captures both continuous and discontinuous innovation […]"* (p. 1253). |
| Sørensen et al. (2013) | *"[…] service encounter-based innovation, which we define as innovation that develops from ideas, knowledge, or practices derived (one way or another) from frontline service employees' meetings with users in the service delivery process (Sørensen and Jensen, 2012)"* (p. 1446). |
| van Riel et al. (2013) | *"In this article, we argue that taking a service constellation perspective has far-reaching consequences for the service innovation process. […] We define and explain service constellations as the combination of multiple interdependent services that provide complementary value to consumers […]"* (pp. 315-316). |
| Windrum and García-Goñi (2008) | *"Innovation is the means by which firms improve the set of technical characteristics and, hence, the service characteristics that consumers are interested in"* (p. 651). |

Finally, the fourth notion, i.e. explication, is of actually elaborating a definition of service innovation. The provided service innovation definitions were all published in articles from the last five years. In line with service research (e.g. Bolton et al., 2014), Zomerdijk and Voss (2011) define service innovation in a rather specific context of experiential services as *"an offer not previously available to customers"* (p. 65); thus an innovation represents a new experience for customers. With a more detailed view, den Hertog et al. (2010) see the cause of this new experience in the introduction of a new service concept, new customer interaction, new value system/ business partners, new revenue model, new organizational, or technological service delivery system (see also Gotsch and Hipp, 2012; Perks et al., 2012). Complementarily, the target of the service innovation is being stressed by Damanpour et al. (2009) who distinguish between current and new customers. Hence, the experience can also be changed by addressing an existing offering to a new client or a new offering to an existing client. Finally, the facilitation of a successful development and delivery of a new service often requires adjustments of firm assets. Firms need to implement structurally new technological, human, or organizational capabilities in their service organization (Aas and Pedersen, 2011; Gotsch and Hipp, 2012). Table 2-4 lists the definitions of service innovation in the category of explication.

**Table 2-4. Definition of Service Innovation: High Degree (Explication)**

| References | Definition in Past Research |
|---|---|
| Aas and Pedersen (2011) | *"They suggest that service innovation may be defined 'as a new or considerably changed service concept, client interaction channel, service delivery system or technological concept that individually, but most likely in combination, leads to one or more (re)new(ed) service functions that are new to the firm and do change the service/good offered on the market and do require structurally new technological, human or organizational capabilities of the service organization'"* (p. 2073). |
| Damanpour et al. (2009) | *"Thus, we define service innovations as the introduction of new services to the existing or new clients and offer of existing services to new clients"* (p. 654). |
| den Hertog et al. (2010) | *"A service innovation is a new service experience or service solution that consists of one or several of the following dimensions: new service concept, new customer interaction, new value system/business partners, new revenue model, new organizational or technological service delivery system"* (p. 494). |
| Gotsch and Hipp (2012) | *"In this context, a service innovation is a new, or significantly modified, service concept, client interaction channel, service delivery, or technological concept that individually, but more likely in combination, leads to one or more new service functions"* (p. 2169). |
| Perks et al. (2012) | *"Service innovations represent new and useful prerequisites or resource constellations to ensure value co-creation in the future"* (p. 936). |

**Table 2-4. Definition of Service Innovation: High Degree (Explication) (continued)**

| References | Definition in Past Research |
|---|---|
| Toivonen and Tuominen (2009) | *"A service innovation is a new service or such a renewal of an existing service which is put into practice and which provides benefit to the organisation that has developed it; the benefit usually derives from the added value that the renewal provides the customers. In addition, to be an innovation the renewal must be new not only to its developer, but in a broader context, and it must involve some element that can be repeated in new situations, i.e. it must show some generalisable feature(s)"* (p. 893). |
| Zomerdijk and Voss (2011) | *"In the context of experiential services, a new service is here defined (based on Johnson et al.) as an offer not previously available to customers, resulting from the addition of offerings to the experience, radical changes in the service delivery process that creates the experience, or incremental improvements to existing service and experience packages or delivery processes that customers perceive as being new" (*p. 65). |

**Development of service innovation definition.** Summarizing the conceptualization of service innovation in past research, the understanding of this concept has not been fully clarified. Nevertheless, the approaches to define service innovation share some conceptual arguments which I will incorporate into a final definition. To achieve this, I consider the aforementioned service innovation definitions and innovation definitions from past product innovation management (Gupta et al., 2007).

As the experimental aspect of service innovation is found to be one of the most important factors which distinguish service innovation from product innovation, it appears crucial to incorporate this notion into a service innovation definition. This feature of experience is also reflected in the distinct characteristics of services, i.e. tangibility, simultaneity, heterogeneity, and perishability of services, which are said to entail certain implications for the innovation context (see Section 1.2. and 2.1.2.). According to findings in past research, a value of a service innovation is therefore perceived by actually consuming it. Without experiencing the service innovation, the customer has difficulties to grasp and understand the service. The new experience of a service innovation can be derived from different sources, such as a new service concept or a new delivery system as other authors have already shown (den Hertog et al., 2010; Gotsch and Hipp, 2012; Perks et al., 2012).

The view on required capabilities and structural conditions to successfully generate innovative services (Aas and Pedersen, 2011; Gotsch and Hipp, 2012) not only includes the important adjustments within an organization but also implies the objective to place this new service on the market and to make profit from it. In a similar vein, Teece (1986) states that innovations represent commercialized new products or processes in the market and thus stresses the aspiration to develop innovations which address customer needs.[7] Therefore, I propose to extend his idea to services and to consider market adoption of a new service as a prerequisite for being a service innovation. As a result, in this work service innovation is understood as subsequently presented:

**Definition**
Service innovation is a new service experience placed in the market.

### 2.1.2. Service Specificities: Implications for Innovation Management Research

Traditionally, services were included in product innovation management research, although research exclusively focused on products or treated services as equal to products. In this line of thought, no specific distinction was made between service and product innovation processes; instead, insights from the manufacturing sector were directly applied to the service context. This relationship between product and service innovation management research is described through the term assimilation (Drejer, 2004) and points to the focus on technical innovations which dominated research on service innovation especially in its early years (Barras, 1986; Gallouj, 1998; Sirilli and Evangelista, 1998). Critics have pointed out that this choice of relationship is too narrow for understanding the dynamics of services (Coombs et al., 2000). Therefore, advocates of the demarcation between service and product innovation management emphasize the necessity to examine the particularities of services and the resulting ramifications on service innovation (de Vries, 2006). In the innovation management field, past research has particularly highlighted the following four characteristics of services as specific challenges for service innovation in comparison to product innovation: intangibility, simultaneity, heterogeneity, and perishability (e.g. de Brentani, 1989; Jaw et al., 2010).

[7] See also the review on the definition of innovation in past research in Hauschildt and Salomo (2007).

**Intangibility**. The first critical feature of services is their intangibility. It refers to the fact that, different to physical goods, services are not touchable, which impedes their value assessment prior to consumption (Easingwood, 1986). While many tangible goods consist of identifiable elements, services primarily have relational properties, thus consist of interactions and experiences (Ordanini et al., 2014). The resulting question has been how customers can be supported in understanding the value added by the offered service (de Brentani, 1989), since the evaluation of the expected future use is pivotal for purchasing decisions (Lemon et al., 2002). As a result, developing service blueprinting was suggested as one of the promising ways to reduce customer uncertainty (Papastathopoulou and Hultink, 2012).

In addition, the appearance of informal new service development processes is attributed to the intangibility of services. As observations indicate, service innovation processes are rather ad hoc and undefined (Miles, 2007). In this respect, it is stated that innovative services are easily developed, hence might not require or lead to the perception that unmanaged development processes are beneficial (Easingwood, 1986).

Another consequence of the intangible nature of services is the difficulty to protect intellectual property related to new services.[8] Protecting new ideas by patents or other formal intellectual property rights is challenging and less prevalent in the service context (Arundel et al., 2007; Berg and Einspruch, 2009; Tether and Massini, 2007). Instead, service firms deploy more often a broader set of protection mechanisms, such as confidentiality contracting, trademarks, or trust (Hipp and Grupp, 2005; Hurmelinna-Laukkanen and Ritala, 2010).

**Simultaneity.** The second characteristic of services is simultaneity, which relates to the production and consumption of a service at the same time (Cowell, 1988). Since efficient and effective service development, delivery, and consumption processes are crucial to satisfy customers (de Brentani, 1989), the relationship of the operations and marketing department is often intertwined (Antonacopoulou and Konstantinou, 2008; Edgett and Parkinson, 1994). Due to the increased proximity between the firm and customer, which characterizes the consumption of services, these departments face the challenge to adequately and directly respond to customer needs. Therefore, research on innovative services emphasizes the outstanding role of front-line personnel (Lages and Piercy, 2012; Melton and Hartline, 2010; Sørensen et al., 2013) and

[8] Services can, however, be patented. For example, Kumar and Turnbull (2008) developed a theoretical framework to determine whether or not a financial innovation should be patented. Since 1998, it is possible to patent business methods in the U.S.

customer involvement (Ettlie and Rosenthal, 2012; Michel et al., 2008; Zomerdijk and Voss, 2011).

Regarding the former aspect, the increased relevance of front-line personnel might require adjustments to the value of established cross-functional teams which in product innovation management are found to provide well-acknowledged advantages (Ernst, 2002). For example, findings point to a critical view on such dedicated new service development units, since the individual relationship between certain employees, i.e. front-line employees, and customers are perceived as extraordinarily important (Leiponen, 2001). With respect to the latter aspect, the near work with customers may compensate for the challenges of prototyping new services, as the innovating firm constantly receives feedback from the relevant customer (Ettlie and Rosenthal, 2011).

Additionally, further interactions are found to be closer: The level of communication intensity and mutual trust between collaborating firms is higher for new service development projects than for new product development projects (Schleimer and Shulman, 2011). An explanation for this finding is that, on the one hand, changing a service which directly affects its delivery process requires more coordination within alliances and, on the other hand, service firms lack alternative control mechanisms, thus rely on a trustworthy and close relationship.

**Heterogeneity.** The third feature of services, heterogeneity, points to the distinct interpretation and perception of services depending on the time, employee, and customer in place (Jaw et al., 2010). Other than products, services are therefore affected by several varying conditions. This volatility in production and consumption is often considered negative due to the occurrence of inconsistencies of quality (de Brentani, 1989) and increased customer uncertainty (Jaw et al., 2010; Maister and Lovelock, 1982). Then again, this feature can entail positive consequences. More customized services might be appreciated, since the individual customer needs are directly addressed (de Brentani, 1989).

As a consequence of the dependency on involved actors, human resources receive a distinct importance in the service context. Findings in past research emphasize that employees are one of the main drivers for service innovation success (Santamaría et al., 2012). Accordingly, the skill set should be continuously improved which leads to substantial resource investments in trainings and personnel development (Pires et al., 2008). Besides considering the aforementioned front-line employees, the special role of human resources also becomes clear through the special responsibilities held by the senior management. As research and development (R&D) is characteristically less formalized, senior managers need to take over the

task to emphasize innovation in services and induce the generation of new service offerings, accordingly (Ettlie and Rosenthal, 2012).

The three described characteristics of intangibility, simultaneity, and heterogeneity direct to the importance of conveying the quality of an innovative service. As de Brentani (1989) shows, identifying the needs of customers via successful service development and supporting customers to assess the quality of the new service, i.e. value added, positively affects market and competitive performance. The increase of customer appreciation of a new service interaction, i.e. service delivery, is found to be similarly crucial.

**Perishability.** The final important characteristic of services is their perishability. This difference to products refers to the fact that services cannot be produced and stored in advance (Johne and Storey, 1998). This constraint diminishes a firm's responsiveness to dynamic customer demands. It additionally questions achieved efficiency levels, which in turn raises suggestions to industrialize processes to some extent for cost reduction (Jaw et al., 2010; Levitt, 1976).

Concluding the demarcation of service and product innovation management, researchers have been able to gather new insights and extend scientific knowledge in the innovation literature by focusing on the distinct specificities of services and their implications for service innovation antecedents and consequences. In accordance to that, de Brentani (1989) sums her findings up in the following way:

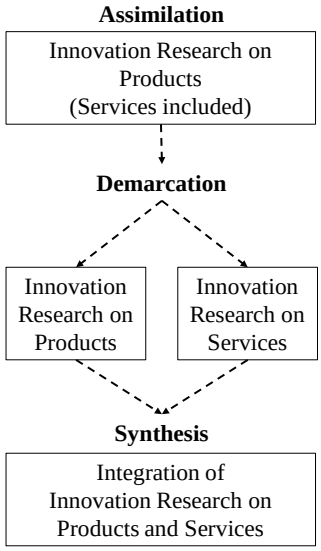
> *"In other words, while new product models are relevant, they need to be adjusted to account for service-specific issues. Introducing a new service process that deals effectively with the complex and experiential nature of services, designing quality and innovative features that successfully differentiate services from competitive offerings and focusing on cost reduction opportunities are key performance issues"* (p. 257).

Especially studies which compare antecedents and/ or consequences of innovation in the service and product context contribute to a better understanding of similarities and differences of these two innovation fields. For example, Prajogo (2006) found that the importance attributed to innovation does not significantly differ from each other; however, service firms benefit less from innovation than manufacturing firms do. In a similar vein, Leiponen (2012) showed that there is an increasing relevance of R&D activities in service firms and that broad knowledge sourcing is similarly beneficial like it is for manufacturing firms. Despite this increased engagement in service innovation, her study indicates that service firms

seem to struggle with the establishment of service innovation capabilities, as the conduct of parallel innovation projects is less successful than for manufacturing firms.

This more integrative research approach leads to the synthesis of service and product innovation management. This 'interactive' relationship expresses the intent to appreciate more openly the specifics of both service innovation and product innovation, while the research results of the investigations are simultaneously integrated to spur research and generate theories relevant to both innovation fields (de Vries, 2006; Drejer, 2004). Emerging acknowledgement of the synthesis perspective can be observed. For instance, Castro et al. (2011) promote this perspective to reflect all types of innovation without preferring one specific sector, service or manufacturing. Similarly, Gallouj and Weinstein (1997) proposed a framework that considers *"specificities of service activities as a starting point [which] might lead to a reformulation of the analysis of innovation and a clear definition of the possible forms it might take"* (p. 538). This conceptual work has paved the way for further aspirations to integrate theories on services, general innovation, and those linked to new service development and innovation management (e.g. de Vries, 2006; Toivonen and Tuominen, 2009). An illustration of the described development of the service innovation management research is presented in Figure 2-1.[9]

**Figure 2-1. Overview of the Development of Service Innovation Management Research**




**Note:** Dashed lines represent logical steps rather than directly influencing relationships.

[9] The development of the service innovation research field as described can be considered as an historical development and tendencies towards an acceptance of the synthesis approach are observable. However, the approaches to analyze service innovation have differed and cannot be clearly assigned to certain years of publication.

Since many products are evolving into commodities, goods-dominant firms struggle with differentiating themselves from their competitors by merely focusing on their traditional product business. Research in the manufacturing industry has shown that there is a raised awareness of the opportunities that services can provide beyond representing a support function (Gebauer et al., 2010; Jacob and Ulaga, 2008; Lay et al., 2010). Respectively, operational and strategic aspects of new services in a manufacturing context have emerged as service research interests (e.g. Eggert et al., 2011; Kindström and Kowalkowski, 2009; Neu and Brown, 2008; Nordin et al., 2011; Salonen, 2011; Visnjic Kastalli et al., 2013). Hence, the existing relevance of service innovation across all industries underscores the need for further examining antecedents and consequences of service innovation.

## 2.2. Integrative Review of Past Research

In this Section the results of the literature review are shown. After describing the methodological approach (Section 2.2.1), the general development of service innovation literature is described in Section 2.2.2.. Next, the underlying theories in past research are analyzed in Section 2.2.3.. In Section 2.2.4. I develop a conceptual framework which includes the main categories of antecedents and consequences of service innovation based on the empirical findings of past research, which are presented subsequently.

### 2.2.1. Method: Literature Review

To analyze past research I chose a review method that aims at integrating the main findings on service innovation management. For this, I applied a key word search for articles in selected outlets, which will be explained in the following paragraphs.[10] This approach is well-equipped to result in a detailed research agenda, as the articles are systematically reviewed and synthesized. Consequently, existing research gaps can be identified. To achieve this endeavor, I focused exclusively on published works. The decision to exclude other works, such as working papers, dissertations, or books, was based on the argument to consider works that successfully passed the blind-review process of relevant outlets, hence have proven to comply with a high standard regarding rigor and relevance. The field of service innovation management has intensively developed in the past years, such that a sufficiently broad set of high-quality articles have already been published, so far. I analyzed both relevant conceptual and empirical

[10] This methodological approach was chosen by several other authors (Busenitz et al., 2003; Short et al., 2008).

works. Although a publication bias might influence the results of this review, I am convinced that the main important findings are yet identified.

The choice of outlets for the systematic review was based on Short (2009). Following his suggestions, leading outlets in the management and marketing fields were included, as well as leading specialized outlets that focus on economics, innovation management, or services. Accordingly, the following 33 outlets were considered: *Academy of Management Journal, Academy of Management Review, Administrative Science Quarterly, California Management Review, Entrepreneurship: Theory & Practice, IEEE Transactions on Engineering Management, Industrial & Corporate Change, Industrial Marketing Management, Industry & Innovation, Journal of Business Venturing, Journal of Engineering and Technology Management, Journal of International Business Studies, Journal of Management, Journal of Management Studies, Journal of Marketing, Journal of Marketing Management, Journal of Product Innovation Management, Journal of Service Management, Journal of Service Research, Long Range Planning, Management Science, Marketing Science, Organization Science, Organization Studies, R&D Management, Research Policy, Service Industries Journal, Small Business Economics, Strategic Entrepreneurship Journal, Strategic Management Journal, Strategic Organization, The Review of Economics and Statistics,* and *Technovation.*[11]

In November 2014, I conducted a keyword search via the EBSCO Business Source Premier database, which was used for multiple prior literature reviews in leading outlets (Becheikh et al., 2006; Van Wijk et al., 2008), with the following keywords: ‘service innovation’, ‘service development’, ‘new service’, and ‘service’. Therefore, I have captured all relevant articles that address services or service industries and was able to check for their relevance regarding innovation. Multiple counts of each article were eliminated, and no limitation regarding the time span of the publications was applied. This search resulted in over 7,400 hits. The search with the terms ‘service innovation’, ‘service development’, and ‘new service’ revealed 243 articles, while the rather imprecise term ‘service’ led to over 7,200 hits, accordingly. After manually reviewing the titles and abstracts, further articles were excluded because of insufficient relatedness to service innovation. In these cases, the focus was placed on, for example, customer services (e.g. Giebelhausen et al., 2014), consumer behavior (e.g.

[11] An overview of the outlets in the sample and their respective Impact Factors is provided in the Appendix, Table A-1.

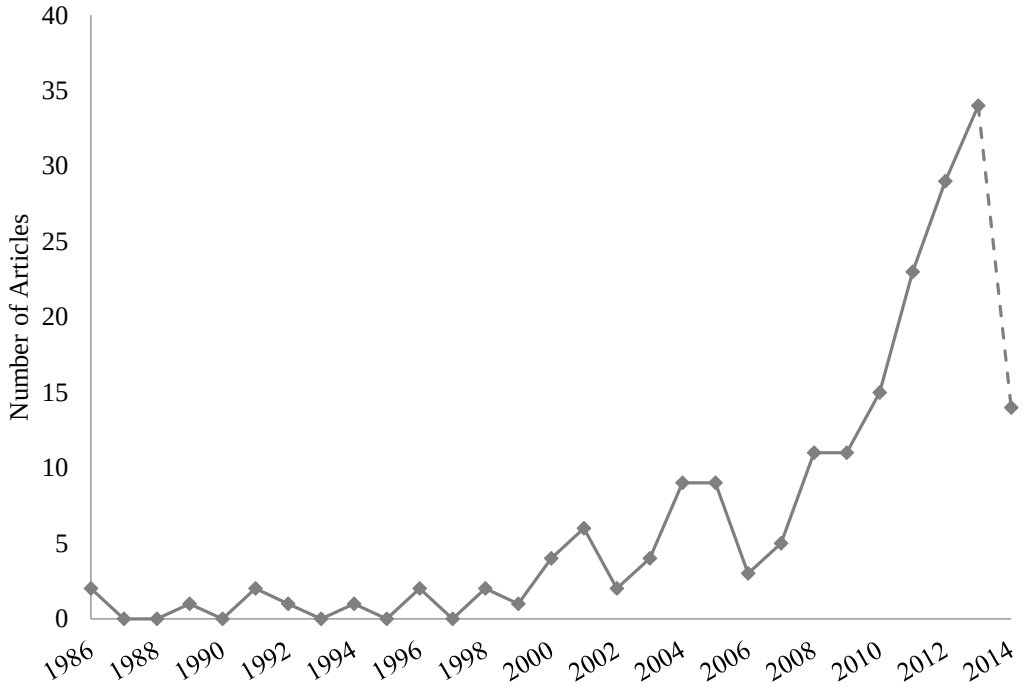
Devezer et al., 2014), or product innovation (e.g. Stevens, 2014). Certain kinds of articles, such as book reviews, were also excluded.

On this basis, I arrived at a final sample of 211 relevant published articles for the in-depth literature analysis. They were systematically reviewed regarding informational aspects, such as year of publication, method (type of empirical study, method, sample, level of investigation), and key findings. Subsequently, an evaluation regarding further categorization opportunities was conducted. This procedure led to a clear picture of the status quo of the works in service innovation management research and enabled a systematic determination of key topics dealt with in prior empirical studies.

### 2.2.2. Evolution of Service Innovation Management Research

Past innovation management research has intensively addressed product innovation (e.g. Brown and Eisenhardt, 1995; Ernst, 2002; Kahn et al., 2006). An indication is the influential outlet 'Journal of Product Innovation Management', probably the most tangible embodiment of the maturity of product innovation management. In contrast, innovative services were neglected and often limited to the context of support services in traditional product firms (Gebauer et al., 2010) or specific industries, such as financial services (e.g. Cooper and de Brentani, 1991; de Brentani and Cooper, 1992; Edgett, 1996). This relatively marginal appreciation of service innovation is rather surprising, since already in the mid-1980s researchers began to empirically examine the distinctive characteristics of services and their influence on innovation activities and success (Easingwood, 1986). Notwithstanding, this research field has been experiencing increased attention in line with the growing interest in service research in general, which is illustrated by the development of the relatively high-ranked 'Journal of Service Research' (Impact Factor: 2.143). In the past 28 years, the number of service innovation articles has been growing substantially. While in each of the years from 1986 till 1999 no more than two articles about service innovation were published in the outlets of the sample, ten publications appeared in 2008, and a peak was arrived in 2013 with 37 publications. Figure 2-2 illustrates the growth in numbers of publications per year. Despite this increased attention dedicated to service innovation, the actual figures demonstrate that the field of service innovation management is still developing (Papastathopoulou and Hultink, 2012).

**Figure 2-2. Growth in Number of Publications per Year**




**Note:** Year 2014 is not fully covered, indicated by the dashed line.

An additional indication of this status is shown in the set of outlets. Service innovation studies were predominantly published in specialized outlets for service research, such as the 'Journal of Service Management' (Impact Factor: 1.290) and 'Journal of Service Research' (Impact Factor: 2.143). Not surprisingly, many studies (31) were published in the 'Journal of Product Innovation Management' (Impact Factor: 1.379) in the last three decades. The outlet 'Research Policy' (Impact Factor: 2.598) which focuses on economics and management also published several service innovation articles (17). In total, only very few articles ware published in top general management outlets. As a conclusion, service innovation management is far away from saturated and thus still has many research gaps which future research should address. An overview of the number of service innovation articles per outlet[12] is given in Figure 2-3.

[12] Outlets that did not publish articles related to service innovation: Administrative Science Quarterly, Academy of Management Review, Management Science, Organization Studies, Journal of Management, Strategic Entrepreneurship Journal, Journal of Business Venturing, Journal of Engineering and Technology Management, Journal of International Business Studies, Journal of Marketing Research, Journal of Marketing, and Marketing Science.

**Figure 2-3. Number of Service Innovation Articles across Outlets**


In Table 2-5 the articles are listed which have been cited most up until recently. Expectably, these articles were predominantly published in well-acknowledged outlets, for example, 'Research Policy' (Impact Factor: 2.598) and 'Journal of Product Innovation Management' (Impact Factor: 1.379). The most cited article, the conceptual work of Gallouj and Weinstein (1997), served several authors as an approach to detail various modes of innovation in the service sectors (e.g. de Vries, 2006; Toivonen and Tuominen, 2009). Moreover, some researchers seem to stand out in the field. For example, Ulrike de Brentani and Robert G. Cooper have heavily influenced the development of the service innovation field (e.g. Cooper and de Brentani, 1991; de Brentani, 1989; de Brentani, 2001).

**Table 2-5. Top 15 Articles on Service Innovations**

| Rank | Number of Citations | Reference | Outlet |
|---|---|---|---|
| 1 | 1273 | Gallouj and Weinstein (1997) | Research Policy |
| 2 | 721 | Muller and Zenker (2001) | Research Policy |
| 3 | 600 | Edvardsson and Olsson (1996) | Service Industries Journal |
| 4 | 551 | de Brentani (2001) | Journal of Product Innovation Management |
| 5 | 531 | Drejer (2004) | Research Policy |
| 6 | 512 | Hipp and Grupp (2005) | Research Policy |
| 7 | 462 | de Brentani (1989) | Journal of Product Innovation Management |
| 8 | 420 | Avlonitis et al. (2001) | Journal of Product Innovation Management |
| 9 | 334 | Cooper and de Brentani (1991) | Journal of Product Innovation Management |
| 10 | 324 | Easingwood (1986) | Journal of Product Innovation Management |
| 11 | 276 | Damanpour et al. (2009) | Journal of Management Studies |
| 12 | 270 | Cooper et al. (1994) | Journal of Product Innovation Management |
| 13 | 269 | Robson and Bennett (2000) | Small Business Economics |
| 14 | 265 | Anand et al. (2007) | Academy of Management Journal |
| 15 | 248 | Neu and Brown (2005) | Journal of Service Research |

**Note:** The information on the number of citations was collected in January 2015.

### 2.2.3. Theories in Service Innovation Management Research

Reviewing the theoretical foundation of past research, it can be observed that the majority of research was rarely based on profound underlying theories. The understanding of the term 'theory' in this work is that the theory has developed to such an extent through conceptual advancements thus that it can be considered established and well-known.[13] I investigated the articles to identify the main applied theories.[14] The results show that of the 211 articles which I analyzed merely 31 build on a theory.[15] This corresponds to about 85 % of the article in the sample[16] which suffer from a theoretical foundation. Furthermore, the landscape of theories used is very scattered. Some authors base their work, for example, on interactions

[13] The understanding of what represents a theory is complicated and imposed by several challenges. In their essay, Sutton and Staw (1995) try to explain what does not constitute a theory. In response to that DiMaggio (1995) and Weick (1995) elaborate on a perspective what theories can be. Both respondents emphasize the value of the development process of building a theory. Hence, it is valuable to acknowledge theories which are still developing. For the purpose of clarity, however, I focus on rather established theories in this work.

[14] In this part of the review, I considered all articles in which theories served as foundation for their theoretical reasoning. Articles in which merely a reference to a theory was made without elaborating on it were not included.

[15] An overview of the theories used in the corresponding articles is given in the Appendix, Table A-2.

[16] Pure theory development papers are not considered in this measure (e.g. Gallouj and Weinstein, 1997).

between technologies and individuals on relatively broad theories such as the socio-technical view (Berger and Nakata, 2013; Damanpour et al., 2009), whereas others apply very specific theories such as the property rights theory (Leiponen, 2008). Regarding theories which seem to be acknowledged and thus applied multiple times, three theories are worth mentioning: 1.) contingency theory, 2.) dynamic capabilities, and 3.) resource-based view.

With respect to contingency theory[17], authors chose this theoretical understanding, as it provides explanations for the need to consider the influence of external factors (Das and Joshi, 2012; Hsieh and Tidd, 2012) and the impact of organizational structures and processes which are aligned to the corporate strategy (Hull, 2004; Lightfoot and Gebauer, 2011; Neu and Brown, 2005). As shown in the work of Das and Joshi (2012), this theory can be helpful to develop hypotheses on moderation effects. The two authors postulate that environmental hostility and a firm's aggressive posture strengthen the relationship between process innovativeness and firm-performance (the former moderating effect is supported, while the latter moderating effect was not significant). Although the contingency theory serves as theoretical foundation several times, the focus in service innovation management seems to rely on the other two theories, i.e. dynamic capabilities and resource-based view.

With his works, Barney (1986, 1991) paved the way for the resource-based view and the dynamic capabilities perspective which can be considered as a further development of the resource-based view (den Hertog et al., 2010). His major argument was that with valuable, rare, inimitable, and non-substitutable resources firms are able to generate sustainable competitive advantage (see also Peteraf, 1993). Since resources include a broad set of factors, authors can apply this understanding to analyze any kind of resources. For example, a study about the value of co-operation to generate the resource knowledge was theoretically based on the resource-based view perspective and found that firms which apply both external and internal knowledge sourcing strategies introduce more often service innovations (Mention, 2011). However, with this approach there seemed to be a lack of clarity regarding what is meant by resources and how exactly these lead to a competitive advantage (Priem and Butler, 2001). For this reason, others sought to reduce this ambiguity. For example, Day and Wensley (1988) focus on capabilities as a specific differentiating resource. As Zhao et al. (2013) showed, this more detailed understanding of resources proved to be more adequate to hypothesize on the role of skills in

[17] This theory is based on works of Blau et al. (1976); Burns and Stalker (1961); Lawrence and Lorsch (1967); Mintzberg (1979); Woodward (1965). For an evaluation of the adequacy of contingency approaches, please see Donaldson (1987).

new service development. Their findings revealed that founding teams of new ventures need to have the appropriate mix of marketing, market linking, and service design capabilities to increase the protectability and scalability of a new service.

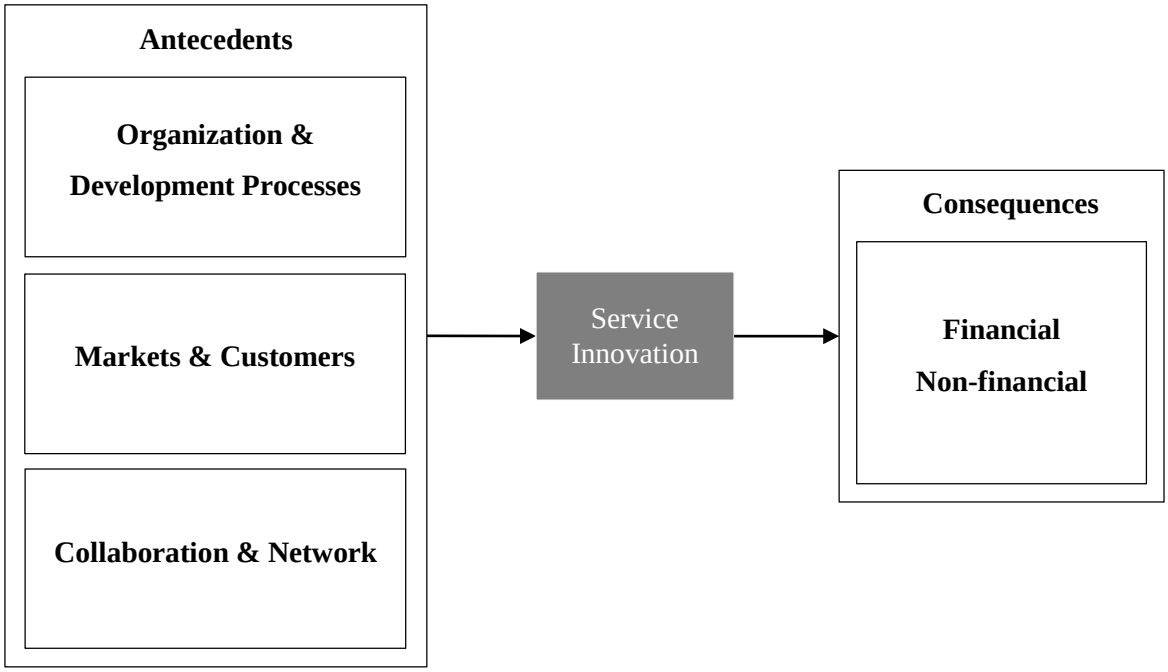
The theory on dynamic capabilities has emerged in the 1990s which tries to deploy a more dynamic perspective to the set of resources. Accordingly, Teece et al. (1997) argue that with dynamic capabilities firms are able to "*integrate, build and reconfigure internal and external competencies to address rapidly changing environments*" (p. 516). In a similar vein, other authors have emphasized the ongoing development of organizational capabilities which determine whether a firm is able to retain competitive advantage or not (Helfat et al., 2007; Helfat and Peteraf, 2003). As the dynamic capabilities perspective includes the volatility of the environment and, consequently, the necessary ever-changing constellation of a firm's resources, this theory seems to convincingly support theoretical arguments made in service innovation literature. For example, the multiple-case study of Fischer et al. (2010) revealed that the dynamic capabilities of sensing, seizing and reconfiguring influence whether a firm pursues an exploitative or explorative approach to develop new service businesses.[18] Similarly, Salunke et al. (2011) developed an advanced understanding of innovation capabilities which emphasizes the importance of combining several capabilities, i.e. episodic learning, relational learning, client-focused learning, and combining resources. At the core of service innovation management lies the requirement to address the changing customer needs and to effectively and efficiently address these with innovative services (Ostrom et al., 2010). Hence, the dynamic capabilities perspective can be a helpful theoretical lens to explain the influence of certain capabilities on new service success.

### 2.2.4. Conceptual Model on Antecedents and Consequences of Service Innovation Management

In the following, the findings from the review, systematization, and integration of the sample's 191 empirical works on service innovation are presented which result in a conceptual model on service innovation (Figure 2-4). I distinguish between antecedents and consequences of service innovation management, the former including the three categories: strategy & processes, markets & customers, and collaboration & network, while the latter includes financial and non-financial consequences. The assignment of the works to each respective category is based on their primary focus.

[18] This article is primarily based on the seminal work of Teece (2007).

**Figure 2-4. Conceptual Framework of Past Research on Service Innovation Management**




**Antecedents: Organization & development processes.** In empirical research on service innovation management mostly the topics of organization and processes have been investigated as antecedents of service innovation. Regarding organization, service innovation success requires a clear corporate purpose (Thwaites, 1992). A service innovation management that finds proliferation and commitment at all levels is conditional, and on that account top and middle management are requested to support this undertaking (Antonacopoulou and Konstantinou, 2008; Bader, 2008; Ettlie and Rosenthal, 2012). A clear formulation of a firm's strategy consequently guides organizational members at all levels to achieve corporate objectives, such as a pure service strategy or enhanced importance of services within a goods-dominant firm (Gebauer et al., 2010). In addition, a shared understanding represents a prerequisite to reach the defined corporate goal. For example, Luo et al. (2012) found that deploying the balance score card is an effective tool to increase service innovation efficiency. Thus, for service providers to achieve sustainable service innovation, it ought to be distributed throughout the organization and promoted by leadership and staff (Lyons et al., 2007). Yet, managers do not always seem fully committed to innovation (Chan et al., 1998) or they are focused on (physical) products with which they have experience (Meyer and DeTore, 2001). This might be considered as an insufficient service innovation awareness and culture which hampers the pursuit of a successful service innovation strategy.

Since informal aspects are assumed to be important in service innovation, the organization of human resources has received high relevance. Studies show that well-trained, committed, and competent staff members influence new service success (e.g. Corrocher et al., 2013; Easingwood, 1986; Van Riel et al., 2004). An effective development method, for example, is the theory of inventive problem solving (TRIZ) creativity training which is based on patent analysis procedures and structures the problem-solving process (Birdi et al., 2012; Chai et al., 2005). Additionally, an incentive system which supports innovativeness is advantageous to motivate the workforce (Lyons et al., 2007). Furthermore, managing the proximity between all relevant departments affords an extension of decision-making and increased discretion (Antonacopoulou and Konstantinou, 2008; Ramirez, 2004; Sørensen et al., 2013), since a larger group interacts with the customer more directly. Santamaría et al. (2012) examined the influence of so-called service-related factors, such as human capital and training, on innovation outcomes (whether any innovation result was achieved in the last two years). Their results clearly confirm this hypothesis. A further empirical investigation came to a similar finding: Highly qualified employees increase the probability of service innovation; however the role of unqualified employees should not be underestimated (Love and Mansury, 2007). As a particularly relevant group of employees, the front-line staff has received considerable attention. Research findings underline their distinct importance and suggest that the capabilities of front-line employees have a significant positive impact on service innovation, especially in the launch phase of a new service (de Brentani, 2001; Melton and Hartline, 2010; van der Boor et al., 2014).

The development process shows that service development processes differ significantly from those of products (Hipp and Grupp, 2005). Whereas goods-dominant firms often have a research and development (R&D) department, most service firms seem to rely more on human resources (Hollenstein, 2003) and less on formalized service development processes (den Hertog et al., 2011; Ettlie and Rosenthal, 2011; Miles, 2007). This approach complicates an accurate analysis of the service development process, since the locus of service development is difficult to detect (Toivonen and Tuominen, 2009). Moreover, quality control is a challenging task. In this respect, new approaches such as visualization and testing possess great potential to overcome these barriers (Meiren and Burger, 2010). In product research, R&D intensity as well as resulting products or patents are often utilized as innovation measures (de Brentani and Cooper, 1992). Within the scope of services such an assessment is hardly possible. Though

some services or business methods can be patented[19] the process remains difficult and is not that established in the broad service context. The process of service development remains fuzzy, and so does the outcome.[20]

Nonetheless, Froehle et al. (2000) showed that a well-defined process improves the speed of development. Similarly, other study results confirm that consistent and well-defined innovative activities are important to generate successful new services (Edgett, 1996; Roberts and Amit, 2003). Therefore, different to the aforementioned conviction, research on service innovation management has found strong arguments to believe that a clearly formulated development process is beneficial.

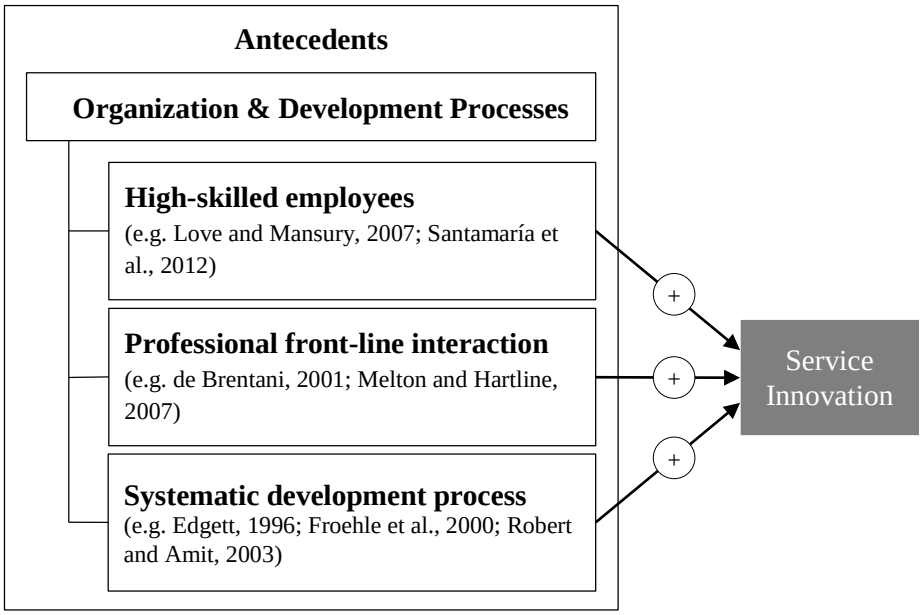
In accordance to that, several authors strive for a systematization of the new service development process to overcome the vague idea of service development. The development of a model illustrating the various dimensions of new service development has been considered as a valuable approach (Ching-Chow, 2007). For example, the results of the qualitative in-depth case study on three healthcare organizations led to the suggestion to divide the new service development process into the following stages to improve the management of new service development projects: 1. service identification, 2. service value net formation, 3. service modeling, 4. service implementation, and 5. service commercialization (Lin and Hsieh, 2014). Similarly, Kindström and Kowalkowski (2009) introduced a four-stage model and found that in the service development process intensive investments of several resources are required in the latter two stages, i.e. sales and delivery, whereas the first two stages, market sensing and the actual development, are more crucial for the product development process. In a similar vein, Lenfle and Midler (2009) emphasize the importance of early involvement of sales personnel in the launch phase of innovative product-related service. A further attempt was made by Avlonitis et al. (2001) who investigated different types of financial service innovation within their specific development processes in terms of activities, formality, and systematic interaction. Their results show that moderate innovativeness, high formalization, and limited interaction among different groups are associated with great successes in profitability and sales, whereas

[19] For example, Kumar and Turnbull (2008) developed a theoretical framework to determine whether or not a financial innovation should be patented. Since 1998, it is possible to patent business methods in the U.S..

[20] In the service context, intellectual property protection is said to be a highly complex endeavor (Amara et al., 2008). Prior findings indicate that this aspect has not yet received sufficient importance in the service industries (Hipp and Grupp, 2005). Exceptions are found in the knowledge-intensive business service sector: The survey of Amara et al. (2008) reveals that the firms in that sector rely on patents, registration of design patterns, and trademarks as complementary methods to protect their innovations and inventions; hence, firms regard the composition of intellectual property protection strategies as beneficial.

high innovativeness, moderate formalization, and high interaction among different groups positively influence non-financial success (Avlonitis et al., 2001). Figure 2-5 provides an overview of the main research findings[21] in the category antecedents: strategy & processes.

**Figure 2-5. Antecedents of Service Innovation: Organization & Development Process**




**Antecedents: Markets & Customers.** Antecedents related to markets and customers have been identified as very important for service innovation in prior work. Regarding the former, findings show that new product and service innovation success share several antecedents, such as product/ market fit, quality of launch, superiority of the product, quality of marketing activities, product quality, and product newness (Cooper and de Brentani, 1991; Cooper et al., 1994; de Brentani, 1989; de Brentani and Cooper, 1992; de Brentani and Ragot, 1996). However, services seem to require specific considerations regarding the degree of customization and the uniformity of the service delivery process (Cooper and de Brentani, 1991). Accordingly, a precise understanding of the targeted market is imperative to create and offer suitable service innovations that generate a competitive advantage. Results indicate that the consideration of market conditions and competitor activities positively influences a firm's resources and the reward in service innovation (Jaw et al., 2010). Furthermore, Cheng and

[21] To provide an insight into the main findings, this figure illustrates the results which were generated in relevant quantitative studies. In the Appendix, Table A-3, all articles with the predominant focus on the category antecedents: strategy & processes are listed with each of their findings.

Krumwiede (2012) found in their survey-based study with the top 500 Taiwanese service firms that market orientation has a significant positive impact on the success of a new service. Hence, market orientation represents a crucial influencing factor on service innovation.

Moreover, the degree of service intangibility is similarly relevant for the success of a new service, as it relates to customer uncertainty about the value added which can be expected by consuming a new service (Cooper and de Brentani, 1991). Therefore, reducing this ambiguity is an important goal (Abramovici and Bancel-Charensol, 2004). To achieve a better understanding, the service offering perceived by the customer must be aligned to his or her needs, which entails manifold implications for the constitution of the new service. For instance, given specific market conditions, aesthetic design, i.e. an appealing as well as experiential design that triggers emotional reactions, helps to enhance competitive advantage, resistance to imitation, and profitability (Candi and Saemundsson, 2011). This is due to the supported association of a service with a corporate brand, and/ or the enhanced customer benefits through the creation of a symbolic value. The attitude towards the perceived images has received particular interest. An experiment by Kleijnen et al. (2005) provided support for the positive impact of image congruence, i.e. a fit between consumers' image and that of an innovation, on consumer attitudes and adoption decisions. With existing image congruence customers can be convinced of the quality of a service, which significantly influences the success of very innovative services (de Brentani, 2001).

Yet, not surprisingly, assessing the customer needs and devising services accordingly remains difficult (Zeithaml et al., 2006). One method is suggested by Lee and Chen (2009) who consider the integration of the quality function deployment[22] and the Kano model[23] as promising because both tools provide information regarding importance, priority, and direction of the service development. Furthermore, added service guarantees also support service development because customer claims are incorporated into future services to preventively avoid reclamations that induce costs (Lidén and Sandén, 2004). Another approach is to systematically evaluate customer experience. Teixeira et al. (2012) found support for the effectiveness of customer experience modeling which integrates rich information on various customer interactions and thus improves service design processes.

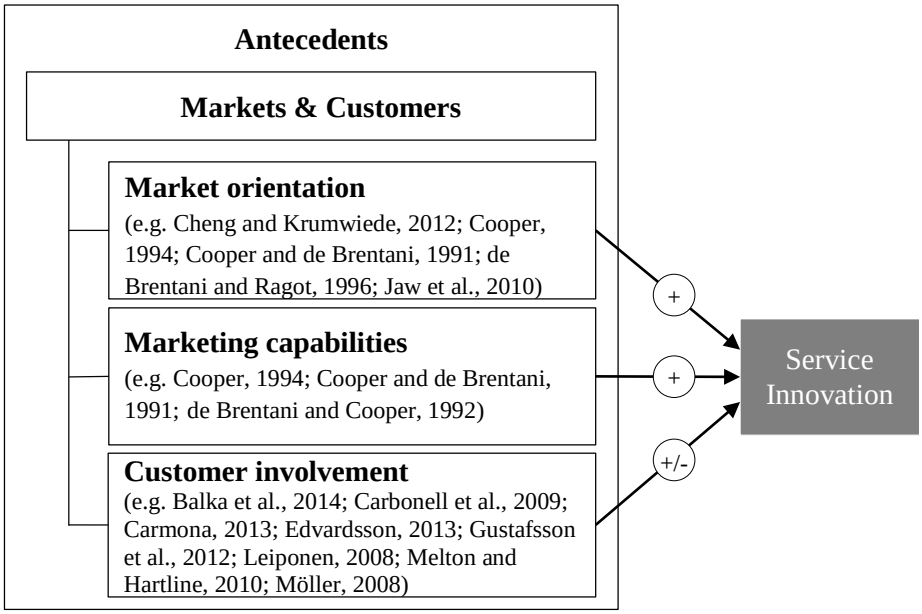
[22] For more details, please see the review on quality function deployment by Chan and Wu (2002).
[23] For more details, please see Joiner (1994); Salem Khalifa (2004); Thompson (1998).

Customers are important for both product and service innovation adoption. However, in services the role of customers receives a unique interpretation. Many authors regard the role of customers as not being limited to the receiver of the service; instead, there is a bid for greater involvement in the service development process (Melton and Hartline, 2010). Findings suggest that involving customers positively influences technical quality and innovation speed (Carbonell et al., 2009). In fact, Oliveira and von Hippel (2011) found that around 85 % of the functional innovation sources of financial services are the users themselves. Hence, customers deliver inspiring thoughts on market opportunities, desired customer benefits, and features of the potential services, or they provide feedback in the course of testing (Melton and Hartline, 2010). Moreover, Elg et al. (2012) agree on the value of customer involvement, as they found that seeing into patient diaries in hospitals increases learning and thus promotes customer-centric new services. This co-production of a customer can be either client-driven or provider-driven. By balancing these two modes the client's immediate needs can be met and thus sustainable innovativeness is created (Möller et al., 2008).

Despite these supporting findings, other investigations point to a more complex relationship between customer involvement and service innovation outcome. For example, Leiponen (2008) examined the governance of knowledge assets in the client-supplier relation; the results pointed to a reduced likeliness to introduce new services or improved existing services which is caused by tight contractual arrangements. In addition, Gustafsson et al. (2012) identify communication as an influencing factor of co-creation success; however, they find indications that this holds true for incremental service innovations but not for radical service innovation. The survey of Balka et al. (2014) similarly challenges general conviction and presents findings regarding the forms and loci of openness in user communities which can have limited or no effect on community perceptions and behavior. In Figure 2-6 the main findings of the articles are presented[24] which elaborate on the category antecedents: markets & customers.

[24] To provide an insight into the main findings, this figure illustrates the results which were generated in relevant quantitative studies. In the Appendix, Table A-4, all articles with the predominant focus on the category antecedents: markets & customers are listed with each of their findings.

**Figure 2-6. Antecedents of Service Innovation: Markets & Customers**



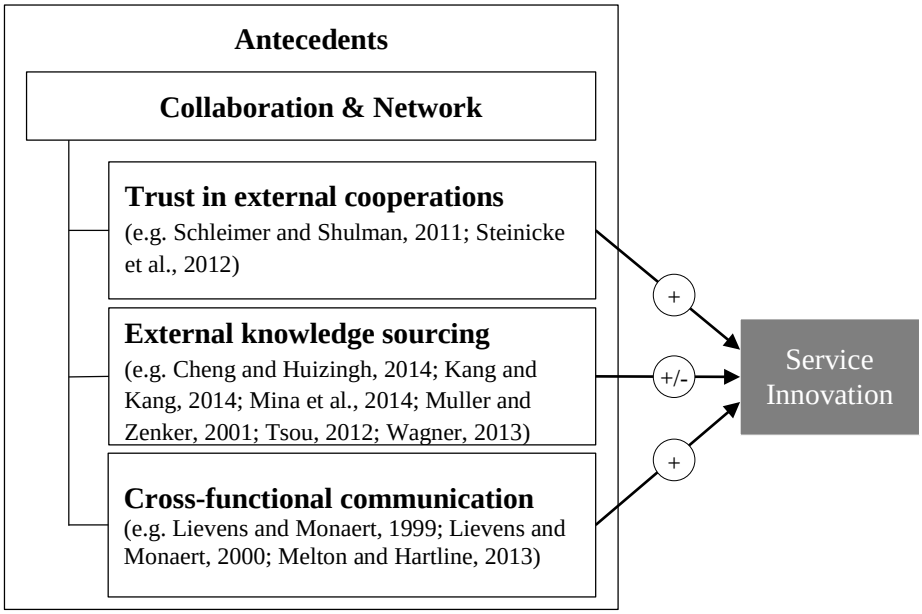

**Antecedents: Collaboration & Network.** Firms that gather information internally and externally are more prone to introduce innovations in the service sector (Mention, 2011). For that reason, two different sources of knowledge have been discussed and analyzed in past research, namely intra-firm collaboration and inter-firm network.

The particular characteristics of services increase uncertainty (see Section 1.2. and Section 2.1.2.). This holds true not merely for customers; likewise the firm's staff suffers from service ambiguity (Lievens and Moenaert, 2000). A suggested approach of reducing the uncertainty is to enhance intra-firm collaboration in terms of inter-project as well as intra-project teamwork (Olausson and Berggren, 2012). Cross-functional teams were found to positively affect innovation performance (Melton and Hartline, 2013). However, the higher the degree of intangibility and variability, the less effective team communication will become in reducing the level of innovative uncertainty (Lievens and Moenaert, 2000). Therefore, to achieve an effective cross-functional communication require adjustments to the organizational structures due to the overlapping areas of the operations, marketing department, and other departments (Sørensen et al., 2013; Thwaites, 1992). Similarly, the organizational design and the project climate contribute to a more effective communication; thus, a supportive infrastructure and commitment to knowledge exchange is beneficial for service improvement and new service introduction (Leiponen, 2006).

Beyond the inner boundaries of organizations, empirical analyses unveil that inter-firm networks among firms, too, influence the innovativeness of service firms (Cheng and Huizingh, 2014; Kowalkowski et al., 2013; Muller and Zenker, 2001). They also support the development of successful integrated solutions (Windahl and Lakemond, 2006). The study by Kang and Kang (2014), for example, supports the positive relationship between external information acquisition (via business service firms, competitors, universities etc.) and service innovation output. Similarly, networks can provide service firms with access to resources and thus enable service innovations (Rusanen et al., 2014). In addition, managers and executives are convinced that inter-firm commitment will increase the service innovation focus and strengthen its impact on corporate performance (Eisingerich et al., 2009). In comparison with product innovation, additional factors, such as a stronger emphasis on mutual trust, receive distinct attention in the context of new services (Schleimer and Shulman, 2011). Accordingly, closer and well-established connections with various business partners enhance service innovation success (Hsueh et al., 2010). Though benefits can be derived from inter-firm networks, the results of the study of Gebauer et al. (2013) highlight the necessity to develop dynamic and operational capabilities to benefit from various network types. Furthermore, Wagner (2013) found contrasting results. In his analysis of the German innovation survey from 2005 he found that customers, supplier, and competitors improve services, but cooperation with universities and consultancies do not affect service innovation performance. Figure 2-7 illustrates the main findings[25] of the articles which are assigned to the category antecedents: collaboration & network.

[25] To provide an insight into the main findings, this figure illustrates the results which were generated in relevant quantitative studies. In the Appendix, Table A-5, all articles with the predominant focus on the category antecedents: collaboration & network are listed with each of their findings.

**Figure 2-7. Antecedents of Service Innovation: Collaboration & Network**

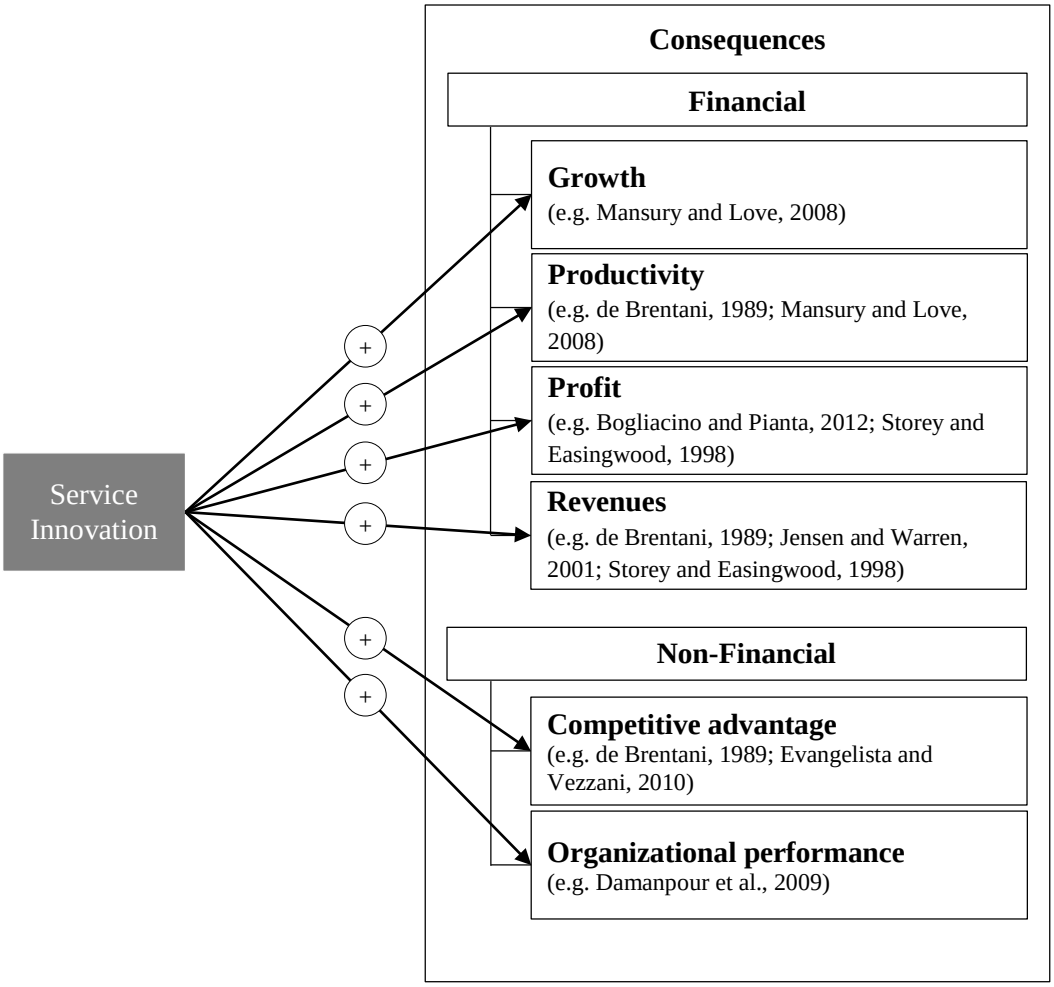



**Financial and Non-Financial Consequences.** Though de Brentani published her study about the effectiveness of certain service development on success factors already in 1989, the clarification of service innovation's consequences represents a largely unexplored issue in service innovation management (Evangelista and Vezzani, 2010). An explanation might be the issue of measuring new service output and new service performance (den Hertog et al., 2011). Consequently, the measurement concepts for product innovation require adjustment, since service innovations – as indicated in the previous paragraphs – are developed by utilizing both technical as well as various softer factors (Abreu et al., 2010). The difficulty of determining accurate measures lies in the latent processes involved and in the ambiguous nature of service innovations (Jensen and Warren, 2001). This can be ascribed to the multifaceted nature of the new service which represents a combination of a set of tangible and intangible antecedents, such as functional know-how, well-established processes, research and development investments, innovative corporate culture, and the customer. In a similar vein, service innovation's outcome is highly interpretable due to its heterogeneous features, which further impedes an accurate measurement. As a result, often the choice of measures does not reflect the actual development process.

A remedial procedure is recommended by Jensen and Warren (2001) who value the usage of real options theory to assess the impact of service R&D activities on firm revenue as an advanced approach. Furthermore, the choice of outcome measures could be extended. For example, the degree of focus on service innovation (Aas and Pedersen, 2011) or innovation intensity (den Hertog et al., 2011) are also possible independent variables. Concluding these attempts, the solution to this issue of difficult evaluation supposedly lies in a broad set of measures (Su, 2011). In this regard, a survey in the UK service sector showed that truly innovative firms measure performance along a number of softer customer-based and internal dimensions, whereas less innovative firms apply predominantly financial measures (Storey and Kelley, 2001). Hence, highly innovative firms seem to appreciate the benefits of considering multiple dimensions of service innovation consequences. Accordingly, outcomes like customer experience are included in studies on service innovation success (Su, 2011). Prior work further shows that the cumulative adoption of various innovation types over time positively influences organizational performance measured with a service performance score (Damanpour et al., 2009), and Evangelista and Vezzani (2010) identified the positive effect of service innovation on gained competitive advantage. In contrast, others have focused on financial outcome dimensions, and their results support that service innovations do have an impact on growth (Mansury and Love, 2008), productivity (Mansury and Love, 2008), and profit (Bogliacino and Pianta, 2013). The main findings[26] of the articles which are assigned to the category consequences: financial & non-financial are presented in Figure 2-8.

[26] To provide an insight into the main findings, this figure illustrates the results which were generated in relevant quantitative studies. In the Appendix, Table A-6, all articles with the predominant focus on the category consequences: financial & non-financial performance are listed with each of their findings.

**Figure 2-8. Consequences of Service Innovation: Financial and Non-Financial**




## 2.3. Future Research Agenda for Managing Service Innovation

In the following, the resulting future research agenda from the systematic and integrative literature review is presented. First, I stress the potential benefits of further work on the conceptualization of service innovation (Section 2.3.1.). After that, I present the main topics which researchers could focus on in the service innovation context, since they have so far been insufficiently addressed in research (Section 2.3.2.). Finally, I point in Chapter 2.3.3. to possible research methods which could contribute to an enhanced level of rigor in service innovation management.

### 2.3.1. Conceptualization of Service Innovation

Despite its escalating attention, there is considerable scope for advancing service innovation management. Prior work has mainly focused on offering empirical investigations without addressing the theoretical foundations in sufficient detail (e.g. de Brentani and Ragot,

1996; Ordanini and Parasuraman, 2011). While their efforts offer fruitful insights, a comparison and integration of empirical results appears to be difficult without a clear conceptual understanding and an underlying theory. Menor and Roth (2007) are no exception in claiming that the "*current theory and understanding of the strategies and tactics for developing new services is inadequate*" (p. 825). Recently, Barczak (2012) expressed the need for more understanding of the similarities and differences between service and product innovation.

The point of departure among prior studies varies significantly. Some authors have pursued the demarcation approach, i.e. considering service innovation separately from product innovation (Gallouj, 1998; Sundbo, 1997). Then again, others advocate for an interwoven relationship, i.e. synthesis, that values the complementing effects of both service and product innovation management (Castro et al., 2011). Given the development of this research stream, the choice of relationship is presumably rather a result of evolution than of argumentation. With the beginning of the service innovation field more research was focused on the distinctiveness of services, whereas recently more authors strive for incorporating findings to the benefit of both product and service innovation management. In this context, I recommend to openly acknowledge the bids for an integrative relationship between service and product innovation (de Vries, 2006; Drejer, 2004).[27]

Furthermore, there is still a lack of consensus regarding the definition of service innovation. Some works focus on specific modes of service innovation (Gustafsson et al., 2012), while others emphasize the specificities of services like their experiential character (den Hertog et al., 2010; Zomerdijk and Voss, 2011). In this work I have made a first attempt to capture the richness of the service innovation concept in a simple statement. Prospectively, more researchers should overcome the varying perspectives to facilitate the comparison of their results and the development of a cumulative body of knowledge on service innovation.

In addition, profound theoretical grounding is found to be rare which hinders comparisons among research findings. Since several theories, such as the resource-based view or the dynamic capabilities perspective, were found to match well with theoretical arguments in the service innovation management context, the resulting suggestion is to apply these theories and thus strengthen the development of hypotheses and make interpretations of research results possible.

[27] See Section 2.1.2. for more details on service specificities and their implications for innovation management research.

### 2.3.2. Research Topics

**Antecedents: strategy & processes.** In the scope of empirical research one of the identified antecedent category is strategy & processes. These factors comprise mainly linkages of an organization's corporate culture, strategic orientations, and structure with new service success (Lyons et al., 2007). The role of corporate change aligned to the requirements of service innovation is relatively underrepresented and deserves considerably more research. It is still not clear, for example, how goods-dominant firms successfully adjust their strategies, organizational structures and culture when adopting services in their portfolio (Antonacopoulou and Konstantinou, 2008).

Service innovation also has implications for an organization's staff. In particular, a salient factor is the need for high-skilled employees who are able to share their knowledge within several functions (Corrocher et al., 2013; Froehle et al., 2000; Thwaites, 1992; Van Riel et al., 2004). However, prior findings indicate a lack of human resource investments (Meyer and DeTore, 2001). Hence, further research is required to shed light on the actual contribution of certain human resource allocations and knowledge sharing structures to clarify the important soft factors that influence service innovation (Abreu et al., 2010; Djellal and Gallouj, 2007).

The academic understanding of the service development process has remained far less clear than the one of product innovation (e.g. Kahn et al., 2006), and the same holds true for its understanding in practice (Hipp and Grupp, 2005; Hollenstein, 2003). As this review shows, a focus has been placed on the less formalized nature (den Hertog et al., 2011; Ettlie and Rosenthal, 2011; Miles, 2007) and the resulting lack of insight into each development stage (Kindström and Kowalkowski, 2009). To be able to assess effectiveness and to assure sustained new service success, it would be advantageous to overcome this existing vagueness. Prior empirical studies have already provided support for the positive impact of rigorous service development processes on new services (Avlonitis et al., 2001; Edgett, 1996; Lenfle and Midler, 2009; Lin and Hsieh, 2014). Accordingly, achieving a more precise picture of the importance of capabilities to develop new services successfully represents a very promising endeavor. Research could clarify what similarities and differences exist between managing product innovation and service innovation processes. In addition, as patents are found to marginally contribute to intellectual property protection, more research on possible protection mechanisms should be investigated to complement to the few prior findings (e.g. Amara et al., 2008; Hipp and Grupp, 2005).

**Antecedents: markets & customer orientation.** The aspects of markets and marketing activities have been studied intensively. As for the role of customers, the orientation towards their expectations has received strong attention in service innovation management. This is not surprising, since one of the main complex tasks is to communicate the added value of a service to a potential customer, whose needs are difficult to detect (Zeithaml et al., 2006). Furthermore, customers have evolved from primarily being receivers of a service to co-producers, and, importantly, to sources of innovation (Elg et al., 2012; Oliveira and von Hippel, 2011). The findings of Ordanini and Parasuraman (2011) demonstrate that collaborating with customers fosters innovation volume and that customer orientation influences how radical the innovation becomes. Thus, involving and satisfying customers is crucial and requires adjustments in operations and marketing management, especially in goods-dominant firms which extend their portfolio with service offerings. These requisite changes have not been addressed sufficiently in research. Researchers could contribute to a better understanding of the effectiveness of customer orientation in both the product and the service development process by identifying existing similarities and differences. In addition, findings on the benefit gained from customer involvement are contradictory (e.g. Balka et al., 2014; Gustafsson et al., 2012; Leiponen, 2008). Future research should try to resolve them and identify factors which influence the impact of customer involvement on service innovation.

**Antecedents: collaboration & network.** In contrast to the aforementioned research topics, the antecedents comprised by intra-firm collaboration and partnerships in networks have been rather poorly examined. Nevertheless, there are appealing empirical studies which underpin the fact that internal collaboration is enhanced by a supportive infrastructure and commitment to knowledge exchange, as these factors generate positive effects on service improvement and new service introduction (Leiponen, 2006; Melton and Hartline, 2013; Olausson and Berggren, 2012). For expanding external networks, Schleimer and Shulman (2011) found that compared to product innovation, additional factors, such as a stronger emphasis on mutual trust, receive distinct attention in the course of new services. Since conflicting results challenge these findings (e.g. Wagner, 2013), research could try to further depict the nature of collaboration as well as the strategies to enable knowledge exchange. Potential research questions could be: In what way does the choice of collaborating partner determine service innovation success or how should collaborations be managed to efficiently and effectively generate successful new services?

**Consequences.** Service innovations are ambiguous, and equally obscured are their consequences. It would be invaluable to give this blurry picture a clear shape. The minority of empirical research (in the present sample less than 10 % of the articles) has emphasized the consequences of service innovation (Evangelista and Vezzani, 2010). Importantly, a few studies have indeed identified a positive relationship between service innovation and firm performance (Aas and Pedersen, 2011; den Hertog et al., 2011; Mansury and Love, 2008). A study on service innovativeness and new service development detected an inverted U-shape association between the degree of innovativeness and financial performance (Avlonitis et al., 2001). Additionally, it revealed that the strongest contributions on non-financial performance are made by major service innovation, while the least contributions are made by 'me-too' offerings. As a result, these prior findings should encourage researchers to intensively investigate the consequences of service innovation in terms of both financial and non-financial outcomes. I propose to explore accurate measures for service innovation's inputs, outputs, and measurement systems that facilitate the evaluation of its influence on corporate performance. Since service quality is of great importance, methods to test the developed services are required. Some methods have been examined, such as simulation (Meiren and Burger, 2010); however, more techniques have to be evaluated against their applicability and validity.

**Additional Research Topics.** As shown in this detailed review, some antecedents and consequences of service innovation have been well received. However, I would like to point to two aspects which suffer from scientific neglect.

Firstly, the infusion of creativity into service innovation processes is worth mentioning (Ostrom et al., 2010). Though innovative culture has been considered important and the softer factors have been underlined (Lyons et al., 2007), it is important to emphasize the value of a more open and creative attitude towards development processes instead of a solely technical perspective. Except for very few works (e.g. Abreu et al., 2010; Zomerdijk and Voss, 2011) this has been unattended in past research, yet, carries high potential to advance research on service innovation management.

Secondly, service innovations are informed by the high information content of services and the widespread use of IT (Hollenstein, 2003). As Hernandez-Pardo et al. (2013) show, the integration of the design phase of the development processes and IT contributes to sustainable product-service systems in small and medium-sized enterprises. I suggest to further explore and examine how IT software and systems can contribute to sustain service innovation success.

### 2.3.3. Methods

Besides the content of service innovation management additional value rests in conceiving appropriate methods in service innovation management. Several studies have been conducted that utilized surveys for a rather specialized sample. Survey research across industries would enhance the understanding of service innovation significantly, as it would disclose firm specific and industry specific factors that influence service innovation. Obviously, the implementation of such methodological approaches demands high resource investment.

Furthermore, besides surveys, case studies were often favored. Case studies are beneficial to explore novel concepts; however, it is worth expanding the 'tool set'. In line with the call of Papastathopoulou and Hultink (2012) for a move toward more rigorous research methodologies, I propose to increase the number of cases and to select the cases based on theoretical reasoning (Eisenhardt, 1989). Moreover, it would be interesting to consider research methods such as experiments that provide knowledge which is relevant to a broader group in research and practice (Sørensen et al., 2010). Examinations on group and individual level could additionally unveil (latent) interrelations between several variables more accurately (Howell and Sheab, 2001; Teece, 2007).

In addition, the probability of service innovation success seems to vary depending on the size of the service-providing firm and the nature of the new service (Corrocher et al., 2013; de Brentani, 1995). A more complex new service offering is presumably very challenging for small firms, whereas large firms have difficulty responding quickly enough to the changing demand. Hence, investigations considering moderators such as the firm size promise interesting findings.

## 2.4. Conclusion and Research Agenda of Dissertation

Services evidently contribute to our economies (The World Bank, 2014) and will play a crucial role for firms within all industries. To outperform competitors, firms are confronted with the challenge of assessing customer needs as accurately as possible and developing services accordingly (Zeithaml et al., 2006). Thus, service innovation will continually experience growing attention in both research and practice and its successful management will represent a critical source of competitive advantage (Salunke et al., 2011). The understanding of service innovation is still limited, leaving much room for important contributions. This chapter has provided a systematic review of prior service innovation management regarding

both conceptual as well as empirical advancements. The detailed analysis of a broad set of works published in leading outlets has yielded several theoretical implications.

Firstly, though many authors emphasize the experiential aspects of new services (den Hertog et al., 2010; Zomerdijk and Voss, 2011), up until now, no broadly acknowledged definition has been elaborated. By examining extant conceptualizations a service innovation definition is suggested and thus the conceptual understanding of service innovation is advanced. In addition, the review unveiled a lack of theoretical grounding which entails the recommendation to base service innovation management on theories that enable comparison and support the theoretical development in service innovation management.

Secondly, based on this review, a conceptual framework is developed by categorizing past empirical research into major antecedents of service innovation, i.e. strategy & processes, markets & customers, and collaboration & network, as well as financial and non-financial consequences. Therefore, the value of the present work is to integrate past research findings on service innovation with the aim to support future research in identifying relevant research gaps.

Finally, the resulting detailed research agenda guides future research on service innovation. In particular, it suggests that future research needs to develop a comprehensive understanding of the concept of service innovation and the impact of capabilities to manage the entire new service development process on firm performance, and, to achieve this, should apply more rigorous methods. Hence, the inference is made that researchers should thoroughly analyze antecedents and consequences of service innovation to further advance this exciting research field.

Based on the aforementioned opportunities in research on service innovation management, the target of this dissertation is provide further insights into service innovation management. Accordingly, I derive research questions which are addressed in the following chapters. First, there is an identified need to clarify the introduction and establishment of service innovation management within a firm. It is still under-researched how service innovation can be successfully managed and established in an organization (Ostrom et al., 2010). The picture of the impact of the systematization of the new service development process on the success of new services and, in addition, of how organizational structures can support these processes remains blurred. Past research indicates that many service firms rely on softer factors, such as human resources and less formalized processes, instead of implementing a well-defined new service development process (e.g. Ettlie and Rosenthal, 2011). However, a systematic approach to the new service development is considered beneficial (Avlonitis et al., 2001; Edgett, 1996;

Lenfle and Midler, 2009; Lin and Hsieh, 2014). These conflicting perspectives lead to the following overall research question which is addressed in Chapter 3:

> **1.) Research question:** How and why do firms manage service innovation activities in their organization differently?

In addition, a more precise understanding of relevant antecedents and consequences of service innovation capabilities is required. High-skilled employees were found to positively influence the successful generation of service innovation; however, in contrast to product innovation research, the role of senior and top management has not been sufficiently addressed research (Cooper et al., 2004b; de Brentani, 2001; Holahan et al., 2014). In addition, often the focus has laid on the degree of innovativeness of new services (Forsman, 2011; e.g. Holahan et al., 2014; Ordanini and Parasuraman, 2011; Perks et al., 2012), while the impact of a firm's service innovativeness has not be analyzed sufficiently. However, these antecedents represent valuable factors for service innovation success and should thus be investigated in more detail. Moreover, service innovation success reflects the capabilities of a firm to generate new services. However, there is a considerable gap with respect to the question how improved capabilities affect firm-level performance, more specifically, different measures of firm success (e.g. den Hertog et al., 2011; Evangelista and Vezzani, 2010). Therefore, the resulting overall research question analyzed in Chapter 4 is:

> **2.) Research question:** What influence do top management commitment and corporate service innovativeness have on service innovation capabilities of a firm and what are the implications for firm-level performance?

# 3. MANAGING SERVICE INNOVATION: A QUALITATIVE STUDY ON RELEVANCE, RESPONSIBILITIES, AND SYSTEMATIZATION

This chapter consists of the qualitative study based on interviews which investigates how firms organizationally and procedurally approach service innovations. Specifically, it addresses the research question how and why firms manage service innovation activities in their organization differently. Section 3.1. provides an introduction to the motivation of this study and details the research questions which are responded to in this chapter. The theoretical background on managing service innovation and organization design is described in Section 3.2. Subsequently, I present the methodological approach in this chapter and explain the data collection, the applied analysis, and the theoretical sampling. Next, I present the results which, firstly, consist of the identification of dimensions that distinguish the firms of the interviews and, secondly, show the three organizational forms in that the firms are grouped into. I compare these identified organizational forms to provide some first explanations about why firms belong to a certain organizational form. In Section 3.5. I present the theoretical contribution of this chapter, which is followed by implications for practice (Section 3.6.) and limitations as well as future research recommendations (Section 3.7.). Finally, I conclude on the findings of the chapter in Section 3.8.

## 3.1. Introduction

Though the potential leverage created by innovative services is well-accepted, firms pursue innovation in services to a lesser extent than innovation in products (Hollenstein, 2003; Miles, 2007). A reason for this imbalance might be the way firms pursue their service innovation activities. Past research indicates that many service firms rely on softer factors, such as human resources and less formalized processes, instead of implementing a clearly new service development process (e.g. Ettlie and Rosenthal, 2011). This difference to product innovation has been attributed to the distinct service characteristics that cause ambiguous service innovation procedures (Abreu et al., 2010; Zeithaml et al., 1985).[28] The result is a complicated measurement of service innovation activities (Jensen and Warren, 2001) and hindrance to identify promising management concepts.

[28] Please see Chapter 2.1.2 for more details.

This unclear picture of service innovation activities obscures the importance of organizational alignment in procedural and structural terms. As de Brentani (1989) found, formalized processes are important to both product and service development processes; however, services require special managerial acknowledgement due to their specificities (Coombs et al., 2000; Drejer, 2004). In contrast to the good understanding of successful new product development processes (Brown and Eisenhardt, 1995; Ernst, 2002) service innovation is a developing research field (Hurmelinna-Laukkanen and Ritala, 2010), and the respective lack of knowledge on successfully managing service innovation requires corrective action. Accordingly, Ostrom et al. (2010) call for supporting firms to "*find new or improved ways to generate, prioritize, and manage service innovation from idea generation through the end of the development life cycle […][and][…] optimize the relationship between organization design and service innovation*" (p.15).

I address this research claim with this study by analyzing the way firms manage service innovation activities in their organization and investigate by whom and how service innovations are generated. In particular, I try to explore the following questions. Firstly, what relevance does service innovation experience in firms? With this question I aim to identify whether the firms see a true benefit in generating service innovations. By responding to this question I contribute to service research, as I deepen the understanding of service innovation. Prior findings suspect that innovation is less prevalent in the service context (Hollenstein, 2003; Miles, 2007). However, I find support that service innovation is highly relevant and increasingly incorporated in firms. In addition, research often recommends to focus on a certain industry sector due to complicated comparisons between different services (Abreu et al., 2010; Castro et al., 2011). I challenge this argument, since the results reveal valid reason to believe that the way firms conduct service innovation is primarily a firm-level rather than an industry-level decision.

Secondly, do firms hold specific responsibilities in their organizational structure that are dedicated to generate new services? Service innovation requires resources and people who pursue the generation of new services. Hence, the implementation of responsibilities can reflect how service innovation is integrated into the organization and to what extent the firms invest in such service innovation activities. With direct response to calls in organizational design research to increase the understanding of a supportive implementation of service innovation from an organizational perspective (Ostrom et al., 2010) the analysis shows that the way firms consider service innovation activities organizationally is very different. The findings indicate

that varying organizational implementations are considered similarly effective, i.e. whether individual employees, teams, or entire departments systematically pursue service innovations full-time or part-time.

Thirdly, how does the actual development procedure of service innovations look like? The rationale behind this question is to investigate whether firms, at all, pursue predefined new service development processes, and, if they do, what activities they consist of. This chapter therefore supplements innovation management literature by examining in detail precise service innovation management concepts. Thus, I remedy the misperception that systematic innovation management is predominantly relevant to new product development (den Hertog et al., 2011; Ettlie and Rosenthal, 2011) and underline the importance of the systematization of new service development.

Finally, why do firms implement their innovative aspirations differently? The final goal of this chapter is to find shared patterns amongst the firms regarding the way they manage service innovations and to provide explanations why they pursue this differently to others. I present arguments that the degree to which firms consider service innovation procedurally and structurally depends on its relevance in the corporate strategy. Thus, I contribute to innovation management and organizational design literature, as I explore factors that determine the way firms manage service innovation from a procedural as well as organizational perspective.

To be able to respond to the presented research questions, I conducted a qualitative empirical study including 22 semi-structured interviews with 15 firms in four industry sectors. Moreover, I complemented these insights with a systematic collection of secondary data on this sample. The findings reveal three organizational forms of managing service innovation, which differ with regard to the dimensions of corporate service innovation relevance, the implementation of service innovation responsibilities, and the systematization of new service development. From these identified organizational forms I derive propositions.

## 3.2. Theoretical Background

**Managing service innovation.** Reviewing past research on the concepts of service innovation management reveals a research field suffering from insufficient attention (Menor et al., 2002). As opposed to product innovation management research, managing service innovation is predominantly indirectly considered in discussions on the little systematization of the new service development process (den Hertog et al., 2011; Ettlie and Rosenthal, 2011), the

closer interactions between the operations department, the sales department, and customers (Sørensen et al., 2013; Storey and Easingwood, 1998; Thwaites, 1992), or the necessity to include other external partners differently in the development process, for example, by collaborations ranging from strong contractually defined development relationships to weak social contacts (Rusanen et al., 2014). Some studies analyzed the incorporation of service innovation in the context of manufacturing firms (e.g. Lightfoot and Gebauer, 2011).

Though there is this identified relative neglect (Ettlie and Rosenthal, 2011), various insightful works have helped us to approach diverse components of the concept of managing service innovation. For example, Gebauer et al. (2010) found in their longitudinal study in the capital goods industry that an unambiguous corporate service strategy formulation guides organizational members at all levels to achieve corporate objectives. In line with their results, Lyons et al. (2007) point to the importance of distributing innovation in services throughout the organization and promoting these by the leadership to enable sustainable innovation. Hence, service innovation is a management task that requires full commitment to assure corporate establishment.

At project level, skilled responsibilities (Kindström and Kowalkowski, 2009; Lenfle and Midler, 2009) and systematization of the new service development process have shown to increase performance measures (Avlonitis et al., 2001; de Brentani, 1989; Edgett, 1996; Froehle et al., 2000). Despite these indications, studies demonstrate that in practice formal research and development (R&D) is predominantly considered in the product development sphere (Hollenstein, 2003) and the fuzziness of the service innovation process still remains (Abreu et al., 2010; Ettlie and Rosenthal, 2011). [29] Therefore, there is an urgent need to identify successful concepts to structure the process of developing service innovations.

**Organizational design.** The organizational design perspective has been considerably unattended in the service innovation context. It is still not clear, what organizational conditions are benevolent for innovating in services (Menor et al., 2002), or what the differences or similarities to successful structural implementations of new product development are (Barczak, 2012). Accordingly, Ostrom et al. (2010) call for more research on how to align organizational structures to successfully innovate in services.

In contrast, research on product innovation has thoughtfully considered the organizational design perspective. For example, Dougherty (1992) analyzed how firms can

[29] Please find more details on past research in service innovation management in Chapter 2.

adjust their organization to maintain or improve their market position in both mature and new businesses, thus benefit from innovations. She concludes that "*uncertainties of innovation can be managed more effectively if people carry out the specific practices of market-technology knowledge creation and exploitation*" (p. 90). Thus, she identified a need to adjust the organizational structures and processes to be able to generate successful new products by pursuing both knowledge strategies exploration and exploitation, i.e. to use existing capabilities and to identify opportunities (Levinthal and March, 1993; March, 1991). Therefore, the organizational design choice was identified as determining factor for the effective pursuit of such differing knowledge strategies. Specifically, the balance of exploitation and exploration has long been considered as a challenging task (Thompson, 1967). There are three views on how firms can design their organizations to support both exploitation and exploration, i.e. a view based on the concept of inertia, a view based on the advantage of cross-functional interdependencies, and a view based on the concept of ambidexterity (see Tushman et al., 2010).

As for the first view, it is argued that firms experience constraints which are caused by several inertia phenomena which impede the ability to explore (Audia et al., 2000; Carroll and Teo, 1996; Christensen and Bower, 1996; Hill and Rothaermel, 2003). As a consequence, firms tried to overcome inertia by either isolating organizational units, such as spinouts (Christensen, 1997), or entering collaborations with external partners, such as alliances, joint ventures, and the like (e.g. Kaplan et al., 2003). Accordingly, exploratory innovation takes place outside the firm or in separated business units. Regarding the second view, past research has found that by establishing formal linking mechanisms across departments, firms are able to explore within their firm. This is achieved by setting up cross-functional teams, creating task interdependencies, or introducing project management (Lawrence and Lorsch, 1967; Ulrich and Eppinger, 1995). Hence, project managers govern the exchange and work of cross-functional teams and inform senior and top management about the progress of the innovation projects. The final view is based on the idea that exploitation and exploration are supported by very different business units which are aligned to the specific requirements of these two knowledge strategies (i.e. efficiency vs. experimentation) (Bradach, 1997; Govindarajan and Kopalle, 2006; Tushman and O'Reilly, 1997). Therefore, a firm that implements ambidextrous organizational design consist of business units whose structures are not consistent with each other. The senior team, again, holds the role of integrating the outcome of the differentiating business units. However, in contrast to the previous view, the units in this ambidextrous design act very autonomous and are rather loosely coupled to other units (e.g. Gilbert, 2005; Helfat et al., 2007;

Smith and Tushman, 2005). With this organizational design, firms are supposed to be able to explore within these highly differentiated exploratory units (Tushman et al., 2010).

These different organizational design choices have distinct effects on innovation outcomes. The exploratory study of Tushman et al. (2010) indicates that ambidextrous organization designs are more effective to yield successful product innovations in comparison to functional, cross-functional, and spinout designs. More precisely, they identify the importance of both the management of innovation streams through the senior team and ambidextrous designs in business units to be able to simultaneously explore and exploit.

Against the backdrop of these findings which point to the influence of organizational design choice on the success of innovation outcomes, it is overdue to investigate if such linkages are similarly apparent in the service innovation context. In line with Papastathopoulou and Hultink (2012) and their expressed urgent need to conduct cross-disciplinary research, I therefore approach the concept of managing service innovation from an innovation management and organizational design perspective in this chapter.

## 3.3. Method: Qualitative Empirical Study based on Interviews

Since existing research addresses the management of service innovation activities insufficiently, I conducted a qualitative empirical study to develop theoretical contributions inductively (Eisenhardt and Graebner, 2007). The advantage of utilizing this kind of methodology lies in its richness of a detailed description on a phenomenon in a given real-life context (Yin, 1994) and the possibility to develop suggestive theoretical ideas from these observations (Edmondson and McManus, 2007). The recommendations of Gibbert et al. (2008) on research strategies to enhance rigor served as a very useful guidance to increase internal validity, construct validity, and external validity.

**Data collection.** Internal validity was increased by applying theory triangulation (Yin, 1994). With the usage of three sources of evidence I was able to adopt multiple perspectives. In 2012, semi-structured interviews were conducted with one or more knowledgeable key informants (Eisenhardt, 1989) which resulted in 22 interviews in 15 firms. All interviews had the aim to identify the firm's relevance attributed to service innovation, the implementation of service innovation responsibilities, and the systematization of new service development. As a consequence, the interviewees were either board members (five), department heads (eight), or employees in a department or in teams concerned with service innovation activities (nine). The

interviews were relatively fluid to give the informant the possibility to respond honestly and without being pressurized or influenced due to a rigid inquiry (Rubin and Rubin, 1995). Though personal interviews often provide richer information, some interview partners asked for a phone interview. In sum, half of the interviews were personally conducted and the other half by phone, with interviews lasting on average about an hour. Table 3-1 provides an overview of the data collection process.

Then, I systematically analyzed annual reports from 2005 and 2011 with the focus on relevant information regarding services and service innovation as well as general financial data, such as generated revenues or R&D expenditures. In those cases where I did not have access to annual reports, I was able to follow up important information with the help of the interview partners or to find relevant information by further reviewing sources like publicly available news or the firms' press releases. Finally, the firm websites represented another source which enlightened the appreciation of innovation in services, since it serves as a presentation platform to customers, shareholders, and further stakeholders.

## Table 3-1. Overview of Data Collection Process

| Firm Label | Revenues (in € Million, 2011) | Number of Employees (in 2011) | Position of Interview Partner | Date (in 2012) | Duration (in Minutes) | Type of Interview | Type of Documentation |
|---|---|---|---|---|---|---|---|
| **C1** | 23,300 | 75,500 | Head of strategic projects | April | 50 | Call | Full transcription |
| **C2** | 8,500 | 59,200 | CEO | May | 75 | Personal | Full transcription |
| **C3** | 250 | 1,100 | CEO, head of human resources, corporate process management | July | 80 | Personal | Full transcription |
| **F1** | 31,400 | 101,000 | Director of private and business clients | March | 90 | Personal | Written notes |
| **F2** | 8,600 | 10,100 | CEO of service provider to F2,<br>COO | May<br>July | 60<br>35 | Call<br>Call | Full transcription<br>Full transcription |
| **F3** | 180 | 800 | Head of product and market management<br>Head of organization | May<br>July | 60<br>45 | Call<br>Call | Full transcription<br>Full transcription |
| **IT1** | 73,500 | 402,000 | Manager, business development<br>Head of service center | July<br>July | 60<br>90 | Call<br>Personal | Full transcription<br>Full transcription |
| **IT2** | 58,700 | 240,000 | Vice president, business development, strategic projects<br>Project manager, business development, strategic projects | June<br>September | 40<br>50 | Call<br>Personal | Full transcription<br>Full transcription |
| **IT3** | 6,800 | 74,000 | Director, laboratory<br>Usability consultant, laboratory | March<br>September | 75<br>50 | Personal<br>Personal | Full transcription<br>Full transcription |
| **IT4** | 5,400 | 68,300 | Manager, business support | April | 45 | Call | Full transcription |
| **IT5** | 2,600 | 15,400 | Project manager, IT department | March | 75 | Personal | Written notes |
| **IT6** | 1,600 | 11,000 | COO | April | 45 | Personal | Full transcription |
| **L1** | 52,800 | 423,400 | Project director, customer solution and innovation | July | 45 | Call | Full transcription |
| **L2** | 4,300 | 21,000 | CFO | July | 60 | Call | Full transcription |
| **L3** | 1,800 | 11,000 | Division manager, strategic marketing and public relations | March | 50 | Call | Full transcription |

**Notes**: C= construction, F= financial services, IT= information technology, L= logistics; numbers indicate individual company and relative size (in number of employees), for example, in the sector construction C1 is larger than C2, and C2 is larger than C3. CEO: chief executive officer; CFO: chief financial officer; COO: chief operating officer.

**Analysis.** A thorough and systematic data preparation was pursued which allows for reconstruction and repeatability. This methodological procedure enhances the construct validity of the analysis. I developed a semi-structured questionnaire (see Appendix, Figure A-1) and established as well as maintained the protocols diligently, since a structured data preparation and preservation is a prerequisite for valid data interpretation. As recommended by Miles and Huberman (1994), the conceptually clustered matrix was applied, thus the richness of the interview data was systematically extracted. By using the software MaxQDA, I was able to code the interviews in dimensions and sub-dimensions. During the process of data collection and codification I iteratively and inductively developed the final coding system (Mayring, 2010). This procedure gave me the opportunity to cluster this sample into three groups, which are presented in the results section (Section 3.4.). According to Short et al. (2008) "*organizational forms are sets of similar firms that are found across industries and that are identified based on an array of organizational features*" (p. 1057). Here, the firms are distinguished along the following dimensions, i.e. corporate service innovation relevance, implementation of service innovation responsibilities, and systematization of new service development processes. Subsequently, I compared my understanding of the identified three groups with the information provided by annual reports and websites and made adjustments where required.

**Theoretical sampling.** I strived for improved external validity by deploying a cross-case analysis (Eisenhardt, 1989) in four industry sectors, namely construction (three firms), financial services (three firms), information technology (IT) (six firms), and logistics (three firms). The sampling was theoretically driven, as the previous perception in service research was considered that there is a prevalent heterogeneity among the sectors (Abreu et al., 2010; Castro et al., 2011). I addressed the resulting impediment for cross-sector investigations by choosing multiple cases in each distinct industry sector. Moreover, I included industry sectors that represent traditionally product firms (construction), pure service providers (financial services, logistics), and a sector that involves both product and service oriented offerings (IT). This gave me the opportunity to examine whether there are observable differences between these businesses with respect to managing service innovation. In addition, since prior literature indicates that smaller firms suffer from resource constraints, which limit investments into new service development capabilities and activities (Abreu et al., 2010), exclusively large firms were included into this in-depth analysis. However, small firms do conduct innovation activities

(Forsman, 2011), yet presumably with some factors similarly and others differently important to small and large firms (de Brentani, 1995).

## 3.4. Results

In this section, I present the findings derived from the qualitative analysis.[30] Section 3.4.1. includes the findings which are derived from the data on all firms in the sample and present the dimensions of managing service innovations which differentiate the firms into three distinct organizational forms. Subsequently, I present the findings on each identified organizational form, i.e. flexible service innovators, attentive service innovators, and systematic service innovators (3.4.2.). In Section 3.4.3., I integrate the findings and elaborate on a dynamic perspective which argues that choice of managing service innovation regarding responsibilities and systematization depends on the strategic relevance of service innovation to the firm.

### 3.4.1. Dimensions of Managing Service Innovation

The interview results indicate that the way the firms in the present study consider service innovations organizationally varies largely. The concept of managing the development of new services ranges from a very vague understanding to a very clear organizational establishment in terms of both procedural and structural dimensions. With the approach to conceptually cluster the insights I was able to identify shared patterns in this sample and thus grouped the firms into three organizational forms, i.e. the strategic, the attentive, and the flexible service innovators. These different groups of service innovators differ along the dimensions of corporate service innovation relevance, the implementation of service innovation responsibilities, and the systematization of new service development. The coding procedure for each dimension and its sub-dimensions is illustrated in the following.

**Corporate service innovation relevance.** I find that to both service and traditionally goods-dominant firms services are very important. Agreement can be similarly found with regard to the strategic potential of service innovation, i.e. the differentiation to the competitors. Several firms in this sample even consider service innovation inevitable to survive in the market, specifically due to prevalent low imitation barriers. Nevertheless, service innovation is

[30] Please note that the interviews were held in German and served as data set to which the analysis was applied. This approach seems more adequate, since the coding procedure should be based on raw data. As this dissertation is written in English, the data is presented in English, as well. This also holds true for the literal quotes of the interviewees which were translated from German to English. Serious consideration was given to the translation to capture the real meaning of the statements made by the interviewees.

not consistently regarded as a must-have. In this respect, one logistics firm of the present sample reflects upon phases and timeframes in which firms can live quite well without innovation.

Furthermore, the nature of the service might be relevant to assess the leverage of service innovation on corporate performance. As an IT firm points out, services that underlie tender processes, thus price competition, bear constraints in their innovative potential. Consequently, the impact on achieving competitive advantage is limited.

The level of corporate service innovation relevance is determined by two sub-dimension, i.e. the extent to which a service innovation culture is apparent and importance that service innovation holds in the corporate strategy. Table 3-2 illustrates the coding procedure for the dimension corporate service innovation relevance.

**Table 3-2. Codifying Corporate Service Innovation Relevance**

| Dimension | Description | Sample Quote from the Interviews |
|---|---|---|
| **Level of service innovation culture** | | |
| Low | The firm has not established a service innovation culture. No clear commitment towards service innovation is communicated corporate wide from top and senior level. | *"The challenge of the bank is to differentiate itself. Banking accounts do not differentiate from one another; they are similar. That is why you must try to differentiate yourself via the customer experience. Innovation is important for firm success. But [in our firm] this approach is only occasionally supported, transparency is the crucial aspect which needs improvement"* (F1). |
| Moderate | The firm has not established a corporate wide service innovation culture; however, some individuals drive innovation projects and occasionally receive support this. | *"[Service innovation] is not that much established; instead, it is strongly driven by individual persons. [I]t is more person dependent. And because I am of the opinion that we have several innovative people in many areas I would say that we are an innovative and open firm"* (F3). |
| High | The firm has fully established a service innovation culture. Communicated from the top and senior level, service innovation are driven corporate wide. | *"[Innovation] is a lot of learning and you learn unbelievably much during the development, because it is innovative, there is nothing like it. And, that is also one side aspect, it requires individual tact and cogency to continue despite disappointments and to further search for new solutions and remain creative. [...] And the [CEO] is a curious person and has fun with new things. [...] And he believed in [innovation], even in times where the supervisory board would have loved to bite the [CEO's] head off. [...] Honestly, if you work for such a firm, there are so many ideas, you do not need to ask for them; internally, we have idea management, and externally the partners and customers. It is rather the challenge to separate the wheat from the chaff"* (L1). |

**Table 3-2. Codifying Corporate Service Innovation Relevance (continued)**

| Dimension | Description | Sample Quote from the Interviews |
|---|---|---|
| **Level of strategic importance of service innovation** | | |
| Low | Service innovation is not part of the corporate strategy. Instead, ideas for new services occur as a result from occasional exchange within the firm and with other external partners. | *"[...] [Y]es, probably the majority of our developments are rather incremental. Well, and I sense them as daily business. As if: oh yes, that is a good idea, try it out, innovation through short official channels: why did we, and I have heard, couldn't we? [...] The other case: I agree with a customer on something, couldn't that be interesting for other customers. And then it remains in the daily business. Our business model is to generate win win, customer benefit and air for us to breathe. At the end of the day, we optimize and share the success in different shares"* (C2). |
| Moderate | Service innovation is not a defined goal of the corporate strategy. However, the firm considers innovative services as an instrument to respond more adequately to customer needs and retain a high level of service quality which is able to compete with other firms. | *"That is the aspiration at [L2]. We do not have "innovative logistics" written on our trucks; that would be too much aspiration. But our aspiration is to provide a service at a quality level and in a way that not everyone would be able to do. So that one does not say, that is enough for now. The manner how one does it, that is where we try to differentiate ourselves, and also, to charge higher prices because one offers more"* (L2). |
| High | Service innovation is clearly defined as part of the corporate strategy. It is considered as crucial key success factor for differentiation. | *"We have a clear strategy [...] that states that we [...] want to be the most innovative logistic service provider. [...] This means that we want to be the first mover in many areas. We want to retain customers and long-term partnerships with good products and as much USPs as possible to differentiate ourselves from the competition, definitely"* (L1). |

**Service innovation responsibilities.** New ideas can emerge from a variety of sources within and outside the firm. Most respondents name decision makers, the sales and customer management departments, business development and marketing departments, external partners, and/ or customers as idea generators. As some phrase it, service innovation can come from anywhere. With respect to the amount of human resources which are fully dedicated to service innovation activities, full-time service innovation responsibility in the form of teams or innovation departments were observed. In such constellations the entire new service development process is supervised by the respective team or department.

Most respondents additionally emphasized the value of collaborating among departments, since multiple actors with different backgrounds are appreciated to contribute to new service success. Often, employees are rather partially engaged in innovation activities next to their regular daily work. For example, the business unit of a technology firm annually conducts a 'Call for Innovation' in which the business development department and the leaders from the service centers of the regions participate. With this procedure they achieve a conjunction of two perspectives, i.e. the more strategic lens applied by the headquarters and the operational point of view gained in the field.

Sustainable innovation in services requires investments. If service innovation teams or departments are implemented, as an interviewee points out, the firm expects a certain return on its investment. One logistics firm makes clear that the driver for building up an innovation center was the aim to become the largest and the most innovative logistics firm in the next years. Another example of very high resource investment is a construction firm which conducts innovation activities at three organizational levels. As the respective interviewee states, this firm has implemented a centralized general innovation management at corporate level, decentralized service departments at division level, and decentralized service innovation activities at project level, which vividly reflects the engagement in service innovation throughout the firm. However, if no or marginal leadership commitment to create organizational responsibilities and to provide necessary investments exists, employees themselves need to expedite their new service ideas. Service innovators repeatedly have to convince decision makers to approve budget for innovation activities and allow the suggested projects. As one logistics firm points out, individuals need to cluster allies behind them and try to elevate their ideas to the decision making level.

Accordingly, I distinguish the dimension of service innovation responsibilities into the range from having no defined service innovation responsibilities implemented to having clearly

and exclusively responsible departments or groups implemented which develop service innovations. Table 3-3 provides insights into the coding procedure.

**Table 3-3. Codifying Implementation of Service Innovation Responsibilities**

| Dimension | Description | Sample Quote from the Interviews |
|---|---|---|
| **Service innovation responsibilities** | | |
| Service innovation responsibilities are not defined | No explicit positions are assigned to the task to generate service innovations. | *"Yes, well, we have the unit strategic development, where they think a lot about innovation. Then of course my unit [strategic marketing and public relation] and in the other marketing departments of the business units [...]. We also have a unit that thinks about innovation regarding the dialogue with the customer and puts them into practice. [...] [In the case of that specific innovation] I could not even say who initiated that, there are several units and subsidies involved. It is rather open, there is no innovation that is blocked and you are not responsible; instead innovation can emerge from everywhere"* (L3). |
| Responsibilities are integrated in functions | Certain positions are required to generate service innovations. Often, daily business in functions is extended by the additional task to generate new service ideas and/ or to develop service innovations. | *"A significant part of the tasks, to quantify, about 50 % of the time is purely development business, which means new products, new consulting processes [...]. It is also formally determined, that is, there is on the hand support for the sales operations of the market employees, and there is a lot of sales development - everything concerning innovation, basically the identification of market changes"* (F3). |
| Service innovation departments/ groups | The organizational structure of the firm includes certain department or groups which exclusively or mainly generate new service ideas and/ or develop service innovations. | *"We have several pillars. We have a R&D department. We have people who try to get innovations externally into the firm via partnerships, who are mainly we, and we are called business development, and then there is incubation, by which I mean the support of firm founders in the early stages, [...] we have an incubation center. The fourth pillar is our venture capital firm, [...] which does risk financing for external parties, with whom we also work together, that is kind of a mixture. And the fifth pillar is acquisition of innovative firms. And then we have some kind of idea management, which you could put as sixth pillar next to the others"* (IT2). |

**Systematization of new service development.** The interviews underline that there is a broad range of concepts regarding the systematization of new service development. On the one hand, I find firms that conduct service innovation projects informally and spontaneously without following a certain process. On the other hand, there are firms which show a very professional approach towards project management. These firms have established a clear and formally implemented new service development concept. Interestingly, I find concepts of service innovation processes which are very similar to established new product development concepts and define the development process from idea generation to commercialization.

Since service innovation projects are linked to required resources, it is to be expected that firms will strive to observe the return on these investments. I observe considerate differences with respect to the follow up of their progress. Beyond typical control mechanism (e.g., how revenue streams develop) some few firms have actually adjusted their control systems and monitor service innovation specific key performance indicators (KPIs). Apparently, additional performance measures are applied which exceed financial aspects: In the case of a young IT firm, for example, the focus is placed on customer and partner satisfaction scores. Opposed to this approach, there are also firms in the sample that strictly observe the achievements of scheduled break-even points.

In line with the interview results, I evaluate two sub-dimensions of the dimension systematization of new service development, which are the determination of the new service development process and the applied control mechanisms that evaluate the service innovation projects. Table 3-4 shows how I codified each of these two sub-dimensions.

**Table 3-4. Codifying Systematization of New Service Development**

| Dimension | Description | Sample Quote from the Interviews |
|---|---|---|
| **Determination of new service development process** | | |
| Ad hoc | No defined new service development process is pursued. Each new service can be developed by different procedures. | *"Well, an idea emerges by talking to each other. One talks in conversations about news and considers whether that might fit to oneself. Often there is a team which thinks about what could be done differently and where the weaknesses in the current method are. So basically you need to see what is possible. […][N]o we do not have a [formalized development process], but we are working on it"* (C2). |
| Routines | There is not a fully defined new service development process in the firm; however, routines have emerged which lead to the continuous pursuit of new service development. | *"For example, we have an online team with employees from the various departments of organization, payment system, product and market management, and communications. And they conduct a Telco every fortnight and talk about what they have experienced, the inputs they received, the visit to the CeBIT or other kind of exchange, and present it to the participants and then ask themselves, whether it could fit to us"* (F3). |
| Predefined processes | The firm has established clearly defined new service development processes which consist of certain development phases. This procedure is repeated for the majority of the service innovation projects. | *"Regarding the structure, we have a funnel, an innovation funnel, to clearly structure [the development process]. That means that every project which will become a project at some point in time, has passed the funnel. That means that there is the first step [...] which is the project initiation phase. That is the idea phase where we receive many many ideas, which stem partially from internal, external, from the customer, from science, from mega trends, they come from everywhere. The first thing we do [...] is to select those ideas from the mass which we establish as projects, to go to the second phase of the funnel, the concept phase. [...] [W]e detail the ideas and think about the potential benefits of the ideas for the business units of [L1] and for the customers. [...] Then it continues with the development phase where everything is developed. Of course, there is a lot of IT development, but also technical knowhow. And at the end is the pilot which is the next phase of the funnel, the pilot phase. [...] [After that] we slide into the next phase, the maturity. That means the maturity phase, where we try to make mature, roll-out able services. These are rolled-out in cooperation with the business units in the respective countries, [the market phase], and then we are practically out [of the process]"* (L1). |

**Table 3-4. Codifying Systematization of New Service Development (continued)**

| Dimension | Description | Sample Quote from the Interviews |
|---|---|---|
| **Control mechanisms** | | |
| General financial control | The firm does not apply control mechanisms which specifically address the evaluation of service innovation projects. | *"Well, nothing happens that goes beyond what you could describe as basic. When I take a project to the European board which requires acceptance by the entire top management, then I surely need to show what I expect from the project, I need to calculate the case, the savings or what I will sell. [...] But I am not aware that there is an explicit policy or specific KPIs; it is rather hands on, like many things are at [L3]"* (L3). |
| Systematic service innovation control | The firm applies control mechanisms which enable a close monitoring and evaluation of the progress of service innovation projects. Distinct key performance indicators for service innovation success are defined. | *"There are close controls. Well we have to setup a business case for every project that goes through the funnel. [...] It depends on the gate that means when you want to go from one phase to the next, you - as the project lead - need to present the achievements or results of the former phase to ask for budget and resources for the next phase. That means every project can die anytime. [...] [T]here are defined tolerance measures and KPIs and the project lead is supposed to act within this frame. If you slip out of the frame, you have to go to the board and ask for exceptions. That means you have a very strict governance to coordinate the project, steer the portfolio and prioritize"* (L1). |

With this coding procedure I was able to systematically evaluate each of the firms against these three main dimensions with their sub-dimensions. As a result, I found shared patterns of the firms which I grouped into three distinct organizational forms of managing service innovation. Table 3-5 provides an overview of these organizational forms and the allocation of the firms to each of them. More details on the three groups of service innovators are presented in in the following Section 3.4.2.

**Table 3-5. Overview of Organizational Forms of Service Innovation**

| | **Flexible Service Innovators** | **Attentive Service Innovators** | **Systematic Service Innovators** |
|---|---|---|---|
| **Firm Label** | **C2, C3, F1, IT5, L3** | **F3, IT1, IT3, IT4, IT6, L2** | **C1, F2, IT2, L1** |
| Corporate service innovation relevance | Low - moderate | Moderate - high | High |
| Implementation of service innovation responsibilities | Service innovation responsibilities are not defined | Service innovation responsibilities are integrated in functions | Service innovation departments/ groups |
| Systematization of new service development processes | Ad hoc<br>General financial control | Routines<br>General financial control | Predefined processes<br>Systematic service innovation control |

**Notes**: C= construction, F= financial services, IT= information technology, L= logistics; numbers indicate individual company and relative size (in number of employees), for example, in the sector construction C1 is larger than C2, and C2 is larger than C3.

### 3.4.2. Three Organizational Forms of Service Innovators

**The flexible service innovators.** The firms assigned to the group of flexible service innovators generally consider service innovation important. Then again, this relevance to the firm is difficult to observe. For example, firm L3 states that innovation[31] is part of the daily work. Simultaneously, the interviewee recognizes a decrease in its prevalence:

> *"[...] [I] have been observing risky tendencies in this growth phase in which we are for some years now that [the innovation DNA] gets lost a bit. Or at least, well, it won't get lost, but it is not a differentiator [...]"* (L3).

A further example of implicit corporate service innovation relevance is given by firm C2. The construction firm considers itself as very innovative. However, analyzing publicly available data and comparing this information with the other firms highlights that innovation in service is not a crucial topic. The focus lies rather on technically driven innovations than on generating new services. This evaluation is supported by statements of the interviewee who describes how people talk about new ideas during informal conversations, yet, did not mention indicators for corporate wide service innovation presence. Another interesting case is the construction firm C3 which recently started to add services to its portfolio. This new venture of offering services is very innovative and promising for the firm itself. However, the remaining challenge it encounters is to convince customers to trust in the firm's competencies and to take advantage of the new offerings. As a result, service innovation is not prioritized and resources marginally invested; instead, it is accepted as promising for the firm's future development.

Since service innovation as such does not experience high relevance in this group of firms, it is not surprising to miss directly responsible employees. If new service ideas are discussed, this either happens at decision making levels (C2, C3) or service innovation projects are initiated from various sources. Firm L3 considers individuals as the driver of certain projects and states that new services may stem from various departments. Thus, similar to firm F1, innovation activities happen parallel to the daily work and no responsibility is directly assigned by the firm. In addition, analysis of publicly available information supports this estimation. The firms in this group do not mention teams or departments that engage in service innovation

[31] In the present sample, the logistics firms often spoke of innovation and did not explicitly use the phrase 'service innovation'. Differing wording was also apparent at financial service providers who often use product innovation as term for their new financial service offerings. However, the subject of the interviews, i.e. service innovation, was clearly communicated to the interviewees and distinguished from product innovation. To make sure that the interviewee and I had the same understanding of service innovation, I asked the interviewee about his/ her understanding regarding both services and service innovation (see semi-structured interview guideline in the Appendix, Figure A-2 to Figure A-7).

activities. If R&D is explicitly mentioned, then the focus is placed on product or technical innovations.

Characterizing for this group is the ad hoc occurrence of new services. This non-existing or low systematization becomes clear considering two missing aspects, namely a clearly defined new service development process and control mechanisms. In this group, new service development processes are heterogeneous and uncertain. In fact, all interviewees struggle to explain how exactly service innovations are developed and brought to the market. In most cases, it happened differently. Moreover, these firms do not apply a control system which is specific for service innovation. Though there is a very low systematization, this does not necessarily mean that there are no successful innovations worth mentioning. The interviewees, indeed, were able to talk about specific examples. For instance, firm IT5's IT department developed a service for internal purpose which it finally brought to market, and firm C2 combined offerings of three business units into one solution. Table 3-6 summarizes the results for the flexible service innovators. Integrating the findings on flexible service innovators, I propose the following:

> **Proposition 1**: Firms with a low to medium level of corporate service innovation relevance develop innovative services through initiatives triggered by varying individuals and pursue an undefined, rather ad hoc new service development process.

**Table 3-6. Organizational Form: Flexible Service Innovators**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **C2** | Service innovation is relevant, however, it is not deliberately pursued. Instead, the topic occurs at different occasions and often as a response to expressed customer needs.<br><br>*"How do we maintain [an innovative culture]? Well, we present new projects, new products, and good ideas at, for example, internal events, meetings, or meetings with other business units. [...] The customers say that they want to be challenged. You need to have ideas. The customer* does not have ideas anymore and is dependent on our ideas." | The focus in innovation lies on technical and technological innovation. Though the firm has changed its perception from a producing firm towards an engineering and service provider, it focuses on innovation initiatives to further improvements of technical know-how and technologies. However, it also considers the improvement of their business models. |
| | The responsibilities for service innovation are not defined.<br><br>*"Interesting suggestions do not [necessarily] emerge from the decision making level, but from the daily business. These are more technical things, from our operations team. The business model developments rather stem from the decision making level."* | Responsibilities are not mentioned. |
| | No service development process is described. This is planned for the future.<br><br>*"We are working on that. A colleague of mine [...] has the task to describe and determine an innovation process and to cultivate it firm-wide. [...] Maybe it was not really a problem. From my perspective we do not lack good ideas; however, we are massively growing so that the reach of the individual leader is not big enough to control [innovation] through the [leaders'] own impetus and own observation of processes. That is why we need something more standardized. [...] [W]e need certain structures so that we do not need to preach that to everyone, so that everyone can do it on her/ his own and knows what the expectations are. Specifically, when new employees arrive."* | Systematization of development process is not mentioned. |

**Table 3-6. Organizational Form: Flexible Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **C3** | Since the market is characterized by intense price competition due to tendering procedures, the firm considers services and service innovation as an opportunity to create profit. However, convincing the customers is perceived as major challenge. | The firm has extended its portfolio with services, which include construction and project development as well as transportation. |
| | *"Recently we have been trying to make ourselves more independent [of the price competition]. Because the manner of this service contracts … there are so many competitors and the value creation is so limited, because the price level is very questionable. [...] Therefore we try to improve our service before as well as after the order [to build a building]."* | |
| | There are people who do not directly work at the building site that have some leeway to think about new products and services. However, no specific positions were named that are directly responsible for service innovation topics. | Responsibilities are not mentioned. |
| | *"Now, we have people who do not drown in the daily business and [...] think out of the box and scan [the scenery] what might pop up: new laws, new norms, or trends, which materials will enter the market, which technologies will prevail? [...] These are employees that sit in the executive department and have some leeway to take care of these things."* | |
| | *"These are people who know or get to know new products and who evaluate their potential to extend the portfolio and to be offered to the customers."* | |
| | No service development process is described. | Systematization of development process is not mentioned. |
| | *"Often we are informed about a construction task which - until then - was not part of our portfolio. Where we ask ourselves, can we do that?"* | |
| | *"We proceed in small steps. First, try something, see how it went, and out of this some new businesses have developed and grown."* | |

**Table 3-6. Organizational Form: Flexible Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **F1** | Service innovation plays an increasingly important role. However, it is not prevalent and communicated corporate wide as crucial strategic factor.<br>*"The proximity to the customer is important, but we are innovative as a sideline. [...] Receiving budget for innovation is very difficult."* | In the annual report on the year 2005 the firm states to consider itself as innovative organization which offers new services to the customers. In 2011, however, no statement regarding innovation is made. |
| | There is an innovative initiative for which especially the marketing staff is responsible for. The focus lies on the interaction with the customer and is rather decoupled from the processes of the daily business. Additionally, ideas may occur from the IT department, since IT significantly supports and enables the financial services.<br>*"[There is a] future branch bank, the IT department and externals like universities."* | Responsibilities are not mentioned. |
| | The service development process is not defined and characterized by individual initiatives and the usage of his/ her own social network.<br>*"[The development process is] less structured, ad hoc. [...] There is no real coordination. Ideas occur at the future branch bank and driven by their responsible people. But there are also many parallel processes happening independent from this project."* | Systematization of development process is not mentioned. |
| **IT5** | Service innovation is not explicitly relevant. The firm emphasizes technical and technological innovation.<br>*"We have built up a training center [to consult on our machines]."* | The focus in innovation lies on technical and technological innovation, which is emphasized by facts and figures on, for example, patent applications and cooperation projects with suppliers and universities. If innovation in services is relevant to the firm then it is not explicitly stated. |
| | Not clear. | Responsibilities are not mentioned. |
| | Not clear. | Systematization of development process is not mentioned. |

**Table 3-6. Organizational Form: Flexible Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **L3** | In recent years the relevance of service innovation has declined.<br>*"[...] [I] have been observing risky tendencies in this growth phase in which we are for some years now that [the innovation DNA] gets lost a bit. Or at least, well, it won't get lost, but it is not a differentiator [...]."*<br>*"Well that is… I wish it would be more present and more dominant. We were good at doing things innovatively and to step ahead and to create leeway. [...] We are not the tip of the spear. You cannot say that. In this sense it is a battle to remain innovative. That is not easy."* | While growth potentials in the C2C are expressed in the annual report in 2005, development aspirations are not mentioned in 2011. Innovation as a topic only finds consideration on the website in the context of sustainability, yet, does not explicitly relate to innovation activities in the provided services. |
| | There are departments that are typically responsible for service innovation projects. However, it is not clearly defined.<br>*"It is relatively open. That means there is not an innovation which is blocked and you are not responsible for it. Instead, innovation can come from everywhere."*<br>*"We do not have a chief innovation officer."* | Responsibilities are not mentioned. |
| | The service development process is not defined.<br>*"[...] [T]here is no corporate wide innovation process that standardizes or structures it in any way. [...] I put it simply, if I can troop up enough allies and it somehow comes through and makes it to the decision committees, then everything is possible."* | Systematization of development process is not mentioned. |

**The attentive service innovators.** The group of attentive service innovators is characterized by a perceived high corporate relevance of service innovation. However, this ascribed importance is not clearly communicated. Within this group, I observe that annual reports, websites, and other publicly available data provide little information on service innovation activities. In addition, the interviewees indicate some constraints. For example, firm F3 describes its culture as open to innovation and its teams having internalized the idea of developing new services. Nevertheless, innovation has not been clearly communicated by top management as a main goal. The firm IT1 is an example for the focus on more technical innovation, where innovation in services plays an increased role but is not as established as product innovation is. For this group service innovation has recently gained more attention, however, it is not core to the firm's strategy.

Predominantly, the firms in this group do not have responsibilities that exclusively develop service innovations. Except from firm IT6 with its technology driven innovation center, all cases assign new services to the task of business development and marketing employees. For example, firm L2 mainly innovates via its centralized business development that organizes a regular innovation circle and manages further proceedings if new service projects are initiated. They also possess a so-called laboratory to test and simulate new services. Even so, as the interviewee concedes, there is a need for further investments:

> *"We need to extend our laboratory, acknowledge playing around, invest money, provide employees with leeway, and take them out of their daily work so that they have time for creativity"* (L2).

Similarly, firm F3's innovation igniter can be found in the product and market management department. Though its firm does not have specific full-time positions for service innovation in place, innovating in services is part of their job descriptions – the firm expects innovative ideas from its employees. Firm IT4 provides its subsidiaries with an internal service of managing new service development projects. This firm's highly decentralized organization profits from project managers that guide each subsidiary in its new service development activities as individually required. Hence, who develops new services and how this is conducted (terminated full-time projects, partially or fully in daily work) differs depending on each subsidiary and the offered services.

The systematization of new service development processes within this group is predominantly characterized by certain routines. The steps followed, however, are mainly not formalized. Instead, these firms pursue procedures which are the result of experience rather

than of elaborated guidelines. Frequently, these firms have implemented repeated meetings (online, personal, or via call) involving the department that is mainly in charge of service innovation activities, decision makers, and employees from the field. As mentioned, firm IT1 conducts annually a so-called 'Call for Innovation', in which managers from service centers worldwide exchange ideas with the business development department members. The case of firm F3 is alike, as the firm has established online teams to provide regular communication on new ideas between several departments. After ideas have been further specified, most firms in this group initiate projects and determine project members. Firm IT3 explains the preference for a semi-formalized approach as follows:

> *"[…] [M]any topics, how we approach the customer depend on the market and the trends which we analyze"* (IT3).

Most firms in this group assess the success of new services. However, often there is no close control of the entire new service project. In addition, I observe various key performance indicators (KPIs) ranging from hard fact measures at corporate level like revenues to more subjective measures at project level, such as proof of concepts to assess potential customer benefits. As an illustration, the relatively young firm IT6 focuses on partner and customer satisfaction scores, whereas firm F3 applies more strict controlling mechanisms which comply with regulatory and statutory requirements, typical for the financial services sector. Then again, even in the case of firm F3, the interview revealed that the firm has not implemented a specific controlling system for service innovation projects. Table 3-7 provides an overview of the findings on the attentive service innovators. As a result of the analysis of this group of service innovators I declare the following proposition:

> **Proposition 2**: Firms with a medium to high level of corporate service innovation relevance develop innovative services through part-time service innovation responsibilities integrated into corporate functions and pursue new service development with relatively flexible but routinized procedures.

**Table 3-7. Organizational Form: Attentive Service Innovators**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **IT1** | With the increased relevance of services, the development of new services experiences increased relevance.<br>*"[...] [Service innovation] is of course a permanent question, what [service], what kind of service does the customer need, what can we offer, where can we surprise the customer with innovation."* | The focus in innovation lies on technical and technological innovation, which is emphasized by facts and figures on, for example, patent applications and cooperation projects with suppliers and universities. Nevertheless, solutions are increasingly also considered in the innovation context. Innovation is regarded as opportunity to sustainably create new businesses as well as new products and solutions. |
| | Often, the business development department is responsible for service innovation projects. In addition, an idea management system as well as competitions take place to involve all employees.<br>*"We have a combined system with the headquarter, where we centrally conduct market observation, and regionally we are closer to the customer. [...] We are in close exchange with the headquarter, which tries to derive a global picture [from our insights from the regions] that fits to the [corporate] strategy."* | For example, a central technology center is implemented to further exchange on technological as well as solution development. This R&D center supports the firm sectors and divisions to develop software for new products and services. |
| | The service development process is characterized by routines and the pursuit of regular events.<br>*"Once a year we have a so-called call for innovation. [...] Well we collect ideas and have a workshop, where we discuss the ideas and then we decide which topics we want to work on. [...] We provide budget and determine a project lead and where we want to develop."*<br>*"I think [the process] is structured, but not formalized [...]."* | For example, innovation days, open innovation initiatives, network with R&D staff and employees at the branches. |

**Table 3-7. Organizational Form: Attentive Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **F3** | Service innovation is relevant, but supported by individuals rather than promoted corporate wide.<br>*"[Service innovation] is not that much established; instead, it is strongly driven by individual persons. [I]t is more person dependent. And because I am of the opinion that we have several innovative people in many areas I would say that we are an innovative and open firm."* | In press releases on the website, the firm states that innovation is regarded as important for the business model. In the annual report of 2011, an innovative service offering represents a crucial contribution to growth. Innovation predominantly targets the customer interaction. |
| | Two departments are mainly responsibly to do both support operations and engage in development projects.<br>*"A significant part of the tasks, to quantify, about 50 % of the time is purely development business, which means new products, new consulting processes [...]. It is also formally determined, that is, there is on the hand support for the sales operations of the market employees, and there is a lot of sales development - everything concerning innovation, basically the identification of market changes."* | The team product and market management for business customers is mentioned as strategically important to develop together with the board new products and services for medium sized firms. |
| | The service development process is not defined. It is rather characterized by routines.<br>*"For example, we have an online team with employees from the various departments of organization, payment system, product and market management and communications. And they conduct a Telco every fortnight and talk about what they have experienced, the inputs they received, the visit to the CeBIT or other kind of exchange, and present it to the participants and then ask themselves, whether it could fit to us."*<br>*"Well, we do not explicitly control for innovation, but we do evaluate the success of new products. That happens quite normal through our sales and accounting cycle [...]."* | Systematization of development process is not mentioned. |

**Table 3-7. Organizational Form: Attentive Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **IT3** | Service innovation is relevant, but not core to the business strategy.<br>*"The customer asks what innovations we have, how can I make my businesses better and quicker with your [firm's] support? That is why innovation is always a facet of the conversation, but not the main emphasis."* | The firm expresses an explicit commitment to developing new solutions and innovations and core to the business strategy. As a consequence of an acquisition the role of innovation has received distinct importance. |
| | Different departments are involved in the projects. The innovation laboratory is relatively small and thus contributes only to a certain extent to the development of new solutions. In addition, an innovation community has been introduced.<br>*"There are several decision makers. First there are the [sales people] of the different markets. Then you need to know what is technologically possible and our colleagues from the delivery department say what can be made possible. [...] We often talk to the business development of [the markets], they know the customers."* | Explicit responsibilities are not mentioned. |
| | Meetings are regularly held with other departments to talk about market developments. The innovation process is not systematized, as the interaction with the customer is very close and thus difficult to pre-determine.<br>*"We hold meetings with the colleagues who are responsible for the different markets. [...] And then we derive ideas from this, to offer new solutions and services."*<br>*"That is why we have this strategy to do relatively small modules, mile stones, to reflect changes of the customer knowledge in the project. You can easily reflect that contractually via change request to reduce risk."* | Systematization of development process is not mentioned. Innovation initiatives, for example, internally an innovative community and externally a competition to find IT talents at universities are introduced. Open innovation is mentioned as approach to cooperate with customers and partners (e.g. customer innovation workshops). |

**Table 3-7. Organizational Form: Attentive Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **IT4** | There are specific business areas where service innovation is relevant. But not all the offered services have the potential to be innovated, for example, huge outsourcing services.<br>*"[New businesses] are those areas where innovation takes place. But the core business is not innovative."* | The continuous development of integrated services offerings is supported and innovation is mentioned as opportunity to respond to specific customer needs. |
| | The firm is very decentrally organized. For this reason, there is a business unit which has the task to internally support other business units to conduct development projects. How each business unit assigns responsibilities is very different.<br>*"We are those who implement the project. That means, if it is about innovation, then it depends on the expertise, the industry, and the service … they are themselves responsible to develop new services [...]. We make sure that such a business unit is able to offer such new service."* | Responsibilities are not mentioned. |
| | A service development process is not defined.<br>*"It depends on the business unit that conducts the new service project."* | Systematization of development process is not mentioned. |
| **IT6** | Service innovation has become less relevant due to the rapid growth of the firm.<br>*"It is done less, because it is getting more complex. The amount of countries that we have, the amount of business partners for which we have to develop products is becoming steadily more."*<br>*"But it is not as if we would drive that strongly. [...] It is not like that at our firm, we are not organized like a Google [with its 5 % of the day to spend on innovation]."* | Innovation is mentioned in the annual report as part of the strategy to increase the number and variety of the services. |
| | Different departments and positions think about innovation in addition to the daily business. A development department implements the ideas, mainly technologically.<br>*"Identifying problems to know what we need to develop basically happens in the countries. [...] Accordingly, the countries come with their idea and the development team has the task to implement that idea, or to develop the best possible product. [...]."* | Responsibilities are not mentioned. |
| | A service development process is not defined. Instead, problems that need to be solved or new ideas are predominantly discussed in meetings of country leaders and the development department.<br>*"Well, it is more formalized as it was, but it is still relatively unformalized. We hold weekly calls with the international vice presidents [...] and there we talk about what the pain points are [...] and where the priorities lie. [...] And that goes back to the development team. [...] And [after development] the respective countries assess whether the problem has been solved or what it had in mind turned out that way and works. And this goes back and forth."* | Systematization of development process is not mentioned. |

**Table 3-7. Organizational Form: Attentive Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **L2** | *Service innovation has increasingly gained importance to increase profit margins and to respond to competitive behavior. Though board members needed to be convinced that innovation is crucial, the need for innovation currently seems to be accepted.* | On the website, innovation is mentioned in the course of the firm's philosophy and history which illustrates the important role of innovative behavior for the corporate growth and success. |
| | *"Innovation does not occur by asking the customer, but by thinking of an improvement of the process. This process improvement is that the process is better, the customer receives the same bill and we keep more for us. [...] If someone in the market has an innovation, then you are forced to imitate."* | |
| | *"Yes, [the process of cultural change towards service innovation] was there in the last years and we have reached a certain level. In an organization there are those of the old school. But we have made it sufficiently clear to the leadership that we need these processes."* | |
| | *"The business development department is responsible for both supporting daily business but also to implement [service innovation] processes. In addition, the firm considers the insight from the operations as valuable and tries to provide branches with more time to think about innovative ideas."* | Responsibilities are not mentioned. |
| | *"The business development department is responsible to bring [the new idea] to the central mock branch [to be developed and tested]."* | |
| | *"[...] [T]hat is why we have innovation days at our branches. We all have certain regions and then we say, with preparation, tell us where you see improvements."* | |
| | The procedures are described as relatively structured; however, an existing defined new service development process is not applied. | Systematization of development process is not mentioned. |
| | *"The [innovation process] is pretty simple and we do work on it. Basically, it starts with regular rounds with experts where sales and production and pure engineering sit together and put all impulses on the table which they received from anywhere. [...] And then they talk, what is worth pursuing."* | |
| | *"We have a department called business development which is also responsible for the innovation circle, where emerged ideas, which come from our people at the market, are assessed. We have decentralized this more, because the people who are close to the actual business can evaluate things better. That is why we conduct innovation days at the various branches. [...] And then we say, with preparation, tell us where improvements are."* | |

**The systematic service innovators.** Innovation in services is crucial; this is attested by all firms I have assigned to the group of systematic service innovators. In contrast to the other two groups of service innovators, this one has the tendency to directly state the commitment to service innovation. Firm C1, which understands itself as a pure solution provider, internally drives innovation and initiates multiple innovation projects to retain its position as one of the innovators in the relevant industry sector. As a result, the firm had product and service R&D expenditures above their sector's average in 2011. Similarly, firm IT2 proclaims that they increasingly rely on innovation and consider it as crucial for the firm's sustainability. Though firm F2 refrains from extensive public descriptions of its innovation activities, its top manager stresses that developing new services and successfully placing them in the market is understood as part of the firm's business:

> *"In the insurance and financial services sectors it is generally the aim to do something new, regularly do innovation […]. If we are successful is a different story, the customer decides about that. If the customer does not buy it, it is not an innovation"* (F2).

Since service innovation is considered strategically important, the firms implement specific responsibilities, accordingly. All firms in this group can directly name positions or teams that are responsible for new service developments. However, the implementation in structural terms varies largely. For example, service innovation teams were found which work full-time on new service developments. As the firms IT2 and L1 express, having innovation implemented in the organizational structure shows unambiguously that innovation is supported by the top management. In a similar vein, implementing teams reflects commitment and assures that those who are expected to generate successful service innovation have space to fulfill this task. Accordingly, firm IT2 says:

> *"We have several pillars through which we innovate […]. Sure is there a commitment to innovation, several thousands of employees work in this area"* (IT2).

In the remaining two cases (C1, F2) service innovation responsibilities are integrated into positions that are also engaged in operational or in marketing activities. Although service innovation is not exclusively the main task of their employees, the firms expect successful new services on a regular basis. In the example of firm C1, they intensively conduct R&D at different corporate and business unit levels by different teams with the aim to achieve both the firm's strategic development and generation of innovative solutions that fit to specific customer needs.

In this group new service development is highly systematized, which represents the most obvious difference to the other two service innovator groups. This high systematization is reflected in the clearly defined new service development processes and relatively tight control mechanisms. In all cases, I encountered formalized process steps, often obligatory to the employees, in order to launch a successful new service. Specifically, all cases indicate that service innovation includes the phases idea generation, evaluation of ideas, actual development, testing, commercialization, and evaluation of the new service's success. Moreover, the interviewees all agree on the benefits derived from such an approach. Representatively, the financial services firm F2 explains:

> "*In the past, we did not have a formalized process. We developed a product with only the sales people in place and had issues getting the product sold. I believe that it is inevitable to formalize the process; a manufacturing firm does not develop a machine, either, if it is not thought through*" (F2).

The rationale of deploying comparably strict control lies in risk reduction. Especially in the businesses that consist of high volume projects a firm's risk management plays an essential role. For example, firm C1 points out that it is highly revenues and profit driven, and thus service innovation projects are evaluated against hard facts. As a result, process innovations are required to break-even within a year; merely few new services assessed to be promising may receive more time to prove profitability. Similarly, the cases of L1 and IT2 demonstrate controlling mechanisms which explicitly involve multiple participants. They have a committee with board members and managers at several levels who consider different key performance indicators (KPIs), such as business cases, return on investment (ROI), revenues, and the like. The results for the systematic service innovators are presented in Table 3-8. Concluding the characterizing features of systematic service innovators, I postulate the following proposition:

> **Proposition 3**: Firms with a high level of corporate service innovation relevance develop innovative services through full-time service innovation responsibilities in the form of departments or groups or clearly defined part-time responsibilities and pursue a predefined as well as controlled new service development process from idea generation to commercialization.

## Table 3-8. Organizational Form: Systematic Service Innovators

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **C1** | Service innovation is clearly stated as highly relevant to the business strategy.<br>*"That is our success factor at the market, there is no other way to convince the customer; everyone can do standard performance. [...] We will extend our portfolio. That is one of the reason why innovation is very important to us. We want to do more, to offer more services to the customer, and want to enter further markets."* | Service innovation is claimed to be a success factor to achieve the strategic goals. This importance is reflected, for example, in the newly acquired measure on the ratio of new ideas which is added to the balanced scorecard to steer the corporate activities. |
| | The service innovation responsibilities are defined at corporate and division level.<br>*"We have an innovation management which takes place at three layers. That means we have a central innovation management, idea management, which also provides support and resources to develop ideas. Then we have that in every division and then also for the projects. [The first layer] is not specifically for the services; however the second and third layer have service units and there we do [innovation] in two ways […]."* | By the year 2011 the firm has established an innovation management that describes that there is a clear assignments of the innovation responsibilities at corporate, division, and project level. |
| | Very clear procedures for innovation projects determine the new service development processes which is characterized by the phase idea generation, concept development, actual development and commercialization.<br>*"[Regarding internal innovations], processes … Those mainly emerge from the operations. The one who had the idea also drives the idea to a certain maturity, content-related, but receives central support [...] to create a business plan. We also support the implementation and provide resources."*<br>*"We are relatively formalized. Almost too formalized. That is why our figures [of successful projects] are that high. [...] Risk management is very important in construction, that is why risk management is one of our core topics and therefore we have transferred the formalities to the area of innovation."*<br>*"[The control mechanisms] are very different. If we have an own business unit or a key account, then it is relatively easy, then there are typical revenues figures. We are pretty much revenues driven or very outcome driven. We rarely to never have innovations that evolve over several years and are costs blocks. [...] We have a marker in the accounting, we can easily determine certain areas [...] and have good possibilities to evaluate [the innovation projects] [...]. We regularly survey the [customer satisfaction]. And if we see that a product increases satisfaction, we are respectively more generous with the revenues figures."* | The firm presents in the annual report of 2005 an innovation funnel that describes the process of innovation from idea to implementation. In addition, the innovation management is said to be structured and systematic. This concept of managing innovation is further defined and described in the annual report on 2011. |

**Table 3-8. Organizational Form: Systematic Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **F2** | Service innovation is clearly stated as highly relevant, as it represents the business model.<br>*"You have identified us as financial service provider, [innovation] is the source of our business model."*<br>*"I believe that the wish to sell drives innovation, the need for innovation. The sales people always need a reason to talk to the customer."* | To fulfill the business goals, the firm continuously optimizes its methods, processes, and products. For this reason is invests is R&D.<br>On the website the firm states that innovation is a part of its brand. |
| | The service innovation responsibilities are assigned to the three product management departments. These departments also cooperate with the organization department, the service managers, and the IT department.<br>*"There are departments which have so-called product responsibility, the product resorts. [...] These product resorts are the constructors of the products. They are practically the ones who put inspiration into the new services. [...] And each of the product resorts has colleagues who deal with the market development in the product field [...], the three product resorts screen the market, the innovations and produce such innovations."*<br>*"In the product resorts you find the constructors of the products. [...]"* | Responsibilities are not mentioned. |
| | Very clear procedures for innovation projects determine the new service development processes which is characterized by the phase idea generation, concept development, actual development, and evaluation after commercialization.<br>*"Someone [...] says that she or he has an idea and tries to describe the product. And that goes to the new product committee which considers whether it is a crazy idea. If not, then it goes to a pre-study. Generally, it receives a market study to find out if it can be commercialized. Then the sales person is asked again, which happens in different ways. When everything is said to be fine and the conditions are clarified, [the new product concept] goes to the construction phase, a project is established to evaluate the preconditions of the production and of the sales, and states how much it will cost. One last check, whether what will be sold and conduces costs is enough to be profitable. And when this happens, an implementation project is established. After a certain period we re-calculate … that was good, that was not so good and needs improvement. That is how we do it."* | Systematization of development process is not mentioned |

**Table 3-9. Organizational Form: Systematic Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **IT2** | Service innovation is very important and falls in the responsibility of the CEO. Many resources are invested to maintain ongoing development processes.<br>*"Yes, several 1,000 employees work [on innovation]. In the telecommunication environment the innovation part of the DNA."* | Innovation in product and services is emphasized as differentiator. The firm invests respectively in technological innovation to satisfy the customer needs. Many new services illustrate the outcome of the firm's innovation activities. |
| | There are different departments and teams which are exclusively responsible for service innovation projects.<br>*"We have several pillars. We have a R&D department. We have people who try to get innovations externally into the firm via partnerships, who are mainly we, and we are called business development, and then there is incubation, by which I mean the support of firm founders in the early stages, [...] we have an incubation center. The fourth pillar is our venture capital firm, [...] which does risk financing for external parties, with whom we also work together, that is kind of a mixture. And the fifth pillar is acquisition of innovative firms. And then we have some kind of idea management, which you could put as sixth pillar next to the others."* | The firm has several responsibilities for innovation activities, such as those units that cooperate with external partners and those that internally research and develop (innovation laboratories). |
| | The innovation process is not formally defined. Routines and certain procedures have evolved, yet, have remained flexible. The procedure for establishing a strategic partnership, for example, is characterized by a so-called easy-to-partner process, whereas internal R&D pursues a typical stage gates process.<br>*"If I have a good suggestions I can go to the management board, find a sympathetic ear and implement it. [...] Maybe bigger topics can work less formally, at least in the preparation, as smaller ones. [...] Well we have just elaborated a formalized process, by other departments that work on efficiency, thus, internal consulting or internal accounting. They provide a process that is supposed to make things easier, but that is easier said than done."* | Systematization of development process is not mentioned |

**Table 3 8. Organizational Form: Systematic Service Innovators (continued)**

| Firm | Interview Results | Summary of Secondary Data Results |
|---|---|---|
| **L1** | Service innovation is clearly stated as highly relevant to the business strategy.<br>*"We have a clear strategy [...] that states that we [...] want to be the most innovative logistic service provider. [...] This means that we want to be the first mover in many areas. We want to retain customers and long-term partnerships with good products and as much USPs as possible to differentiate ourselves from the competition, definitely."*<br><br>The service innovation responsibilities are clearly defined.<br>*"[...] We [the innovation center] try to get our innovation projects from idea to market maturity, which get accepted by a central committee, which is the innovation board [...], and the program office steers the portfolio management."*<br>*"Well, we are the unit customer solution innovation [...]. You need to ask yourself how to bring innovation to a large firm. In my opinion, you need to decouple from the daily business and from the daily budget."*<br>Very clear procedures for innovation projects determine the new service development processes which is characterized by the phase idea generation, concept development, actual development, and commercialization. Gates during the process are implemented to assure market success.<br>*"Regarding the structure, we have a funnel, an innovation funnel, to clearly structure [the development process]. That means that every project which will become a project at some point in time, has passed the funnel. That means that there is the first step [...] which is the project initiation phase. That is the idea phase where we receive many many ideas, which stem partially from internal, external, from the customer, from science, from mega trends, they come from everywhere. The first thing we do [...] is to select those ideas from the mass which we establish as projects, to go to the second phase of the funnel, the concept phase. [...] [W]e detail the ideas and think about the potential benefits of the ideas for the business units of [L1] and for the customers. [...] Then it continues with the development phase where everything is developed. Of course, there is a lot of IT development, but also technical knowhow. And at the end is the pilot which is the next phase of the funnel, the pilot phase. [...] [After that] we slide into the next phase, the maturity. That means the maturity phase, where we try to make mature, roll-out able services. These are rolled-out in cooperation with the business units in the respective countries, [the market phase], and then we are practically out [of the process]."* | The firm dedicates an own website to the innovation center and provides an overview of the projects. Often the innovations relates to technical and technological solutions; however, they predominantly affect the logistic services the firm offers.<br><br>The innovations center develops new solutions in cooperation with the key account management and belongs to the responsibility of the chief commercial officer (annual report 2011). In addition, the idea management is introduced that gives all employees the opportunity to hand in new ideas for products and processes.<br><br>Systematization of development process is not mentioned. |

### 3.4.3. Comparing the Organizational Forms: The Role of Relevance for Systematization and Responsibilities

The results of the study show that firms differ in the relevance assigned to service innovation, in the organizational implementation in the form of responsibilities, and in their degree of systematization of service innovation activities. The effectiveness of certain management and organizational design choices presumably depends on specific conditions. In this line of thought, I compare the groups of the study with the aim to extract the factors that determine the choice of organizational form.

Considering the results of the organizational form, I cannot observe that the industry sector influences the organizational form of managing service innovation. Instead, each of the sectors is represented in all three service innovator groups. Thus, the way firms manage their service innovation activities seems to depend on other factors than the market they are active in. Another factor might be the firm size which is frequently considered relevant, since a large firm size implies the ability to provide sufficient resources (e.g. Abreu et al., 2010; Shefer and Frenkel, 2005). All the interview partners belong to large firms, with the smallest firm consisting of 800 employees and the largest of about 400,000 employees.[32] Nevertheless, there can be the tendency observed that rather the larger firms belong the group of systematic service innovators: I find the largest or second largest firm of each sector represented in this group. The reason for this allocation might be that very large firms, often facing pressure by severe competitiveness, ought to strive for differentiation. Accordingly, they are interested in opportunities to offer new services and to maintain or improve their position in the market. A further explanation could be that with a very large firm, which is often internationally active, efficiency plays a crucial role. These firms can simply not afford to pursue service innovation projects which lack a systematic management. To be able to fully benefit from innovation activities and to produce synergies, very large firms might see the need to better control and thus improve the outcomes of such projects.

Reviewing the findings on the different organizational forms of managing service innovation, I would recommend applying a more dynamic perspective on organizational forms that firms could obtain. Those firms that strategically do not focus on service innovations are often open for ad hoc innovations and react to their occurrence in a flexible manner (e.g. an

[32] The European Commission considers a firm large if it consists of more than 250 employees and a turnover of € 50 Million or more (European Commission, 2015).

individual finds support for initiating a project). They desist from a systematic service innovation generation, but take advantage of new services when possible. This understanding is in line with works that stress the value of unpredictability and so-called accidental innovations (Austin et al., 2012). For example, Yoo et al. (2006) illustrate the effectiveness of iterative development processes which lead to unexpected outcomes.

If service innovation does play a strategic role and is associated with potential performance improvements, at least routines and managerial attention towards service innovations is apparent. However, the process as such it not clarified in detail and control mechanisms are not strictly applied. Often, repeated cross-functional exchange is initiated to trigger innovative ideas. This corresponds to prior service innovation literature which often implies that specifically services with their characteristic difference to products require relatively more room for creativity and less strict procedures (Abreu et al., 2010; Ettlie and Rosenthal, 2011).

A very professional and systematic management of service innovation is implemented by firms that clearly emphasize and value service innovation as a source of differentiation. Service innovation is defined as a strategic objective and therefore pursued with extensive support from top management and distributed throughout the firm. To support new service projects, the firms allocate required resources and seek for structural alignment. Similar to findings in product innovation management (Cooper et al., 2004b; Ernst, 2002), firms that establish an appropriate level of systematization of new service development processes and define service innovation responsibilities are more capable to constantly generate successful new services.

In conclusion, the results indicate that the choice of implemented responsibilities and the degree of systematization of the new service development process seem to strongly depend on the strategic relevance accounted to service innovation. I find support that continuously and successfully innovating in service relies heavily on aligned organizational structures and controllable developmental procedures.

## 3.5. Theoretical Implications

The aim of this qualitative empirical study is to investigate how firms manage service innovation activities in their organization and to identify reasons for differing organizational implementations. Services have been experiencing soared attention, since they have become

relevant to the majority of firms. Recalling famous examples like the solution provider IBM and Apple with its iTunes store demonstrates this new importance of services.[33] Accordingly, researchers' focus in service research has extended from predominantly marketing and customer relations to other research fields, such as service innovation (Ostrom et al., 2010). The study shows that service innovation is relevant to all firms I analyzed. In fact, the majority emphasizes innovative activities and invests resources, as innovating in services is considered inevitable to ensure survival and valued as potential leverage to be ahead of the competitors. By analyzing procedures and structures to generate new services the results have implications for service research, organization design research, and innovation management.

**Service research.** This chapter contributes to service research, as it responds to the research question regarding what relevance service innovation experiences in firms. I find support to investigate firms across several industry sectors. In contrast to the existing conviction that the heterogeneity of sectors impedes comparisons (Abreu et al., 2010; Ostrom et al., 2010), I identified shared patterns among firms from different sectors. In a similar vein, this analysis shows that service innovation is not limited to pure service providers. Although traditional product providers often focus on technical innovations, I observe an increased attention dedicated to new service development activities. Thus, the recognition and implementation of managing service innovation seems to be firm specific rather than industry specific. Every group of service innovators includes the very distinct sectors construction, financial services, IT, and logistics. I conclude from this that other factors than the service and the market context in which it is provided determine how service innovation is reflected in a firm's procedures and structures. Instead, the way firms manage and organize service innovation activities seems to be determined by the strategic importance assigned to innovative services. Supporting the findings of Gebauer et al. (2010), those firms that value service innovations as potential source of competitive advantage are characterized by a clear understanding about how to conduct service innovation activities.

**Organization design research.** With this study I contribute to organization design research, since it provides insights on the dependency between the relevance of service innovation in the corporate strategy and organization design choice. In the context of organization research, service innovation has been neglected in past research, whereas in product innovations, for example, the influence of organizational design choice on innovation

[33] Please see more details on the relevance of service innovation for firms in practice in Chapter 1.

outcomes has been illustrated (see e.g. Tushman et al., 2010). In service innovation management, rather specific organizational factors like the importance of high-skilled employees (Van Riel et al., 2004) have been investigated. The effect of organization design choices on service innovation outcomes, however, has received marginal attention. Thereforme, the remaining research question is whether firms hold specific responsibilities in their organizational structure that are dedicated to generate new services.

As a result of this chapter, I find that firms implement responsibilities very differently. On the one hand, for example, marketing or business development departments perform service innovation in addition to their daily work. Then again, there are several examples of full-time service innovation responsibilities in the form of R&D departments or terminated service innovation projects. Moreover, I observe that service innovation activities are both centrally and decentrally organized. I find that for some firms it seems appropriate to implement one dedicated team or assign respective positions, hence invest a significant amount of resources. This organizational design is especially relevant when the firm's strategic goal is to establish itself as a service innovator in the market. Others, however, consider it reasonable and sufficient to be attentive or flexible to service innovations by implementing partial or varying responsibilities. Derived from these arguments, I infer in response to the stated research question of why firms implement their innovative aspirations differently that depending on the strategic relevance assigned to service innovation, the organizational design is adjusted towards an implementation of defined groups or departments.

**Innovation management research.** I supplement innovation management research by revealing the value of a systematic approach towards managing service innovation and thus respond to the research question of how the actual development procedure of service innovations looks like. In the beginning, innovation literature has predominantly focused on products, whereas service innovation management was characterized by an idle development (Ettlie and Rosenthal, 2011; Kahn, 2001). The reason for this relative neglect might be the ambiguous nature of services, which is said to impede the measurement of new service outcomes (Jensen and Warren, 2001). Service innovation seems to be a concept that is difficult to grasp. As a consequence, it remains unresolved how firms successfully conduct service innovation activities. This study underlines that firms have already implemented service innovation management systems and that they deliberately focus on their refinements. Despite the assumption that service innovation may not require systematization (den Hertog et al., 2011; Ettlie and Rosenthal, 2011), some firms actually are convinced of the benefits derived from

controlled and defined new service development processes. This opinion is mainly expressed by those firms which pursue service innovation for strategic reasons. Hence, though this study cannot quantitatively identify antecedents for successful service innovation, I found that implementing responsibilities and defining new service development processes is considered more effective than relying solely on spontaneously occurring ideas for new services.

Innovations may happen by accidents (Austin et al., 2012), yet, considering budget requirements, several firms in the sample see a necessity to be able to monitor and to evaluate both service innovation activities and their resulting outcomes. Accordingly, some firms have clearly defined innovation steps and apply control mechanisms, such as comparing financial measures. Though the implementation of managing service innovation varies within the sample, the identified systematic developmental processes share the phases of idea generation, evaluation of ideas, actual development, testing, marketing, and evaluation of the new service success. This approach is very close to what we learn from product innovation management (Booz et al., 1982; Cooper et al., 2004b; Prajogo, 2006). Interestingly, in some cases where there is no systematized service innovation process, firms in the present sample have already decided to change this circumstance. Hence, the results support the value of systematizing new service development processes. Therefore, the conclusion on the stated research question of why firms implement their innovative aspirations differently would be that in dependence on a high strategic relevance assigned to service innovation, a clear determination of the new service development is employed.

Despite the acknowledged effectiveness of systematically developing innovative services, too much formalization may impede creativity. The firms that strictly organize service innovation concede that more freedom in the development process could lead to more interesting and radical service innovation. I conclude that firms will benefit from a balanced systematization that enables controlled and effective development processes, yet does not diminish creative thinking.

## 3.6. Implications for Practice

I find indications that there is a need for firms to critically evaluate the strategic relevance of service innovation, since the more important innovative services are to accomplish organizational goals, the more systematic a firm should conduct their development. As the

examples have shown, in such cases where service innovation holds a considerate part in the corporate strategy, a clear communication with regards to the corporate goal can be observed (e.g., becoming one of the most innovative firms in the respective sectors within a certain period of time). Especially, top managers as initiators of the idea to approach service innovations more strategically have influenced the shift towards establishing supportive structures for managing service innovations. Clearly defined responsibilities, be it in the form of full-time responsible departments or teams, or service innovation as a part-time task of other functions, would facilitate and promote the development of successful new services. Though, for example, the logistics sector is known to focus on efficiency and thus invests in steady improvements, the findings of the interviews confirm that especially large logistics firms address the topic of innovation and do not limit their view to incremental innovations; instead, I have found that new departments were introduced which consisted of both existing employees from other departments of the focal firm or newly hired employees with very distinct backgrounds. Thus, with a clear corporate goal and top management support towards the engagement in service innovation, firms invest required resources and adjust their organization, accordingly. The predominant valuation stated in the interviews is that such adjustments in the organization are beneficial for service innovation success.

Another interesting finding is the definition of a new service development process. Research has observed that in practice new services are developed informally and rather ad hoc (Miles, 2007). In contrast, I find that firms do setup service innovation projects systematically and pursue predefined steps. Particularly, the systematic service innovators in this chapter have deployed approaches to manage service innovation processes which are very similar to the development processes in the product innovation context. For example, a financial service firm describes a typical phase model which includes defined steps and respective responsibilities from idea generation, concept development, actual development, to monitored market introduction with potential adjustments. Hence, innovation managers are well advised to structure their new service development processes which facilitate a systematic and thus more controllable process. Even if service innovation is not representing one of the major strategic goals of the firm, this chapter shows that established routines support the generation of promising service innovation. Many firms in the interviews described repeated meetings consisting of people from different departments which help to think about future threats and opportunities from multiple perspectives. Thus, by introducing such procedures which are fairly

simple to implement, senior managers can support the ability of the firm to adequately respond to environmental changes.

Moreover, to assure the effectiveness of resource allocations and a sufficient return on investment, organizations should apply control mechanisms. For managers this means that new service projects need to be observed and included in the controlling systems; however this control should not constrain the idea generators and service developers in being creative and thus innovative. The interviews revealed that, similar to best practices in new product development, firms that continuously pursue service innovation projects indeed adjust their control measure to measure the progress of their multiple projects. Though the firms which were assigned to the groups of flexible and attentive service innovators tend to apply common financial control mechanisms, the interviews direct to an increased need to deploy a specific service innovation control system if the firm considers service innovation as a clear differentiator to competitors and thus invests heavily in innovative services. Accordingly, innovation managers should assess the applicability of existing control systems and applied key performance indicators, and adjust them if required.

Traditional goods-dominant firms should review their new product development activities, since established R&D processes and organizational implementations might similarly be relevant to managing new service development. Firms can utilize their knowledge on product innovation management in the service field. Nevertheless, since services are different to products, innovation managers should acknowledge the resulting specificities and apply amendments in the service context where necessary. For example, as services are intangible, the conceptualization and design of new services might require other tools and processes, such as visualization, or specific organizational structures that enable cooperation between the relevant departments. In a similar vein, service innovation managers can learn from new product development concepts and benefit from a more systematic approach towards service innovation.

## 3.7. Limitations and Future Research

The findings are imposed by several limitations. Though I interviewed knowledgeable key informants and collected rich secondary data, the information I was able to gather is bounded for the following main reasons. A relatively small number of firms for each sector was considered, which limits the representation of the sample. Additionally, I analyzed statements made by one to three interviewees per firm, hence considered subjective views that might not

correspond to the overall understanding of the firm. Another limitation is that I depended on complementary firm information that was offered to the public, which potentially does not fully reflect the lived reality of the firm. The firms in this study represented less innovative and more innovative firms. However, this sampling potentially suffers from bias, as I interviewed firms that indicated at least some relevance accounted to service innovation during the interview acquisition phase. Nevertheless, I am convinced that this qualitative study conduces to service research, organizational design research, and innovation management research. I hope to trigger further research and propose to address specifically the following aspects.

From the results of this investigation I am not able to derive the most successful choice of organizational design for managing service innovation activities. The service research field should more intensively clarify the impact of new services on enhanced market position, i.e. what consequences specific management concept of service innovation have for corporate performance measures. This study indicates that by continuously and effectively generating new services, the firms expect to keep track of their competitors or even to position themselves at the very front. Empirical studies could contribute to enhanced service innovation understanding by identifying antecedents for successfully managing service innovation. For example, the emphasized role of top and senior management in the service innovation process should be analyzed to discover how these decision makers can provide the foundation for an innovative culture and for successful developmental processes.

In addition, the balance between deliberately managed yet also flexible new service developmental processes should be analyzed in prospective research. I see an urgent need to examine new service development processes and structural alignment in respect of their effectiveness. Researchers could benefit from the concept of ambidexterity which stresses the need for balancing exploration (i.e. innovation) and exploitation (i.e. efficiency) to identify advantageous structural implementations of service innovation (Gupta et al., 2006; Raisch et al., 2009; Turner et al., 2013).

Furthermore, it would be valuable to identify similarities and differences between new product and new service development processes. Service innovation management research may benefit from the advanced understanding in successful product innovation. Moreover, I see an urgent need to converge service innovation and product innovation management, since the present study supports the tendency to provide solutions rather than purely products or services (Neu and Brown, 2005; Sawhney et al., 2004).

## 3.8. Conclusion

Following claims from research, the main objective of this study is to examine how firms implement service innovation activities in their organization (Ostrom et al., 2010; Papastathopoulou and Hultink, 2012). With 22 semi-structured investigative interviews in 15 firms and secondary data analysis I was able to identify three groups of organizational forms that differ with regards to the dimensions of relevance attributed to service innovation, the implementation of service innovation responsibilities, and degree of systematization of new service development.

As a result, this qualitative study underscores existing corporate service innovation relevance across distinct industry sectors. Furthermore, support is found for the effectiveness of responsibility implementations ranging from R&D departments and full-time employees to informally considered service innovation job tasks as well as defined new service development processes. The choice of organizational implementation and the degree of systematization seem to differ in dependence of the corporate relevance of service innovation in the firm's strategy. In sum, I found valid reason to believe that an increase of corporate performance through successful service innovation requires controllable developmental procedures and supportive organizational structures. I hope to trigger research which assists firms in managing their service innovations more successfully.

# 4. MANAGING SERVICE INNOVATION: A QUANTITATIVE STUDY ON SERVICE INNOVATION CAPABILITIES

This chapter includes the survey-based study on antecedents and consequences of service innovation capabilities held by firms. It addresses the research question what influence top management commitment and corporate service innovativeness have on a firm's service innovation capabilities and what the implications for firm-level performance are. In Section 4.1., I briefly introduce the relevance of the topic and describe the theoretical framework which determines the structure of this chapter.

Next, I present the study regarding its research design, sampling, and the data collection process. I further describe the data analysis method, i.e. partial least squares structural equation modeling (PLS-SEM), and the measures used for the calculations (Section 4.2.). At this point, the reader should have an impression of the conceptual framework which is empirically tested and, thus, be sufficiently informed about the reliability and validity of the data.

Then, Section 4.3. includes the analysis on the antecedents proposed in the theoretical framework. In this section, I will provide the theoretical background on decision making and learning in innovation and their relationship to innovation capabilities, which serves as foundation for the hypotheses development on the positive influence of top management commitment and corporate service innovativeness on service innovation capabilities. Subsequently, the results of the analysis and additional robustness checks are described. Theoretical and practical implications are presented. Finally, I point to the limitations of the study and prospective research possibilities.

Subsequently, Section 4.4. focuses on the consequences of service innovation capabilities. Similar to the setup of prior section, I introduce to the theoretical background on the consequences of innovation capabilities and derive hypotheses adjusted to the service context. This is followed by the presentation of the results of the analyses and additional robustness checks. After discussing these findings, I highlight their implications for theory and practice. I address limitations of the study and make suggestions for future research.

Finally, Section 4.5. provides a summary on the chapter. I conclude on the findings by pointing to the main theoretical contributions made by this quantitative investigation.

## 4.1. Introduction and Theoretical Framework

Research on service innovation has developed intensively in the last decades (Papastathopoulou and Hultink, 2012). However, as Barczak (2012) points out, the question remains unresolved *"whether or not what we know about product development and innovation applies readily to services and hybrid offerings"* (p. 355). Hence, there is an expressed need to clarify what important antecedents influence service innovation success, and what implications these increased capabilities to develop service innovations have for firm-level performance.

Within her study on success factors, de Brentani (2001) identified the crucial role of top managers for building an innovation culture and concludes that they are the beginning of successful service innovations. Despite these insights, decision makers' actual role in innovation has predominantly been addressed in product innovation research (Cooper et al., 2004b; Holahan et al., 2014), and less been acknowledged in the service innovation field. Rather, the focus often lies on other actors, such as front-line personnel or customers (e.g. Ettlie and Rosenthal, 2012; Lages and Piercy, 2012; Melton and Hartline, 2010; Michel et al., 2008; Sørensen et al., 2013; Zomerdijk and Voss, 2011). As top and senior managers determine corporate goals and face the challenge to steer their firm towards them, it would be most valuable to understand in detail how they can influence the success of service innovations.

In addition, research on innovative services has often focused on the degree of innovativeness of new services (Forsman, 2011; e.g. Holahan et al., 2014; Ordanini and Parasuraman, 2011; Perks et al., 2012). In contrast, the extent to which a firm is engaged in service innovation activities, in this work understood as corporate service innovativeness, has received marginal interest. A valuable exception is the study of Ordanini and Parasuraman (2011). They find that the volume of service innovations positively affects corporate performance. Yet, these findings were derived from a single-industry study and are limited to the hotel sector. Consequently, to be able to evaluate the effectiveness of a constant pursuit of service innovation projects, it is necessary to clarify the influence of this increased level of service innovativeness at firm-level on the success of service innovations.

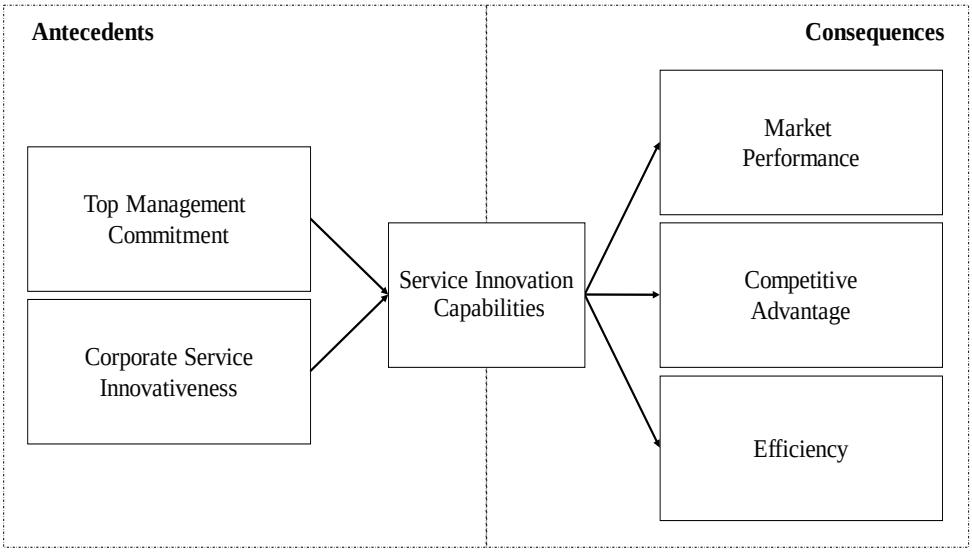
In a similar vein, researchers have identified a considerable need to detail the impact of service innovation on firm-level performance (den Hertog et al., 2011; Evangelista and Vezzani, 2010). Specifically, it is unresolved how differently certain firm-level performance measured are influenced by service innovations. Thus, it is required to unveil the influence of

service innovation on a more comprehensive set of performance measures to gain a better grasp of the importance of successful innovations for firms.

In order to reduce this existing research gap I apply a dynamic capabilities point of view which, in the service innovation field, has found considerable attention (e.g. den Hertog et al., 2010; Fischer et al., 2010; Forsman, 2011; Hogan et al., 2011; Menor and Roth, 2008; Salunke et al., 2011; Storey and Hughes, 2013). I agree on the suitability of this theoretical lens, since this theoretical foundation gives the opportunity to explain the complex relationships between influencing factors and outcome measures. The concept underpins the importance of an ongoing developmental process, which companies need to pursue (Eisenhardt and Martin, 2000), and emphasizes the value of increased capabilities to generate innovations.

Based on these considerations, the aim of this chapter is to respond to the following two research questions: Firstly, what influence do top management commitment and corporate service innovativeness have on service innovation capabilities? Secondly, what implications do these improved service innovation capabilities have for firm-level performance? Accordingly, I postulate a theoretical framework with the capabilities to develop successful service innovations at its center (Figure 4-1).

**Figure 4-1. Theoretical Framework on Service Innovation Capabilities**




**Note**: ⟶ positive relationship.

I propose that top management commitment positively influences service innovation capabilities, since decision makers provide the conditions to innovate and assure the alignment between innovation projects and corporate objectives (Brown and Eisenhardt, 1995; Cooper et

al., 2004a). In addition, the constant engagement in service innovation activities, i.e. corporate service innovativeness, promotes learning processes (Teece, 2007) which lead to increased service innovation capabilities. Consequently, both factors contribute to the enhancement of capabilities to generate successful innovative services.

I further propose that these capabilities will affect different corporate performance indicators. The suggestion is that market performance will increase, since increased capabilities will generate service innovations that address and potentially exceed customer needs (de Brentani, 1989; de Brentani and Ragot, 1996). Furthermore, increased service innovation capabilities imply that a firm can anticipate future developments in the environment (Peteraf, 1993). Therefore, firms with developed service innovation capabilities can be proactive and generate new services with the potential to surpass the services of the competitors. Finally, since service innovations are often associated with the improvement and enhancement of service offerings and service delivery (Chen et al., 2009), increased capabilities will positively influence efficiency gains (Melton and Hartline, 2010).

## 4.2. Method: Survey-based Study

### 4.2.1. Research Design and Sampling Procedure

To test the proposed theoretical framework I conducted a survey-based study with key informants. This method is a research approach that is often chosen in capabilities and innovation research (e.g. Danneels, 2008; Moorman and Miner, 1997; Storey and Kahn, 2010). In the following, I will describe the sampling procedure, the development of the questionnaire, the process of data collection, and provide some information on the descriptive statistics of the sample.

**Sampling.** I pursued a multi-sector approach to address indications in prior research that sector differences have implications for the firms' service innovation activities (Abreu et al., 2010; Castro et al., 2011). The database 'Hoppenstedt Firmendatenbank für Hochschulen' was used to gather secondary data on the sample. The sample consisted of the 442 largest firms from Austria, Germany, and Switzerland in the sectors of construction (113), financial services (99), IT services (119), and logistics (111) (industry codes: WZ 2008 41-43, 64-66, 61-63, 49-53, respectively[34]). Therefore, the sample consisted of a sector that is characterized as a traditionally producing sector (construction), a sector that includes firms which often offer both

[34] Firms can hold multiple industry codes.

products and services (IT services), and sectors with pure service providers (financial services and logistics).

**Questionnaire.** The questionnaire was based on 22 semi-structured interviews conducted in 15 firms from the four sectors of the present study (see Chapter 3) and complemented by further relevant past research.[35] To ensure functionality, correctness, and understanding, 19 pre-testers of whom eight were practitioners and eleven academics tested the survey's online and hardcopy version. Subsequently, I incorporated the pre-testers' comments into the questionnaire and made corresponding adjustments. The final questionnaire is shown in the Appendix (Figure A-2 to Figure A-7). The questionnaire included mainly multi-item Likert-type scales which ranged from 1, *"strongly disagree"*, to 7, *"strongly agree"*. These items constituted reflective constructs. In addition, further scales were included, such as binary scales (*"yes"*/ *"no"*) and ratio scales reflecting shares (*"0 %, 1-10 %, 11-20 %, … , 91-100 %"*). The setup of the questionnaire was the following: First, an introductory text described the background of the questionnaire and the goal of the study, which is to analyze how firms can effectively manage service innovation. In addition, I emphasized the benefit of receiving an individual benchmarking report and, importantly, assured for anonymity and confidentiality regarding data usage. If the respondents were interested to receive a final individualized benchmarking report of the study, they were able to leave their email address. This personal information was, however, not included in the data analysis. Next, the respondents were provided with a service innovation definition to make sure that all respondents had a shared understanding of service innovation. Then, questions regarding the organizational establishment of service innovation and the actual activities in the service innovation process were presented. After that, the respondents were asked to assess the outcomes of their service innovation activities, other innovation activities (related to product and technology), and the environment of the firm. Finally, fill-in questions to gather an overview of the firm and the respondent him-/herself were offered. Information on sensitive data like the firm's revenues or innovation budget were not obligatory and could be left out by the respondents.

I used subjective measures for the analysis because of several reasons. It would have been difficult to obtain adequate objective measures, as, on the one hand, the antecedents are deliberately based on subjective assessments and, on the other hand, the firms in the sample are not necessarily listed, thus, do not need to publish specific financial statements nor do they need

[35] See more details on specific literature in the paragraph about the used measures in Section 4.2.2.

to provide information on the outcomes of their innovation activities. Moreover, research has shown that respondents may prefer questions about perceived performance, because they avoid violating policy agreements regarding confidential internal data (Song et al., 2005). In addition to the perspective of the respondents, also from an analysis perspective a perceptual performance measure can be beneficial. With such multidimensional constructs a comparison across firms, industries, and economic conditions is possible (Gruber et al., 2010).

Despite these arguments for perceptual measures, surveys based on self-reported data are threatened by common method bias (Podsakoff and Organ, 1986). In order to increase the accuracy of the data and reduce potential common method variance, I followed the suggestion of Podsakoff et al. (2003) to collect data for the endogenous and exogenous variables from different sources. I thus collected data from two respondents of each firm and therefore addressed the threat of common method bias rooted in a single-respondent approach. Nevertheless, a bias might still pose a problem on the relationships within the proposed theoretical framework. To examine the existence of such bias I conducted both exploratory and confirmatory factor analysis with the Harman's one-factor test (Malhotra et al., 2006), which is similar to those tests already shown in other survey-based studies (e.g. Schilke, 2014). The exploratory factor analysis with all 32 indicators of the theoretical framework[36] suggested that no single factor explains more than 30 percent of the total variance in the variables. Within the confirmatory factor analysis, I compared the fit of the single-factor model with the fit of model comprising all indicators (McFarlin and Sweeney, 1992). The single-factor model has a significantly worse fit ($\chi^2_{diff} = 1017.8$; $df_{diff} = 29$; $p < .01$). Considering these results, I conclude that common method bias should not dilute the analyses.

**Data collection.** As a first step, I identified suitable respondents. The collection of the contact details allowed me to directly approach the potential participants. During a seven month period from April through October 2013 I contacted by phone and/ or email typically the top managers or directors whose departments are involved in service innovation projects. If interest to participate was expressed, the contact person was regularly reminded to fill out the survey. In the case of no response, I repeatedly followed-up and asked for participation. Due to the aim to collect two completed questionnaires per firm, I asked the initial contact person to recommend an additional knowledgeable informant for participation. If no such informant was named, I autonomously tried to identify and contact a further suitable informant of the firm.

[36] The control variables product innovation orientation and dynamic environment were included. Please see an introduction to the applied measures in Section 4.2.2.

As a result, a total of 209 completed questionnaires were returned including 87 firms that participated with two respondents; 122 firms responded with at least one filled-out survey. This corresponds to a double-respondent response rate of 19.7 % and a single-respondent response rate of 27.6 %, which is comparable to other survey studies with key informants in management and innovation research (e.g. Chen et al., 2009; Foss et al., 2013; Schilke, 2014). In the scope of the main analyses, I used the sub-sample of 87 firms with double respondents. For robustness checks, I also used the data from one respondent of each firm, which are 122 questionnaires.[37]

**Descriptive statistics.** With respect to the participating firms (n = 122), the four sectors have a fairly balanced representation with 23.8 % of the firms which are active in construction, 22.9 % in financial services, 27.9 % in IT services, and 25.4 % in logistics. The median size of the firms is 2,000 (in number of employees) with a median age of 49 years. In total, of the participating firms 71.3 % provided two fully completed questionnaires. The picture of the sub-sample remains similar to the sample of all participating firms. The sectors are represented with a relatively equal share (construction: 17.2 %; financial services: 25.3 %; IT services: 28.7 %; logistics: 28.7 %). The median size based on the number of employees is 2,110 and the firms are 47 years old (median). Table 4-1 provides an overview of the firms which participated in the study.

**Table 4-1. Descriptive Statistics on Participating Firms**

| | All Participating Firms | | Firms with Double Respondents | |
|---|---|---|---|---|
| **Sector** | **Quantity** | **%** | **Quantity** | **%** |
| Construction | 29 | 23.77 | 15 | 17.24 |
| Financial services | 28 | 22.95 | 22 | 25.29 |
| IT services | 34 | 27.87 | 25 | 28.74 |
| Logistics | 31 | 25.41 | 25 | 28.74 |
| Total | 122 | 100.00 | 87 | 100.00 |
| Median size (employees) | 2,000 | | 2,110 | |
| Median age | 49 | | 47 | |

**Note**: Figures in percentage are rounded.

[37] For the purpose of clarification: In total, 122 firms participated in the survey. Of these 122 firms, 87 responded with double respondents (i.e. 174 questionnaires) and the remaining 35 firms responded with a single respondent (174 + 35 = 209 completed questionnaires).

For the statistical analyses, mainly the top managers and senior managers who are highly knowledgeable of the overall firm performance were the first respondents.[38] The second respondent of a participating firm held detailed knowledge about service innovation projects and their success and was predominantly involved in the actual development process of new services. Hence, the respondents with a higher position were regarded as first respondents, while the other respondent was determined as second respondent. If the level of the position was the same, the respondent with the longer tenure at the respective firm was assigned to the group of first respondents. The distribution regarding the position of the respondents is summarized in Table 4-2. Of the respondents, 17.8 % were top managers, 29.9 % senior managers, 32.8 % employees whose work is related to service innovation, and the remaining 19.5 % specified their position in the category *"other"*. Therefore, the calculations were run on data provided by a highly knowledgeable set of respondents.

I conducted comparison tests between the cleansed sample and non-respondent firms. No significant differences ($p < .10$) were found regarding firm age, size, and sector. Additionally, I tested for differences between early and late respondents (Armstrong and Overton, 1977). No significant difference ($p < .10$) was found regarding the concept variables top management commitment, corporate service innovativeness, service innovation capabilities, market performance, competitive advantage, and efficiency.

**Table 4-2. Overview of Key Informants in Sub-Sample**

| | 1st Respondent | | 2nd Respondent | | Total | |
|---|---|---|---|---|---|---|
| **Position** | **Quantity** | **%** | **Quantity** | **%** | **Quantity** | **%** |
| Top Management | 23 | 26.44 | 8 | 9.20 | 31 | 17.82 |
| Senior Management | 31 | 35.63 | 21 | 24.14 | 52 | 29.89 |
| Service Innovation Employee | 19 | 21.84 | 38 | 43.68 | 57 | 32.76 |
| Other | 14 | 16.09 | 20 | 22.99 | 34 | 19.54 |
| Total | 87 | 100 | 87 | 100 | 174 | 100 |

**Note**: Figures in percentage are rounded.

[38] Those respondents who were assigned to the group of the first respondents were also included in the analysis on the data from the sample containing all single respondents (n = 122). Those respondents who were assigned to the group of the second respondents were excluded from the analysis on the data based on the single respondents.

To better understand how service innovation is positioned in the firm, the respondents were asked to evaluate how often specific departments and groups are mainly in lead of service innovation projects. Multiple answers were possible. In Table 4-3 an overview of the answers is given. The results reveal that the lead of projects is often assigned to several functions within the firm. Along the sectors, predominantly the departments marketing and strategy as well as project management and top managers hold a leading role. The research and development (R&D) department is mentioned seldom as lead of service innovation projects (7.6 % of the answers) which is in line of findings in literature that an explicit R&D department is less prevalent in the service context (den Hertog et al., 2011; Ettlie and Rosenthal, 2011; Miles, 2007). Interestingly, also the operations departments play an important role. Except in the financial service sector, this function is frequently in

**Table 4-3. Lead of Service Innovation Projects per Department/ Group**

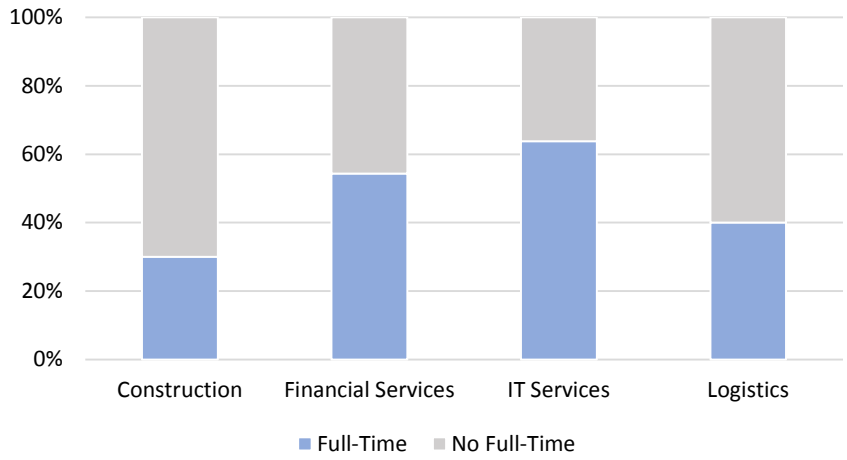
| Sector | Marketing | Strategy | Project Management | Research & Development | IT | Operations | Top Management | Other Department | Total Number | Total % |
|---|---|---|---|---|---|---|---|---|---|---|
| Construction | 8 | 9 | 10 | 2 | 3 | 13 | 14 | 2 | 61 | 17.23 |
| Financial services | 28 | 20 | 15 | 3 | 8 | 6 | 15 | 10 | 105 | 29.66 |
| Logistics | 24 | 12 | 22 | 8 | 10 | 10 | 13 | 6 | 105 | 29.66 |
| IT services | 9 | 19 | 8 | 9 | 6 | 11 | 15 | 6 | 83 | 23.45 |
| Number | 69 | 60 | 55 | 22 | 27 | 40 | 57 | 24 | 354 | |
| % | 19.49 | 16.95 | 15.54 | 6.21 | 7.63 | 11.30 | 16.10 | 6.78 | | 100 |

**Notes**: n = 174. Figures in percentage are rounded. Multiple answers were possible. Reading examples: 1. In the construction sector, eight respondents consider the marketing department as often in lead of service innovation projects. 2. The marketing department often has the lead in 19.5 % of the answers.

charge of service innovation projects. Another salient aspect is the difference among the sectors: While the financial services and logistics sectors name far more functions and groups as leaders of service innovation projects (each sector almost a third of the answers), the construction and IT services sector consider less positions in lead of such projects (17.2 % and 23.5 %, respectively). As the sectors share the patterns along the different departments, these results could mean that the former sectors dedicate a broader set of functional responsibilities to service innovations projects. An indicator for organizational relevance of service innovation can be the alignment of structures and resources. For example, the establishment of full-time responsibilities for service innovation projects can reflect how much a firm is involved in innovative activities.[39] In the questionnaire, full-time responsibility meant that working on service innovations is the main task, somewhat the daily business. This can be differently implemented in the firm, for example, in the form of temporary projects or dedicated departments or groups. Figure 4-2 depicts the share of full-time responsibilities for service innovation for each sector in the sub-sample. In sum, about half of the firms implement such full-time engagement for developing new services. The construction sector with about 30 % of its firms shows the lowest amount of full-time responsibilities.

[39] See related works on product innovation, e.g. Argyres and Silverman (2004); Moenaert and Souder (1990); Santarelli and Sterlacchini (1990).

**Figure 4-2. Full-Time Responsibilities for Service Innovation across Industries**




**Note**: n = 174.

### 4.2.2. Partial Least Squares Structural Equation Modeling and Measures

**Analysis**. I tested the theoretical framework with partial least squares structural equation modeling (PLS-SEM) and chose this analysis method for several reasons. First, PLS-SEM copes with relatively small sample sizes (Hair et al., 2011). With 87 paired responses the present data set is considered relatively small, yet fulfills the criterion to be larger than ten times the largest number of structural paths directed at a particular latent construct (Barclay, Higgins, & Thompson, 1995), which is 50 in this case, and is larger than 65 to achieve a statistical power of 80 % with an $R^2$ of at least .25 at the significance level $p < .05$ (Cohen, 1992). Second, the research goal is to find support for the postulated theoretical framework. Research on the influencing factors of service innovation capabilities is far away from saturated, and the same holds true for their effects on corporate performance measures. Hence, my investigation is exploratory in nature, which is said to be well analyzed by PLS-SEM (Chen et al., 2009; Hair et al., 2011). Finally, PLS-SEM has fewer constraints and statistical specifications than covariance-based techniques (CB-SEM) (Groth et al., 2009). For the calculations, I used the freely available software SmartPLS 2.0 (Ringle et al., 2005). In the PLS-SEM analyses, I used the bootstrapping procedure with 5,000 resamples and 87 cases[40] to generate the t-values (Fornell and Bookstein, 1982; Hair et al., 2014). Ordinary least squares (OLS) analyses will be applied to provide robustness checks of the PLS-SEM results using the software STATA 12.

[40] It is recommended that "*each bootstrap sample should have the same number of observations as the original sample*" (Hair et al., 2014, p. 132).

**Measures.** The constructs of the theoretical framework are primarily based on past research on service and product innovation, with the constructs from the latter adapted to the service innovation context. For the applied constructs, I used seven-point Likert-type scales which ranged from 1, "*strongly disagree*"/ "*much worse*", to 7, "*strongly agree*"/ "*much better*". All constructs consisted of multiple items and were reflective.

- Top management commitment

The top management commitment construct was mainly based on Swink's (2000) three-item construct that includes project goal determination, sufficient resource provision, and commitment to the project. To clarify that the statements relate to service innovation projects and not to product innovation projects the items were adjusted, accordingly. The phrase *"Our firm's Top Management …"* introduced the items about top managers' behavior to which the respondent could indicate his/ her level of agreement. Furthermore, I extended the construct of Swink (2000) by a reverse-coded item ("… *does not support service innovation projects"*) to further reduce sources for common method bias (Baumgartner and Steenkamp, 2001; Podsakoff et al., 2012). Regarding the final item of the construct I consider the actual involvement of top managers as decision makers to be crucial which is in line with the accepted suggestions of Cooper et al. (2004a). I thus added the item *"… is strongly involved in important decisions regarding service innovations projects."*

- Corporate service innovativeness

For the construct corporate service innovativeness I operationalized the extent of service innovation activity which is reflected in the stable engagement in service innovation projects. For this, I adjusted innovativeness constructs to the present study. I based the items on statements measuring the presence of certain degrees of innovativeness of the service innovation projects in the firm and considered a scale developed by Gatignon et al. (2002). Since their scale is mainly related to the radicalness of technology innovation, I additionally incorporated scales developed in the service innovation field, e.g. de Brentani's (2001) single-item of innovativeness and the items in the study of Oke (2007) that distinguish between incremental, me-too, and radical innovations. To capture the extent of service innovation at corporate level the items were preceded by *"The majority of our firm's innovations are …."* This introduction was followed by differing levels of innovativeness of the firm's service innovations to which the respondent could individually express the level of agreement.

- Service innovation capabilities

The construct reflecting service innovation capabilities was inspired by the relative firm success scale of Dyer and Song (1997). Besides considering corporate performance outcomes like market shares, the authors phrase statements about the new product program success, for example, that the new product program has met its objectives. I selected those two items from this construct, which are linked to innovation program success, and adjusted them to the service context. In addition, I complemented these two items with the statement *"From an overall profitability standpoint, our new service development program has been successful."* Hence, the construct comprises how successful the firm is to generate service innovations. In contrast to the following consequence measures, this construct focuses on the capabilities to develop innovative service. However, it does not cover the effect which these service innovations have on firm-level performance indicators. This idea to capture capabilities in the evaluation of the overall ability to conduct service innovation projects conforms with past research (e.g. Storey and Hughes, 2013).

An alternative construct was used to check on the robustness of the construct of service innovation capabilities. In line with other works (e.g. Menor and Roth, 2007), I used an alternative construct that reflects the actual activities in the different phases of a new service development process.[41] Since a new service development process can be distinguished in several phases (see e.g. Ching-Chow, 2007; Kindström and Kowalkowski, 2009; Lenfle and Midler, 2009), I applied a higher-order construct.[42] For example, the construct included items such as *"In the initial phase of a service innovation project… we determine goals for the service innovation"*, *"In the development phase of a service innovation project … we develop a concept for the service innovation (e.g. as a sort of prototype)"*, or *"In the commercialization phase of a service innovation project … we support our customers regarding the service innovation (e.g. with trainings)."*

[41] The construct was assessed against reliability, convergent validity, and discriminant validity of the measurement model. The results revealed satisfying values (see Appendix, Table A-9); however, regarding the model's overall fit the results are below accepted thresholds in research ($\chi^2$/ df = 1.69; RMSEA = .09; SRMR = .09; CFI = .78; TLI = .76; IFI = .79) (e.g. Groth et al., 2009). To avoid confusion, this construct is not included in the following paragraphs which present the assessment of the measurement model of the proposed theoretical model.

[42] Higher-order models (or hierarchical component models) are used to involve testing second-order structures that contain two layers of constructs (Hair et al., 2014). A higher-order model can be setup thus that a general construct consists of several sub-dimensions. In this case, the new service development activities are reflected by activities in three differentiated phases, i.e. the initiation phase, the development phase, and the commercialization phase.

- Market performance

To measure the firm's market performance I used the sales and market share performance scale developed by de Brentani (1989). The introductory sentence *"The service innovations of our firm lead to…"* was phrased, which was followed by five statements. Since the pre-tests indicated that the optional statement in de Brentani's (1989) scale might cause ambiguity (e.g. *"exceeded sales/ customer use level objectives"*), I desisted from those unclear statements and preferred the four items regarding market share, profitability and firm image (see also Cooper et al., 1994; Cooper and Kleinschmidt, 1995). Furthermore, I added *"increased incoming orders"* as an insight from prior interviews with practitioners (see Chapter 3).

- Competitive advantage

Similar to Carbonell et al. (2009), I assessed the gained competitive advantage through service innovations with items from the competitive performance scale of de Brentani (1989). This non-financial measure captures the superiority of the service innovations in comparison to the competitors' new services. The competitive advantage is achieved by better service outcomes, service experience made by the customers, and unique benefits perceived by the customers.

- Efficiency

I operationalized improved efficiency as reduced costs. The applied construct is primarily based on de Brentani's (1989) three-item cost performance scale. Since the aim is to measure the constructs' reliably and validly, I use such a multi-item construct instead of relying on a single-item (e.g. den Hertog et al., 2011). As with the corporate market performance scale, the cost scale's items were preceded by the introduction *"The service innovations of our firm lead to…."* The respondents were asked to indicate their agreement to the statements whether service innovation lead to lowered costs, to lower costs than expected, and whether they help to generate cost efficiencies.

As with the construct service innovation capabilities, I applied an alternative construct that reflects the firm-level performance.[43] This construct measures the success in comparison

[43] The construct was assessed against reliability, convergent validity, and discriminant validity of the measurement model. The results revealed satisfying values (see Appendix, Table A-9). Similarly, the model fit was satisfying ($\chi^2$/ df = 1.29; RMSEA = .06; SRMR = .08; CFI = .93; TLI = .92; IFI = .93). To avoid confusion, this construct is not included in the following paragraphs which present the assessment of the measurement model of the proposed theoretical model.

with relevant competitors. In response to the question *"Relative to your competitors, how does your company perform concerning the following statements?"* the respondents were asked to evaluate, for example, their firm's performance regarding *"Achieving overall performance"*, *"Attaining market share"*, and *"Marketing activities."*

- Controls

I included the control measures product innovation orientation, environmental dynamism, firm size, firm age, and sector. The first measure relates to the extent of product innovation relevance, which is measured with the product innovation strategy scale of Li and Atuahene-Gima (2001). Product innovation orientation is included in the analyses, as it might affect service innovation capabilities and firm-level performance of a firm. A broad experience in innovation activities could possibly enhance a firm's capabilities to generate innovative services successfully. The second construct I consider is environmental dynamism, a well-acknowledged variable in innovation research, for which I used items from the scales applied in other innovation studies (De Luca and Atuahene-Gima, 2007; Jansen et al., 2006). For example, environmental dynamism has been found to influence the relationship between dynamic capabilities and competitive advantage (Schilke, 2014) as well as between strategic leadership and organizational learning (Jansen et al., 2009). Finally, I included further control measures in additional robustness checks, such as firm size, firm age, and sector. The former two controls are relevant to check for the influence of available resources and existing experience/ inertia (e.g. Huergo and Jaumandreu, 2004; Shefer and Frenkel, 2005). Regarding the latter control measure, since prior research states that service sectors are difficult to compare due to their specificities (Abreu et al., 2010; Castro et al., 2011), I analyzed whether belonging to a certain sector has implications for the relation proposed in the theoretical framework.

**Measurement model.** I assessed the reliability, convergent validity, and discriminant validity of the measurement model to be able to test the hypothesized model.[44] As a first step, I conducted both an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA). To have a first indication for the distinctiveness of the constructs, I conducted an EFA on the independent as well as dependent variables with varimax-rotation and Kaiser

[44] The variables used for the exogenous and control variables were provided by the second respondents, while the variables used for the endogenous variables were provided by the first respondents. The construct service innovation capabilities is endogenous; however, since it requires detailed knowledge about the ability to generate service innovations, the group of second respondents was chosen to provide the data on this construct (see more explanation about the assignments of the respondent groups in the paragraph about descriptive statistics in Section 4.2.1.).

normalization (Backhaus et al., 2003; Hair et al., 2009). The results indicate that the items of the constructs predominantly load according to the theoretical reasoning. One exception is the item "The service innovations give our firm an important competitive advantage" loads on the constructs market performance with a loading of .54 and on competitive advantage with a loading of .60. Since the item clearly refers to competitive advantage, thus theoretically relates more to the respective construct, this item should sufficiently reflect this latent construct. Another exception is the item *"Our firm's service innovations lead to large market share (relative)"* which loads more on the construct market performance (.62) and less on the construct efficiency with a value of .53. As the item is theoretically stronger related to the former construct and loads more on it, the item will be further considered as reflecting the market performance. Moreover, the item *"The overall performance of our new service development program has met our objects"* does not load on the construct service innovation capabilities. Since this item is considered theoretically relevant to what the construct reflects, I will continue to analyze this item in the following CFA. For the interested reader, the results are shown in the Appendix (Table A-7 and Table A-8).

Subsequently, I conducted a CFA with the software tools AMOS 21 and STATA 12. The Cronbach's alphas of all scales are well above .70, which indicates a high internal consistency reliability of the constructs (Hair et al., 2009). Although the loading of the items *"… does not support service innovation projects"* and *"defines very explicit service innovation project objectives"* was relatively low (.57 and .59, respectively), I consider them as theoretically relevant for the construct. Therefore, based on established statistics literature I refrained from dropping this item and continued the evaluation of the constructs overall fit and construct validity (Backhaus et al., 2011; Hair et al., 2009). All constructs revealed a composite reliability in the range of .78 and .92, which is considered satisfactory (Chin, 1998; Hair et al., 2009). Furthermore, the scales of the model show an average variance extracted (AVE) which is greater than .50, i.e. the constructs explain more than

**Table 4-4. Measure Validation**

| Items | Loadings | Cron. α | CR | AVE |
|---|---|---|---|---|
| *Top management commitment* | | .82 | .83 | .51 |
| Our firm's Top Management | | | | |
| - defines very explicit service innovation project objectives | .59 | | | |
| - provides the necessary resources for service innovation projects | .73 | | | |
| - is strongly committed to service innovations | .98 | | | |
| - does not support service innovation projects | .57 | | | |
| - is strongly involved in important decisions regarding service innovations projects | .63 | | | |

| Items | Loadings | Cron. α | CR | AVE |
|---|---|---|---|---|
| *Top management commitment* | | .82 | .83 | .51 |
| *Corporate service innovativeness* | | .76 | .78 | .55 |
| The majority of our firm's service innovations are | | | | |
| - new to the world | .83 | | | |
| - new to the relevant industry | .82 | | | |
| - new to our firm | .53 | | | |
| *Service innovation capabilities* | | .84 | .85 | .66 |
| The overall performance of our new service development program has met our objectives | .66 | | | |
| From an overall profitability standpoint, our new service development program has been successful | .83 | | | |
| Compared with our major competitors, our overall new service development program is far more successful | .91 | | | |
| *Market performance* | | .90 | .91 | .66 |
| Our firm's service innovations lead to | | | | |
| - increased market share | .87 | | | |
| - increased incoming orders | .87 | | | |
| - large market share (relative) | .82 | | | |
| - high profitability (in total) | .77 | | | |
| - strong positive impact on our firm's image (reputation) | .72 | | | |
| *Competitive advantage* | | .92 | .92 | .75 |
| We (our firm) generate superior services to competitors | .92 | | | |
| We generate services whose impact is superior to the impact of our competitors' services (e.g. increased efficiency) | .95 | | | |
| The service innovations' unique benefits are perceived as superior to competitors | .82 | | | |
| The service innovations give our firm an important competitive advantage | .75 | | | |
| *Efficiency* | | .89 | .90 | .74 |
| Our firm's service innovations lead to | | | | |
| - substantially reduced costs | .93 | | | |
| - costs which are lower than expected | .80 | | | |
| - important costs efficiencies | .85 | | | |
| *Product innovation orientation* | | .90 | .91 | .66 |
| We (our firm) place constant emphasis on developing new products through allocating substantial financial resources | .86 | | | |
| We develop a large variety of new product lines | .85 | | | |
| We constantly introduce new products to the market | .93 | | | |
| Our organization has a strong overall commitment to develop and market new products | .82 | | | |
| We are used to dramatic changes to our product | .56 | | | |
| *Environmental dynamism* | | .83 | .84 | .56 |
| Environmental changes in our market are intense | .85 | | | |
| Our clients regularly ask for new services | .67 | | | |
| In our market, changes are taking place continuously | .87 | | | |
| In our market, the volumes of services to be delivered change fast and often | .59 | | | |

**Notes:** n = 87. Loadings: standard coefficient; Cron. α: Cronbach's α; CR: composite reliability; AVE: average variance extracted. All factor loadings are significant at $p < .01$. All items were measured on a seven-point scale, anchored by 1 = strongly disagree and 7 = strongly agree.

half of the variance of their indicators (Hair et al., 2014). Therefore, I find evidence for convergent validity of all constructs. An overview of the items of the constructs is provided in Table 4-4.[45] To test for discriminant validity I followed Fornell and Lacker's (1981) approach and checked if each of the construct shared less variance with the other constructs than with its own associated indicators. For this, I square rooted the AVEs of each construct and proved whether the resulting value is greater than the highest correlation with another construct. As reported in Table 4-5, all constructs fulfilled this criterion, thus I consider the discriminant validity provided.[46]

**Table 4-5. Means, Standard Deviations, and Correlations**

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| Top management commitment | 4.81 | 1.26 | (.71) | | | | | | | |
| Corporate service innovativeness | 4.05 | 1.34 | .22 | (.74) | | | | | | |
| Service innovation capabilities | 4.20 | 1.24 | .54 | .47 | (.81) | | | | | |
| Market performance | 4.54 | 1.17 | .30 | .24 | .51 | (.81) | | | | |
| Competitive advantage | 4.51 | 1.18 | .20 | .32 | .50 | .67 | (.86) | | | |
| Efficiency | 3.62 | 1.24 | .25 | .23 | .37 | .65 | .55 | (.86) | | |
| Product innovation orientation | 3.15 | 1.43 | .39 | .29 | .32 | .14 | .01 | .07 | (.88) | |
| Environmental dynamism | 4.80 | 1.15 | .25 | .28 | .31 | .25 | .09 | .13 | .20 | (.75) |

**Notes:** n = 87. Numbers on the diagonal show square roots of AVE, numbers below the diagonal show correlations. Correlations with absolute value >.28 are significant at the level $p < .01$ and with a value > .21 at the level $p < .05$.

I further assessed the model's overall fit to the data. According to methodological literature, a value of normed Chi-square smaller than two (conservative threshold), a root-mean-square error of approximation (RMSEA) smaller than .08, and a standardized root mean square residual (SRMR) smaller than .10 indicate a satisfactory goodness-of-fit (Hair et al., 2009). The postulated model fulfills the required criteria ($\chi^2$/ df = 1.43; RMSEA = .07; SRMR = .08). With regard to the fit measures of CFI, TLI and IFI, the model shows satisfactory values around .90 (CFI = .90, TLI = .88, IFI = .90). Since SmartPLS cannot calculate the tolerance levels in the

[45] Information on the alternative constructs are provided in the Appendix, Table A-9.
[46] The correlation matrix of all used variables shown in the Appendix, Table A-10.

predictor constructs, I used STATA 12 to check for multi-collinearity. All values are below a maximum value of 1.75 (variable service innovation capabilities) and thus lie in the accepted range (Hair et al., 2009; Hair et al., 2014).

## 4.3. Antecedents of Service Innovation Capabilities

### 4.3.1. Past Research on Antecedents of Dynamic Capabilities

**Decision making in innovation.** Organizations face a continuously changing environment. To be able to respond to the environmental instabilities, dynamic capabilities literature has emphasized the crucial role of decision making. For example, in his review on dynamic capabilities, Barreto (2010) considers timely and market-oriented decision making as central to the dynamic capabilities construct. This understanding is aligned with the conclusion of Teece (2007) that managers need to anticipate emerging threats and identify potential opportunities. For this reason, an unbiased evaluation of both future developments in the market and return on investments can be crucial. Managers are responsible to determine resource allocations by considering how external activities and internal activities, such as innovation projects, connect. With developed dynamic capabilities, the result of the decision making should be the change of resources that leads to a competitive advantage (Peteraf et al., 2013). To accomplish this challenging goal, managers are required to get involved in current processes and deliberately adjust organizational processes with a long term orientation (Pablo et al., 2007; Salvato, 2003). This multi-faceted role of top managers is additionally reflected by the need to continuously revise product offerings, systems, routines, and structures, but also to actively communicate with the organization's members to achieve acceptance for innovation and efficiency as important overarching corporate goals (Teece, 2007).

In product innovation literature top and senior managers' role in innovation processes is well-acknowledged (Ernst, 2002; Holahan et al., 2014). For example, Bart (1991) found in his exploratory study that the formal control is relatively loose, while the involvement of top managers, i.e. the informal control, is relatively strict. This appreciation for engagement is in line with the idea of a successful stage gate process (Cooper et al., 2004b), where senior managers are advised to participate in gate meetings. Research on service innovation emphasizes that service innovation projects need to reflect an organizations strategy (Thwaites, 1992) and assigns the top management to ensure such alignment (Antonacopoulou and Konstantinou, 2008; Bader, 2008). In line with this view, the study of Van Riel et al. (2004) reveals that service innovation success is dependent on the knowledge and information of

decision makers. However, other stakeholders including customers and front-line employees have received more attention by research in the service innovation context (Lee and Chen, 2009; Melton and Hartline, 2010; Zomerdijk and Voss, 2011). As a result of this focus in research, the actual involvement of decision makers and its effect on service innovation capabilities of the firm has remained underrepresented in the service innovation literature.

**Learning in innovation**. Learning mechanisms shape the development of capabilities and knowledge (Eisenhardt and Martin, 2000). To foster learning, organizations can pursue R&D activities or collaborate externally (Teece, 2007). As research indicates, repeated practice might contribute to learning; however, there are multiple works that direct to a more systematic application of learning mechanisms. For example, Argote (1999) and Zander and Kogut (1995) found that formalizing the learning experience into defined processes facilitates the establishment of repeatable routines. Findings from the cross-industry study of alliances conducted by Kale et al. (2002) also underline the value of transferring the gained experience into (in this case) a dedicated function in the firm. Another way to benefit more from learning is to create a conscious learning process. Zollo and Winter (2002) stress the importance of knowledge articulation and knowledge codification, which are especially relevant in situations characterized by little experience, ambiguity, and uncertainty of outcomes in tasks. Though this systematic learning seems to be beneficial for many firms, Zahra et al. (2006) raise attention that for new ventures, learning with a trial-and-error approach is more likely to occur due to the lack of experience.

In the new product development field, the knowledge about innovation is considered very specific and is strongly influenced by previous knowledge generating processes (Block et al., 2013; Carlile, 2004; Keupp and Gassmann, 2013). Though firms might be established and have generated innovation capabilities through learning, they are required to continuously review and adjust their existing knowledge (Ahuja and Morris Lampert, 2001). Hence, recombining existing knowledge can serve as overhaul of organizational capabilities (Floyd and Wooldridge, 1999; Zahra et al., 1999). In the service innovation context, only few studies addressed the importance of learning (Anderson et al., 2011; Blazevic and Lievens, 2004; Pires et al., 2008). For example, findings illustrate that there is a positive impact of the learning process on commitment to service innovation (Anderson et al., 2011). A further example is the study of Pires et al. (2008) who identify the importance of continuous improvement of service companies' process innovations. Despite these few investigations, the question remains to what extent constant learning influences a company's service innovation capabilities.

### 4.3.2. Theory and Hypotheses on Antecedents of Service Innovation Capabilities

**Influence of top management commitment on service innovation capabilities.** Innovation projects supported by the organization's decision makers are more successful than those without support (Swink, 2000). Especially in the product innovation literature the importance of senior management has received broad acceptance (Brown and Eisenhardt, 1995; Cooper et al., 2004a; Holahan et al., 2014). The identified role that senior managers possess is manifold: First, they are important to assure that the preconditions are implemented to pursue innovation products, i.e. provide financial as well as political resources, such as the approval to continue the innovation project (Cooper and Kleinschmidt, 1995; Kuczmarski, 2006). Second, they implement a culture of innovation and creative problem solving, which furthers the innovative ideas and thus the development of promising new products (Imai et al., 1985). Third, senior management should get involved in innovation projects, for example by participating in go/ kill decisions of innovation projects (Cooper et al., 2004b; Montoya-Weiss and Calantone, 1994; Reid and De Brentani, 2004). Finally, by determining a vision and fulfilling a leadership function decision makers assure alignment of the corporate's strategy and the innovation project goals (Cooper et al., 2004a; Imai et al., 1985).

Though the disparity of services and products (Cooper and de Brentani, 1991; Jaw et al., 2010) requires differentiation in innovation activities (de Vries, 2006; Vargo and Lusch, 2004), the importance of decision makers is equally important. First findings have shown that their participation in service innovation projects leads to an increase of new service success (Martin Jr. and Horne, 1995). In a similar vein, de Brentani and Ragot (1996) state that top and senior managers can positively influence the outcome of new services by promoting an innovation culture, assuring strategic alignment, and acting as so-called visionaries and mentors in the new service development process (see also Blazevic and Lievens, 2004). This engagement was found to be even more relevant for very innovative new services (de Brentani, 2001). Besides these examples, the role of decision makers in service innovation project has not been further investigated. Whether their actual commitment leads to improved capabilities to develop service innovation or not has not been clarified, so far.

As de Brentani (2001) states, "*successful innovation starts with senior management and explicates the specific importance of the top management level*" (p. 183). Thus, top management holds a special role in service innovation. Besides promoting innovation projects with financial resources and general encouragement to pursue innovation, top managers' role in providing investments in human resources is additionally crucial. Since the service innovation literature

assigns a decisive leverage of service innovation skills to develop successful service innovations (Easingwood, 1986; Van Riel et al., 2004), it is very important that top management supports personnel development and hires service innovation experts. Furthermore, the decision makers at the strategic level consider long term objectives and are able to guide service innovation projects towards the organization's intended direction. Being involved in the innovation projects, for example by setting service innovation project goals, the top management is able to assure strategic orientation and express commitment to innovation projects.

As a consequence, the capabilities to pursue service innovation will increase, because top managers create the innovation culture within the organization, they provide required preconditions for the service innovation projects, and ensure the strategic orientation of service innovation activities. Moreover, part of the firm's strategy is to address the challenge of a changing environment. The involvement in service innovation projects enables the top management to assess the adequacy of new service development routines against existing and upcoming environmental changes and initiate adjustments, accordingly. Hence, top management commitment constantly advances service innovation capabilities. Therefore, I propose:

> **H1:** Top management commitment to service innovation is positively associated with service innovation capabilities.

**Influence of corporate service innovativeness on service innovation capabilities**. The conduction of innovation activities can serve as a learning mechanism that increases dynamic capabilities (Teece, 2007). A continuous engagement in innovation does not only increase the knowledge about how to innovate, i.e. which specific routines are beneficial; rather, it gives the firm the opportunity to constantly revise its routines against both changing internal and external requirements. Accordingly, dynamic capabilities are considered to be "*organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die*" (Eisenhardt and Martin, 2000, p. 1107). These organizational and strategic routines consist of various elements, such as the product development process and cross-functional R&D teams (Teece, 2007). Consequently, an emphasis on service innovation will similarly affect service innovation capabilities in multiple ways. As indicated in the dynamic capabilities literature, a firm that builds up innovation capabilities systematically, will probably advance its capabilities more effectively (Argote, 1999; Zollo and Winter, 2002). Hence, continuously stressing the importance of service

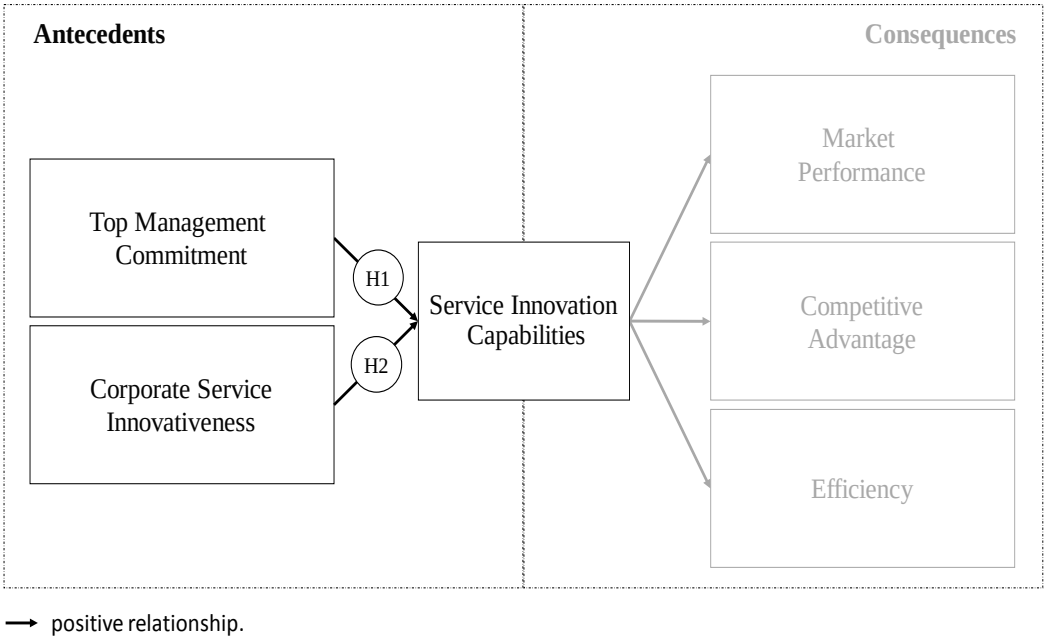
innovation, for example by communicating new service success stories and lessons learnt organization-wide, will further the development of service innovation capabilities.

In general innovation literature, the degree of innovativeness or newness of innovations has received considerable attention (Ernst, 2002; Papastathopoulou and Hultink, 2012). Often the innovations are characterized as ranging from not innovative to highly innovative (Avlonitis et al., 2001). Despite this apparent agreement, a clear cut differentiation between the levels of innovativeness is challenging and even the mature product innovation research has not been able to clarify definitions and operationalization (Garcia and Calantone, 2002). Furthermore, service innovations are characterized as predominantly incremental (Chan et al., 1998; Forsman, 2011; Roberts and Amit, 2003) and the interpretation of innovativeness of services is even more complicated by the fact that service characteristics differ to those of products. The services' intangibility and heterogeneity make them ambiguous and thus difficult to grasp (Jaw et al., 2010).

To address this vagueness and interpretability of service innovativeness, I emphasize the extent of organization's service innovation activities, i.e. corporate service innovativeness, instead of distinguishing between the degrees of innovativeness of individual new services. The aim is to capture the organizational developmental dynamic capabilities, which potentially comprise developing service innovations with distinctive levels of radicalness. This idea is aligned with the understanding of service innovation which leads to new experiences for current and new customers (Damanpour et al., 2009; den Hertog et al., 2010). Hence, if a firm develops services that are perceived as new or different by the customers, it has performed innovative activities. I argue that firms that continuously engage in service innovation projects are innovative, and the more they strive to develop new services, the higher the level of corporate service innovativeness is. Accordingly, firms will learn through the development of services (Blazevic and Lievens, 2004) which may be categorized differently with regard to their individual degree of innovativeness. In conclusion, a firm that continuously engages in service innovation learns and builds up valuable experience and knowledge. This innovativeness will further enhance the firm's capabilities to successfully develop new services. Therefore, I postulate:

> **H2:** Corporate service innovativeness is positively associated with service innovation capabilities.

**Figure 4-3. Antecedents of Service Innovation Capabilities**




### 4.3.3. Results

Table 4-6 presents the results of the partial least squares structural equation modeling (PLS-SEM) analysis.[47] The hypothesized relationships regarding the antecedents in the theoretical framework are supported by the results; both relationships are significant at the level $p < .01$ (H1-H2). Top management commitment and corporate service innovativeness have a comparable positive impact on service innovation capabilities with $\beta = .43$ and $\beta = .32$, respectively.

Following the procedure of Groth et al. (2009), I compared a baseline model which includes the control variables product innovation orientation and environmental dynamism to the theoretical framework. This enabled me to detect the increased variance explained by the model's constructs. I checked with ordinary least squares (OLS) regressions whether the increase in variance explained was significant and found that the variance explained of all endogenous variables was significantly increased at the level $p < .01$. The additional $R^2$ is .25 for service innovation capabilities. In the baseline model, the control variables product innovation orientation and environmental dynamism significantly influence the variable service

[47] Table 4-6 contains the results of the PLS-SEM analysis on the theoretical model. The results concerning the proposed relationships of the consequences are grayed out. In Section 4.4.3., the same table is presented with the results regarding all proposed relationships in the theoretical model.

innovation capabilities ($\beta$ = .32 at significance level p < .01 and $\beta$ = .28 at significance level p < .05, respectively). These effects vanish in the proposed theoretical framework.

As suggested by Hair et al. (2014), I further analyzed the predictive relevance for the constructs in the postulated theoretical framework. Accordingly, I conducted the blindfolding procedure to calculate $Q^2$ for each endogenous constructs. The $Q^2$ value of the construct service innovation capabilities is with a value of .33 considerably above zero, which indicates support for the model's predictive relevance. I determined the effect size $f^2$ to identify the contribution of each exogenous variable to an endogenous variable's $R^2$ (Hair et al., 2014). With $f^2$ values above .15 the variables top management commitment (.26) and corporate service innovativeness (.15) have a medium effect on service innovation capabilities' $R^2$. In the Appendix, more details on the predictive relevance and the impact of the influencing variables are reported (Table A-11).

**Table 4-6. Results of PLS-SEM Analysis**

| Hypothesis | Path from | Via | To | Baseline Model Path Coefficient (t-statistic) | Theoretical Model Path Coefficient (t-statistic) | Extended Model Path Coefficient (t-statistic) |
|---|---|---|---|---|---|---|
| H1 | Top M. Com. | | SI Cap. | | .43** (4.47) | .42** (4.53) |
| H2 | Corp. S. Inno. | | SI Cap. | | .32** (3.73) | .31** (3.62) |
| H3a | SI Cap. | | Market Perf. | | .47** (4.64) | .40** (3.50) |
| H3b | SI Cap. | | Comp. Adv. | | .57** (6.05) | .49** (4.37) |
| H3c | SI Cap. | | Efficiency | | .37** (3.55) | .27* (2.47) |
| | E. Dynamism | | SI Cap. | .28* (2.36) | .11 (1.01) | .10 (1.04) |
| | Product Inno. | | SI Cap. | .32** (2.71) | .10 (0.95) | .11 (0.99) |
| | E. Dynamism | | Market Perf. | .22 (1.55) | .08 (0.60) | .07 (0.48) |
| | Product Inno. | | Market Perf. | .07 (0.58) | -.09 (0.71) | -.11 (0.75) |
| | E. Dynamism | | Comp. Adv. | .13 (0.82) | -.04 (0.53) | -.07 (0.72) |
| | Product Inno. | | Comp. Adv. | .02 (0.21) | -.17 (1.54) | -.19† (1.71) |
| | E. Dynamism | | Efficiency | .15 (1.06) | . 04 (0.18) | .01 (0.05) |
| | Product Inno. | | Efficiency | .08 (0.55) | -.05 (0.33) | -.09 (0.52) |
| | Top M. Com. | | Market Perf. | | | .14 (0.78) |
| | Top M. Com. | | Comp. Adv. | | | .03 (0.09) |
| | Top M. Com. | | Efficiency | | | .13 (0.81) |
| | Corp. S. Inno. | | Market Perf. | | | .01 (0.10) |
| | Corp. S. Inno. | | Comp. Adv. | | | .16 (1.29) |
| | Corp. S. Inno. | | Efficiency | | | .11 (0.81) |
| | Top M. Com. | SI Cap. | Market Perf. | | | .30* (2.24) |
| | Top M. Com. | SI Cap. | Comp. Adv. | | | .23† (1.76) |
| | Top M. Com. | SI Cap. | Efficiency | | | .25† (1.81) |
| | Corp. S. Inno. | SI Cap. | Market Perf. | | | .14 (1.30) |
| | Corp. S. Inno. | SI Cap. | Comp. Adv. | | | .31* (2.60) |
| | Corp. S. Inno. | SI Cap. | Efficiency | | | .19 (1.56) |
| $R^2$, SI Cap. | | | | .22 | .47 | .46 |
| $R^2$, Market Perf. | | | | .05 | .22 | .23 |
| $R^2$, Comp. Adv. | | | | .03 | .27 | .29 |
| $R^2$, Efficiency | | | | .02 | .13 | .15 |

**Notes:** n = 87; PLS-SEM: partial least squares structural equation modeling; Comp. Adv.: competitive advantage; Corp. S. Inno.: corporate service innovativeness; E. Dynamism: environmental dynamism; Market Perf.: market performance; Product Inno.: product innovation orientation; Top M. Com.: top management commitment; SI Cap.: service innovation capabilities. Values of t were calculated with bootstrapping procedure with 5,000 samples of 87 cases. Significance level: † < 10 %; * < 5 %; ** < 1 %.

I extended the analysis by identifying moderating effects of both control variables. Product innovation orientation neither moderated the relationship of the exogenous variable top management commitment nor of corporate service innovativeness to the endogenous variable service innovation capabilities. Hence, whether a company regularly pursues product innovation activities does not affect the influence of top management commitment and corporate service innovativeness on a company's capabilities to generate new services. I also checked for moderating effects of environmental dynamism. I did not find any indications for moderated relationships through the control variable environmental dynamism.

**Table 4-7. Alternative Service Innovation Capability Construct (PLS-SEM)**

| | | | Theoretical Model | |
|---|---|---|---|---|
| | | | n = 87 | n = 122 |
| **Hypothesis** | **Path from** | **To** | **Path Coefficient (t-statistic)** | **Path Coefficient (t-statistic)** |
| H1 (alternative) | Top M. Com. | SI Cap. (2) | .33** (3.03) | .41** (6.87) |
| H2 (alternative) | Corp. S. Inno. | SI Cap. (2) | .32** (3.47) | .27** (4.00) |
| H3a (alternative) | SI Cap. (2) | Market Perf. | .29** (2.46) | .58** (6.18) |
| H3b (alternative) | SI Cap. (2) | Comp. Adv. | .33** (2.73) | .59** (6.26) |
| H3c (alternative) | SI Cap. (2) | Efficiency | .26* (1.99) | .40** (4.19) |
| | E. Dynamism | SI Activities | .22* (2.47) | .20** (3.02) |
| | Product Inno. | SI Activities | .09 (0.69) | .12 (1.48) |
| | E. Dynamism | Market Perf. | .10 (0.70) | .16† (1.58) |
| | Product Inno. | Market Perf. | -.01 (0.06) | .08 (0.92) |
| | E. Dynamism | Comp. Adv. | -.01 (0.16) | -.01 (0.03) |
| | Product Inno. | Comp. Adv. | -.07 (0.51) | .13 (1.32) |
| | E. Dynamism | Efficiency | . 04 (0.13) | .18† (1.57) |
| | Product Inno. | Efficiency | -.01 (0.05) | .06 (0.62) |
| $R^2$, SI Cap. (2) | | | .44 | .57 |
| $R^2$, Market Perf. | | | .12 | .52 |
| $R^2$, Comp. Adv. | | | .08 | .44 |
| $R^2$, Efficiency | | | .10 | .30 |

**Notes:** PLS-SEM: partial least squares structural equation modeling; Comp. Adv.: competitive advantage; Corp. S. Inno.: corporate service Innovativeness; E. Dynamism: environmental dynamism; Market Perf.: market performance; Product Inno.: product innovation orientation; Top M. Com.: top management commitment; SI Cap. (2): service innovation capabilities (alternative construct). Values of t were calculated with bootstrapping procedure with 5,000 samples of 87/ 122 cases. Significance level: † = p < 10 %; * = p < 5 %; ** = p < 1 %.

I conducted PLS-SEM analyses with alternative constructs for the endogenous constructs service innovation capabilities (see Table 4-7). By using this alternative construct, it

was possible to reflect service innovation capabilities with activities related to the process of new service development (see Section 4.2.2.). The results of the calculation with the alternative service innovation capabilities construct show similar findings on the relationship between top management commitment and service innovation capabilities (represented with the alternative construct) with $\beta = .33$ at a significance level of .01, although the effect size decreased by .10. The same holds true for the construct corporate service innovativeness which has a significant positive impact on service innovation capabilities (represented with the alternative the construct) with $\beta = .32$ at a significance level of .01. Here, the effect size remained the same.

In addition, I conducted OLS regression analyses for two main reasons: to further confirm the results and to be able to include further control variables (see Section 4.2.2). Since the sample size lays constraints to PLS-SEM analyses with regard to the number of constructs and relationships (Barclay et al., 1995; Cohen, 1992), I was not able to consider firm industry, firm age and firm size in the PLS-SEM calculations. This limitation is compensated by the applied OLS regressions. The results confirm the findings from the PLS-SEM calculations (see Table 4-8). Top management commitment has a positive significant effect on service innovation capabilities ($\beta = .39$ at significance level $p < .01$), and corporate service innovativeness also shows comparable results with a positive significant impact on service innovation capabilities ($\beta = .32$ at significance level $p < .01$). The $R^2$ change between the model that includes all control variable, i.e. firm size, firm age, sectors, environmental dynamism, and product innovation orientation, and the model with all control variables as well as the proposed influencing factors of the theoretical model is with .24 significant at the level $p < .01$. While the firm age has a weak significant negative impact on service innovation capabilities in the model without the constructs environmental dynamism, product innovation orientation, top management commitment, and corporate service innovativeness, this effect vanishes in the models including these constructs. Similar to the results derived from the PLS-SEM analyses, environmental dynamism and product innovation orientation positively influence service innovation capabilities, yet the impact is not apparent in the model including the hypothesized relationship between top management commitment and corporate service innovativeness with service innovation capabilities.

**Table 4-8. Service Innovation Capabilities as Dependent Variable (OLS Regression)**

| | n = 87 | | | n = 121 | | |
|---|---|---|---|---|---|---|
| **Variables** | **Model 1** | **Model 2** | **Model 3** | **Model 1** | **Model 2** | **Model 3** |
| Intercept | 4.6** (.66) | 3.0** (.86) | .6 (.74) | 4.0** (.56) | 2.4** (.66) | .52 (.52) |
| Firm size (log) | .05 (.07) | -.00 (.04) | -.00 (.06) | .13* (.07) | .04 (.06) | .03 (.05) |
| Firm age (log) | -.28* (.12) | -.19 (.12) | -.07 (.09) | -.23† (.13) | -.12 (.12) | -.05 (.09) |
| Industry: financial services | .57 (.43) | .14 (.41) | .22 (.33) | .27 (.32) | -.21 (.31) | .05 (.25) |
| Industry: logistics | .30 (.43) | -.16 (.38) | -.07 (.37) | -.00 (.36) | -.37 (.30) | -.23 (.24) |
| Industry: IT services | .03 (.41) | -.54 (.36) | -.41 (.35) | .06 (.34) | -.75* (.33) | -.39 (.28) |
| Environmental dynamism[b] | | .28* (.12) | .13 (.12) | | .25* (.11) | .05 (.10) |
| Product innovation orientation[b] | | .25* (.10) | .05 (.09) | | .36** (.09) | .13† (.07) |
| H1: Top management commitment[b] | | | .39** (.10) | | | .39** (.08) |
| H2: Corporate service innovativeness[b] | | | .32** (.09) | | | .35** (.08) |
| $R^2$ | .08 | .23 | .46 | .05 | .27 | .57 |
| $R^2$ change | | .14** | .24** | | .22** | .30** |
| F | 1.59 | 4.18** | 9.05** | 1.15 | 6.02** | 15.25** |

**Notes**: OLS: ordinary least squares; [a] Unstandardized coefficients are given; robust standard errors in parentheses. [b] Mean-centered. Significance level: † = p < 10 %; * = p < 5 %; ** = p < 1 %.

I ran the same PLS-SEM[48] and OLS regression[49] analyses with the sample consisting of single respondents from each company (n = 122). The results predominantly confirm the findings based on the sub-sample. Surprisingly, the positive influence of top management commitment on service innovation capabilities is not significant ($\beta = .27$). Although in the OLS regression analyses this relationships remains significant using both samples, i.e. single respondents and double respondents, the PLS-SEM analyses lead to differing results. In addition, it is worth mentioning that the influence of product innovation orientation on service innovation capabilities remains in the model including all influencing factors, though weakly significant. This deviates slightly from the results in the PLS-SEM analyses. In Table 4-9 the

[48] See results in the Appendix, Table A-12.
[49] See results in Table 4-8.

results of the hypotheses testing based on the PLS-SEM and OLS regression analyses applied to both samples are summarized.

**Table 4-9. Summary of Hypotheses Testing on Antecedents**

| | n = 87 | | n = 122 | |
|---|---|---|---|---|
| | **PLS-SEM** | **OLS Reg.** | **PLS-SEM** | **OLS Reg.** |
| H1 | supported | supported | not supported | supported |
| H2 | supported | supported | supported | supported |

**Notes:** n = 87: double respondents, n = 122: single respondents. PLS-SEM: partial least squares structural equation modeling; OLS Reg.: ordinary least squares regression.

### 4.3.4. Discussion and Theoretical Implications

In this section, the focus lies on the antecedents of service innovation capabilities. The results clearly underline the crucial role of top management, as its commitment to service innovation positively affects an organization's service innovation capabilities. In line with the dynamic capabilities literature, top management is required to provide the conditions for innovation activities and to be involved in innovation projects (Teece, 2007). Hence, I conclude that support from the top level for innovation is necessary for both products and services. Equally important is the level of innovativeness of the firm, which has a positive impact on service innovation capabilities. If a firm permanently conducts service innovation projects, the findings of this study confirm that this enhances the capabilities to generate new services. This insight clearly underlines the relevance and effectiveness of learning mechanisms. As proposed by others (Argote, 1999; Zollo and Winter, 2002), deliberate engagement and learning enhance even more the establishment of capabilities. I infer from these findings that decision makers need to promote a service innovation culture by performing both adoption of an active role in service innovation projects and encouraging the pursuit of such projects.

The picture of the systematic development of service innovations is not clear at all. On the one hand, researchers advocate a new service development that is similar to that of new product development (Drejer, 2004), others, then again, stress the specificities of services which requires a differing management of service innovation (Lee and Chen, 2009; Melton and Hartline, 2010; Zomerdijk and Voss, 2011). With this study I am not able to resolve this discussion. However, in line with dynamic capabilities research and findings in product innovation research, I find reason to believe that deliberately and systematically building up service innovation capabilities is inevitable to generate measureable benefits from new services.

While service innovations may occur ad hoc (Ettlie and Rosenthal, 2011), in firms with established service innovation engagement the generated new services are more successful. Especially the great effect of the level of corporate service innovativeness unveils the need to consciously pursue service innovation activities. If the firm shows minimal interest in service innovation, the results indicate that the level of capabilities is relatively low.

Regarding the impact of product innovation orientation on service innovation capabilities, the majority of the analyses shows that this relationship vanishes in the model that includes the hypothesized relationships. Hence, top management commitment and corporate service innovativeness contribute to explaining why the level of service innovation capabilities increases, while product innovation orientation seems to only have an influence in the baseline model which includes product innovation orientation and environmental dynamism. Though counterintuitive at first sight, I interpret these results as confirming the presence of service innovation specificities. Therefore, they stress the importance of other factors, such as the here empirically supported engagement from the top management and an ongoing engagement in service innovation. However, in some analyses the positive influence of product innovation orientation remains, even though weakly reliable. Therefore, the interpretation of the results should be handled with caution.

With regard to environmental dynamism, I find that its level does not influence service innovation capabilities. Considering the identified influence of environmental dynamism in general innovation research (Grindley and Teece, 1997; Li and Atuahene-Gima, 2001), these results question the relevance of environmental dynamism in service research. The firms in the sample do not belong to highly dynamic sectors, which are predominantly characterized by technology intensity (EPO & OHIM, 2013). Hence, environmental dynamism might not be the crucial factor which influences service innovation aspirations and the setup of service innovation capabilities of these service providing firms.

Opposed to prevalent convictions in service research (Abreu et al., 2010; Castro et al., 2011), I found that the postulated relationships are applicable to several sectors. The results show that the establishment of service innovation capabilities seems to be similar between distinctive sectors and I was not able to detect influences based on sector relatedness. Therefore, this study underlines commonalities of firms across sectors and thus stresses firm specific rather than sector specific factors concerning the establishment of service innovation capabilities.

**Innovation management research.** The contribution of this study on the antecedents of service innovation capabilities to innovation management research is that I find support for

the importance of top management to commit to service innovations and of corporate service innovativeness to generate service innovations successfully. Although previous research has found first empirical support for the relevance of top managers to increase learning success in single innovation projects (Blazevic and Lievens, 2004), the overall impact of top management commitment on the setup of service innovation capabilities at corporate level is not clarified. Instead, certain actors, such as front-line personnel and customers, were well-acknowledged as determinants of service innovation success (e.g. Ettlie and Rosenthal, 2012; Lages and Piercy, 2012; Melton and Hartline, 2010; Michel et al., 2008; Sørensen et al., 2013; Zomerdijk and Voss, 2011). In addition, rather the level of innovativeness of individual service innovation instead of the extent of constant pursuit of service innovation projects has dominated past research (Forsman, 2011; Ordanini and Parasuraman, 2011; Perks et al., 2012). Hence, this study empirically shows that for companies to benefit from service innovations it requires continuously involved top managers and ongoing corporate service innovation engagement.

**Service research.** I contribute to service research by disentangling indirect and direct relationships between influencing factors and the establishment of capabilities to generate new services. Prior service research has often focused on the impact of antecedents on the success rates at service innovation project-level (Avlonitis et al., 2001; Therrien et al., 2011). With the applied dynamic capabilities perspective I was able to identify the influence of top management commitment and corporate service innovativeness on building up service innovation capabilities at corporate level, thus increased success in conducting service innovation projects. The impact of increased service innovation capabilities on firm-level performance indicators can therefore be analyzed separately (see Section 4.4.). This facilitates a more detailed understanding of the complex relationships of service innovation capabilities.

### 4.3.5. Implications for Practice

This study consisted of firms from various sectors which offer services ranging from very standardized to predominantly project-based services often influenced by technical and technological aspects. Despite this difference, I find that regarding the establishment of service innovation capabilities the support from top managers and corporate service innovativeness is inevitable for all firms. Thus, top managers as well as innovation managers are required to promote innovation projects and get involved. It will not be sufficient to let initiatives like innovation contests be arranged that are open to any idea for new services. Service innovation projects should be aligned to the corporate strategy. To achieve this, a high attention from the

top management and senior level is required, as service innovation projects will then be more successful in meeting defined goals and will have the potential to contribute to the firm's overall performance. This leads to the consequence that innovation managers hold the role of coordinating and integrating the exchange between the projects teams and top management level (Tushman et al., 2010).

Since corporate service innovativeness increases service innovation capabilities, service innovation projects should not be the result of single initiatives. Top managers should rather contribute to an ongoing engagement in service innovation activities which will lead to increased success rates of service innovation projects. This means that there needs to be a shift towards a professional approach to conduct service innovation; similar to research and development in the context of products. Accordingly, top management should include service innovation in their set of corporate goals. If a systematic pursuit of service innovation is established, the firm can develop service innovation capabilities through experience and learning mechanism. More precisely, by conducting service innovation on a regular base, the innovation managers can improve service innovation activities and processes and adjust them if necessary.

To reach the determined goals of service innovation project, it is necessary to develop the required service innovation capabilities. It is risky to solely rely on exceptional individuals who bring up an innovative idea; instead, firms are required to invest in personnel development and to establish supporting structures and processes which help the employees at all levels to contribute to an overall corporate capability to generate successful service innovations (Kuczmarski, 2006; Love and Roper, 2009; Melton and Hartline, 2013). Therefore, it will be necessary to evaluate existing organizational structures and whether job descriptions fit to the requirements of service innovation. It could be a promising approach to establish cross-sectional teams that are dedicated to develop service innovation or to define a specific amount of time where typical daily work is replaced by working on innovative ideas for new services.

### 4.3.6. Limitations and Future Research

Though the present data fulfills the methodological requirements to conduct PLS-SEM analyses (Cohen, 1992; Hair et al., 2014), the relatively small sample size requires cautious interpretation of the results. As I emphasized, this study is exploratory and provides first insights into the complex relationships of service innovation capabilities. It would be valuable to repeat this study with a larger sample set to check for the robustness of the results.

I controlled for common method bias and reduced a potential threat by using the double respondent research approach. I provided arguments for the rules of assignments to each group of respondents (Section 4.2.1.). However, since the theoretical framework of this study comprises several endogenous constructs, i.e. service innovation capabilities as well as the three firm-level performance indicators, I was not able to use different respondents for each analyzed relationship. In the case of the relationships between the antecedents and service innovation capabilities, I used the data of the group of second respondents. Thus, common method bias might influence the findings. To further mitigate potential bias, future research could use secondary data for service innovation capabilities indicators (e.g. performance measures of service innovation programs based on project reports). In addition, though I have derived the hypothesized relationships based on prior research and theoretical deliberations, causality remains an issue in this cross-sectional study. Accordingly, to grasp lagged effects, longitudinal studies would help to make causal inferences.

I have shown that the firm level as unit of analysis contributed to the understanding of relationships between top management commitment, corporate service innovativeness, and service innovation capabilities. It is important that future research details these relationships. For example, with multi-level analysis researchers could analyze what constitutes corporate service innovation capabilities. Research questions like whether a well-defined service innovation program or the breadth of innovation tools (e.g. established innovation department, temporary innovation project teams, innovation contests, etc.) are crucial for developmental capabilities could be addressed.

## 4.4. Consequences of Service Innovation Capabilities

### 4.4.1. Past Research on Consequences of Dynamic Capabilities

Barreto (2010) concisely describes in his review of dynamic capabilities the discussions in prior research on the link between dynamic capabilities and performance measures. Although the direct causal relation is debated by various researchers (e.g. Eisenhardt and Martin, 2000; Zott, 2003), the dominating conviction is that dynamic capabilities positively influence corporate performance and lead to a competitive advantage (Makadok, 2001; Teece, 2007; Zollo and Winter, 2002). However, some argue that if dynamic capabilities are inadequately used (Zahra et al., 2006) or alternative ways are more cost efficient (Winter, 2003) their development and cultivation may cause damage instead of achievement.

In product innovation literature there is a relatively clear picture of the value of developmental capabilities. For example, concepts like the stage gate process are accepted to increase efficiency in the development of new products (Cooper et al., 2004a; Griffin, 1997; Kahn et al., 2006). Furthermore, the incorporation of innovation within the organization's processes and structures has been thoroughly analyzed (Griffin, 1997) and corresponding main success factors identified (Ernst, 2002). In contrast, the picture of the impact of generating new services on corporate performance measures is still vague. Some researchers in the field of service innovation advocate the applicability of acknowledged routines in the new product development sphere to the service innovation context (Drejer, 2004; Ettlie and Rosenthal, 2011). Consequently, these proponents of product and service similarity consider accepted new product development success factors equivalent for the success of new services. The more predominant view, however, is that the difference between service and product implies certain specificities in the innovation context (Berg and Einspruch, 2009; Hurmelinna-Laukkanen and Ritala, 2010). Hence, service innovation research and product innovation may trigger and benefit one another (de Vries, 2006), but the results regarding the link between innovation capabilities and outcomes may not be directly transferrable.

That service innovations have an effect on performance measures has been investigated in a few studies. The existing studies show that service innovations may have an impact on growth (Aas and Pedersen, 2011; Mansury and Love, 2008), financial firm performance (Bogliacino and Pianta, 2013; den Hertog et al., 2011), and operating results (Aas and Pedersen, 2011). However, according to Evangelista and Vezzani (2010), the clarification of service innovation's consequences represents a mainly unexplored topic in service innovation research. A possible explanation is the challenge of measuring service output and service performance (den Hertog et al., 2011), as service innovations are more difficult to evaluate in their effects due to their distinctive characteristics compared to products (Jensen and Warren, 2001). Accordingly, Storey and Kelley (2001) proposed to assess a broad set of measurement ranging from financial to non-financial measures. Regarding the influence of increased service innovation capabilities on firm-level performance literature has missed to fully clarify its existence and strength.

### 4.4.2. Theory and Hypotheses on Consequences of Service Innovation Capabilities

Developing and maintaining dynamic capabilities requires investments which are supposed to improve firms' ability to cope with the changing environment. The basic idea of

the dynamic capabilities construct is to perform better by being able to "*systematically solve problems*" (Barreto, 2010, p. 271). As dynamic capabilities imply product development activities (Eisenhardt and Martin, 2000; Helfat et al., 2007), research underlines that effective innovation processes contribute to improved performance (Helfat et al., 2007). Accordingly, I argue that not the service innovation per se leads to increased outcome measures; rather, the capabilities to adequately address changes in the environment will result in innovative services which are more successful in the market than those of competitors. Opposed to the prevalent understanding of service innovations, which seem to emerge ad hoc (Ettlie and Rosenthal, 2011), I suggest in line with the dynamic capabilities point of view that with service innovation capabilities organizations systematically address the challenges of a dynamic environment. R&D in services might be less formalized (Ettlie and Rosenthal, 2011; Hollenstein, 2003); however, I consider the need to control service innovation projects towards successful outcomes similarly important.

Product innovation research has found that new product development competencies can lead to improved commercial performance (Ernst, 2002; Montoya-Weiss and Calantone, 1994). For example, a study on the U.S. pharmaceutical industry suggests a positive relationship between the propensity to innovate and long-term firm profitability (Roberts, 1999). In a similar vein, Geroski et al. (1993) observe direct effects of innovation on profitability measures. However, they stress the greater indirect effects that result from the transformation of innovation into improved internal capabilities, such as reduced spillovers about the innovations and margins generated.

Papastathopoulou and Hultink (2012) observe in their review on the service innovation literature a decline of the interest on performance measurement in the last decade. This is surprising, since service innovation research lacks conclusive findings regarding the effect of service innovation on firm-level performance measures. Some results indicate that a positive relation between service innovation and performance exists (Aas and Pedersen, 2011; Bogliacino and Pianta, 2013; Cainelli et al., 2006; den Hertog et al., 2011; Mansury and Love, 2008; Menor and Roth, 2008); yet, there are indications that the impact of service innovation on financial and non-financial performance measures is different depending on the service innovation type and how new services are developed (Avlonitis et al., 2001).

I extend the understanding of the direct relationship between individual service innovation projects and performance and suggest a positive impact of service innovation capabilities on firm-level performance measures. By emphasizing the capability component I

seek to address the complexity of direct and indirect effects between service innovations and performance measures (Forsman, 2011; Geroski et al., 1993; Storey and Kahn, 2010). In line with existing studies, I propose a positive relationship between service innovation capabilities and market performance, since increased capabilities will generate service innovations that address and potentially exceed the customer needs (Aas and Pedersen, 2011; de Brentani, 1989). Additionally, to achieve a more holistic view of service innovation capabilities' effects, I derive hypotheses that relate to two further distinct service innovation capabilities outcomes. On the one hand, I consider the implicit value of dynamic capabilities, i.e. to achieve a competitive advantage, and on the other hand I focus on a key specificity of service innovation that explains the focus on improved efficiency.

First, the argument is made that increased service innovation capabilities have an impact on the corporate's position in the market. By considering changes in the environment and gaining experience through the engagement in new service development, i.e. improving service innovation capabilities, the firm will gain a competitive advantage by rearranging its resources and changing its offerings (Peteraf et al., 2013). The innovative services that result from such innovation processes will have a higher probability to appropriately anticipate the change in both demand in the market and competitor behavior (Menor and Roth, 2008). Accordingly, these new services will perform better than those of their competitors.

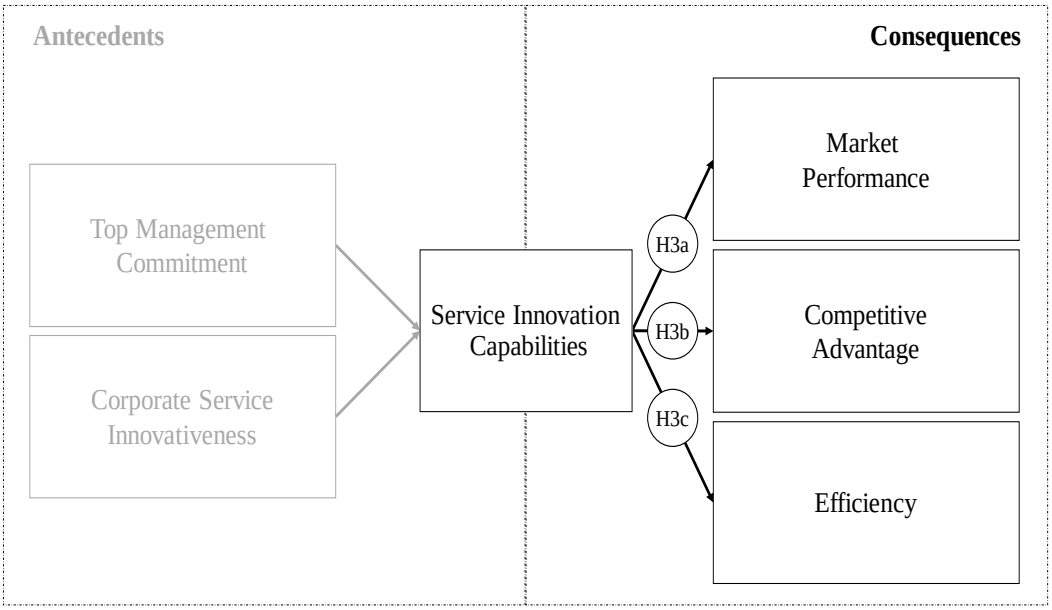
Second, the close interaction with the customer is one of the main differences between products and services (Melton and Hartline, 2010; Oliveira and von Hippel, 2011). This distinct feature of services has several implications. One is that firms can benefit more from the input of customers, hence address the expressed needs and suggested improvements by the customers (Oliveira and von Hippel, 2011). Furthermore, service innovations are often related to service delivery (e.g. Castro et al., 2011; Chen et al., 2009; Cooper and de Brentani, 1991; Koelling et al., 2010; Toivonen and Tuominen, 2009). Smooth delivery processes are found to be crucial for the service innovation success (Chan et al., 1998; Forsman, 2011; Roberts and Amit, 2003). This relevance of significant advancements to satisfy customer needs is also reflected in the incremental character attributed to service innovations. Services are constantly refined. In addition, the perishability of services results in an increased need for fluent operations (de Brentani, 1989). Therefore, these continuous improvements in processes lead to the conclusion that efficiency gains have a salient importance in the service innovation context. Considering these multiple effects of service innovation capabilities, I hypothesize:

**H3a:** Service innovation capabilities are positively associated with market performance.

**H3b:** Service innovation capabilities are positively associated with competitive advantage.

**H3c:** Service innovation capabilities are positively associated with efficiency.

**Figure 4-4. Consequences of Service Innovation Capabilities**




**Note**: ⟶ positive relationship.

### 4.4.3. Results

The hypothesized relationships with regard to the impact of service innovation capabilities on the performance measures in the theoretical framework are supported by the results. Table 4-8 contains the results of the analysis based on partial least squares structural equation modeling (PLS-SEM).[50] All relationships are significant at the level $p < .01$ (H3a-c). The strongest effect is placed on competitive advantage with $\beta = .57$, followed by the effect on market performance with a value of $\beta = .47$. Though slightly weaker, the effect of service innovation capabilities on efficiency is still substantial with a path coefficient of $\beta = .37$.

[50] Table 4-8 contains the results of the PLS-SEM analysis on the theoretical model. The results concerning the proposed relationships of the antecedents are grayed out (see Section 4.3.3. for further details on the results on the antecedents of service innovation capabilities).

As with the antecedents in Section 4.3.3, I compared a baseline model which included the control variables product innovation orientation and dynamism to the theoretical framework (Groth et al., 2009). This enabled me to detect the increased variance explained by the model's constructs. I found that the variance explained of all endogenous variables was significantly increased at the level $p < .01$. The additional $R^2$ is .17 for market performance, .24 for competitive advantage, and .11 for cost efficiencies.

The predictive relevance for the constructs in the postulated theoretical framework was further analyzed (Hair et al., 2014). Accordingly, I conducted the blindfolding procedure to calculate $Q^2$ for each endogenous constructs. The construct market performance obtained a value .18, competitive advantage .22, and efficiency .09. Thus, all $Q^2$ values are considerably above zero indicating support for the model's predictive relevance. I determined the effect size $f^2$ to identify the contribution of each exogenous variable to the $R^2$ of the three endogenous variables (Hair et al., 2014). With an $f^2$ value above .15 the variable service innovation capabilities contributes with a medium effect of .21 to market performance. With a value of .11 to competitive advantage and with an $f^2$ of .05 to efficiency the construct service innovation capabilities contributes with a small effect. An overview of the predictive relevance and the impact of the influencing variables is provided in the Appendix, Table A-11.

Moreover, indirect effects were investigated. For this purpose, I included the proposed antecedents of service innovation capabilities, i.e. top management commitment and corporate service innovativeness, which are the subject in Section 4.4. In comparison to the results from the proposed theoretical framework, all effects remained similar, yet, decreased in some cases. For example, the impact of service innovation capabilities on efficiency decreased from $\beta = .36$ to $\beta = .30$ (significant at level $p < .05$). Moreover, the results indicate that the exogenous variables top management commitment and corporate service innovativeness have no significant direct effect on the three performance measures. However, total effect analyses reveal that – via the variable service innovation capabilities – top management commitment has a significant effect on market performance ($\beta = .30$, significant at level $p < .05$), corporate service innovativeness has a significant effect on competitive advantage ($\beta = .31$, significant at level $p < .05$), and top management commitment influences competitive advantage ($\beta = .23$) and efficiency ($\beta = .25$) with

**Table 4-10. Results of PLS-SEM Analysis**

| | | | | Baseline Model | Theoretical Model | Extended Model |
|---|---|---|---|---|---|---|
| **Hypothesis** | **Path from** | **Via** | **To** | **Path Coefficient (t-statistic)** | **Path Coefficient (t-statistic)** | **Path Coefficient (t-statistic)** |
| H1 | Top M. Com. | | SI Cap. | | .43** (4.47) | .42** (4.53) |
| H2 | Corp. S. Inno. | | SI Cap. | | .32** (3.73) | .31** (3.62) |
| H3a | SI Cap. | | Market Perf. | | .47** (4.64) | .40** (3.50) |
| H3b | SI Cap. | | Comp. Adv. | | .57** (6.05) | .49** (4.37) |
| H3c | SI Cap. | | Efficiency | | .37** (3.55) | .27* (2.47) |
| | E. Dynamism | | SI Cap. | .28* (2.36) | .11 (1.01) | .10 (1.04) |
| | Product Inno. | | SI Cap. | .32** (2.71) | .10 (0.95) | .11 (0.99) |
| | E. Dynamism | | Market Perf. | .22 (1.55) | .08 (0.60) | .07 (0.48) |
| | Product Inno. | | Market Perf. | .07 (0.58) | -.09 (0.71) | -.11 (0.75) |
| | E. Dynamism | | Comp. Adv. | .13 (0.82) | -.04 (0.53) | -.07 (0.72) |
| | Product Inno. | | Comp. Adv. | .02 (0.21) | -.17 (1.54) | -.19† (1.71) |
| | E. Dynamism | | Efficiency | .15 (1.06) | . 04 (0.18) | .01 (0.05) |
| | Product Inno. | | Efficiency | .08 (0.55) | -.05 (0.33) | -.09 (0.52) |
| | Top M. Com. | | Market Perf. | | | .14 (0.78) |
| | Top M. Com. | | Comp. Adv. | | | .03 (0.09) |
| | Top M. Com. | | Efficiency | | | .13 (0.81) |
| | Corp. S. Inno. | | Market Perf. | | | .01 (0.10) |
| | Corp. S. Inno. | | Comp. Adv. | | | .16 (1.29) |
| | Corp. S. Inno. | | Efficiency | | | .11 (0.81) |
| | Top M. Com. | SI Cap. | Market Perf. | | | .30* (2.24) |
| | Top M. Com. | SI Cap. | Comp. Adv. | | | .23† (1.76) |
| | Top M. Com. | SI Cap. | Efficiency | | | .25† (1.81) |
| | Corp. S. Inno. | SI Cap. | Market Perf. | | | .14 (1.30) |
| | Corp. S. Inno. | SI Cap. | Comp. Adv. | | | .31* (2.60) |
| | Corp. S. Inno. | SI Cap. | Efficiency | | | .19 (1.56) |
| $R^2$, SI Cap. | | | | .22 | .47 | .46 |
| $R^2$, Market Perf. | | | | .05 | .22 | .23 |
| $R^2$, Comp. Adv. | | | | .03 | .27 | .29 |
| $R^2$, Efficiency | | | | .02 | .13 | .15 |

**Notes:** n = 87; PLS-SEM: partial least squares structural equation modeling; Comp. Adv.: competitive advantage; Corp. S. Inno.: corporate service innovativeness; E. Dynamism: environmental dynamism; Market Perf.: market performance; Product Inno.: product innovation orientation; Top M. Com.: top management commitment; SI Cap.: service innovation capabilities. Values of t were calculated with bootstrapping procedure with 5,000 samples of 87 cases. Significance level: † = p < 10 %; * = p < 5 %; ** = p < 1 %.

weak significance at a level of p < .10. As in the case of the analyses on the service innovation capabilities construct, I conducted PLS-SEM analyses with an alternative construct for firm-

level performance (see Table 4-11). This construct reflects the performance of a firm in comparison to its competitors (see Section 4.2.2.). The outcome of the PLS-SEM calculation with this firm-level performance measure led to comparable results. Service innovation capabilities has a significant impact on firm-level performance (represented with the alternative construct) with $\beta$ = .34 at a significance level of .01. However, this impact is weaker than for all three firm-level performance measures used in the proposed theoretical model.

**Table 4-11. Alternative Firm-Level Performance Construct (PLS-SEM)**

| | | | Theoretical Model | |
|---|---|---|---|---|
| | | | n = 87 | n = 122 |
| **Hypothesis** | **Path from** | **To** | **Path Coefficient (t-statistic)** | **Path Coefficient (t-statistic)** |
| H1 | Top M. Com. | SI Cap. | .42** (4.43) | .22 (0.98) |
| H2 | Corp. S. Inno. | SI Cap. | .32** (3.61) | .48** (6.40) |
| H3 (alternative) | SI Cap. | Rel. Perf. | .34** (3.28) | .23 (0.18) |
| | E. Dynamism | SI Cap. | .11 (1.01) | -.03 (0.33) |
| | Product Inno. | SI Cap. | .10 (0.98) | .10 (1.03) |
| | E. Dynamism | Rel. Perf. | -.01 (0.11) | -.09 (1.08) |
| | Product Inno. | Rel. Perf. | .00 (0.03) | .10 (1.24) |
| $R^2$, SI Cap. | | | .46 | .38 |
| $R^2$, Rel. Perf. | | | .11 | .02 |

**Notes:** PLS-SEM: partial least squares structural equation modeling; Corp. S. Inno.: corporate service innovativeness; E. Dynamism: environmental dynamism; Product Inno.: product innovation orientation; Rel. Perf.: relative performance; Top M. Com.: top management commitment; SI Cap.: service innovation capabilities. Values of t were calculated with bootstrapping procedure with 5,000 samples of 87 respective 122 cases. Significance level: † = p < 10 %; * = p < 5 %; ** = p < 1 %.

As described in Section 4.3.3., I conducted additional analyses based on ordinary least squares (OLS) regressions to strengthen the findings in the PLS-SEM analyses. The results prove to be confirming (see Table 4-12 as an example, the results on the dependent variables competitive advantage and efficiency are reported in the Appendix, Table 4-12 and Table 3-13). Service innovation capabilities have a positive significant impact on market performance ($\beta$ = .46 at significance level p < .01), competitive advantage ($\beta$ = .57 at significance level p < .01), and efficiency ($\beta$ = .39 at significance level p < .01).[51]

[51] I applied additional cross-model hypotheses testing (Clogg et al., 1995) to analyze the difference between each of the effect size of service innovation capabilities. In Model 3, the comparison tests do not show a significant difference. The comparison of the coefficients of Model 4, however, indicate that the effects of service innovation capabilities on market performance and competitive advantage are significantly different to the

**Table 4-12. Market Performance as Dependent Variable (OLS Regression)**

| | n = 87 | | | | n = 121 | | | |
|---|---|---|---|---|---|---|---|---|
| **Variables** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 1** | **Model 2** | **Model 3** | **Model 4** |
| Intercept | 4.3** (.58) | 3.2** (.80) | 1.8** (.66) | 1.6* (.69) | 4.2** (.53) | 2.2** (.60) | .42 (.42) | .16 (.48) |
| Firm size (log) | .19* (.08) | .15† (.08) | .15* (.07) | .16* (.07) | .16* (.07) | .06 (.05) | .02 (.05) | .03 (.05) |
| Firm age (log) | -.26* (.11) | -.19 (.12) | -.10 (.11) | -.10 (.11) | -.30* (.12) | -.15 (.11) | -.06 (.07) | -.06 (.07) |
| Industry: Financial services | -.33 (.37) | -.58 (.37) | -.65† (.34) | -.62† (.34) | .33 (.36) | -.23 (.34) | -.08 (.24) | -.03 (.23) |
| Industry: Logistics | -.31 (.42) | -.57 (.45) | -.50 (.42) | -.47 (.44) | .18 (.38) | -.25 (.31) | .02 (.23) | .02 (.21) |
| Industry: IT services | -.43 (.58) | -.77* (.36) | -.52 (.36) | -.49 (.36) | .15 (.34) | -.80* (.36) | -.25 (.28) | -.23 (.26) |
| Environmental dynamism[b] | | .24† (.14) | .11 (.13) | .10 (.13) | | .41** (.13) | .22** (.08) | .19* (.08) |
| Product innovation orientation[b] | | .10 (.09) | -.02 (.08) | -.03 (.10) | | .31** (.60) | .04 (.06) | .02 (.06) |
| H3a: Service innovation capabilties[b] | | | .46** (.10) | .45** (.12) | | | .74** (.05) | .63** (.08) |
| Top management commitment[b] | | | | .05 (.11) | | | | .11† (.07) |
| Corporate service innovativeness[b] | | | | -.02 (.09) | | | | .09 (.08) |
| $R^2$ | .08 | .14 | .33 | .33 | .08 | .34 | .71 | .72 |
| $R^2$ change | | .06† | .19** | .00 | | .25 ** | .38 ** | .01 † |
| F | 1.82 | 2.00 | 5.93 | 4.87 | 2.01 | 6.59 | 54.56 | 45.24 |

**Notes**: OLS: ordinary least squares; [a] Unstandardized coefficients are given; robust standard errors in parentheses. [b] Mean-centered. Significance level: † = p < 10 %; * = p < 5 %; ** = p < 1 %.

Model 4 in each of the regression analyses includes the exogenous variable top management commitment and corporate service innovativeness. The results indicate that these two variables lead to a change in the impact of the relationships in the proposed theoretical model. For example, in the case of competitive advantage and efficiency, the added factors result in a decreased effect size of service innovation capabilities; however, the impact remains highly significant, while the exogenous variables have no significant influence on the firm-level performance measures. The $R^2$ change between the model that includes all control variable, i.e. firm size, firm age, sectors, environmental dynamism, and product innovation orientation, and the model with all control variables as well as the proposed influencing factors of the theoretical

effect of service innovation capabilities on efficiency (on market performance, $\beta$ = .45: significantly different to $\beta$ = .27 at level .10; on competitive advantage, $\beta$ = .50: significantly different to $\beta$ = .27 at level .10).

model is significant at the level $p < .01$ for all firm-level performance measures (market performance: $R^2$ change = .19; competitive advantage: $R^2$ change = .28; efficiency $R^2$ = .12). Regarding the control variables, product innovation orientation is worth mentioning: In the case of the dependent variable competitive advantage, increasing product innovation orientation leads to less achieved competitive advantage through service innovation. Besides this finding, firm size has a positive impact on market performance generated by service innovation with $\beta$ = .15 at a significance level of $p < .05$.

To further analyze the robustness of the results, I conducted PLS-SEM[52] and OLS regression[53] analyses with the sample including the data from single respondents of each company (n = 122). The results support the findings based on the sub-sample. Noteworthy are the varying values of $R^2$: The results based on single respondent data show that the variance of service innovation capabilities is explained less ($R^2_{122}$-$R^2_{87}$ = -.14) and the variance of the firm-level performance indicators (market performance: $R^2_{122}$-$R^2_{87}$ = .39; competitive advantage: $R^2_{122}$-$R^2_{87}$ = .39; efficiency: $R^2_{122}$-$R^2_{87}$ = .19) is explained more than in the case of double respondents. With regard to the results of the OLS regression analyses, a deviating result is that environmental dynamism positively influences the market performance (significant at level $p < .01$) and efficiency (significant at level $p < .10$). Hence, a perceived higher environmental dynamism positively influences the gained market performance and efficiency level caused by service innovation.

In addition, the control variable of sectors seems to have some influence on the achieved firm-level performance. For example, in the case of market performance, the sector financial services is negatively associated with service innovation capabilities (reference group is the sector construction). However, this impact is weakly significant at level $p < .10$ and not apparent in the results based on the sample including single respondents data. Another example is the impact of belonging to the logistics sector. In the case of the performance measure efficiency, there is a positive impact (reference group is the sector construction). Again, these findings should be cautiously interpreted, as this relationship is weakly significant at level $p < .10$ and only detected in the sample consisting of single respondents.

**Table 4-13. Summary of Hypotheses Testing on Consequences**

| | **n = 87** | **n = 122** |
|---|---|---|

[52] See results in the Appendix, Table A-12.

[53] See results in Table 4-12 (dependent variable: market performance), and in the Appendix, Table A-13 (dependent variable: competitive advantage) and Table A-14 (dependent variable: efficiency).

| | PLS-SEM | OLS Reg. | PLS-SEM | OLS Reg. |
|---|---|---|---|---|
| H3a | supported | supported | supported | supported |
| H3b | supported | supported | supported | supported |
| H3c | supported | supported | supported | supported |

**Notes:** PLS-SEM: partial least squares structural equation modeling; OLS Reg.: ordinary least squares regression.

### 4.4.4. Discussion and Theoretical Implications

This survey-based study focuses on top managers' commitment and corporate service innovativeness to shed light on their importance on the establishment of service innovation capabilities and the ensuing effect on firm-level performance.

Prior research has found inconclusive results regarding performance effects and a remedial suggestion was to consider multiple performance indicators (den Hertog et al., 2011; Storey and Kelley, 2001). With this study I respond to these calls and apply a broader understanding of innovation effects. I was able to detail relationships and found a strong relationship between increased service innovation capabilities and firm-level performance effects. Service innovation capabilities do have an impact on efficiency, yet to a lesser degree than its impact on the other two performance indicators, i.e. market performance and competitive advantage. Opposed to the importance attributed to efficiency and improvement of services offerings and their delivery (de Brentani, 1989; Forsman, 2011; Roberts and Amit, 2003), these results suspect an inferior role. An explanation might be that improvements are made in certain organizational places where they do not fall under the heading of innovation. For example, the improvements made by front-line employees who constantly revise and adjust the interaction with the customer might not be considered as result of a service innovation project. Therefore, efficiency gains may not always be attributed to service innovation capabilities. A further reason could be that effects of service innovation projects on cost structures are not as thoroughly monitored as the market performance or competitive position are and thus linkages are difficult to make.

The results show that top management commitment does not have a direct impact on the performance measures, but an indirect effect via service innovation capabilities on market performance. Hence, top management commitment is crucial to build up the capabilities to generate new service, and it increases sales and market share performance. This is not surprising, since the decision makers at the top level often focus on financial measures and closely monitor the firm's performance in the market (Storey and Kelley, 2001). Thus, with increased top management commitment the goals of service innovation project are directed

towards enhanced market performance. With respect to the direct and indirect effects of corporate service innovativeness findings reveal that a more innovative firm demonstrates increased service innovation capabilities and indirectly higher competitiveness. A firm that purposely conducts service innovation projects is therefore able to tap the potential to differentiate its offerings from those of the competitors. This study thus offers evidence on that experience which is gained from continuously innovating in services indeed increases the achievement of competitive advantage.

Regarding the impact of product innovation orientation on service innovation performance indicators I did not find any effects. As a consequence, the present results stress the importance of other factors, such as the development of specific service innovation capabilities, which in this study significantly contribute to the understanding of firm-level performance. With respect to environmental dynamism, the results show in the case of the sample including single respondents a significant positive influence on firm-level performance. This finding is in line with general innovation research (Grindley and Teece, 1997; Li and Atuahene-Gima, 2001). However, the calculations with the data based on the double respondents do not show these effects. Therefore, I cannot clearly interpret these results.

Contrasting to findings in past service research (Abreu et al., 2010; Castro et al., 2011), I was not able to identify a determining role of belonging to a specific sector. Instead, the results lead to the conclusion that the postulated relationships between service innovation capabilities and their antecedents and consequences are predominantly similar among the distinctive sectors. Therefore, this study's results allow the inference that there are existing commonalities of firms across sectors and thus stresses firm specific factors, i.e. the level of service innovation capabilities, which influence the achieved firm-level performance.

**Innovation management research.** This study contributes to innovation management research by resolving the intertwined and thus unclear relationships which characterize the picture of influencing factors and firm-level performance indicators. Previous works have analyzed the impact of antecedents on the success rates at service innovation project level (Avlonitis et al., 2001; Therrien et al., 2011). By adopting a dynamic capabilities perspective the value of professionally building up service innovation capabilities is emphasized. It is empirically shown that with this increased success in developing innovative services firm-level performance indicators can be improved. Past research on service innovation management has observed a rather informal approach of firms towards generating new services (Ettlie and

Rosenthal, 2011; Miles, 2007). However, with this work I underline the need for a firm to deliberately increase service innovation capabilities to achieve increased firm success.

**Service research.** The findings of this work add to service research, as they unveil the positive relationship between improved service innovation capabilities and firm-level performance. This investigation directly responds to calls of Evangelista and Vezzani (2010) and others (den Hertog et al., 2011; Jensen and Warren, 2001). Therefore, I was able to improve the ambiguous understanding in research of the service innovation impact on corporate performance. Specifically, this study sheds light on the relative impact of service innovation capabilities on each of the firm-level performance indicators. The often stressed importance of smooth processes (e.g. Chan et al., 1998; Forsman, 2011; Roberts and Amit, 2003), i.e. efficiency, was found to be influenced by increased service innovation capabilities. However, in comparison to market performance and competitive advantage, the linkage between increased capabilities to this firm-level performance indicator seems to be weaker. Therefore, this chapter provides insights into the effect of established corporate capabilities to develop service innovation on firm performance which is measured by a broad set of measures.

### 4.4.5. Implications for Practice

This study shows that a successful service innovation program can enhance a firm's success. Hence, top managers should purposely encourage and promote the development of the firm's service innovation capabilities. For example, it should be communicated that service innovation is part of the firm's strategy and that corresponding projects are measured against monetary and non-monetary returns. Yet, managers need to consider that the organizational structure and human resources should be revised and potentially adjusted, to provide the conditions to pursue service innovation projects regularly (Kuczmarski, 2006). As suggested, formalization of knowledge, such as implementing defined processes or establishing departments, can help firms to enhance their capabilities to generate successful new services (Argote, 1999; Zander and Kogut, 1995).

In addition, the results of this study also point to the relevance of service innovation capabilities for achieving differing firm-level performance measures. Although the importance of efficiency is emphasized in the context of services, top managers can learn from this study that service innovation capabilities hold differentiation potential. Service innovation thus does not need to be limited to the context of incremental innovation or, simply stated, to the goal of becoming better at what the firm is already doing. Instead, top managers should consider service

innovation as an opportunity to respond to the rapid changes in the market. Due to the ever changing environments, existing service offerings quickly become overdue. With service innovations that fulfill customer (new) needs, top managers in cooperation with their innovation managers can satisfy both existing and new customers. Hence, by investing in the establishment of capabilities to generate successful new services, managers can expect to gain competitive advantage.

To be able to continuously improve the position in the market, the findings in this study recommend decision makers to build up and retain commitment to service innovation, for example by pursuing ongoing service innovation projects and showing involvement from the top and senior management level. The result of such investments will be an increased capability which finally increases firm-level performance.

### 4.4.6. Limitations and Future Research

The data used in this study meets the methodological requirements which are defined in prior research to apply PLS-SEM analysis (Cohen, 1992; Hair et al., 2014). Nevertheless, the relatively small sample size should provoke cautious handling of the findings. As this study is meant to contribute to a better understanding of the very complex relationships of service innovation capabilities, and thus should be considered to be rather exploratory, it is recommended to replicate the investigation with a larger sample set.

Common method bias remains a challenge in survey-based studies. Although I controlled for this and reduced a potential threat by using data for the construct service innovation capabilities and the three firm-level performance indicators from two different sources, the use of complementing secondary data for the firm-level performance indicators would offset this issue. In addition, the relationships hypothesized in the theoretical framework are based on thorough reviews of past research and intensive theoretical reasoning. However, causality cannot be fully clarified in such a cross-sectional study. As a consequence, additional longitudinal studies would shed light on the direction of the relationships.

Moreover, the proposed theoretical framework consists of intra-organizational factors. This enabled to unveil the complex inner relationships that contribute to firm-level performance. Future research on service innovation should try to consider external factors that affect the establishment of service innovation capabilities. For example, the seminal work of Teece (2007) stresses the value of absorptive capacity. Knowledge can be derived from various sources, such as customers, suppliers, or research institutes. Research on service innovation

could increase the understanding of learning processes and capabilities development by considering these external influences on firms.

## 4.5. Conclusion

The aim of this study is to improve the understanding about factors that enhance firm-level performance through service innovations. To achieve this, I provide insights on the influence of top management commitment and corporate service innovativeness on service innovation capabilities and the resulting effect on firm-level performance. I developed a theoretical framework and empirically tested the postulated relationships by analyzing survey-based data from double respondents from 87 firms from various sectors. I therefore directly respond to recent calls to clarify the applicability of the knowledge about new product development to the service context (Barczak, 2012).

The PLS-SEM and OLS regression analyses support the hypothesized relationships. A firm in which the top managers show commitment to service innovation projects and which continuously engages in service innovation projects increases its capabilities to generate service innovations. If the firm has increased service innovation capabilities it can expect to achieve improved firm-level performance in the form of market performance, competitive advantage, and efficiency. These results on the role of innovation capabilities correspond to findings in product innovation research (Brown and Eisenhardt, 1995; Ernst, 2002). In particular, the contribution of this study to research is threefold.

Advancing management research, this study sheds further light on the importance of top management commitment to service innovations and an ongoing engagement in service innovation to generate successful new services. More precisely, an overall impact of top management commitment on the setup of service innovation capabilities at corporate level is identified. In addition, rather than focusing on the radicalness of individual service innovations, this study empirically supports the benefits derived from increased corporate service innovativeness, as it results in improved capabilities to generate service innovations.

As a contribution to innovation research, the findings of this study help to clarify both relationships on and of the establishment of capabilities to generate new services. With the applied dynamic capabilities perspective, I substantiated the influence of top management commitment and corporate service innovativeness on the level of service innovation capabilities, thus increased success in conducting service innovation projects. In addition, from

a firm-level performance perspective, the present findings reveal that building up service innovation capabilities is beneficial to improve market performance, competitive advantage, and efficiency.

The findings of this work add to service research, as they unveil the positive relationship between improved service innovation capabilities and firm-level performance, thus improves the ambiguous understanding in research about influence of service innovation capabilities on corporate performance. Specifically, I was able to sheds light on the relative impact of service innovation capabilities on each of the firm-level performance indicators. The impact of increased service innovation capabilities on market performance and competitive advantage is stronger than the impact on efficiency.

# 5. SUMMARY OF THE DISSERTATION

## 5.1. Content of the Dissertation and Main Findings

Service innovation has increasingly gained acknowledgement to contribute to economic growth and well-being (European Commission, 2014; OECD, 2013). At policy-level, governments establish institutions and initiate projects which are dedicated to raise the awareness of the benefits derived from service innovations and promote the development of firms' capabilities to generate such innovative services (e.g. European Union, 2011; Tether and Massini, 2007).

As for firms, multiple examples can be named which illustrate the importance of innovative services. Firms like Amazon and Apple would not experience such enormous success if they had not invested in the development of service innovations (e.g. Amazon Prime or Apple's iTunes Store). In addition, product business faces decreasing profit margins; a phenomenon that many manufacturing companies have painfully experienced. Services have shown to help to overcome this issue and yield the potential to ensure steady revenue streams and, additionally, to serve as differentiator. Firms like IBM and Rolls-Royce have used services to develop solutions for their customers and thus are able to offer value-added services. Innovation in services has thus turned out to be strategically relevant for firms from various industry sectors.

Aligned with the increased relevance of innovative services in practice, research has more intensively focused on service innovation in the last years. While up to the year 2000 only very few articles on service innovation were published, a soaring increase of publications can be observed since then (see Section 2.2.2.). Despite this raised attention, authors still describe the service innovation research field as developing. As the product innovation field, in contrast, is a well-established research field, the question arises why service innovation may require distinct investigations. The rationale in the differentiation is often argued to lie in the distinguishing characteristics of services to products, which are mainly intangibility, simultaneity, heterogeneity, and perishability. These specificities entail implications for the development of innovative services. Accordingly, special attention is pointed to managing service innovation, since their informal character supposedly requires less formalized structures and processes. Research has focused on special roles which are being held by front-line

employees and on the integration of customers in developing new services. However, past research has not yet been able to fully clarify how firms can successfully manage service innovation and why they might differently implement service innovation from an organizational and procedural point of view. Indeed, more research on the development of service innovation capabilities is necessary. The importance of top managers and the overall corporate service innovativeness on the establishment of service innovation capabilities has been neglected, so far. The same applies to firm-level performance which can be expected from increased capabilities to generate new services. Accordingly, the main overall research questions of this dissertation are: 1.) How and why do firms manage service innovation activities in their organization differently? 2.) What influence do top management commitment and corporate service innovativeness have on service innovation capabilities of a firm and what are the implications for firm-level performance?

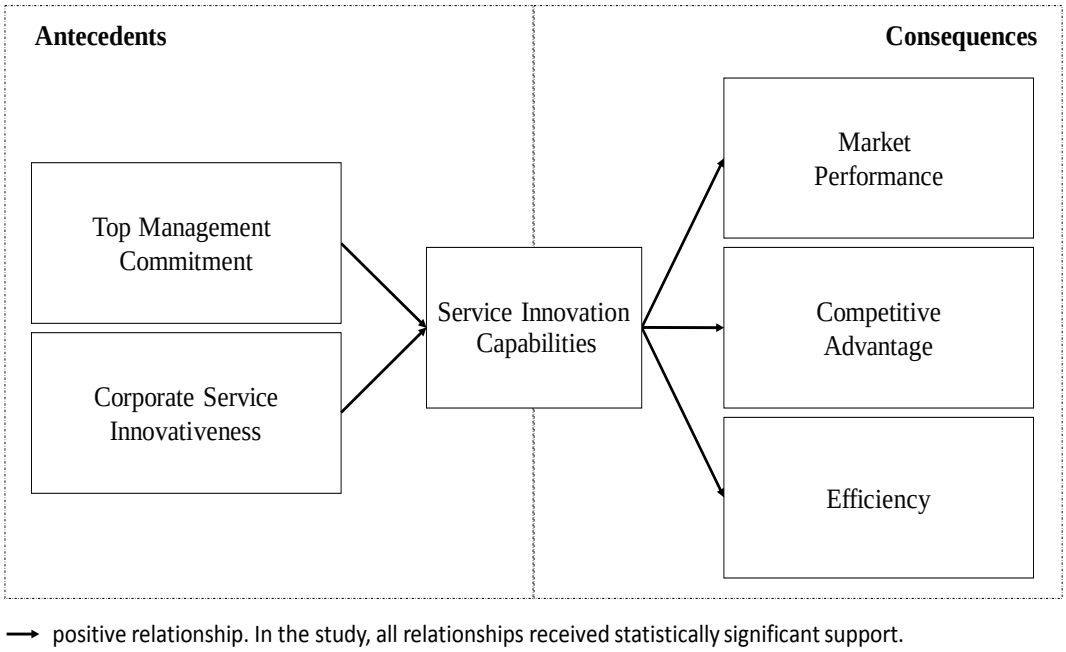
To respond to the first research question I investigated the way firms manage service innovation activities in their organization and by whom and how service innovations are developed. Moreover, I examined why firms implement their service innovation activities differently. To achieve this I conducted a qualitative empirical study which included 22 semi-structured interviews with 15 firms in the sectors of construction, financial services, IT services, and logistics. With a systematic collection of secondary data on this sample I was able to complement and further assess these insights. The findings reveal three organizational forms of managing service innovation which differ with regard to the dimensions of corporate service innovation relevance, the implementation of service innovation responsibilities, and the systematization of new service development: the flexible service innovators, the attentive service innovators, and the systematic service innovators. The derived propositions are the following:

> **Proposition 1**: Firms with a low to medium level of corporate service innovation relevance develop innovative services through initiatives triggered by varying individuals and pursue an undefined, rather ad hoc new service development process.
>
> **Proposition 2:** Firms with a medium to high level of corporate service innovation relevance develop innovative services through part-time service innovation responsibilities integrated into corporate functions and pursue new service development with relatively flexible but routinized procedures.
>
> **Proposition 3**: Firms with a high level of corporate service innovation relevance develop innovative services through full-time service innovation responsibilities in the form of departments or groups or clearly defined part-time responsibilities and pursue a predefined as well as controlled new service development process from idea generation to commercialization.

Summarizing, the results reflect a strong dependence on the strategic relevance accounted to service innovation for the choice of implemented responsibilities and the degree of systematization of the new service development process. The study finds support that continuously and successfully innovating in service relies heavily on aligned organizational structures and controllable developmental procedures.

Addressing the second research question, the aim is to improve the understanding about factors that enhance firm-level performance through service innovations. Deploying a dynamic capabilities perspective, I conducted a quantitative study which underlines the importance of service innovation capabilities. More specifically, a theoretical framework is developed that proposes a positive relationship of top management commitment and corporate service innovativeness with service innovation capabilities and a positive relationship between service innovation capabilities and the firm-level performance indicators market performance, competitive advantage, and efficiency. A survey with double respondents from 87 companies from the sectors construction, financial services, IT services, and logistics was conducted to test the proposed theoretical framework by applying partial least squares structural equation modeling (PLS-SEM). All hypothesized relationships found support and robustness checks including alternative analysis methods and cross-sample calculations further confirm these results.

**Figure 5-1. Findings on Service Innovation Capabilities**




## 5.2. Theoretical Implications

### 5.2.1. Antecedents of Service Innovation

**Innovation management research.** With this dissertation I contribute to innovation management research by identifying the importance of a systematic approach towards managing service innovation. Service innovation is a complex concept which is challenging to define and measure (Jensen and Warren, 2001). Therefore, how firms successfully pursue service innovation activities and embed them in their organizational structures is still an open question. This dissertation adds to the understanding on how firms can manage service innovation to successfully develop new services.

Although past research has observed a low level of systematization (den Hertog et al., 2011; Ettlie and Rosenthal, 2011), the firms presented in Chapter 3 expressed their belief in controlled and defined new service development processes. Often, those firms that strategically regard service innovation important share this view. As a result, I found that the organizational implementation of responsibilities and the determination of new service development processes is considered very effective to generate promising service innovations. Particularly, the study revealed similarities to findings in product innovation management: With clearly defined

service innovation steps (the phases of idea generation, evaluation of ideas, actual development, testing, marketing, and evaluation of the new service success) this development process is very similar to concepts in product innovation management like the stage-gate process (Booz et al., 1982; Cooper et al., 2004b; Prajogo, 2006).

As a result of Chapter 4, establishing service innovation capabilities is beneficial for firms. Past research has missed to clarify the impact of top management commitment on the establishment of a firm's service innovation capabilities. Instead, the focus often lay on other actors, such as front-line personnel or customers (e.g. Ettlie and Rosenthal, 2012; Lages and Piercy, 2012; Melton and Hartline, 2010; Michel et al., 2008; Sørensen et al., 2013; Zomerdijk and Voss, 2011). Moreover, the level of innovativeness of individual service innovation has received considerate attention in literature (Forsman, 2011; e.g. Holahan et al., 2014; Ordanini and Parasuraman, 2011; Perks et al., 2012), while the firm's service innovativeness has been predominantly neglected. By quantitatively investigating antecedents of service innovation capabilities I find support for the importance of top management to commit to service innovations and of corporate service innovativeness to increase the capability to generate service innovations successfully.

**Service research.** This dissertation contributes to service research, as I find solid arguments to conduct cross-sectoral research on new services (see Chapter 3). Opposed to observations in past research that heterogeneity of sectors hampers the interpretation of results (Abreu et al., 2010; Ostrom et al., 2010), I found shared patterns among firms from different sectors. Thus, I conclude that the way firms manage and organize their service innovation activities depends on the firm-specific strategic relevance attributed to innovative services. If service innovation is part of the corporate strategy then I find a professional approach towards managing service innovation. Accordingly, the findings show that service innovation is crucial to both pure service providers as well as product providers. Although the latter group values the potentials derived from technical innovations, I observed an increased attention towards new service development activities.

In addition, Chapter 4 contributes to service research by resolving the ambiguous indirect and direct relationships between influencing factors and the establishment of capabilities to generate new services. Past service research frequently addressed the question of antecedents' impact on the outcome of individual service innovation projects without further evaluating the influence on firm-level performance measures (Avlonitis et al., 2001; Therrien et al., 2011). The applied dynamic capabilities perspective enable me to identify the influence

of top management commitment and corporate service innovativeness on establishing service innovation capabilities at corporate level, thus increased success in conducting service innovation projects, and to separately analyze how this level of service innovation capabilities determines the firm success. This added to a more detailed understanding of the complex relationships of service innovation capabilities that a firm can establish.

**Organization design research.** With this dissertation I add to organization design research, since it sheds light on the dependency between the relevance of service innovation in the corporate strategy and the choice of organization design. I was able to find arguments for the assumption that in the case of strategic importance of service innovation, firms do establish organizational structures and responsibilities (e.g. innovation project teams, innovation departments) to encourage creativity and provide the sufficient resources for the successful development of service innovations. In the context of organization research, service innovation has been neglected in past research, whereas in product innovations the effect of organizational design choice on innovation outcomes has been investigated (Tushman et al., 2010). In service innovation management, however, rather specific organizational factors such as the importance of high-skilled employees were addressed (Van Riel et al., 2004).

### 5.2.2. Consequences of Service Innovation

**Innovation management research.** This dissertation contributes to innovation research by making apparent the intertwined relationships of antecedents and consequences of service innovation capabilities. Previous works have analyzed the impact of antecedents on the success rates at service innovation project level (Avlonitis et al., 2001; Therrien et al., 2011). By adopting a dynamic capabilities perspective the value of building up service innovation capabilities is emphasized. Therefore, I add to the understanding of the impact of a professional approach to build up capabilities at corporate level to generate new services. It is shown that with this increased success in developing innovative services firm-level performance indicators can be improved. Past research has observed that firms generate new services rather informally (Ettlie and Rosenthal, 2011; Miles, 2007). Contrarily, with this work I underline the value of deliberately advancing service innovation capabilities at corporate level to achieve increased firm success.

**Service research.** The findings of this dissertation complement to service research, as they unveil the positive relationship between improved service innovation capabilities and firm-level performance. In more detail, I was able to reveal the distinct strength of impact that service

innovation capabilities have on several firm-level performance indicators. The findings reflect that efficiency, often an emphasized factor in the service context (e.g. Chan et al., 1998; Forsman, 2011; Roberts and Amit, 2003), is less affected by increased service innovation capabilities than market performance and competitive advantage. Hence, the dissertation contributes to the understanding of the effect of established corporate capabilities to generate new service on firm success which is measured by a broader, thus more comprehensive set of firm-level performance indicators.

## 5.3. Implications for Practice

The studies presented in this dissertation were conducted in the sectors of construction, financial services, IT services, and logistics. Therefore, I was able to consider sectors that predominantly consist of pure service providers (financial services and logistics) and sectors that include firms offering both products and services (construction and IT services). Several implications can be derived from the findings of this dissertation.

Firstly, firms should determine the relevance of service innovation from a strategic point of view. The more important new services are to accomplish overall corporate goals, the more systematic a firm should pursue their development. Clearly defined responsibilities facilitate and promote the development of successful new services. How exactly this organizational implementation takes place, depends on the organization. Full-time responsible departments or teams, or service innovation as a part-time task of other functions are possible approaches to organizationally embed service innovation. Moreover, effectiveness of resource allocations and a sufficient return on investment should be subject to a systematic control mechanism. For top and senior managers this means that they need to adjust the existing controlling systems to new service projects; however control should be balanced and should not limit the creative space that employees need to develop innovative services.

Secondly, this dissertation illustrates that for the establishment of service innovation capabilities the support from top managers and corporate service innovativeness is inevitable for all firms. Thus, managers need to promote innovation projects and get involved. It will not be sufficient to rely on spontaneously occurring service innovation projects. Initiatives like innovation contests might lead to some few new service ideas. However, the results of this work point to the importance to establish capabilities as a firm to continuously develop successful new services. With top management support, service innovation projects are aligned to the overall corporate strategy and thus contribute to the achievements of defined corporate goals.

As a consequence, these new services have an increased potential to add to firm-level performance. Moreover, firms need to invest in personnel development and provide supporting structures and processes which help the employees at all levels to contribute to an overall corporate capability to generate successful service innovations. This also calls for a shift towards a professional approach to conduct service innovation as we find in the context of products.

Thirdly, the results of this dissertation point to the relevance of service innovation capabilities for achieving different goals. Although the importance of efficiency is emphasized in the context of services, managers can learn from the present results that service innovation capabilities can help to achieve competitive advantage. Therefore, managers can tap into the potential of services not only to improve the offering, but to enhance it by value-added new services. With innovation, firms have the opportunity to address customer needs in a way that distinguishes from their competitors.

Finally, traditional goods-dominant firms should review their new product development activities. It could be possible that existing R&D processes and structures are similarly relevant to managing new service development. Firms can exploit their knowledge on product innovation management and apply it to the service field. Nevertheless, due to the difference of services and products managers should acknowledge the resulting specificities and consider potential adjustments. For example, the intangibility of services might require other tools and processes to be able to conceptualize and design service innovations. Visualization, simulations, blueprints etc. are such promising approaches. In addition, organizational structures that facilitate cooperation between relevant departments are equally important. The same holds true for the opposite direction: Service providers can learn from new product development concepts and benefit from the experience of systematically generating service innovations.

## 5.4. Outlook

Against the backdrop of Chapter 3 on how and why firms manage service innovation differently, the most successful choice of organizational design for managing service innovation activities would be an interesting research endeavor. This work shows that by systematically generating new services firms expect to gain competitive advantage, or at least to assure survival. Nevertheless, it is an open question which organizational design choice is the most beneficial one. Do dedicated service innovation departments create increased firm-

level performance success? Or are service innovation projects consisting of cross-sectional teams the key to develop promising service innovations? In addition, the balance between systematization and flexibility of new service development processes should be analyzed in prospective research. Especially questions like for what type of service innovations (for example radical vs. incremental) is a high level of systematization a supporting factor and when are more informal and open procedures beneficial? Researchers could benefit from the concept of ambidexterity which stresses the need for balancing exploration (i.e. innovation) and exploitation (i.e. efficiency) to identify the most appropriate organizational and procedural implementations of service innovation.

Regarding the insights derived from Chapter 4 several further research questions can be derived. The aim of the work was to measure the linkage between top management commitment and corporate service innovativeness with service innovation capabilities and the resulting impact on firm-level performance. Thus, the firm level was the unit of analysis. It would be interesting to further detail these relationships. What constitutes corporate service innovation capabilities? Are so-called innovation champions necessary to build up corporate capabilities (service innovation driven by people) or are rather well-defined service innovation programs the key to service innovation success (service innovation driven by organizational conditions)?

Moreover, the work is focused on intra-organizational factors to unveil the complex inner relationships that increase firm-level performance. Future research on service innovation should try to consider external factors that affect the establishment of service innovation capabilities. The understanding of the importance of including external knowledge is not yet conclusive (e.g. Gebauer et al., 2013; Wagner, 2013). Further research is required to resolve this ambiguity. For example, absorptive capacity might be a useful concept. What knowledge sourcing strategies are helpful for generating new services? What benefit is gained by cooperating with different external partners (e.g. customers, suppliers, or research institutes)?

Methodologically, the relatively small sample size imposes important limitations to the findings of the work. It would be valuable to repeat the studies in this dissertation with a larger sample across sectors. To further mitigate potential common method bias in quantitative empirical research, the usage of secondary data on service innovation capabilities indicators (e.g. performance measures of service innovation programs based on project reports) could be a promising attempt. In addition, longitudinal studies would help to identify lagged-effects and hence lead to suggestions about the direction of the analyzed relationships.

Finally, the analysis of similarities and differences between managing service innovation and product innovation is a valuable approach towards synthesizing these two research fields. Service innovation management research may benefit from the advanced understanding in successful product innovation and vice versa. The dissertation stresses the change in selling purely products or services; instead, solutions seem to represent the promising approach to successfully address intense competitiveness in the respective markets. Therefore, a clear cut distinction between individual sectors is similarly difficult, as they share challenges in the context of building up innovation capabilities. It would be beneficial for research as well as practice to conduct large-scale empirical studies across several sectors.

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# APPENDIX

## FIGURES



## TABLES

# 2. CHAPTER

## Table 2-I. Overview of the Outlets used in the Sample

| Focus of Outlet | Outlet (Impact Factor 2013) |
|---|---|
| Economics/management | Research Policy (2.598) |
| Engineering | IEEE Transactions on Engineering Management (0.938), Journal of Engineering and Technology Management (2.106) |
| Entrepreneurship | Entrepreneurship: Theory & Practice (2.447), Journal of Business Venturing (3.265), Strategic Entrepreneurship Journal (1.744) |
| Innovation | Industrial & Corporate Change (1.330), Industry & Innovation (1.116), Journal of Product Innovation Management (1.379), R&D Management (1.266), Technovation (2.704) |
| Management | Academy of Management Journal (4.974), Academy of Management Review (7.817), Administrative Science Quarterly (2.394), California Management Review (1.944), Journal of International Business Studies (3.594), Journal of Management (6.862), Journal of Management Studies (3.277), Management Science (2.524), Organization Science (3.807), Organization Studies (2.504), Strategic Management Journal (2.993), Strategic Organization (1.853) |
| Marketing | Industrial Marketing Management (1.897), Journal of Marketing (3.819), Journal of Marketing Management (0.702), Marketing Science (2.208) |
| Service | Journal of Service Management (1.290), Journal of Service Research (2.143), Service Industries Journal (1.017) |

**Note**: The outlet service industries journal did not receive an impact factor in 2013 due to "stacking" (see: http://admin-apps.webofknowledge.com/JCR/static_html/notices/notices.htm). Here, the value of the year 2012 is used.

## Table 2-II. Overview of Theories in Past Research on Service Innovation

| Applied Theory (Frequency) | References |
|---|---|
| Activity theory (1) | Lin and Hsieh (2014) |
| Adoption theory (1) | Kleijnen et al. (2005) |
| Bounded rationality theory (1) | Gounaris and Korito (2012) |
| Complexity theory (1) | Chae (2012) |
| Contingency theory (5) | Das and Joshi (2012); Hull (2004); Hsieh and Tidd (2012); Lightfood and Gebauer (2011); Neu and Brown (2005) |
| Dynamic capabilities (7) | Den Hertog et al. (2010); Fischer et al. (2010); Hogan et al. (2011); Mention (2011); Neu and Brown (2005); Salunke et al. (2011); Spring and Araujo (2012) |
| Fit logic (1) | Ordanini et al. (2014) |
| Innovation diffusion (2) | Frattini et al. (2013); Wang et al. (2012) |
| Life cycle theory (1) | Anand et al. (2007 |
| Pioneer advantage (1) | Song et al. (2000) |
| Profiting from innovation (1) | Hurmelinna-Laukkanen and Ritala (2010) |
| Property rights theory (1) | Leiponen (2008) |
| Resource-based view/ resource-based competitive advantage theory (5) | Mention (2011); Möller et al. (2008); Neu and Brown (2005); Zhao et al. (2013) |
| Socio-technical view (2) | Berger and Nakata (2013); Damanpour et al. (2009) |
| Social system theory (1) | Perks and Riihela (2004) |
| Teleological theories (1) | Anand et al. (2007) |
| Transaction cost theory (1) | Kohtamäki et al. (2013) |

## Table 2-III. Past Research on Antecedents: Strategy & Processes

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Easingwood (1986) | Qualitative: 1.: unstructured interviews/ service firms (20); 2.: survey (63) | Service industries: Firm | **Service characteristics with important implications on new service development (NSD)[1] activities**<br>• Simultaneity of consumption and production: affects the constitution of NSD; staff from operations department is integrated into the decision-making process<br>• Intangibility of services: possibility of increasing the rate of new product launch; customers' buying decision depends on perceived corporate image |
| Thwaites (1992) | Quantitative: Survey/ data analysis via the innovation section of the survey (63) | Building societies: Firm | **Antecedents of new product initiative success**<br>• Clear corporate strategies that will guide the organization towards its objectives<br>• Utilize well-trained, committed, and competent staff<br>• Infrastructure supporting communication<br>• Acceptance that change of values, attitudes, and operating systems takes time |
| Edgett (1996) | Quantitative: Survey with senior managers from American and Canadian firms (82) | Finance: Project | **Successful product development process**<br>• A well-established new product process<br>• Early marketing activity that harvests ideas and provides insights into the situation of the market and competitors<br>• Quality of execution and the emphasis on control of processes |
| Chan et al. (1998) | Quantitative: Survey in retail and wholesale, financial services, hotel and restaurant, and tourism sector (99) | Service industries: Firm | **Managers' attitudes and the practice regarding service innovation**<br>• Confinement of service development to incremental innovations; not fully committed<br>• Most of the service firms do not have formal innovation processes implemented<br>• Mostly the marketing department conducts external review activities, and suppliers or the parent firm develop product, or on a trial-and-error basis<br>• Perception that service innovation is the task of the marketing manager |
| Froehle et al. (2000) | Quantitative: Survey/ U.S. subset of firms participating in the International Service Study (182) | Service industries: Firm | **Influence of team-based organizational structure, NSD process design, and information technology (IT) choices on NSD success**<br>• Cross-functional teams determine how effective a firm's NSD efforts are<br>• A higher degree of NSD process formalization leads to an increase of NSD speed indirectly which determines the firm's ability to develop new services<br>• IT choices directly affect both the speed of the NSD process and the general effectiveness of the firm's NSD activities |
| Song et al. (2000) | Quantitative: Survey/ firms across nine countries: U.S., UK, Germany, Japan, China, Taiwan, Hong Kong, South Korea, and Singapore (982) | Service industries: Firm | **Pioneering advantage in the service industries**<br>• Pioneers achieve a higher market share than later entrants do<br>• There is a perceived preemptive pioneering advantage<br>• Western service managers view preemptive pioneering advantages to be more important, whereas Asian Pacific service managers perceive behavioral advantages as more important<br>• Service managers ascribe economic advantages to the pioneering firm, behavioral pioneering advantages are perceived as important |

[1] In Tables 2-III to 2-VI, the abbreviation NSD will be used for 'new service development'.

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Avlonitis et al. (2001) | Quantitative: "Dropping off"-method of survey/ 84 financial firms (132 new financial services) | Finance: Project | **Identification of financial service innovation with their specific development processes in terms of activities, formality, cross-functional involvement, as well as performance outcomes**<br>1. new to the market services; 2. new to the firm services; 3. new delivery processes; 4. service modifications; 5. service line extensions; 6. service repositioning<br>• U-shape association between degree of innovativeness and financial performance<br>• High innovativeness has positive impact on non-financial performance measures |
| Meyer and DeTore (2001) | Qualitative: Case study/ reinsurance firm (1) | Finance: Firm | **Identified challenges to transform from a single-product to a platform-based approach**<br>• Senior executives concentrate on and are experienced in product developments, and less experienced in utilizing platforms into products and services for new markets<br>• The firm is active in one specific market<br>• Lack of human resources which are invested and committed<br>• Individuals consider subsystems as beneficial, but doubt cooperation among divisions<br>• Platform development is the remit of engineers<br>• The new platforms are not clarified in the sense of processes and management |
| Vermeulen (2001) | Qualitative: Survey/ banks (25) and insurance firms (25) | Finance: Firm | **Product innovation in the financial services sector**<br>• Most firms have implemented multi-disciplinary project teams to develop new products<br>• The creation of such teams has proven to lead to poor communications between the various functional specialists involved<br>• The development stages in the financial service sector matches the description in general literature on new product development. Often some of these stages are conducted simultaneously<br>• Marketing is crucial |
| Czarnitzki and Spielkamp (2003) | Quantitative: Secondary research/ Mannheim Innovation Panel - Services in 1993-1997 with service firms (2,200) | Services industries: Firm | **Business services in Germany**<br>• Knowledge-intensive business services (KIBS)[2] utilize information and communication technologies<br>• KIBS trigger innovation by applying innovation capacity, knowledge, creativity, market and management skills |
| Hollenstein (2003) | Quantitative: Cluster analysis on basic modes of innovation (880) | Service industries: Firm | **Understanding innovation patterns**<br>• Lower R&D in services as compared to manufacturing<br>• Human resources are crucial for the generation of service innovations<br>• Service innovations are characterized by a high degree of information content, ubiquity of IT usage, and their non-technological nature<br>• Clustering of distinctive 'innovation modes': Science-based high-tech firms with full network integration; IT-oriented network-integrated developers; market-oriented incremental innovators with weak external links; cost-oriented process innovators with strong external links along the value chain; low-profile innovators with hardly any external links |
| Ivory et al. (2003) | Qualitative: Case study/ the capital goods projects ALSTOM transport | Capital goods intensive industries: Project | **Shift in design management in capital goods projects**<br>• Firms acknowledge that equipment design efforts should be adjusted, to assure long-term service reliability<br>• The distinct responses can be explained by the differing natures of their extended networks, which comprised both projects themselves and the organizational structure surrounding the projects |

[2] In Tables 2-III to 2-VI, the abbreviation KIBS will be used for 'knowledge-intensive business service'.

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Roberts and Amit (2003) | Quantitative: Secondary analysis, search in Australian business press and annual report of firms (1,297) | Finance: Firm | **Antecedents of innovation success**<br>• More innovative activity; more consistent in that activity; a set of activities different from the industry standard<br>• Firm's history of innovative activity significantly affects its current financial performance<br>• Firm's competitive position results from the previous innovative activities; accumulation effects of a series of incremental changes<br>• First mover are not that prosperous |
| Hull (2004) | Quantitative: Survey with respondents from the product development, business development, total quality management, business process reengineering, and productivity improvement (62) | Service industries: Firm | **Composite Model: the construct of the operating system which influences performance, i.e. efficiency as well as product innovation**<br>• The organization of Early Simultaneous Involvement (ESI) has the greatest effect<br>• The impact of ESI is augmented by an interaction effect with In-process Design Controls<br>• The magnitude of the innovation strategy positively influences the model's impact |
| Ramirez (2004) | Qualitative: Case study/ UK telecommunication firm (1) | IT: Firm | **ICT development's impact on management of new products as well as services**<br>• Value of integrating broader groups of employees into the innovation process<br>• Yet shaping the work-related routines of a firm is a difficult process: management might be required to enhance empowerment of employees; increased discretion; adapt how a task is pursued |
| Van Riel et al. (2004) | Quantitative: Mail survey/ senior managers of firms producing high-technology services (251) | High-tech service industry: Firm | **Internal innovation success antecedents**<br>• Direct and positive influence of well informed and knowledgeable decision-makers<br>• Market orientation: an organizational climate supportive of knowledge exchange mediates the positive effects of collecting customer as well as technology information<br>• Competitor orientation shows negative effects, and managerial seniority appears to play a minor role |
| Chai et al. (2005) | Qualitative: Case study/ a leisure resort island (1) and a university (1) | Service industries: Project | **A theory of inventive problem solving (TRIZ)- based method for new service design**<br>• A new TRIZ-based approach is proposed<br>• TRIZ problem-solving tools and its knowledge base are integrated |
| Hipp and Grupp (2005) | Qualitative: Survey by Mannheim Innovation Panel / firms from the service industry (about 400 to 2,000) | Service industries: Firm | **Differences of service sector to manufacturing industry**<br>• Less systematic organization of the innovation process; usually do conduct the typical R&D; structure of expenditure; patent protection and theoretical concept of patent competition is of minor importance; manufacturers registered a respectable number of trademark applications for novel services; the patterns of service innovation are less sector-dependent; every type of innovator can be found within each individual service industry<br>• Emphasis on joint analysis of manufacturing and services; special attention to KIBS |
| Leiponen (2005) | Quantitative: Survey/ Finnish KIBS (167) | KIBS: Firm | **Organizing knowledge and innovation**<br>• Collective application of knowledge is more likely to lead to significant improvements in services than individual application of knowledge<br>• External sourcing of knowledge, particularly from customers and competitors, is more conducive to new service introductions than local and incremental learning on the job<br>• Broad information sourcing and internal cooperation to mobilize knowledge thus support the renewal of KIBS<br>• More significant service innovations are also supported by highly educated employees, but the role of R&D investments is not significant |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Verganti and Buganza (2005) | Qualitative: Case study/ conducted on Italian Internet-based firms (2) | Online news-paper: Firm | **Managing service innovation**<br>• The service life cycle requires flexibility<br>• Inertia towards changing both the firm's back end as well as the customer may impair the life-cycle flexibility<br>• To diminish prospective inertia life-cycle flexibility may be incorporated into the first service design |
| Vermeulen et al. (2005) | Quantitative: Survey/ small service firms (502) | Service industries: Firm | **Key determinants for new product introductions and firm performance in small service firms**<br>• Supplier-dominated service firms (e.g. retail stores, personal services, hotels) perform less frequently activities which trigger innovation than production-intensive ones (e.g. wholesale, transport, financial services) and KIBS firms (e.g. consultancy, engineering, architecture, research)<br>• The potential for increasing firm performance through innovation boosting might be greater for supplier-dominated firms<br>• Those who actively search for opportunities (to adopt innovations developed elsewhere) and observe the needs of their customers will have more new product introductions<br>• In production-intensive services, significant antecedents are related to market research, documentation of change activities and employee involvement in innovation activities<br>• In KIBS, the introduction of new products seems to depend predominantly on market research and the involvement of employees |
| Wong and He (2005) | Quantitative: Survey/ manufacturing firms (371) and KIBS (181) | Manufacturing KIBS: Firm | **Innovation behavior in Singapore's KIBS and manufacturing firms**<br>• The proportion of innovation is higher for KIBS firms than for manufacturing firms, but the latter are more likely to conduct R&D than the former<br>• KIBS firms invest more in human capital, training, innovation, and R&D than manufacturing firms<br>• KIBS firms and manufacturing firms strive for similar innovation goals, despite some differences<br>• Manufacturing firms are more likely to engage in overseas partnerships for innovation than KIBS firms are<br>• There is a U-pattern of innovation collaboration with geographic distance for both KIBS and manufacturing firms<br>• For KIBS firms social capitals are to successfully provide manufacturing clients with innovation support<br>• The importance of spatial proximity is determined by the different phases of innovation support |
| de Vries (2006) | Qualitative: Case study/ innovation projects (5) | Service industries: Project | **Enhanced representation of theory on innovation**<br>• Client technology dimension; multiple providers' competencies; multiple providers' technology<br>• Integrative: both forms of innovation- technological and non-technological |
| Ching-Chow (2007) | Qualitative: Case study/ firm Taiwan Securities (1) | Service industries: Firm | **Elaboration of framework for systems approach of NSD**<br>• Key design stages: 1. process design; 2. quality design; 3. production-management design; 4. capacity design; 5. management design; 6. physical and technical design<br>• Integrated and systematic approach is very effective |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Love and Mansury (2007) | Quantitative: Survey/ U.S. business services (206) | Business services: Firm | **Formal vs. informal R&D**<br>• External linkages, particularly with customers, suppliers and strategic alliances, significantly enhance innovation performance in terms of the introduction of new services<br>• A highly qualified workforce increases the probability of service and organizational innovation, and increases the extent of a firm's innovation, but unqualified employees also play an important role<br>• Contrasting with some earlier research on services, the presence of formal and informal R&D significantly increases the extent of new-to-market and new-to-firm innovation |
| Lyons et al. (2007) | Qualitative: Case study/ investment banks | Finance: Firm | **Service innovation and its distinctive antecedents**<br>• Four fundamental enablers: 1. value in boundary spanning; 2. client relationships are broad and deep; 3. design and execution are tightly integrated; 4. CEO's articulate a clear vision of innovation<br>• A sustained service innovation: is dispersed in the organization; is fluid and continuous; balances risks and rewards; determines hiring and promoting; is enabled by leadership |
| Miles (2007) | Qualitative: Analysis of existing statistical sources, interviews and workshops/ service firms' managers | Service industries: Firm | **R&D in services**<br>• Services R&D statistics still rather inadequate<br>• Expectation that 1. services' business R&D will continually increase; 2. yet less than expected from the prevalence of services in economies; 3. many services' innovation will continue to rely heavily on sources not directly linked to R&D<br>• Claim for frameworks for R&D management that recognize the distinctiveness of the service sectors and types of firms |
| Amara et al. (2008) | Quantitative: Survey/ CEO or senior managers from Canadian innovative service establishments in engineering services (627), computer system design services (1,514), and management consulting (484) | Service industries: Firm | **How KIBS protect their inventions and innovations**<br>• Much more complex than predicted by the current conceptual frameworks<br>• KIBS become more R&D intensive<br>• They tend to rely not only on patents, but on the complementarities of a large variety of legal and informal mechanisms: patents, trademarks, complexity of designs, secrecy, and lead-time advantages over competitors |
| Bader (2008) | Qualitative: Case study/ the (re-)insurance firm Swiss Re (1) | Finance: Firm | **Factors determining intellectual property management's success**<br>• Strategic proliferation (support from top/ middle management, large and highly diversified patent portfolio, sustainable intellectual property activities and sufficient monetary assets)<br>• Organizational proliferation (awareness program, incentivizing for inventions, shared knowledge to encode inventions, local explorative partners)<br>• Collaboration (external expert know-how) and legally protecting value position |
| Consoli (2008) | Qualitative: Case study/ Automated Teller Machine (ATM) and Electronic Fund Transfer at Point of Sale | Finance: Firm | **Systems of innovation and industry evolution**<br>• How changing configurations of the knowledge base combined with the emergence and adaptation of institutional structures stirred a paradigm of service innovation in an information-intensive industry like banking<br>• There are subtleties of a dual evolutionary process underpinning the development of a system of innovation: the growing ecology of actors and the emergence of new forms of coordination across them |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Pires et al. (2008) | Quantitative: Empirical tests of an innovation output model (integrating service and manufacturing firms) with data taken from CIS[3] 3 for Portugal | Various Sector | **Comparison of determinants of product and service innovations**<br>• In services there are significantly differing innovative behaviors in terms of intramural and extramural R&D<br>• In services the size matters less than in manufacturing<br>• Youth positively influences both young service firms and young manufacturing, though the former are more probable pioneer innovators than the latter<br>• Great importance of experience and learning in service process innovations, as young service firms are less likely to introduce such types of innovations |
| Tether and Tajar (2008) | Quantitative: Exploratory statistical technique of multiple correspondence analysis, usage of 'Innobarometer 2002'/ managers in 3,014 European firms via computer aided telephone interviewing | Various: Sector | **Three modes of innovation are presented**<br>1. product research; 2. process-technologies; 3. organizational-cooperation<br>• 1. & 2.: prevalent amongst high-technology firms and low-technology manufacturing firms<br>• 3.: less known, organizational innovation which is more prominent in services; service innovations are frequently 'soft' |
| Berg and Einspruch (2009) | Qualitative: Data Surface Mining (Berg and Einspruch, 2004)/ 1. Business Week and Boston Consulting Groups' survey in 2006 of innovative firms (1,070), 2. Ocean Tomo (2006) firm analysis (300) | Service industries: Firm | **Intellectual property in the service sector: innovation and technology management**<br>• There are significant differences in the role that intellectual property plays in the management of technology in both goods and service sectors |
| Chen et al. (2009) | Quantitative: Survey/ paired samples from the marketing and IT departments of firms in the Taiwanese financial industry (123) | Finance: Firm | **Innovation in service delivery**<br>• Antecedents: Innovation orientation; external partner collaboration; information technology capability<br>• Innovation in service delivery enhances the firm's financial performance |
| Kindström and Kowalkowski (2009) | Qualitative: Explorative case study/ semi-structured interviews with service, R&D, general, and application managers of Swedish manufacturing firms (10), focus group during research period (2004-08) | Manufacturing industries: Firm | **Elaboration of a four-stage service offering development framework:** 1. market sensing; 2.development; 3. sales; 4. delivery<br>Critical aspects of NSD in manufacturing<br>• The importance of considering both NSD and new product development (NPD) together<br>• Compared to traditional NPD, NSD requires less initial investment in the stages 1 and 2, but stages 3 and 4 are typically more time-consuming, resource intensive, complex to manage, and also costly |
| Lenfle and Midler (2009) | Qualitative: Case study/ design process of the Emergency and Breakdown Call E/ B Call | Automotive: Project | **Management of final phases of designing an innovative product-related service**<br>• Two difficulties of innovative product-related service launch<br>1. Concurrent engineering - importance of early involvement of sales personnel<br>2. Structural constraints of the sales process to educate the customer<br>3. Quality of upstream design work for performance, challenge of late changes, the role of management structures in this phase, emphasize importance of support with managing problems and help to capitalize on the accumulated knowledge |

[3] In Tables 2-III to 2-VI, the abbreviation CIS will be used for 'Community innovation survey' which is part of the EU science and technology statistics (Eurostat, 2014)

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Shearmur and Doloreux (2009) | Quantitative: Survey/ KIBS from Quebec, Canada (1,122) | KIBS: Firm | **Influence of geographic conditions on innovation**<br>• Geographic patterns of innovation exist amongst KIBS firms in Quebec, although they are not those expected if there were a connection between local territory and innovation<br>• Innovation first decreases with distance from the core of metropolitan areas, then, after 30-50 km, begins to increase again, though this pattern is not the same for all sub-sectors<br>• This pattern is in keeping with recent theoretically derived expectations relating to the geography of innovation |
| Toivonen and Tuominen (2009) | Qualitative: Case study/ real estate and construction services (1) and KIBS (1) | Real estate and constructions, KIBS: Firm | **Nature and emergence of innovations in services**<br>• Instead of a systematically isolated process, the innovation processes are often intertwined with the actual service delivery process<br>• Separating the service system from the service process and adding the service concept is crucial to analyze the 'loci' of service innovation |
| Vence and Trigo (2009) | Quantitative: Secondary research/ CIS3 for European countries provided by Eurostat, EU-15, Iceland and Norway, 1998-2000 | Service industries: Sector | **Diversity of innovation patterns in services**<br>• More innovative firms cooperate in the service sector than in the manufacturing sector<br>• There are differences regarding the propensity to cooperate among firms in the various service sub-sectors |
| Abreu et al. (2010) | Qualitative: Secondary research: UK CIS4 between 2002-2004 (16,000 firms in GB); case study (20) | Service industries: Firm | **Intensity and the nature of innovation in services**<br>• Introduction and use of ICT represents the main technological aspect of service innovation<br>• Non-technological aspects of innovation, organizational change, and the role of human capital educated in 'soft' skills, such as arts and humanities<br>• There is a large diversity among sectors regarding how and to what extent innovation is executed |
| Amara et al. (2010) | Quantitative: Secondary data analysis/ Canada Innovation Survey 2003 (2,625) | KIBS: Firm | **Existing complementarities due to three patterns of complementary innovation capabilities, one pattern of substitute activities and finally, four patterns of innovation capabilities that are independent from each other**<br>1. between internal R&D, external R&D, acquisition of equipment and machinery, and marketing activities<br>2. between external R&D, acquisition of equipment and machinery, acquisition of external knowledge and marketing activities<br>3. between acquisition of equipment and machinery, acquisition of external knowledge and marketing activities |
| Chamberlin et al. (2009) | Quantitative: Secondary research/ Statistics Canada's 2003 Survey of Innovation (3,701 firms in 34 services sectors) | Service industries: Sector | **Inter-sectoral differences**<br>• Most important business success factors: satisfying existing customers, developing niche, export and domestic markets, hiring skilled workers, using teams and encouraging risk-taking, developing knowledge sharing culture, documenting best practices, using partnerships and alliances to acquire knowledge, ensuring good quality control practices, implementing ICTs, etc.<br>• The firms that showed an international orientation were focused on offering information services to producers, while the firms that were domestically oriented were offering various types of customers (producers, consumers) and various types of services (physical services, information services)<br>• Innovative firms are more prone to develop their human resources, to manage their organizational knowledge and adopt new technologies than non-innovative firms, the latter being more likely to consider proximity to customers and suppliers crucial |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Gebauer et al. (2010) | Qualitative: 1.: longitudinal study, semi-structured interview/ manufacturing firms in 1997, 2001, and 2004 (97); 2.: case study/ selected firms (15); cluster analysis and cross-tabulation | Various: Firm | **Four identified patterns of changing the service strategy**<br>1. Customer service strategy: after-sales service provider<br>2. After-sales service provider: customer-support service provider<br>3. Customer-support service provider: development partner<br>4. Customer-support service provider: the outsourcing partner<br>• There is a specific alignment between service strategy and organizational structure and design |
| Hurmelinna-Laukkanen and Ritala (2010) | Qualitative: Secondary data analysis from websites, newspapers etc. and case study/ managers from the Finnish Mobile TV in 2007 (in total 15) | Media: Project | **The difference of service innovation to technology/ product innovation regarding intellectual property protection**<br>• Characteristics separating service innovations from product/ process innovations influence the efficacy of protection<br>• Service innovators cannot rely solely on intellectual property right strategies, as those who work with products might do: they must take a broader perspective, and utilize means such as human resource management, lead time, and contracting |
| Koelling et al. (2010) | Qualitative: (Multi-)case study/ German service innovators (80) (selection via contest) | Service industries: Firm | **The strategic relevance of the fit between innovative service offering and interaction**<br>• A clear and well-formulated service innovation strategy facilitates the design of successful service innovations<br>• Whether the strategy is low cost, differentiated or mixed emphasis, significant for success is the alignment of the strategic approach and the particular design of its service delivery system |
| Meiren and Burger (2010) | Qualitative: Case study/ 'knowledge on demand' service by Siemens Switzerland (1) | IT: Project | **Testing of services within the NSD process**<br>• Testing can be important to the development of new services<br>• ServLab: Visualization and testing of service concepts allow creation of 'service prototypes' |
| Castro et al. (2011) | Quantitative: Secondary research/ Instituto Nacional de Estadística database, Spanish firms (11,330) | Various: Firm | **Difference between innovations made by service and manufacturing firms**<br>• Manufacturing firms show a greater propensity to technologically innovate, i.e. product and process-related innovations<br>• Service firms are more prone to conduct organizational as well as commercial innovations |
| Ettlie and Rosenthal (2011) | Quantitative: Field-based hypothesis development and testing study/ firms purchased from a private survey firm (CorpTech) and MBA classes (total: 67 cases, of which 29 were service and 38 were manufacturing firms) | Various: Firm | **Difference between manufacturing innovators and service innovators**<br>• Manufacturing state with more probability that new strategies and structures are required when products are new<br>• Services are better in transforming novelty into success<br>• Services are significantly more prone to engage in shorter formal beta testing and to exploit manager ideas (internally sourced)<br>• Similarity between manufacturing innovators and service innovators: manufacturing and services show a similar tendency to exploit customer ideas (externally sourced) for new offerings |
| Forsman (2011) | Quantitative: Survey/ small business owners and managers (708) | Various: Firm | **Service innovation in small firms**<br>• Rarely radical innovations and greater effort to support the development of incremental innovations<br>• More difficult to sustain the advancement also in other sectors, innovation capabilities and input obtained by networks are crucial determinants of innovation capacity<br>• Within innovation policies small firms are considered as a homogeneous group, suggestion is to consider significant differences between the firms as innovators |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Hogan et al. (2011) | Quantitative: Multi-stage scale development via interviews/ 37 participants and surveyed 463 respondents from professional service firms | Service industries: Firm | **Reconceptualization of the innovation capability of professional service firm**<br>• Emphasis on multi-dimensional nature of innovation capability in the scope of this sector, i.e. client-focused, marketing-focused, and technology-focused innovation capability<br>• Provided evidence of face validity, content validity, convergent and discriminant validity, nomological validity and reliability of developed scale |
| Lightfoot and Gebauer (2011) | Qualitative: Case study/ Western European capital goods manufacturing firms (24) | Capital goods intensive industries: Project | **Configuration of determinants for service innovation**<br>• It is very complex to align service strategies with determinants for innovations<br>• The orchestration of the determinants is connected to the innovation success<br>• Altering configurations of determinants can create counterproductive effects and threaten both the success of service innovation projects and implementation of service strategies |
| Nordin et al. (2011) | Qualitative: Longitudinal study/ exploratory workshops, focus-group sessions, individual semi-structured in-depth interviews, and presentation of own firm in European manufacturing firms (9) | Manufacturing industries: Firm | **Challenges for manufacturing firms that extend their traditional product offerings by services**<br>• Greater customization of an offering is associated with: greater operational risk; reduced strategic risk; less financial risk<br>• Bundling strategy (pure or mixed) is associated with: greater operational risk; greater financial risk<br>• Mixed bundling strategy is associated with: lower strategic risk than pure ones<br>• A wider range of offerings is associated with: greater operational risk; greater financial risk; more strategic risk |
| Patrício et al. (2011) | Qualitative: Case study/ new retail grocery service (1) and redesigning a bank service (1) | Service industries: Project | **Multilevel Service Design**<br>• Integrates contributions from NSD, interaction design, and service design<br>• Integrates co-creative nature of customer experiences |
| Salonen (2011) | Qualitative: Case study/ the industrial manufacturers of capital equipment Wärtsilä and Kone | Manufacturing industries: Firm | **Service transition strategies of industrial manufacturers**<br>• Manufacturers develop product-related services in a separate service division<br>• The strategy of integrated solutions has the aim to increase the competitiveness of their core product offering under industry circumstances |
| Salunke et al. (2011) | Qualitative: Interviews/ project-oriented service firms (13) | Service industries: Firm | **Dynamic capabilities**<br>• The model proposes that entrepreneurial innovative service firms create and maintain a set of dynamic capabilities that enable them to generate impactful innovations and sustained competitive advantage<br>• Firms utilize, create, extend, and modify processes to sustainably build key dynamic capabilities |
| Andersson et al. (2012) | Quantitative: Secondary data analysis/ Swedish CIS4 (2,177) | Various: Firm | **R&D strategies**<br>• Firms with persistent R&D investments and a general superiority in sales, exports, productivity, profitability and wages are less likely to generate entrepreneurs than firms with temporary or no R&D investments<br>• Start-ups from KIBS firms with persistent R&D investments have a significantly increased probability of survival, whereas no corresponding association between the R&D strategies of incumbents and survival of entrepreneurial spawns is found for incumbents in manufacturing sectors<br>• Spin-outs from KIBS firms are more likely to survive if they start in the same sector, indicating the importance of inherited knowledge<br>• R&D intensive firms are less likely to generate employee start-ups, but their entrepreneurial spawns tend to be of higher quality |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Birdi et al. (2012) | Quantitative: Longitudinal and multisource evaluation strategies/ design engineers (123) | Engineering: Individual | **Effectiveness of theory of inventive problem solving (TRIZ) creativity training**<br>• TRIZ training leads to short-term improvements in both the creative problem-solving skills and motivation to innovate, and these were associated with longer term improvements in their idea suggestion in the workplace<br>• The resulting ideas are translated into new innovations and improved performance at work as a result of the training |
| D'Alvano and Hidalgo (2012) | Quantitative: Survey in trade, healthcare and education sector (124) | Service industries: Firm | **Innovation management tools and the degree of development of innovation process**<br>• Activities and practices are more developed than use of innovation management tools, and also show that leading innovation organizations have a higher use of innovation management tools |
| Das and Joshi (2012) | Quantitative: Survey/ technology service provider (108) | Service industries: Firm | **Process innovativeness in technology service firms**<br>• Process innovativeness increases firm performance<br>• Environmental hostility (external contingency) has a moderating effect on the relationship between process innovativeness with firm performance; whereas aggressive posture (internal contingency) has no moderating effect |
| Ettlie and Rosenthal (2012) | Qualitative: Case study on new service offerings (9) | Manufacturing: Project | **Service innovation in manufacturing industry with two development and launch strategies:**<br>1. The engineering culture path to commercialization tends to nurture concepts new to the firm and requires multi-functional strategy making, and does well with champions from operations that have deep knowledge of the conversion process in the respective industry context<br>2. The entrepreneurial orientation path tends to nurture concepts new to the industry or new to the world paired with sole champions from R&D or Engineering. CEO/ President sponsorship is very important for both strategies and either of it works well depending upon development culture and available resources |
| Leiponen (2012) | Quantitative: Longitudinal secondary data from Finnish CIS and Statistics Finland (533 firms) | Various: Firm | **Comparison between service and manufacturing firms**<br>• R&D investments play an important role in service innovations (contrary to prior research results)<br>• Both service and manufacturing firms benefit from breadth in external knowledge sourcing strategies, however for service firms parallel innovation objectives have a detrimental impact |
| Luo et al. (2012) | Qualitative: Delphi method: asking for preferences/ units in a Taiwanese district hospital (4) | Health: Project | **Balanced score card**<br>• Valuable operation-level strategic planning tool for service innovation efficiency<br>• Four perspectives are important: internal process, learning and growth, customer, and financial |
| Santamaría et al. (2012) | Quantitative: Secondary data from Spanish CIS (12,972 firms) | Manufacturing: Firm | **Service innovation in manufacturing industry**<br>• Service innovations are related to human resource development and have closer links to customers - service innovation by manufacturers has much in common with the innovation patterns detected in service sector firms<br>• Differences across manufacturers: the lowest- and highest-tech sectors report more service innovations than the medium-tech sectors |
| Wooder and Baker (2012) | Qualitative: Case study/ firm Sargentia, service: M-PESA | IT industry: Firm | **Service innovation stages**<br>• Phases: 1. start-up, 2. maturing, 3. steady state<br>• Important factors: identify customer needs, 'keeping it simple', remain flexible, motivate critical mass of new customers |
| Barquet et al. (2013) | Qualitative: Case study based on a workshop (1) | Machine tools: Firm | **Adoption of product-service systems (PSS)**<br>• Framework development<br>• Analysis of (1) firm's business context, (2) choice of appropriate type of PSS, and (3) definition of their PSS characteristics |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Berger and Nakata (2013) | Qualitative: Case study, interviews, observations, document and data analysis/ ICT implementations projects in sub-Saharan African countries (5) | Finance: Project | **IT for financial service innovation in 'Base of the Pyramid' markets, IT implementations are effective if they:**<br>1. address customer and agent limits with the technologies, and are accepted and supported by trained staff who monitor technology use and make responsive system adjustments,<br>2. exploit and promote supportive governmental regulations and actions, as well as leverage sound electronic fund transfer switches,<br>3. and account for low business capabilities and evolving market competition, along with the underdeveloped financial sector and financial literacy of the population. |
| Castro-Lucas et al. (2013) | Quantitative: Survey in France (51) | Service industries: Firm | **International development of service innovations**<br>• Service innovation plays an important role in international performance but far less than international experience and even less than the mastery of ICT<br>• International competence of the firm's personnel also enhances innovative behavior |
| Chen and Hsu (2013) | Quantitative: Commodity Research Bureau's Yearbook (60) | Finance: Project | **Relevance of innovative financial services (futures)**<br>• A stepwise regression model is fitted to the data set, and findings indicate that financially innovative futures dominate trading volume while traditional agricultural futures have little impact |
| Corrocher et al. (2013) | Quantitative: Survey, cluster analysis (Cluster 1: 86, Cluster 2: 109, Cluster 3: 103, Cluster 4: 143) | KIBS: Firm | **Growth in KIBS**<br>• Within the KIBS sector, younger firms tend to outperform incumbents in terms of sales growth; large firms tend to grow more than small firms<br>• The effects of firm size and age vary substantially according to the firm's specific pattern of innovation; in particular, very innovative firms tend to outperform competitors regardless of their age or size, while for conservative KIBS size constitutes a prerequisite for growth<br>• The investment in human capital and in the service distribution network also represent important competitive leverages for growing KIBS |
| Frattini et al. (2013) | Quantitative: Secondary data analysis/ new mobile value-added services (9,300) | Telecommuni-cation: Project | **Launch decisions and the early market survival of innovations**<br>• Communicating the distinctive characteristics of the new product or service and partnering with external organizations during the launch process are tactics that work particularly well with radical innovations<br>• Investments in corporate advertising lead instead to a tangible improvement of the probability of early market survival for both radical and incremental innovations |
| Guisado-González et al. (2013) | Quantitative: Secondary data analysis/ 2000 Survey of Technological Innovation (433) | Hospitality: Firm | **Coexisting innovation strategies**<br>• The innovation strategies that coexist most frequently are (1) the acquisition of external technology services and research and development cooperation and (2) the acquisition of machinery and non-material technologies<br>• Only the acquisition of machinery has a statistically significant impact on innovation performance; however, contrary to expectations, the influence appears to be negative |
| Hernandez-Pardo et al. (2013) | Qualitative: Survey/ small and medium-sized enterprises (SMEs[4]) (38) | Various: Firm | **Product-service systems (PSS) in SMEs**<br>• An integration between design process and ICTs appears to be a key mechanism in developing sustainable PSS in SMEs |

[4] In Tables 2-III to 2-VI, the abbreviation SMEs will be used for 'small and medium-sized enterprises'.

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Kuester et al. (2013) | Qualitative: Cluster analysis with secondary data from the Mannheim Innovation Panel and subsequent interviews/ German service firms (1,016) and managers (23) | Service industries: Firm | **Sectoral heterogeneity in NSD**<br>• Four service innovation types are determined: 1. efficient developers, 2. innovative developers, 3. interactive adopters, and 4. standardized adopters<br>• Identified success factors, i.e. service-related, process-related, firm-related, and market-related success factors are differently important for each innovation type |
| Leal-Rodríguez et al. (2013) | Quantitative: Survey/ Spanish hospitals | Health: Firm | **Knowledge management, relational learning, and the effectiveness of innovation outcomes**<br>• A deep and broad knowledge base leads to better innovation outcomes<br>• Hospitals and/ or units that invest and involve themselves in relational learning mechanisms are more likely to foster innovations |
| Moreno et al. (2013) | Quantitative | Various: Firm | **Proactive innovative behavior in new services**<br>• The client's participation in the process of innovation is greater in service firms that possess a larger innovation gap and are more proactive<br>• The opposite is the case for formalization and decentralization, which occur in lower levels in service firms<br>• Decentralization and formalization are lower in service than in manufacturing firms |
| Rapaccini et al. (2013) | Qualitative: Case study based on interviews and workshops (3) | Manufacturing industries: Firm | **New service development in product-service systems (PSS)**<br>• The model adopts a five-stage scale on which key elements are evaluated according to the following dimensions: 1. the approach used to manage processes and projects, 2. the use of specific resources, skills, and tools, 3. the involvement of customers, suppliers, and other stakeholders, and 4. the adoption of performance management systems |
| Sørensen et al. (2013) | Qualitative: Case study based on interviews, participations, and observations/ Scandinavian service firms (11) | Service industries: Firm | **Organizational conditions for service encounter-based innovation**<br>• Organizational support system (organizational confidence, correspondence capability, organizational decision capacity)<br>• Front office innovation climate (entrepreneurial working values, social intelligence, recognition incentives) |
| Tejada and Moreno (2013) | Quantitative: Survey/ Andalusian hotel SMEs (125) | Hospitality: Firm | **Innovation in tourism SMEs**<br>• Tourism innovation: product, process, marketing, and organizational<br>• Innovation patterns: tour-operator, geographic localization or co-operation |
| Trigo (2013) | Quantitative: Secondary data analysis/ firms from 20 Spanish service industries (2,148) | Service industries: Firm | **Innovation in R&D- and Non-R&D-intensive service firms**<br>• Organizational innovation counts for three of the four profiles, the new management techniques being the most common organizational innovation in all clusters<br>• Micro- and small-sized firms from several subsectors are more likely to be R&D-oriented than medium and large firms |
| Zhao et al. (2013) | Quantitative: Secondary data analysis/ new independent businesses listed in the Dun & Bradstreet Corporation database (1,246 firms) | Various: Firm | **Team capabilities**<br>• Strategic positional advantages, i.e. scalability and protectability, mediates founding team capabilities and new venture performance |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Strategy & Processes - Key Findings |
|---|---|---|---|
| Lin and Hsieh (2014) | Qualitative: Interviews with representatives from three firms (12) | Health: Project | **Sustainable new services**<br>• Challenges for NSD projects are user needs identification, the involvement of emergent technology, and collaboration between entities from different industries<br>• Five propositions which could be used for guiding stakeholders to effectively manage NSD projects to offer sustainable newly developed services: 1. Service identification, 2. service value net formation, 3. service modeling, 4. service implementation, 5. service commercialization |
| Méndez et al. (2014) | Quantitative: Survey with students (108) | Retail: Individual | **Factors that encourage individuals to choose franchise activity**<br>• There is no relation between entrepreneurship attitude and the business model<br>• The most important personal characteristics are tolerance for ambiguity and inner control |
| Messeni Petruzzelli and Savino (2014) | Qualitative: Case study/ Danish haute cuisine chef René Redzepi and his restaurant Noma | Hospitality: Firm | **The role of search and recombination in service innovation**<br>• Searching and recombining components across time may be beneficial for the success of an innovation, especially when they are culturally close to the inventor and relatively unexploited in the specific industry<br>• The positive contribution of old components is enhanced when they are recombined with other geographically proximate elements and when new techniques and solutions are employed |
| Rigtering et al. (2014) | Quantitative: Secondary data analysis/ small and medium-sized enterprises from Germany, Austria, and Switzerland (1,612) | Various: Firm | **Entrepreneurial orientation (EO)**<br>• On the overall level as well as for each of the three sub-categories proactiveness, innovativeness, and risk-taking service firms have a higher EO<br>• A firm's EO and its growth aspirations do not show significant differences<br>• EO is a strategic orientation of highest value for service firms, as well, under the premise of growth-orientation |
| Shin-Horng et al. (2014) | Qualitative: Case studies on Taiwanese innovative e-healthcare programs (4) | Health: Firm | **Systemic service innovations in e-Healthcare**<br>• The service organization of e-healthcare needs to take a broad view towards customer space and service benefit, especially when it comes to the formation of a commercially viable business concept<br>• E-healthcare services are not just means of promoting healthcare service quality and health interest of the service recipients, but may bring about a substantial impact on the cost and revenue structure of the service organization<br>• It is essential for the manager in the hospital to consider e-healthcare services as an integral part of medical care operations, when evaluating the cost-effectiveness of e-healthcare |

## Table 2-IV. Past Research on Antecedents: Markets & Customers

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Markets & Customers – Key Findings |
|---|---|---|---|
| Cooper and de Brentani (1991) | Quantitative: Survey/ financial firms (25 firms, 56 successful, 50 failed products) | Finance: Project | **Antecedents of new services success**<br>• Dominating factors: synergy, product and market fit; quality of execution of launch; unique and superior product; quality of execution of marketing activities<br>• Secondary factors: market size & growth; service expertise; quality of execution of technical activities and of service delivery and of execution of pre-development activities; tangible evidence<br>• Factors specific to services: degree of customization; uniformity of the service delivery process; degree of service intangibility |
| Hedvall and Paltschik (1991) | Quantitative: Factor as well as cluster analysis/ customers of 12 Swedish Pharmacies (498) | Pharma-ceutical: Individual | **Heterogeneity of customers' need for interaction**<br>• Service production system needs to be flexible enough to serve different customers adequately<br>• Contented, pharmacist-dependent customers as well as information seekers desire more strong interaction<br>• Independent customers prefer basic, no-trimmings service<br>• Discontented customers need quality improvements |
| de Brentani and Cooper (1992) | Quantitative: Survey/ 37 financial services firms (56 successful, 50 failed projects) | Finance: Project | **Determinants of new financial services for businesses success**<br>• Equally relevant for new manufactured and new service products: product and market fit; quality of conducting launch and marketing activities; synergy or product and firm fit; and service expertise; product advantage |
| Cooper et al. (1994) | Quantitative: Survey/ firms in financial services sector (173) | Finance: Project | **Specific antecedents that distinguish the moderately successful ones from the very successful**<br>• Financial performance: marketing synergy, market-driven new product process, marketing communication customer service, managerial/ financial synergy, launch preparation<br>• Relationship enhancement performance: a market driven new product process, launch preparation, product responsiveness, product advantage<br>• Market development performance: innovative technology, a market-driven new product process, effective marketing communication |
| de Brentani and Ragot (1996) | Quantitative: 1. survey (55 firms, 112 projects), 2. in-depth case study/ Canadian firms (5) | KIBS: Project | **Determinants of the success of new professional services**<br>• Strong external orientation: product superiority (uniqueness and innovativeness); client and marketing fit; customer participation<br>• Strong internal orientation: emphasis on the corporate expertise and resources; the innovative culture of the firm; the skill in NSD they have gained over the years |
| Storey and Easingwood (1998) | Quantitative: Survey/ new financial service products (152) | Finance: Project | **The augmented service offering**<br>• Introduction of performance dimensions: sales performance (S); enhanced opportunities (EO); profitability (P)<br>− Service product factors explain 9.9 % (S), 16.3 % (EO), and 70,6 % (P)<br>− Service augmentations explain 54.7 % (S), 66.3 % (EO), and 0.0 % (P)<br>− Marketing support explains 35.5 % (S), 17.4 % (EO), and 29.4 % (P) |
| de Brentani (2001) | Quantitative: Mail survey/ managers from various business services in Canada (115) | Service industries: Project | **Very innovative vs. incremental new services**<br>• Similarities of very innovative and incremental new services: client need/ fit; frontline expertise<br>• Primary differences regarding: strategy and resource fit; innovation culture and management; service quality evidence<br>• Secondary differences regarding: service complexity/ cost; NSD: formal evaluation and design, market potential |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Markets & Customers – Key Findings |
|---|---|---|---|
| Abramovici and Bancel-Charensol (2004) | Qualitative: Case study/ French service firms (3 projects) | Hospitality, Transportation: Project | **The impact of customers on innovation success**<br>• Understanding the added value; desire and ability to be involved; training methods; external communication contributing to adoption by customers |
| Carlvaho Vieira et al. (2004) | Quantitative: Survey/ 120 Portuguese firms (63 successful and 57 failed services) | Finance: Project | **New services margin/ high success discriminators**<br>• The financial and non-financial return of new services is determined by several factors presented in the model: marketing effort; relative advantage; global quality; management synergies; innovativeness to market; NSD process formalization; corporate image; forecast/ regulation<br>• Different/ less factors that discriminate between new services of moderate and high success |
| Lidén and Sandén (2004) | Qualitative: Multiple case study (one host, two micro cases) via personal interviews and content analysis/ informants (31) and documented guarantee reports (41) | Temporary work business and staffing service: Firm | **Adding service guarantees as service development**<br>• A too simplistic image of how easily these results may be obtained; underestimation of formalization<br>• Rather service improvements than new services<br>• Efforts are best focused on the improvements that customers appreciate the most - something that service development theorists regard as difficult |
| Kleijnen et al. (2005) | Quantitative: Two scenario experiments/ public respondents (105), private respondents (104) | Potential customers: Individual | **The fit between consumers' image and the image of an innovation**<br>• Image congruence has a significant impact on the attitudes of consumers and their decision to adopt<br>• Image congruence and the consumption situation are interrelated<br>• Consumers with low image congruence are more influenced by situational factors than consumers with high |
| Neu and Brown (2005) | Qualitative: Case study/ successful service development of IT firms (3), failed service development (1) | IT: Project | **Factors that enable the formation of successful B2B services**<br>• Given a complex market, successful business service development depends on managers' ability to form a strategy that is aligned to such conditions<br>• Adopting a market and a customer-centered orientation<br>• Forming an added value that fits both components of a complex market<br>• Have access to existing organizational resources that match the demands of a complex market |
| Leiponen (2008) | Quantitative: Survey/ 100 largest firms in six industries in Finland (145) | KIBS: Firm | **Governing knowledge assets in client-supplier relationships**<br>• Through service innovation contractual arrangements can have varying consequences<br>• Bargaining power increases the likelihood of retaining control rights<br>• Innovative service firms tend to retain control rights over their intellectual property, however, the direction of causality is not firmly clarified |
| Michel et al. (2008) | Qualitative: Case study/ innovation projects that changed the way customers co-create value (26) | Various: Project | **Elaboration of managerial framework regarding the role of customers in service as well as product innovation**<br>• Service logic approach, outside-in: managers change the role of customers to users, buyers, and payers<br>• Service logic approach, inside-out: support customers to become smarter through smarter offerings, by relieving or enabling them of certain co-creating activities, and by reconfiguring value constellations |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Markets & Customers – Key Findings |
|---|---|---|---|
| Möller et al. (2008) | Quantitative: Case study/ Finland-based industrial firms concerning their networking, business models, and international service strategies (91) | Various: Firm | **Co-production with customers - modes of innovation**<br>• Client-driven collaboration is rooted in the ability of the service provider to approach the client's immediate and explicit needs<br>• Provider-driven innovation modes relate to the development of innovations that would not exist without providers' commitment and risk-taking behavior<br>• Balanced mode of service co-creation: congruent objectives may result in services that meet both the clients' immediate needs and serve as a lever for future services |
| Carbonell et al. (2009) | Quantitative: Survey/ various firms selected from the Dun & Bradstreet Corporation database 2004 listing of Spanish service firms (102) | Service industries: Firm | **Customer involvement as antecedent of the NSD process**<br>• CI has a positive direct impact on technical quality and innovation speed<br>• CI has an indirect impact on competitive superiority and sales performance via both technical quality and innovation speed<br>• There is a positive impact of technological novelty as well as technological turbulence on customer involvement<br>• No moderating effects of the stage of the development process were found |
| Lee and Chen (2009) | Qualitative: Case study/ computer laboratory at Taiwanese high school and British restaurant in 5 star hotel in Taiwan (2), 1. case: students (288), manager surveys (1); 2. case: customer (219), managers surveys (26) | Education and Hospitality: Individual | **The efficient development process, the customer orientation, and the input**<br>• Validation of integrative model (Kano's model with quality function deployment)<br>• The advantage: customers need to be assigned to specific categories, so that each category would show a different relationship regarding satisfaction<br>• Revised improved ratio calculated by the increasing degree of satisfaction: adjusts the importance of customer need, and emphasizes the increased customer satisfaction achieved with NSD |
| Candi (2010) | Quantitative: Case study; longitudinal study with survey/ new technology-based firms (first round: 118, second round: 101) | New technology-based: Firm | **The objectives underlying new technology-based firms managers' decisions to use aesthetic design in NSD**<br>• Winning new customers; creating and supporting a positive image of their firms within their target market; retaining existing customers with lower costs<br>• Often managers' expectations regarding the benefits of emphasizing aesthetic design in NSD are realized |
| Hsien-Tang and Hsi-Peng (2010) | Quantitative : Secondary data for setting up items; survey/ Taiwanese communications firms (377) | Communica-tion: Firm | **Measuring innovation competencies for integrated services**<br>• Elaboration of a measurement tool of innovation competencies for integrated services<br>• The dimensions with the most important effects on overall innovation competencies: 1. industry specific (0.45); 2. market-related (0.23); 3. technology-related (0.14); 4. product-related (0.13); 5. organization-related (0.13) |
| Jaw et al. (2010) | Quantitative: Survey/ Taiwanese top 500 service firms and top 100 financial firms (136) | Service industries: Firm | **Determinants of successful NSD**<br>• Heterogeneity (service characteristic), perishability (service characteristic), and market orientation have positive impact on a firm's resources and benefits gained by innovation<br>• Innovation efforts and market orientation have positive impact on NSD performance |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Markets & Customers – Key Findings |
|---|---|---|---|
| Melton and Hartline (2010) | Quantitative: Survey of high positioned managers from U.S. service firms (160) | Service industries: Firm | **The influence of the customer and the frontline employee on NSD performance**<br>• In certain stages of the NSD process there is an indirect impact on sales performance and project development efficiency<br>• Positive effects are mediated by service marketability and launch preparation<br>• Involving customers in the design and development stages helps to identify market opportunities, generate and evaluate new services, define benefits and features of the potential service, and provide extensive feedback for product and market testing<br>• Frontline employees are less effective in generating new service ideas |
| Candi (2011) | Quantitative: Longitudinal study via surveys/ CEOs of technology-based firms (1. 65 in 2005, 2. 63 (from previous year) in 2006, 3. 101 in 2007) | Technology-based industries: Firm | **Conditions under which the use of aesthetic design is likely to improve performance**<br>• Aesthetic design's impact on competitive advantage as well as profitability: when the level of commoditization is high<br>• Aesthetic design's impact on resistance to service imitation: stronger when the relative importance of aesthetic design in a firms' sector is low |
| Liao and Cheng (2011) | Quantitative: Two experiments (consumers) | Consumer: Individual | **Self-service innovation failures are evaluated depending on brand equity and attribution**<br>• High-equity brands suffer less from the adverse effects of self-service innovation failures when compared with low-equity brands<br>• Self-service innovation failures are more detrimental to high-equity brands if they are caused by service providers' internal factors as well as low service recovery |
| Oliveira and von Hippel (2011) | Qualitative: Secondary research/ retail banking service (25) and corporate banking service (22); plus interviews with banking experts on questions not answered in secondary data (12) | Finance: Project | **Users as service innovators**<br>• Source of functional innovations ( %: total, retail, corporate services): user (85 %, 84 %, 86 %); bank (9 %, 8 %, 9 %); joint user and bank (6 %, 8 %, 5 %)<br>• Processes vary: manually for users; via IT system for provider<br>• Similar to product innovation findings, since the three antecedents are similarly applicable: 1. significant amount of info on needs; 2. generally encountered by lead users that might be able to develop; 3. high probability to generalize findings |
| Ordanini and Parasuraman (2011) | Quantitative: Survey and secondary research/ Italian hotels (91) and AIDA Bureau Van Djick database for performance measures ('revenues per room' and 'EBIT-to-sales' for Italian firms with >10 employees) | Hospitality: Firm | **Determinants of service innovation's volume as well as radicalness, and the effect of the latter on performance (revenue growth and profit growth)**<br>• Collaborating with customers fosters innovation volume but not radicalness and vice versa for collaborating with business partners<br>• A firm's customer orientation both directly and in interaction with innovative orientation contributes to innovation radicalness<br>• Collaborating with contact employees enhances both innovation volume and radicalness<br>• The use of knowledge integration mechanisms contributes to innovation radicalness<br>• Both innovation outcomes have significant but different effects on the two success measures |
| Tsai et al. (2011) | Quantitative: Panel, service concept model, service gap model/ customers from various industries (100) of three Taiwanese banks | Finance: Firm | **Advancing NSD by incorporating customer needs and expectations**<br>• To ensure NSD success an analysis of customer preferences and reduction of discrepancies between customer satisfaction of perceptions and expectations is important |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Markets & Customers – Key Findings |
|---|---|---|---|
| Zomerdijk and Voss (2011) | Qualitative: Case study/ interviews with those involved in experiential service design in the organizations studied (which were identified via successful peers or experts) | Various: Firm | **Experiential Services Development**<br>• NSD processes need to be both systematic and flexible; market research requires empathetic and ethnographic approaches; learning from others is beneficial; the design utilizes tools that emphasize the experiential and emotional aspects of service delivery, such as customer journey and touch point analysis, storytelling, and metaphors<br>• The experiential services development needs: metrics to evaluate the emotional factors of customer experiences; cross-functional teams and involvement of front-line employees; a broad base for creativity |
| Chang and Yen (2012) | Quantitative: Survey with Taiwanese business units in service firms (235) | Service industries: Project | **Market orientation and service innovation**<br>• Customer orientation spurs incremental service innovation while inter-functional coordination spurs radical service innovation, both of which, in turn, enhance new service performance<br>• The impact of competitor orientation on new service performance is fully mediated by radical service innovation |
| Elg et al. (2012) | Qualitative: Action research, 1.: joint process to increase understanding (e.g. workshops); 2.: testing the model with diaries from patients (53) | Health: Individual | **Co-creation and learning through patient diaries**<br>• Three learning methods: the model may be used as a means for generating and collecting patient ideas; a single patient's story can be illustrated and can serve as incentive for health-care service development and creation of patient-centered care<br>• A larger number of diaries can be analyzed and combined with patient surveys to provide a deeper understanding of how the patient experiences health care services |
| Gounaris and Koritos (2012) | Quantitative: Survey/ adopters from four Greek banks, non-adopters were executive MBA students | Finance: Individual | **Bounded rationality relevance for adopters and non-adopters**<br>• Adopters: they relate specific innovation attributes and identify specific benefits<br>• Non-adopters: since they do not have any direct experience with the innovation they lack this familiarity |
| Gustafsson et al. (2012) | Quantitative: Survey with service or product development managers of European firms (207) | Various: Project | **The impact of communication on customer service innovation co-creation**<br>• Three dimensions of customer co-creation: 1. frequency, 2. direction, 3. content<br>• For incremental service innovations: positive effect; for radical service innovations: frequency with a positive and content with a negative effect |
| Lages and Piercy (2012) | Quantitative: Survey/ frontline employees (839) | Hospitality: Individual | **The value of identifying customer needs**<br>• The major driver of generation of ideas for service improvements is reading of customer needs by employees followed by affective organizational commitment and job satisfaction<br>• Special care should be put into selecting and recruiting employees who have the ability to read customer needs<br>• Organizations should invest in creating work environments that encourage and reward the flow of ideas for service improvement |
| Mahr and Lievens (2012) | Quantitative: Netnography and Consensual Agreement Technique (CAT)/ contributions of users in six mobile service innovation projects (676) | IT: Individual | **Virtual lead user communities as driver for innovation**<br>• The value of virtual lead user communities contributions stems from their ability to suggest solutions instead of simply describing problems or stating customer needs<br>• Lead users' technical expertise makes them particularly well-suited to develop new functionalities, but less so for design and usability improvements<br>• The digital context favors the creation of explicit knowledge that can be easily integrated into the development of new products<br>• Contributions given by lead users in a proactive way contain more novel insights than reactive contributions such as answers to community members' questions |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Markets & Customers – Key Findings |
|---|---|---|---|
| Schmidt et al. (2012) | Quantitative: Survey about nearly 2,100 motion pictures released in the U.S. from 1982 through 2000/ consumers at theatres in several cities (12,482) | Multimedia: Individual | **Age and sex determine new service evaluation**<br>• Older consumers are more critical of new services and rate them lower after consuming them relative to younger ones<br>• Women evaluate new services significantly more favorably than men. These results appear robust because women did not rate products that are normally developed and targeted to men (e.g. action/ adventure and science-fiction movies) lower than men; no evidence to support the notion of a 'chick flick' was found |
| Teixeira et al. (2012) | Qualitative: Interviews to test conceptualization of customer experience modeling/ residential customers regarding multimedia service provider (17) | Multimedia: Individual | **Customer experience modeling**<br>• The CEM allows systematization of its complex information<br>• CEM can facilitate the work of multidisciplinary design teams by providing more insightful inputs (orchestration of experience elements) to service design |
| Wang et al. (2012) | Quantitative: Survey/ Taiwanese bank customers (285) | Finance: Individual | **User adoption of new web service**<br>• Perceived relative advantage, perceived complexity, perceived compatibility, perceived uncertainty, and perceived transaction frequency are salient determinants of user adoption of web ATM |
| Alves (2013) | Qualitative: Case studies from United Nations awards | Public: Firm | **Co-creation in public services**<br>• Discussion on how co-creation, within a Service-Dominant logic, contributes to innovation in public-sector organizations and how to overcome the challenges posed by scarce resources and a multiplicity of clients and objectives and maintain citizen consensus around these activities |
| Biggemann et al. (2013) | Qualitative: Interviews on specific cases with suppliers and customers (5 suppliers, 5 customers) | Mining: Firm | **Developing and implementing customer solutions**<br>• The forces that drive customer and supplier interests and motivation to co-develop customer solutions may change over time, thus redefining the aim and scope of solutions and creating failure risk<br>• Customers present problems; suppliers respond, on the basis of not only the feasibility of the customer-specific solution but also of their evaluation of future solutions in a broader market; then suppliers aim to standardize successful solutions across markets<br>• Customers want close supplier relationships and unique solutions but also like standardized and repeatable solutions<br>• From a network perspective, a novel solution can have a market-shaping effect and evoke reactions from other actors who want to enhance their market position |
| Carmona-Lavado et al. (2013) | Quantitative: Survey/ KIBS (63) | KIBS: Firm | **Service innovativeness and innovation success in technology-based KIBS**<br>• The positive effect of human capital on service innovativeness is moderated by intensity in collaboration with clients, being human capital enhanced by organizational and social capital<br>• The effect of social capital on service innovativeness is partially mediated by human capital and also moderated by intensity in collaboration with clients<br>• Service innovativeness positively affects innovation success, while intensity in collaboration with clients has a higher effect |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Markets & Customers – Key Findings |
|---|---|---|---|
| Chen and Hsu (2013) | Quantitative: Survey/ Taiwanese firms (307) | Non-profit: Firm | **The role of market orientation for entrepreneurial orientation and firm performance**<br>• There is an existing inverted U-shaped relationship between each sub-dimension of entrepreneurial orientation and performance<br>• These relationships though do not exist for each sub-dimension of market orientation: when both market intelligence generation and responsiveness are high, the relationship between innovativeness and performance will be in a linear form<br>• Under the condition of high-market intelligence responsiveness, the higher proactiveness will lead to a higher performance level |
| Edvardsson et al. (2013) | Quantitative: Survey/ new service projects (500) | Service industries: Project | **New service development strategy**<br>• Managers are convinced that customer co-creation is most important for NSD success<br>• Contrary to management belief, a service development strategy is the 'missing link' in improving NSD performance<br>• There is an interaction effect between integrated development teams and customer co-creation: project managers should focus on individual competencies on the development team and how they interact with customers throughout the NSD process |
| Kohtamäki et al. (2013) | Quantitative: Survey/ Finnish firms (91) | Machine and equipment: Firm | **R&D services and the importance of relational capital**<br>• Relational capital affects supplier profitability at the level of customer relationships<br>• Relational capital moderates the link between R&D service exchanges and supplier profitability in the customer relationship<br>• R&D services have no direct impact on supplier profitability in the customer relationship - without relational capital they provide insufficient resources |
| Raja et al. (2013) | Qualitative: Interviews with key informants of an original equipment manufacturer (33 Repgrid interviews) | Manufacturing industries: Firm | **Integrating products and services**<br>• Important key attributes: knowledge, access, relational dynamic, range of product and service offerings, delivery, price, and locality<br>• Relational dynamic and access have the most influence on customer satisfaction |
| Balka et al. (2014) | Quantitative: Survey with 20 online communities (309) | Electronics, IT: Individual | **Selective openness**<br>• Openness increases community members' involvement in the innovation project and their contributions to it<br>• Some forms and loci of openness strongly affect community perceptions and behavior, while others have limited or no impact<br>• Thus, at least in relation to user communities, the trade-off that firms face between external value creation and internal value capture is softer than hitherto understood |
| Bolton et al. (2014) | Qualitative: Interviews with executives in successful firms (n.a.) | Service industries: Project | **The value of radical approaches**<br>• To truly understand customers and provide service experiences that engage and delight them is important to make a difference<br>• The new challenge for marketing is to help firms find and implement these small details to make a large impact on the overall customer experience |
| Ordanini et al. (2014) | Qualitative: Comparative case study/ customers at luxury hotel (300) | Hospitality: Individual | **Service innovation configurations' effect on new service adoption**<br>• Individual service attributes have complex trade-off effects and specific combinations of attributes act as sufficient conditions for new service adoption<br>• The composition of such combinations differs according to the different co-production requirements |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Markets & Customers – Key Findings |
|---|---|---|---|
| Payne and Frow (2014) | Qualitative: Interviews and complementary secondary data/ British Telecom and Zurich Financial Services | Telecommunication, Finance: Firm | **How large and complex service enterprises adopt structured processes for developing innovative value proposition**<br>• Formal development of value propositions (for customer management)<br>• Innovation in value proposition development represents a substantive opportunity for marketing to reassert its influence in the boardroom |
| van der Boor et al. (2014) | Quantitative: GSM Association database on mobile financial services | Telecommunication: Project | **Users from developing countries as innovators**<br>• 85 % of the innovations in this field originated in developing countries<br>• At least 50 % of all mobile financial services were pioneered by users, approximately 45 % by producers, and the remaining were jointly developed by users and producers<br>• The main factors contributing to these innovations to occur in developing countries are the high levels of need, the existence of flexible platforms, in combination with increased access to ICT<br>• Services developed by users diffused at more than double the rate of producer-innovations<br>• Three-quarters of the innovations that originated in non-OECD countries have already diffused to OECD countries, and the (user) innovations are therefore globally meaningful |

## Table 2-V. Past Research on Antecedents: Collaboration & Network

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Collaboration & Network – Key Findings |
|---|---|---|---|
| Lievens et al. (1999) | Quantitative: Survey/ banks and savings institutions (36) | Finance: Project | **Communication among the innovation process of new financial services**<br>• The higher the degree of intangibility of the new financial service, the higher the level of work-related uncertainty, and the less effective project team communication will become in reducing the level of innovative uncertainty<br>• The higher service variability, the more uncertain the task, the less effective project team communication will become in reducing the level of innovative uncertainty<br>• The degree of commercial new financial service success is positively related to the level of uncertainty reduction about customers, technologies, competitors, and resources |
| Lievens and Moenaert (2000) | Quantitative: Survey/ Belgian banks (36), commercially successful (37) and commercially failed (65) projects | Finance: Project | **Project communication during the new financial service innovation process**<br>• Uncertainty reduction contributes to the financial and technological new services' success<br>• Factors influencing effectiveness of project communication: organizational design; the level of complexity and formalization; the level of centralization; the project climate |
| Muller and Zenker (2001) | Quantitative: Postal innovation survey in different French and German regions/ manufacturing SMEs and KIBS (1,903 and 1,393, respectively) | Manufacturing industries, KIBS: Firm | **Interaction between SMEs and KIBS, and its effect on the innovation systems**<br>• SMEs and KIBS that interact are more innovative than firms that do not interact; interactions impact innovation features<br>• The respective national innovation systems discernibly influence on SME's and KIBS' tendency to interact on their knowledge-related activities, and on their innovation capacities |
| Dougherty (2004) | Qualitative: Ethnographic interview/ KIBS (9), i.e. here professional services and utility-like services (in total 59) | KIBS: Individual | **Theory: Three organizing principles together provide an infrastructure of relationships through which people generate practice-based knowledge organization-wide**<br>• Strategic articulation of the firm's practices<br>• Redesigning work to incorporate the three activities of practice<br>• Establishment of a corporate R&D to focus on the practice |
| Perks and Riihela (2004) | Qualitative: Case study/ Consignia, UK postal service, two new ICT services | Postal service: Project | **Critical factors underlying the nature of inter-functional activities and outcomes**<br>• Mechanisms to incorporate appropriate and timely functional input into the NSD process<br>• Stakeholder integration to prevent unnecessary effort by project managers<br>• Clear and structured hierarchy of authority increases efficiency<br>• Organizational context influences inter-functional behavior<br>• Time to communicate and develop shared understanding is important |
| Mattsson et al. (2005) | Qualitative: Case study in tourism firms (8) | Hospitality: Firm | **Innovation systems in Tourism**<br>• It is argued that scene-takers, in the form of individual entrepreneurs and organizations, perform a crucial function in the innovation system in developing and maintaining the scene |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Collaboration & Network – Key Findings |
|---|---|---|---|
| Leiponen (2006) | Quantitative: Survey/ industrial design, advertising, machine and process engineering, electrical engineering, management consulting, and R&D services (167) | Service industries: Firm | **Organizational knowledge in business services and effects of knowledge on innovation performance**<br>• Collective/ organizationally controlled knowledge is linked to service improvements and new service introductions<br>• Team-based knowledge supports new service introductions<br>• A strategy based on service solutions and tradable technologies is conducive to service improvements<br>• Explicit individual knowledge, i.e. higher education of service experts, weakly supports development new to the firm services<br>• Explicit individual skills may enable internal communication and knowledge acquisition from the external environment<br>• Individual tacit knowledge is negatively correlated with innovation |
| Windahl and Lakemond (2006) | Qualitative: Comparative case study/ initiatives of manufacturing firm (2) | Capital goods intensive industry: Project | **Six factors are crucial for the development integrated solutions**<br>1. The strength of the relationships between the different actors involved; 2. firm's position in the network; 3. firm's network horizon; 4. solution's impact on existing internal activities; 5. solution's impact on customers' core processes; 6. external determinants<br>• Inter- and intra-firm relationships can both enable and impede the development of integrated solutions |
| Anand et al. (2007) | Qualitative: Semi-structured interviews; additional secondary data such as archival material / London management consulting firms (4) | Manage-ment consulting: Process | **Elaboration of several ways of innovative knowledge-based structures' emergence and embedding**<br>• Socialized Agency is combined with one element (emergence step) and then the two remaining (embedding step)<br>• Hence, three diverse pathways occur: the expertise-based; the turf-based; the support-based pathway; if not entire process, failure occurs |
| Windrum and García-Goñi (2008) | Qualitative: Case study/ ophthalmology unit of the La Princesa Hospital in Madrid, Spain, ambulatory surgery (1) | Public health service: Project | **Elaboration of a neo-Schumpeterian model of health service innovation**<br>• Advantages: analysis of interactions between economic, social, and political spheres constituting innovations' complex selection environment (multi-agent model); consideration of recursive impact of radical innovations on the competences and preferences of agents, and their relative power; provision of more adequate definitions for radical and incremental innovation<br>• Distinction between sectors with human capital intensive and physical capital intensive production (not product and service distinctions per se) |
| Eisingerich et al. (2009) | Quantitative: Exploratory in-depth interviews/ managers and executives of professional service firms across different industries (38) | Service industries: Firm | **Inter-organizational relationships' effect on innovation focus and performance**<br>• Diverse inter-organizational relationships diminish the positive impact of innovation focus on firm performance<br>• Inter-organizational relationship commitment increases service innovation focus and strengthens the relationship between innovation focus and firm performance |
| Fischer et al. (2010) | Qualitative: Interpretative multiple-case study approach/ firms providing capital goods and services | Capital goods manufacturing: Firm | **How dynamic capabilities of sensing, seizing and reconfiguring shape the way in which service business is developed**<br>• Firms either exploit or explore the opportunities<br>• Dynamic capabilities differ between the two approaches and predict which way a firm chooses<br>• Dynamic capabilities are more interrelated to exploration than exploitation<br>• Dynamic capabilities associated with the exploitation amends existing knowledge on the transformation from products to services |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Collaboration & Network – Key Findings |
|---|---|---|---|
| Hsueh et al. (2010) | Quantitative: Survey/ business-to-business (B2B) software service industry (158) | IT: Firm | **Relationship between network embeddedness and service innovation performance**<br>• To improve service innovation performance firms need to form closer relations with business partners<br>• Significant positive correlation: relational embeddedness (stronger and more repetitive connections); structural embeddedness (more directly or indirectly established external networks); resource embeddedness (improvement of strategic resource management); positional embeddedness (intermediary position); supplier embeddedness (good relations); customer embeddedness (good relations) |
| Storey and Kahn (2010) | Quantitative: Survey/ marketing directors of UK service firms (121) | Service industries: Firm | **Knowledge management strategies and task knowledge in stimulating service innovation**<br>• Firms employing the strategies codification and personalization reflect higher levels of NSD knowledge<br>• Codification promotes NSD proficiency (an ability to execute NSD activities)<br>• Personalization promotes greater NSD innovativeness (market perception of the firm as novel and as an innovator)<br>• Combination most promising for creating sustainable competitive advantage |
| Anderson et al. (2011) | Quantitative: Survey/ service firms (81) | Service industries: Firm | **Innovation in services via learning in the context of a joint venture**<br>• There is a positive and direct influence of the cooperative learning process and the partners' commitment to innovate |
| Mention (2011) | Quantitative: Logistic regression model/ data from 4th Community Innovation Survey covering 2002-2004, Luxembourgish service firms (1,052) | Service industries: Firm | **The impact of cooperative activities and the use of internal and external input on the propensity of firms to introduce to the market innovations**<br>• Firms provided with internal and external information and firms involved in science-based collaboration are more likely to introduce new services<br>• Information obtained from competitors seems to have a negative influence on the degree of novelty of innovation |
| Schleimer and Shulman (2011) | Quantitative: Survey/ alliances (194) | Various: Firm | **Difference between NSD and NPD**<br>• Collaboration between firms in NSD is configured and works differently than collaboration between firms in NPD<br>• Stronger, positive relationship of intensity levels of cooperation among firms involved in NPD and development performance than in NSD<br>• In NSD, intensity of mutual trust has a stronger, more positive relationship with development performance than in NPD |
| Hakanen and Jaakkola (2012) | Qualitative: Interviews and observation of workshops from two business networks (51 interviews, 21 firm workshops) | Various: Network | **Co-creation of business networks**<br>• Effective co-creation of solutions requires a fit between the perceptions of multiple suppliers and their customers with regard to core content, operations and processes, customer experience, and value of the solution<br>• Co-creation is affected by, e.g. customer's preferences for participation and value, and the degree of competition, clarity of role division and rapport among the suppliers |
| Hsieh and Tidd (2012) | Qualitative: Interviews on four projects with involved actors in a closed/ open and radical/ incremental new service project (52) | Trade: Firm | **The impact of novelty on open/ closed NSD**<br>• Higher levels of project novelty demand higher intensity of knowledge sharing and communication; the more closed NSD tends to reduce the development time, but the more open approach improves the variety and quality of innovation<br>• The intensity and quality of relationships differentiates innovation outcomes, i.e. generative interactions |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Collaboration & Network – Key Findings |
|---|---|---|---|
| Olausson and Berggren (2012) | Qualitative: Comparative study/ firms Scania and Micronic | Capital goods Manufacturing industries: Firm | **The role of services in complex product development projects**<br>• Informational flows can compensate for asymmetries in triads of specialized functions and facilitate thoughtful trade-off decisions<br>• It is important to create conditions for integrated knowledge-based approaches across functions, which involve the generation and sharing of new knowledge |
| Perks et al. (2012) | Qualitative: Single case study (car insurance firm) | Finance: Firm | **A co-creation path is not simple or uni-faceted**<br>• Two main patterns of sequences: 1. one is dominated by ad hoc and enduring independent innovation be network actors, 2. one is initiated and driven by lead-firm innovation activity |
| Steinicke et al. (2012) | Quantitative: Survey on horizontal service cooperations (225) | Logistics: Firm | **Governance in horizontal service cooperation**<br>• The choice of governance measures improves the innovativeness of service cooperation<br>• The use of formalization and balanced mutual influence, combined with cultural similarity provides the basis for the development of new or enhanced services within the cooperation<br>• In contexts that build on equity-based contracts, innovativeness is driven by the degree of mutual influence among partners |
| Taifi and Passiante (2012) | Qualitative: Interviews and meetings with managers, questionnaire for members of strategic community (36) | Automotive: Firm/ department | **Strategic community creation**<br>• The most important mechanisms and dynamisms are IT-based communication, the strategic leadership of the founders, the use of a reward system as incentive to knowledge creation and sharing, and the indirect ties of the strategic community with other after-sales services firms |
| Trigo and Vence (2012) | Quantitative: secondary data analysis on Spanish Technological Panel 2004/ innovating service firms (2,148) | Service industries: Firm | **Scope and patterns of innovation cooperation**<br>• Typology of cooperation: intensive in techno-scientific, intensive in interactions with clients, and low intensive lonely innovators (probable to 59 %)<br>• Coexistence of different cooperation patterns within the same industry |
| Tsou (2012) | Quantitative: Survey (118 firms) | Finance: Firm | **Knowledge integration mechanisms support collaboration competency and partner match for new e-services**<br>• Collaboration competency and partner match relate positively to knowledge integration mechanisms, which in turn relate positively to e-service innovation<br>• Partner match relates positively to collaboration competency<br>• There is a mediating effect of knowledge integration mechanisms on the relationship between collaboration competency and e-service product innovation |
| Chaston (2013) | Quantitative: Survey/ small independent financial advisors (131) | Finance: Firm | **Open innovation and business performance**<br>• Independent financial advisor involvement in networks and open innovation can assist business performance |
| Gebauer et al. (2013) | Qualitative: 1.: Pilot study: interviews with and secondary data from firms in Western Europe (17 firms); 2.: in-depth study on each identified business network (4) | Capital goods Manufacturing industries: Firm/ network | **Service networks for solutions**<br>• Four service network types were identified that support the focal firm to shift to solutions: 1. vertical after-sales, 2. horizontal outsourcing, 3. vertical life-cycle, and 4. horizontal integration<br>• Dynamic capabilities and operational capabilities are required to form and utilize each network type |
| Hu et al. (2013) | Qualitative: Case study/ area innovation system centered in Hsinchu Science-Based Industrial Park in Taiwan (207) | Various: Network | **KIBS and client innovation**<br>• Knowledge intensive business services function in an intermediary role in the innovation system<br>• These services enhance their customers' capacity for specialization, subsequently improving their evolutionary capabilities and producing tangible innovative cycles |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Collaboration & Network – Key Findings |
|---|---|---|---|
| Kowalkowski et al. (2013) | Qualitative: Interviews with SMEs (13) | Manufacturing: Firm | **New value constellation at SMEs**<br>• No predefined transition process for service infusion in SMEs; do not have the resources to build new organizational units or create new specialists<br>• They differentiate themselves through new value constellations within business networks<br>• The heterogeneity of service offerings and business networks means those value constellations take many forms |
| Melton and Hartline (2013) | Quantitative: Survey in U.S. (160) | Service industries: Project | **Cross-functional teams, front-line employees, and learning orientation in NSD**<br>• Cross-functional teams, front-line employees, and learning orientation consistently influence NSD sales and process efficiency outcomes when they first create a service having (1) superior attributes and expert frontline employee service delivery (service marketability) and/ or (2) a well-targeted launch with formal promotion to internal and external markets (launch effectiveness)<br>• Those NSD project characteristics in turn yield favorable new service performance results; specifically, service marketability and launch effectiveness mediate the influence of cross-functional teams on NSD outcomes<br>• Launch effectiveness mediates the influence of learning orientation, and service marketability mediates the impact of front-line employees<br>• Cross-functional teams and learning orientation have greater effect on NSD sales performance than do front-line employees |
| Wagner (2013) | Quantitative: Secondary data from Mannheim Innovation Panel (390 firms) | Logistics: Firm | **Collaboration for B2B service innovation**<br>• Customers, suppliers, and competitors contribute to service improvement<br>• Customers contribute to services that are new to the firm<br>• Universities and consultancies do not affect service innovation performance |
| Cheng and Huizingh (2014) | Quantitative: Survey/ Asian service firms (223) | Service industries: Firm | **Performing open innovation activities is significantly and positively related to all four dimensions of innovation performance:**<br>• 1. new product/ service innovativeness, 2. new product/ service success, 3. customer performance, and 4. financial performance<br>• Open innovation positively affects a broad range of innovation performance indicators<br>• The impact on new service innovativeness and financial performance is relatively stronger.<br>• Regarding the influence of a firm's strategic orientation, all significant moderation effects are positive<br>• Entrepreneurial orientation strengthens the positive performance effects of open innovation significantly more than market orientation and resource orientation do. In turn, market orientation has a significantly stronger moderation effect than resource orientation |
| Kang and Kang (2014) | Quantitative: Secondary data from South Korean CIS (454 firms) | Various: Firm | **The impact of external knowledge sourcing on service innovation**<br>• Joint development has an inverted U-shaped association with service innovation output<br>• The technology purchasing has negative (positive) impact on service innovation output when its extent is below (above) the threshold<br>• External information acquisition has a positive effect on service innovation output |

| Reference | Method (Sample Size) | Sector: Level | Antecedents: Collaboration & Network – Key Findings |
|---|---|---|---|
| Mina et al. (2014) | Quantitative: UK~IRC Open Innovation Survey (788) | Various: Firm | **Open service innovation**<br>• The larger the firm and its R&D expenditures, the more open innovations are apparent<br>• Business service engage more in open innovations than manufacturers<br>• Business services consider scientific and technical knowledge more important than market knowledge in comparison to manufacturers<br>• Open innovation is associated with the adoption of a business model that includes service in manufacturing firms<br>• Service-integrated manufacturers conduct more informal knowledge-exchange activities |
| Rusanen (2014) | Qualitative: Longitudinal, multi-case analysis (3) | Technical services: Firm | **Access to resources for service innovation**<br>• Firms seek a range of resources through different types of network relationships for service innovation<br>• Four types of resource access strategies were identified: absorption, acquisition, sharing, and co-creation<br>• The findings show how easily transferable resources can be accessed through weak relationships and low-intensity collaboration<br>• Access to resources that are difficult to transfer, instead, necessitates strong relationships and high-intensity collaboration |

## Table 2-VI. Past Research on Consequences: Financial & Non-Financial Performance

| Reference | Method (Sample Size) | Sector: Level | Consequences – Key Findings |
|---|---|---|---|
| de Brentani (1989) | Quantitative : 1.: personal interviews/ managers from industrial services (about 92); 2.: selection of new service product (150 successful and 126 failed) | Service industries: Project | **Measures for success in new services: sales and market share performance; competitive performance, 'other boosters', and cost performance**<br>• Distinctive factors for services: introduction of new service process (deals with complex and experiential nature of services; designing quality and innovative features; focusing on cost reduction opportunities)<br>• Shared with products: service superiority; service quality; service newness; efficiency of service development; staff competence; synergy potential; customer orientation; internal cooperation; top management; support; interdisciplinary teams; service responsiveness |
| Storey and Easingwood (1998) | Quantitative: Survey/ new financial service products (152) | Finance: Project | **The augmented service offering**<br>• Introduction of performance dimensions: sales performance (S); enhanced opportunities (EO); profitability (P)<br>− Service product factors explain 9.9 % (S), 16.3 % (EO), and 70,6 % (P)<br>− Service augmentations explain 54.7 % (S), 66.3 % (EO), and 0.0 % (P)<br>− Marketing support explains 35.5 % (S), 17.4 % (EO), and 29.4 % (P) |
| Jensen and Warren (2001) | Quantitative: Case study/ British Telecommunications plc (e-commerce project) | Telecommuni-cation: Project | **The impact of service innovation on firm-level financial performance**<br>• Relation between research and the ensuing revenue is not clear<br>• More emphasis on tacit knowledge and the less formal nature of the research processes results in little available historical data |
| Cainelli et al. (2004) | Quantitative: Longitudinal study via secondary research/ Italian CIS2 data and System of the Enterprise Accounts (735) | Service industries: Firm | **The impact of innovation on economic performance in services**<br>• Innovating firms outperform non-innovating firms in terms of productivity levels and economic growth; productivity is linked to the amount of innovation expenditures, especially those devoted to the acquisition and internal development of new software |
| Elche and González (2008) | Quantitative: Survey/ Spanish small service firms (167) | Service industries: Firm | **The influence of innovation on performance**<br>• Firms, which come closest to the optimum innovation profile achieve better results; those that deviate from the ideal profile show a lack of adjustment between production and innovation strategy, and therefore their performance tends to suffer<br>• The above is valid in the case of services with high intensity innovation; however, in the other group composed of service firms with low intensity innovation, an adjustment of innovation decisions to idealize a profile does not guarantee superior profits |
| Mansury and Love (2008) | Quantitative: Survey/ U.S. business service firms (206) | Service industries: Firm | **The impact of service innovation on business performance**<br>• The presence of service innovation and its extent has a consistently positive effect on growth, but not on productivity<br>• External linkages in the innovation process have a great positive impact on performance<br>• Innovation is measured as a discrete or continuous variable, and regardless of the level of innovation, i.e. new to the market or new to the firm |

| Reference | Method (Sample Size) | Sector: Level | Consequences – Key Findings |
|---|---|---|---|
| Damanpour et al. (2009) | Quantitative: Databases and surveys: dataset by Audit Commission; data from the 2001 UK census; survey to local governments in England 2001-'04 cross-sectional units of 168 (respondents: 312, 139, 156, 196 and 1,190, 825, 991, 860) | Public sector: Firm | **The impact of innovation on organizational performance depends on compositions of innovation types over time**<br>• Cumulative adoption of innovation types over time positively influences organizational performance<br>• Focusing on a specific type of innovation over time has negative impact on organizational performance<br>• Divergence from industry norm in adopting innovation types positively impacts performance (weakly supported) |
| Evangelista and Vezzani (2010) | Quantitative: Secondary research/ Italian CIS4 2002-2004 | Various: Firm | **Economic impact of technological and organizational innovations**<br>• Four innovation modes due to the ways firms combine technological and non-technological innovations, these are present and relevant in both manufacturing and service sectors<br>• Strategies characterized by the joint introduction of product, process, and archovations give to both manufacturing and service firms a clear competitive advantage vis à vis both firms non-innovative and with a narrow approach to innovation<br>• A few significant differences between services and manufacturing firms in the relevance and economic impact of different types of innovation strategies |
| Storey and Kelley (2001) | Quantitative: Survey/ executives in leading UK service firms (43) | Service industries: Firm | **How service firms evaluate their NSD activities**<br>• Firms are still not satisfied with their ability to develop new services<br>• Employ a limited number of measures of performance, and often these do not reflect the reasons behind development<br>• The degree of innovativeness determines the choice of measures<br>− Financial performance measures are most often used by less innovative firms<br>− Fast followers employ customer-based measures of performance<br>− Truly innovative firms measure performance along a number of softer internal dimensions |
| Aas and Pedersen (2011) | Quantitative: Secondary research/ Norwegian CIS 2006 data and economic accounting data from The Norwegian Register of firm Accounts (3,575 manufacturing, 1,132 service firms) | Various: Firm | **The impact of service innovation focus on the financial performance**<br>• Manufacturing firms focusing on service innovation have significantly higher growth of operating results than firms not focusing on service innovation<br>• Regarding service firms, no significant relationship was identified |
| den Hertog et al. (2011) | Quantitative: Survey/ firms in hospitality sector (613) | Hospitality: Firm | **Measuring innovation in a 'low-tech' service industry**<br>• Innovation in this service industry is much higher and more varied than regularly reported<br>• Innovation activities in 'low-tech industries' can be in place with less formalized forms of (service) innovation management<br>• Higher innovation intensity is associated with better firm performance |

| Reference | Method (Sample Size) | Sector: Level | Consequences – Key Findings |
|---|---|---|---|
| Ordanini and Parasuraman (2011) | Quantitative: Survey and secondary research/ Italian hotels (91) and AIDA Bureau Van Djick database for performance measures ('revenues per room' and 'EBIT-to-sales' for Italian firms with >10 employees) | Hospitality: Firm | **Determinants of service innovation's volume as well as radicalness, and the effect of the latter on performance (revenue growth and profit growth)**<br>• Collaborating with customers fosters innovation volume but not radicalness and vice versa for collaborating with business partners<br>• A firm's customer orientation both directly and in interaction with innovative orientation contributes to innovation radicalness<br>• Collaborating with contact employees enhances both innovation volume and radicalness<br>• The use of knowledge integration mechanisms contributes to innovation radicalness<br>• Both innovation outcomes have significant but different effects on the two success measures |
| Su (2011) | Quantitative: Survey/ customers of ethnic restaurants (322) | Hospitality: Individual | **Role of service innovation and customer experience in ethnic restaurants**<br>• Innovation has significant effects on behavioral intention and experience<br>• Customer experience mediates the influence of service innovation on customers' behavioral intention |
| Therrien et al. (2011) | Quantitative: Secondary research/ 2003 Canadian Survey of Innovation in Select Service Industries (10,680 projects) | Service industries: Project | **Innovation novelty's impact on sales performance**<br>• To derive more sales from innovation, service firms need to enter the market early (world-first and to some extent, Canada-first) or to introduce new products with high level of novelty<br>• Importance of early-entry (world-first) or novel content in commercialization performance differs with industries |
| Bogliacino and Pianta (2013) | Quantitative: Secondary data analysis/ Sectoral Innovation Database (21 manufacturing and 17 service sectors) | Various: Industry | **The relation between profits, R&D, and innovation**<br>• Support for Schumpeterian 'engine of progress'<br>• Three-equation model exploring the determinants of industries' R&D intensities, innovative turnover, and profit growth, which show the complexity of relationships, reciprocal influences, and feedback loops |
| Ferreira et al. (2013) | Quantitative: Econometric model (1,000 firms) | KIBS: Firm | **The innovativeness of KIBS**<br>• Non-KIBS firms are in possession of significantly greater innovation capacities than KIBS firms, though KIBS firms place a greater comparative importance on innovation in comparison with their non-KIBS peers<br>• Non-KIBS firms perform comparatively better than specialist KIBS firms |
| Lin (2013) | Quantitative: Survey (277 firms) | Hospitality industry: Firm | **Service innovation, service quality, and performance**<br>• Service innovation affects firm performance through direct and indirect paths where service quality plays a positive mediating role, and the direct impact is larger than the indirect one<br>• The innovation mode is cost-reductive, which focuses on eliminating internal cost rather than improving service quality<br>• Assurance and reliability are important for performance implications |
| Liu (2013) | Quantitative: Survey/ Chinese KIBS (169 firms) | KIBS: Project | **Service innovativeness**<br>• Service innovativeness does not play a moderating role in the relationship between market orientation and innovative performance, but a mediating role in this relationship<br>• For NSD, project innovativeness is only a temporary trait<br>• The impact of market orientation is to spur innovativeness, which, in turn, affects innovative performance |

| Reference | Method (Sample Size) | Sector: Level | Consequences – Key Findings |
|---|---|---|---|
| Prajogo et al. (2013) | Quantitative: Survey/ Australian service SMEs (180) | Various service: Firm | **The effect of exploration vs. exploitation on business performance in SMEs**<br>• No difference between small- and medium-sized firms regarding their innovation orientations<br>• Differences exist between the firm's size regarding the effect of innovation orientations on business performance: exploitation innovation has a stronger effect on business performance among small firms than medium-sized firms and exploration innovations has a stronger effect on business performance among medium-sized firms than on small firms |
| Visnjic Kastalli et al. (2013) | Qualitative: Single in-depth case study (Atlas Copco Compressor Technique) | Capital goods: Firm | **The integration of services in manufacturing firms**<br>• Two separate but related dimensions of the market performance of service activities are important:<br>1. 'service adoption' reflecting the proportion of customers who purchase the manufacturer's services<br>2. 'service coverage' signaling the range of service elements or the comprehensiveness of the service contract that customers opt for<br>• These two indicators should be supplemented with a 'complementarity index' designed to disclose whether the relationship between products and services is reinforcing or substitutive |

# 3. CHAPTER

## Figure 3-I. Semi-Structured Interview Guideline

UNIVERSITÄT MANNHEIM
BETRIEBSWIRTSCHAFTSLEHRE

Dipl.-Kffr. Stephanie Smith
Lehrstuhl für ABWL und Organisation

### Interviewleitfaden: „Profiting from Service Innovation“

**Allgemeine Fragen**

- Organisationsstruktur des Unternehmens (Geschäftsbereiche, Hierarchie etc.)
- Existiert in Ihrem Unternehmen eine Organisationseinheit, die explizit für Dienstleistungen zuständig ist? Wann gegründet?
- Besitzt Ihr Unternehmen eine Forschungs- und Entwicklungsabteilung? Für Dienstleistungen?
- Welche Bedeutung haben Dienstleistungen in Ihrem Unternehmen? Anteil an Umsatz?

**Fragen zur Strategie**

- Welche strategischen Ziele werden mit Dienstleistungen verfolgt? Wie werden diese verfolgt?
- Welche Rolle spielt Innovation in Ihrem Unternehmen? Bei Dienstleistungen?
- Wie würden Sie Dienstleistungsinnovation definieren?

**Fragen zur Unternehmenseinheit, die Dienstleistungen entwickelt (Marketing, F&E, Projekt-basiert, etc.)**

- Wer entwickelt neue Dienstleistungen? Wo ist die verantwortliche Unternehmenseinheit organisatorisch angesiedelt (zentral vs. dezentral)?
- Welche Hauptaufgaben und Ziele hat die verantwortliche Unternehmenseinheit?
- Woran wird der Erfolg gemessen? Welche Kennzahlen sind besonders relevant?
- Welchen Hintergrund haben die Mitarbeiter der verantwortlichen Unternehmenseinheit?
- Mit welchen Unternehmensbereichen arbeitet die verantwortliche Unternehmenseinheit zusammen und wie erfolgt die Koordination?

**Fragen zur Dienstleistungsentwicklung**

- Wie entsteht eine neue Dienstleistung? Ist dies formalisiert oder eher auf einem weniger strukturierten Vorgehen basiert?
- Wie erfolgt die Koordination zwischen den Entwicklungsstufen (Ideengenerierung, Entwicklung und Kommerzialisierung)?
- Welche Stellen/Abteilungen sind in diesen Prozessen involviert?
- Involvieren Sie Kunden in den Entwicklungsprozess? Wie?
- Sind die neuen Dienstleistungen eher sehr innovativ oder eher inkrementell?

**Fragen zum Dienstleistungsangebot**

- Wie viele Dienstleistungen haben Sie in den letzten 3 Jahren neu entwickelt?
- Wie viele von diesen waren/sind erfolgreich?
- Wie beurteilen Sie die zukünftige Entwicklung Ihres Dienstleistungsangebots?
- Wie bewerten Sie die Aussage, dass kein Unternehmen ohne innovative Dienstleistungen am Markt erfolgreich sein kann?

# 4. CHAPTER

## Figure 4-I. Questionnaire (Cover Page)

UNIVERSITÄT MANNHEIM

**Lehrstuhl für ABWL und Organisation**
Schloss
D-68131 Mannheim

**Benchmarking-Studie**
**„Effektives Management von Dienstleistungsinnovationen“**

### Ziel der Studie

Langfristige Innovationsfähigkeit ist in dynamischen Märkten unabdingbar und hat einen entscheidenden Einfluss auf die Wettbewerbsfähigkeit von Unternehmen. Auch im Dienstleistungsbereich hat die Bedeutung von Innovation in den letzten Jahren rasant zugenommen. Jedoch scheint die Entwicklung von Dienstleistungsinnovationen in Unternehmen verschiedenartig gestaltet zu sein.

Ziel der Studie ist es daher, die Innovations- und Leistungsfähigkeit von Unternehmen in Abhängigkeit ihres **Managements von Dienstleistungsinnovation zu bewerten** und aussagekräftige **Erfolgsfaktoren hierfür zu identifizieren**.

### Ihre Vorteile

Für Ihre Teilnahme an dieser Studie erhalten Sie einen **individuellen und kostenlosen Ergebnisbericht**, in dem wir Ihr Unternehmen mit Top-Performern sowie dem Durchschnitt Ihrer Branche vergleichen und wertvolle Handlungsempfehlungen zur Steigerung Ihrer Innovationsfähigkeit zusammenstellen.

### Vertraulichkeit

Alle im Fragebogen gesammelten Informationen werden selbstverständlich **streng vertraulich** behandelt und in **anonymisierter Form** ausgewertet. Die Ergebnisse werden ausschließlich in komprimierter, statistisch verarbeiteter Form dargestellt, so dass keine Rückschlüsse auf Ihr Unternehmen oder Sie als Person gezogen werden können.

### Hinweise zum Fragebogen

- Für die Auswertung der Ergebnisse ist es besonders wichtig, dass Sie **alle Fragen beantworten**, auch wenn Sie sich bei der Antwort nicht ganz sicher sind. Eine ungefähre Angabe Ihrerseits ist wertvoller als ein unvollständiger Fragebogen.
- Es gibt keine richtigen oder falschen Antworten. Wir bitten Sie bewusst um **Ihre subjektive Einschätzung**.
- Einzelne Fragen sind inhaltlich ähnlich. Dies hat methodische Hintergründe und soll die Anwendbarkeit statistischer Analyseverfahren ermöglichen.

Bei Rückfragen stehen wir Ihnen jederzeit gerne persönlich zur Verfügung.

**Vielen Dank für Ihre Teilnahme!**

Dipl.-Kffr. Stephanie Smith

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# Figure 4-II. Questionnaire (Page 1 of 5)

UNIVERSITÄT MANNHEIM

**Effektives Management von Dienstleistungsinnovationen**

Die nachstehenden Fragen beziehen sich auf das Management von Dienstleistungsinnovationen innerhalb Ihres Unternehmens. Eine **Dienstleistung** ist ein **immaterielles Gut**, das physisch nicht greifbar ist. Eine **Dienstleistungsinnovation** liegt dann vor, wenn **gegenwärtigen oder neuen Kunden** eine **neue oder veränderte Dienstleistung** angeboten wird.

## Dienstleistungsangebot

| **Inwieweit stimmen Sie den nachfolgenden Aussagen zu?** | **Stimme gar nicht zu** 1 | 2 | 3 | 4 | 5 | 6 | **Stimme voll zu** 7 |
|---|---|---|---|---|---|---|---|
| Wir bieten Produkte an und ergänzen diese mit Dienstleistungen. | O | O | O | O | O | O | O |
| Wir bieten ausschließlich Dienstleistungen an. | O | O | O | O | O | O | O |
| Die Funktion unserer Dienstleistung liegt in der Unterstützung unserer Produkte. | O | O | O | O | O | O | O |
| Dienstleistungen bestimmen unser Portfolio. | O | O | O | O | O | O | O |
| Unser Unternehmen ist ein reiner Dienstleistungsanbieter. | O | O | O | O | O | O | O |
| Unsere Kunden haben vor der tatsächlichen Inanspruchnahme unserer Dienstleistungen Schwierigkeiten, diese einzuschätzen. | O | O | O | O | O | O | O |
| Es ist herausfordernd, unseren Kunden die einzelnen Bestandteile unserer Dienstleistungen zu kommunizieren. | O | O | O | O | O | O | O |
| Unsere Kunden können das Konzept unserer Dienstleistungen leicht verstehen. | O | O | O | O | O | O | O |
| Unsere Kunden bewerten eher die Wirkung unserer Dienstleistungen (z.B. erhöhte Effizienz) als die Dienstleistung an sich. | O | O | O | O | O | O | O |
| Wir müssen uns sehr bemühen, das Abstraktionsniveau unserer Dienstleistungen zu reduzieren. | O | O | O | O | O | O | O |

## Umsetzung von Dienstleistungsinnovation

**Gibt es spezielle Unternehmenseinheiten (z.B. Abteilung, bestimmtes Team), deren Verantwortung ausschließlich in der Durchführung von Dienstleistungsinnovations-Projekten liegt?**

O ja O nein

**Wenn ja**, nennen Sie bitte die Bezeichnung für die drei größten Unternehmenseinheiten (gemäß ihrer Mitarbeiteranzahl) und seit wann diese Unternehmenseinheiten existieren. Sofern Sie nur eine oder zwei Unternehmenseinheiten besitzen, dann lassen Sie die entsprechenden Felder bitte frei.

**Unternehmenseinheit 1**, Bezeichnung: _____

Existiert seit: O < 1 Jahr O 1-2 Jahren O 3-5 Jahren O 6-10 Jahren O 11-20 Jahren O > 21 Jahren

O keine weitere vorhanden

**Unternehmenseinheit 2**, Bezeichnung: _____

Existiert seit: O < 1 Jahr O 1-2 Jahren O 3-5 Jahren O 6-10 Jahren O 11-20 Jahren O > 21 Jahren

O keine weitere vorhanden

**Unternehmenseinheit 3**, Bezeichnung: _____

Existiert seit: O < 1 Jahr O 1-2 Jahren O 3-5 Jahren O 6-10 Jahren O 11-20 Jahren O > 21 Jahren

| **Inwieweit stimmen Sie den nachfolgenden Aussagen zu?** | **Stimme gar nicht zu** 1 | 2 | 3 | 4 | 5 | 6 | **Stimme voll zu** 7 |
|---|---|---|---|---|---|---|---|
| **Dienstleistungsinnovationen werden oft von Mitarbeiter/innen** | | | | | | | |
| - aus der Marketing-/Vertriebsabteilung entwickelt. | O | O | O | O | O | O | O |
| - aus der Strategieabteilung (Unternehmensentwicklung/-planung) entwickelt. | O | O | O | O | O | O | O |
| - aus der IT-Abteilung entwickelt. | O | O | O | O | O | O | O |
| - aus unseren operativen Einheiten entwickelt. | O | O | O | O | O | O | O |
| **Dienstleistungsinnovation werden oft in Kooperation** | | | | | | | |
| - mit Kunden entwickelt. | O | O | O | O | O | O | O |
| - mit Zulieferern entwickelt. | O | O | O | O | O | O | O |
| - mit Forschungseinrichtungen (z.B. Universitäten, Institute) entwickelt. | O | O | O | O | O | O | O |
| - mit marktfremden Unternehmen entwickelt. | O | O | O | O | O | O | O |
| - mit Wettbewerbern entwickelt. | O | O | O | O | O | O | O |
| **Dienstleistungsinnovationen werden oft durch** | | | | | | | |
| - Einzelaktivitäten (z.B. im Rahmen eines Innovationswettbewerbs) von verschiedenen Personen entwickelt, unabhängig von der jeweiligen Position. | O | O | O | O | O | O | O |

**Wie viele Mitarbeiter/innen arbeiten im Durchschnitt gleichzeitig an Dienstleistungsinnovations-Projekten insgesamt in Ihrem Unternehmen?**

O < 1 O 1 - 5 O 6 - 10 O 11 - 20 O 21 - 50 O 51 - 100 O 101 - 500 O > 500

**Wer hat üblicherweise die Leitung in einem Dienstleistungsinnovations-Projekt in Ihrem Unternehmen?**

O Marketing/Vertrieb
O IT
O Strategieabteilung (Unternehmensentwicklung/-planung)
O Operative Einheiten (z.B. Außendienst)
O Projekt Management
O Oberste Führungsebene
O Forschung & Entwicklung
O Andere: _____

## Figure 4-III. Questionnaire (Page 2 of 5)

UNIVERSITÄT MANNHEIM

**Effektives Management von Dienstleistungsinnovationen**

### Dienstleistungsinnovations-Prozess

| Inwieweit stimmen Sie den nachfolgenden Aussagen zu? | Stimme gar nicht zu 1 | 2 | 3 | 4 | 5 | 6 | Stimme voll zu 7 |
|---|---|---|---|---|---|---|---|
| Wir (unser Unternehmen) nutzen strukturierte Prozesse, um Dienstleistungsinnovationen zu entwickeln. | O | O | O | O | O | O | O |
| Die Prozessschritte der Dienstleistungsentwicklung sind klar verständlich für alle Mitarbeiter/innen, die Dienstleistungsinnovationen entwickeln (z.B. durch formelle Beschreibungen). | O | O | O | O | O | O | O |
| Die Entwicklungsprozesse der Dienstleistungsinnovationen variieren stark zwischen verschiedenen Dienstleistungs-Projekten. | O | O | O | O | O | O | O |
| Die Mehrheit der Dienstleistungsinnovations-Projekte wird in einem einheitlichen Ablauf durchgeführt. | O | O | O | O | O | O | O |
| Wir verfolgen ein systematisches Vorgehen, um Dienstleistungsinnovationen zu entwickeln. | O | O | O | O | O | O | O |
| **Die oberste Führungsebene in unserem Unternehmen** | | | | | | | |
| - definiert sehr klare Ziele für Dienstleistungsinnovations-Projekte. | O | O | O | O | O | O | O |
| - stellt die notwendigen Mittel für Dienstleistungsinnovationen bereit. | O | O | O | O | O | O | O |
| - engagiert sich sehr für Dienstleistungsinnovationen. | O | O | O | O | O | O | O |
| - unterstützt Dienstleistungsinnovations-Projekte nicht. | O | O | O | O | O | O | O |
| - ist sehr stark in die wesentlichen Entscheidungen im Rahmen von Dienstleistungsinnovations-Projekten involviert. | O | O | O | O | O | O | O |

| Inwieweit stimmen Sie den nachfolgenden Aussagen zu? | Stimme gar nicht zu 1 | 2 | 3 | 4 | 5 | 6 | Stimme voll zu 7 |
|---|---|---|---|---|---|---|---|
| **In der Anfangsphase eines Dienstleistungsleistungsinnovations-Projektes** | | | | | | | |
| - investieren wir (unser Unternehmen) sehr viel in die Ideengenerierung (z.B. Zeit, Mittel). | O | O | O | O | O | O | O |
| - legen wir Ziele der Dienstleistungsinnovationen fest. | O | O | O | O | O | O | O |
| - analysieren wir sehr intensiv die Marktsituation (z.B. Trends, Marktveränderungen, Potenziale). | O | O | O | O | O | O | O |
| - bewerten wir den Umfang des Dienstleistungsinnovations-Projektes (z.B. erforderliches Budget, zeitlicher Rahmen, Risiko). | O | O | O | O | O | O | O |
| - bestimmen wir die gewünschten Wirkungen der Dienstleistungsinnovation für Kunden (z.B. erhöhte Effizienz). | O | O | O | O | O | O | O |
| - investieren wir stets ausreichend Ressourcen. | O | O | O | O | O | O | O |
| - meistern wir sehr kompetent anstehende Aufgaben. | O | O | O | O | O | O | O |
| - führen wir Arbeitsschritte sehr qualifiziert aus. | O | O | O | O | O | O | O |
| **In der Entwicklungsphase einer Dienstleistungsinnovation** | | | | | | | |
| - entwickeln wir ein Konzept für die Dienstleistungsinnovation (z.B. als eine Art Prototyp). | O | O | O | O | O | O | O |
| - bereiten wir ein Vermarktungskonzept vor. | O | O | O | O | O | O | O |
| - führen wir intensiv Tests der Dienstleistungsinnovation durch (z.B. intern, im ausgewählten Kundenkreis). | O | O | O | O | O | O | O |
| - werten wir durchgeführte Tests aus, bevor die Dienstleistungsinnovation in den Markt eingeführt wird. | O | O | O | O | O | O | O |
| - legen wir eine Gesamtstrategie fest, bevor die Dienstleistungsinnovation in den Markt eingeführt wird. | O | O | O | O | O | O | O |
| - investieren wir stets ausreichend Ressourcen. | O | O | O | O | O | O | O |
| - meistern wir sehr kompetent anstehende Aufgaben. | O | O | O | O | O | O | O |
| - führen wir Arbeitsschritte sehr qualifiziert aus. | O | O | O | O | O | O | O |
| **In der Vermarktungsphase einer Dienstleistungsinnovation** | | | | | | | |
| - investieren wir sehr viele Mittel in die Markteinführung der Dienstleistungsinnovation (Verkauf, Werbung, Vertrieb). | O | O | O | O | O | O | O |
| - geben wir unseren Kunden viel Hilfestellung bzgl. der Dienstleistungsinnovation (z.B. durch Trainings). | O | O | O | O | O | O | O |
| - holen wir umfassend Rückmeldungen der Kunden ein (z.B. durch Kundenbefragung, Kundendienst). | O | O | O | O | O | O | O |
| - überwachen wir umfassend Reaktionen der Wettbewerber. | O | O | O | O | O | O | O |
| - investieren wir stets ausreichend Ressourcen. | O | O | O | O | O | O | O |
| - meistern wir sehr kompetent anstehende Aufgaben. | O | O | O | O | O | O | O |
| - führen wir Arbeitsschritte sehr qualifiziert aus. | O | O | O | O | O | O | O |

## Figure 4-IV. Questionnaire (Page 3 of 5)

UNIVERSITÄT MANNHEIM

**Effektives Management von Dienstleistungsinnovationen**

### Ergebnis der Innovationsaktivitäten

| **Inwieweit stimmen Sie den nachfolgenden Aussagen zu?** | **Stimme gar nicht zu** 1 | 2 | 3 | 4 | 5 | 6 | **Stimme voll zu** 7 |
|---|---|---|---|---|---|---|---|
| Wir (unser Unternehmen) generieren insgesamt überlegene Dienstleistungen im Vergleich zu unseren Hauptwettbewerbern. | O | O | O | O | O | O | O |
| Wir generieren Dienstleistungen, welche in ihrer Wirkung denen unserer Hauptwettbewerber überlegen sind (z.B. durch erhöhte Effizienz). | O | O | O | O | O | O | O |
| Die Alleinstellungsmerkmale unserer Dienstleistungsinnovationen werden im Vergleich zu denen unserer Hauptwettbewerber als überlegen wahrgenommen. | O | O | O | O | O | O | O |
| Im Vergleich zu unseren Hauptwettbewerbern ist unser Dienstleistungsinnovations-Programm viel erfolgreicher. | O | O | O | O | O | O | O |
| Die Dienstleistungsinnovationen ermöglichen uns einen wichtigen Wettbewerbsvorteil. | O | O | O | O | O | O | O |
| Insgesamt erreicht unser Dienstleistungsinnovations-Programm unsere Zielvorgaben. | O | O | O | O | O | O | O |
| Aus Sicht der Gesamtprofitabilität ist unser Dienstleistungsinnovations-Programm erfolgreich. | O | O | O | O | O | O | O |
| **Die Dienstleistungsinnovationen unseres Unternehmens führen zu** | | | | | | | |
| - einem gesteigerten Marktanteil. | O | O | O | O | O | O | O |
| - gesteigerten Auftragseingängen. | O | O | O | O | O | O | O |
| - einem großen relativen Marktanteil. | O | O | O | O | O | O | O |
| - einer hohen Profitabilität (insgesamt). | O | O | O | O | O | O | O |
| - starken positiven Auswirkungen auf das Image des Unternehmens (Reputation). | O | O | O | O | O | O | O |
| - substantiell verringerten Kosten. | O | O | O | O | O | O | O |
| - niedrigeren Kosten als erwartet. | O | O | O | O | O | O | O |
| - wichtigen Kosteneffizienzen für uns. | O | O | O | O | O | O | O |
| **Die meisten Dienstleistungsinnovationen unseres Unternehmens sind** | | | | | | | |
| - neu für die Welt. | O | O | O | O | O | O | O |
| - neu für die relevante Industrie. | O | O | O | O | O | O | O |
| - neu für unsere Organisation. | O | O | O | O | O | O | O |
| - eine erhebliche Verbesserung der Dienstleistung. | O | O | O | O | O | O | O |
| - eine geringfügige Veränderung der Dienstleistung. | O | O | O | O | O | O | O |

| **Wie schneidet Ihr Unternehmen im Vergleich zu den Wettbewerbern bzgl. der nachfolgenden Aussagen ab?** | **Viel schlechter** 1 | 2 | 3 | 4 | 5 | 6 | **Viel besser** 7 |
|---|---|---|---|---|---|---|---|
| Erreichte Gesamtleistung | O | O | O | O | O | O | O |
| Erreichter Marktanteil | O | O | O | O | O | O | O |
| Erreichtes Wachstum | O | O | O | O | O | O | O |
| Aktuelle Profitabilität | O | O | O | O | O | O | O |
| Return-on-Sales (ROS) | O | O | O | O | O | O | O |
| Marketing Aktivitäten | O | O | O | O | O | O | O |

### Weitere Innovationsaktivitäten

| **Inwieweit stimmen Sie den nachfolgenden Aussagen zu?** | **Stimme gar nicht zu** 1 | 2 | 3 | 4 | 5 | 6 | **Stimme voll zu** 7 |
|---|---|---|---|---|---|---|---|
| Wir (unser Unternehmen) bringen ständig neue Produkte auf den Markt. | O | O | O | O | O | O | O |
| Wir legen stets Wert auf die Entwicklung neuer Produkte durch die Bereitstellung erheblicher finanzieller Mittel. | O | O | O | O | O | O | O |
| Wir entwickeln regelmäßig eine große Vielfalt an neuen Produktlinien. | O | O | O | O | O | O | O |
| In unserem Unternehmen gibt es eine starke übergreifende Verpflichtung zur Entwicklung und Vermarktung neuer Produkte. | O | O | O | O | O | O | O |
| Wir sind dramatische Veränderungen unserer Produktlinien gewöhnt. | O | O | O | O | O | O | O |
| Wir bringen ständig neue Technologien auf den Markt. | O | O | O | O | O | O | O |
| Wir legen stets Wert auf die Entwicklung neuer Technologien durch die Bereitstellung erheblicher finanzieller Mittel. | O | O | O | O | O | O | O |
| Wir entwickeln regelmäßig eine große Vielfalt an neuen Technologien. | O | O | O | O | O | O | O |
| In unserem Unternehmen gibt es eine starke übergreifende Verpflichtung zur Entwicklung und Vermarktung neuer Technologien. | O | O | O | O | O | O | O |
| Wir sind dramatische Veränderungen unserer Technologien gewöhnt. | O | O | O | O | O | O | O |

## Figure 4-V. Questionnaire (Page 4 of 5)

UNIVERSITÄT MANNHEIM

**Effektives Management von Dienstleistungsinnovationen**

### Das Unternehmensumfeld

| Inwieweit stimmen Sie den nachfolgenden Aussagen zu? | Stimme gar nicht zu 1 | 2 | 3 | 4 | 5 | 6 | Stimme voll zu 7 |
|---|---|---|---|---|---|---|---|
| Unser Marktumfeld ist starken Veränderungen ausgesetzt. | O | O | O | O | O | O | O |
| Unsere Kunden fragen regelmäßig nach neuen Dienstleistungen. | O | O | O | O | O | O | O |
| In unserem Markt finden Veränderungen kontinuierlich statt. | O | O | O | O | O | O | O |
| Seit einem Jahr hat sich nichts in unserem Markt verändert. | O | O | O | O | O | O | O |
| In unserem Markt verändert sich die Menge an zu liefernden Dienstleistungen oft und schnell. | O | O | O | O | O | O | O |
| Wir (unser Unternehmen) haben relativ starke Wettbewerber. | O | O | O | O | O | O | O |
| Der Wettbewerb in unserem Markt ist intensiv. | O | O | O | O | O | O | O |
| Der Wettbewerb in unserem Markt ist extrem hoch. | O | O | O | O | O | O | O |
| Preiswettbewerb ist ein Kennzeichen unseres Marktes. | O | O | O | O | O | O | O |
| **Unter unseren Wettbewerbern** | | | | | | | |
| - entwickeln viele kontinuierlich Dienstleistungsinnovationen. | O | O | O | O | O | O | O |
| - bewerten viele Dienstleistungsinnovationen als strategisch relevant. | O | O | O | O | O | O | O |
| - führen nur wenige Dienstleistungsinnovationen am Markt ein. | O | O | O | O | O | O | O |
| - investieren viele ausreichend Ressourcen, um Dienstleistungsinnovationen anbieten zu können. | O | O | O | O | O | O | O |

### Überblick über Ihr Unternehmen

| Inwieweit stimmen Sie den nachfolgenden Aussagen zu? | Stimme gar nicht zu 1 | 2 | 3 | 4 | 5 | 6 | Stimme voll zu 7 |
|---|---|---|---|---|---|---|---|
| Unsere Organisation erwirtschaftet einen Großteil ihrer Umsätze mit dem Angebot von maßgeschneiderten Lösungen für einzelne Kunden. | O | O | O | O | O | O | O |
| Wir führen die Geschäfte mit unseren Kunden auf einer langfristigen Basis durch. | O | O | O | O | O | O | O |
| **Das Kerngeschäft unseres Unternehmens liegt im** | | | | | | | |
| - (Individual-)Dienstleistungsgeschäft. | O | O | O | O | O | O | O |
| - Projektgeschäft. | O | O | O | O | O | O | O |
| - Systemgeschäft. | O | O | O | O | O | O | O |
| - Zulieferergeschäft. | O | O | O | O | O | O | O |

**Bitte nennen Sie**

- die Anzahl der beschäftigten Mitarbeiter/innen in Ihrem Unternehmen. ungefähr: _____
- das jährliche Budget für Dienstleistungsinnovations-Projekte (in Euro). ungefähr: _____
- die Anzahl der momentanen Dienstleistungsinnovations-Projekte. ungefähr: _____
- das Alter Ihres Unternehmens (Anzahl Jahre seit Unternehmensgründung). ungefähr: _____

**Wie hoch war der Gesamtumsatz Ihres Unternehmens**

- im letzten Geschäftsjahr (in Millionen Euro)? ungefähr: _____
- im vorletzten Geschäftsjahr (in Millionen Euro)? ungefähr: _____

**Wie hoch war das operative Ergebnis (EBIT) Ihres Unternehmens**

- im letzten Geschäftsjahr (in Millionen Euro)? ungefähr: _____
- im vorletzten Geschäftsjahr (in Millionen Euro)? ungefähr: _____

**Wie hoch war die Gesamtkapitalrentabilität (ROA) Ihres Unternehmens**

- im letzten Geschäftsjahr (in Prozent)? ungefähr: _____
- im vorletzten Geschäftsjahr (in Prozent)? ungefähr: _____

**Wie hoch war die Eigenkapitalrentabilität (ROE) Ihres Unternehmens**

- im letzten Geschäftsjahr (in Prozent)? ungefähr: _____
- im vorletzten Geschäftsjahr (in Prozent)? ungefähr: _____

**Wie hoch ist der Umsatzanteil, der im Business-to-Business Markt generiert wird?**

O 0 % O 1-10 % O 11-20 % O 21-40 % O 41-60 % O 61-80 % O 81-90 % O 91-100 %

**In welcher Industrie ist Ihr Unternehmen angesiedelt?**

O Baugewerbe
O Finanzdienstleistung, Versicherungsdienstleistung
O Logistik, Transportwesen
O IT
O Andere: _____

## Figure 4-VI. Questionnaire (Page 5 of 5)

UNIVERSITÄT MANNHEIM

**Effektives Management von Dienstleistungsinnovationen**

**Ist Ihr Unternehmen auch international tätig?**

O ja O nein

**Seit wie vielen Jahren arbeiten Sie in Ihrem Unternehmen?**

ungefähr: _____ Jahre

**Welche Position haben Sie inne?**

| | |
|---|---|
| O Vorstand/Geschäftsführung | O Leiter/in Marketing/Vertrieb |
| O Leiter/in Forschung und Entwicklung | O Mitarbeiter/in Marketing/Vertrieb |
| O Mitarbeiter/in Forschung und Entwicklung | O Leiter/in einer operativen Einheit (z.B. Außendienst) |
| O Leiter/in Strategieabteilung (Unternehmensentwicklung/-planung) | O Mitarbeiter/in einer operativen Einheit (z.B. Außendienst) |
| O Mitarbeiter/in Strategieabteilung (Unternehmensentwicklung/-planung) | O Andere: _____ |

**Herzlichen Dank für Ihre Teilnahme!**

Für die **Zusendung Ihres individuellen Ergebnisberichts** geben Sie bitte hier Ihre Kontaktdaten an.

| | |
|---|---|
| Name, Vorname: | _____ |
| E-Mail: | _____ |
| Unternehmen: | _____ |

## Table 4-I: Measure Validation of Alternative Constructs

| Items | Loadings | Cron. α | CR | AVE |
|---|---|---|---|---|
| *Service innovation capabilities 2 (alternative service innovation capabilities measures)* | | .91 | .93 | .51 |
| In the initial phase of a service innovation project | | | | |
| - we determine goals for the service innovation. | .69 | | | |
| - we intensively analyze the market situation (e.g. trends, market changes, opportunities). | .72 | | | |
| - we assess the scope of the service innovation projects (e.g. required budget, time frame, risk). | .76 | | | |
| - we determine the aspired impact of the service innovation (e.g. increased efficiency). | .74 | | | |
| In the development phase of a service innovation project | | | | |
| - we develop a concept for the service innovation (e.g. as a sort of prototype). | .73 | | | |
| - we prepare a commercialization concept. | .75 | | | |
| - we intensively test the service innovation (e.g. internally, with selected customers). | .70 | | | |
| - we evaluate conducted tests before we introduce the service innovation to the market. | .66 | | | |
| In the commercialization phase of a service innovation project | | | | |
| - we invest many resources in the market introduction of a service innovation (e.g. sales activities, advertisement). | .69 | | | |
| - we support our customers regarding the service innovation (e.g. with trainings). | .72 | | | |
| - we collect feedback from our customers (e.g. with the help of customer survey, customer support). | .75 | | | |
| - we monitor the reactions of our competitors. | .69 | | | |
| *Relative performance (alternative firm-level performance measure)* | | .83 | .88 | .60 |
| Relative to your competitors, how does your company perform concerning the following statements? | | | | |
| - Achieving overall performance | .84 | | | |
| - Attaining market share | .81 | | | |
| - Attaining growth | .77 | | | |
| - Current profitability | .76 | | | |
| - Marketing activities | .66 | | | |

**Notes**: n=87. Loadings: standard coefficient; Cron. α: Cronbach's α; CR: composite reliability; AVE: average variance extracted. All factor loadings are significant at $p < .01$. All items were measured on a seven-point scale, anchored by 1 = strongly disagree/much worse and 7 = strongly agree/much better.

## Table 4-II. Factor Loadings of Independent Variables

| Item | Factor 1<br>Prod. Inno. | Factor 2<br>E. Dynamism | Factor 3<br>Top M. Com. | Factor 4<br>Corp. S. Inno. |
|---|---|---|---|---|
| Our firm's Top Management | | | | |
| - defines very explicit service innovation project objectives. | | | .59 | |
| - provides the necessary resources for service innovation projects. | | | .70 | |
| - is strongly committed to service innovations. | | | .88 | |
| - is strongly involved in important decisions regarding service innovations projects. | | | .57 | |
| - does not support service innovation projects. | | | .63 | |
| The majority of our firm's service innovations are | | | | |
| - new to the world. | | | | .74 |
| - new to the relevant industry. | | | | .81 |
| - new to our firm. | | | | .50 |
| We (our firm) place constant emphasis on developing new products through allocating substantial financial resources. | .83 | | | |
| We develop a large variety of new product lines. | .81 | | | |
| We constantly introduce new products to the market. | .89 | | | |
| Our organization has a strong overall commitment to develop and market new products. | .81 | | | |
| We are used to dramatic changes to our product. | .55 | | | |
| Environmental changes in our market are intense. | | .76 | | |
| Our clients regularly ask for new services | | .66 | | |
| In our market, changes are taking place continuously. | | .81 | | |
| For over a year, nothing has changed in our market. | | | | |
| In our market, the volumes of services to be delivered change fast and often. | | .64 | | |

**Notes**: Corp. S. Inno.: Corporate Service Innovativeness; E. Dynamism: Environmental Dynamism; Product Inno.: Product Innovation Orientation; Top M. Com.: Top Management Commitment. Exploratory factor analysis was conducted with varimax-rotation and Kaiser normalization. Factor loadings > .5 are shown.

## Table 4-III. Factor Loadings of Dependent Variables

| Item | Factor 1 Market Perf. | Factor 2 Comp. Adv. | Factor 3 Efficiency | Factor 4 SI Cap. |
|---|---|---|---|---|
| The overall performance of our new service development program has met our objectives | | | | |
| From an overall profitability standpoint, our new service development program has been successful | | | | .98 |
| Compared with our major competitors, our overall new service development program is far more successful | | | | .97 |
| Our firm's service innovations lead to | | | | |
| - increased market share | .77 | | | |
| - increased incoming orders | .82 | | | |
| - large market share (relative) | .62 | | .53 | |
| - high profitability (in total) | .54 | | | |
| - strong positive impact on our firm's image (reputation) | .66 | | | |
| We (our firm) generate superior services to competitors | | .83 | | |
| We generate services whose impact is superior to the impact of our competitors' services (e.g. increased efficiency) | | .87 | | |
| The service innovations' unique benefits are perceived as superior to competitors | | .75 | | |
| The service innovations give our firm an important competitive advantage | .54 | .60 | | |
| Our firm's service innovations lead to | | | | |
| - substantially reduced costs. | | | .82 | |
| - costs which are lower than expected. | | | .78 | |
| - important costs efficiencies. | | | .73 | |

**Notes**: Comp. Adv.: Competitive Advantage; Market Perf.: Market Performance; SI Cap.: Service Innovation Capabilities. Exploratory factor analysis was conducted with varimax-rotation and Kaiser normalization. Factor loadings > .5 are shown.

## Table 4-IV. Correlation Matrix of all Variables

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Top management commitment | 4.81 | 1.26 | | | | | | | | | | | | | | | |
| Corporate service innovativeness | 4.05 | 1.34 | .22 | | | | | | | | | | | | | | |
| Service innovation capabilities | 4.20 | 1.24 | .54 | .47 | | | | | | | | | | | | | |
| Market performance | 4.54 | 1.17 | .30 | .24 | .51 | | | | | | | | | | | | |
| Competitive advantage | 4.51 | 1.18 | .20 | .32 | .50 | .67 | | | | | | | | | | | |
| Efficiency | 3.62 | 1.24 | .25 | .23 | .37 | .65 | .55 | | | | | | | | | | |
| Firm size (log) | 7.97 | 1.82 | -.14 | .14 | -.01 | .18 | .06 | .22 | | | | | | | | | |
| Firm age (log) | 3.77 | 1.09 | -.24 | -14 | -.21 | -09 | .01 | .08 | .43 | | | | | | | | |
| Industry: financial services[a] | | | .02 | -.03 | .14 | -.04 | .07 | .03 | -.01 | .07 | | | | | | | |
| Industry: logistics[a] | | | .01 | .08 | .05 | .07 | .06 | .22 | .27 | .01 | -.37 | | | | | | |
| Industry: IT services[a] | | | .03 | .14 | -.07 | -.06 | -.08 | -.20 | -.13 | -.22 | -.37 | -.40 | | | | | |
| Product innovation orientation | 3.15 | 1.43 | .39 | .29 | .32 | .14 | .01 | .07 | .13 | -.07 | .04 | .11 | .13 | | | | |
| Environmental dynamism | 4.80 | 1.15 | .25 | .28 | .31 | .25 | .09 | .13 | .09 | -.23 | .00 | .06 | .21 | .20 | | | |
| Service innovation capabilities 2 (alternative) | 4.73 | 1.11 | .47 | .48 | .61 | .34 | .28 | .26 | .18 | -.08 | .10 | .16 | -.08 | .32 | .44 | | |
| Relative performance (alternative) | 4.56 | .93 | .12 | .23 | .34 | .50 | .54 | .33 | .28 | -.01 | -.01 | .18 | -.08 | .09 | .10 | .19 | |

**Notes**: n=87. Numbers on the diagonal show square roots of AVE, numbers below the diagonal show correlations. Correlations with absolute value >.28 are significant at the level $p < .01$ and >.21 at the level $p < .05$. [a] Dummy variables with the sector construction as reference group.

**Table 4-V. Overview of Theoretical Model's Predictive Relevance and Impact of its Influencing Variables**

| **Influencing Variable** | **n=87** | | **n=122** | |
|---|---|---|---|---|
| | **SI Cap.** ($Q^2$ = .33) | **Market Perf.** ($Q^2$ = .18) | **SI Cap.** ($Q^2$ = .08) | **Market Perf.** ($Q^2$ = .45) |
| | **$f^2$ Effect Size** | **$f^2$ Effect Size** | **$f^2$ Effect Size** | **$f^2$ Effect Size** |
| Top M. Com. | .28 | .01 | .03 | .16 |
| Corp. S. Inno. | .17 | .00 | .22 | .07 |
| SI Cap. | | .11 | | .20 |
| | **Comp. Adv.** ($Q^2$ = .22) | **Efficiency** ($Q^2$ = .09) | **Comp. Adv.** ($Q^2$ = .57) | **Efficiency** ($Q^2$ = .31) |
| | **$f^2$ Effect Size** | **$f^2$ Effect Size** | **$f^2$ Effect Size** | **$f^2$ Effect Size** |
| Top M. Com. | .00 | .01 | .10 | .08 |
| Corp. S. Inno. | .03 | .01 | .23 | .02 |
| SI Cap. | .20 | .05 | .55 | .06 |

**Notes:** Comp. Adv.: Competitive Advantage; Corp. S. Inno.: Corporate Service Innovativeness; Market Perf.: Market Performance; Top M. Com.: Top Management Commitment; SI Cap.: Service Innovation Capabilities. $f^2$ Effect size: assesses an influencing variable's contribution to an endogenous latent variable's $R^2$ value. $Q^2$: a measure of predictive relevance based on the blindfolding technique.

**Table 4-VI. Results of PLS-SEM Analyses – Comparison between Double and Single Respondents**

| | | | Theoretical Model | |
|---|---|---|---|---|
| | | | n=87 | n=122 |
| **Hypothesis** | **Path from** | **To** | **Path Coefficient (t-statistic)** | **Path Coefficient (t-statistic)** |
| H1 | Top M. Com. | SI Cap. | .43** (4.47) | .27 (1.35) |
| H2 | Corp. S. Inno. | SI Cap. | .32** (3.73) | .43** (5.90) |
| H3a | SI Cap. | Market Perf. | .47** (4.64) | .57** (4.72) |
| H3b | SI Cap. | Comp. Adv. | .57** (6.05) | .71** (9.28) |
| H3c | SI Cap. | Efficiency | .37** (3.55) | .38** (4.20) |
| | E. Dynamism | SI Cap. | .11 (1.01) | -.01 (0.09) |
| | Product Inno. | SI Cap. | .10 (0.95) | .06 (0.42) |
| | E. Dynamism | Market Perf. | .08 (0.60) | .27** (3.74) |
| | Product Inno. | Market Perf. | -.09 (0.71) | .10 (1.40) |
| | E. Dynamism | Comp. Adv. | -.04 (0.53) | .09 (1.36) |
| | Product Inno. | Comp. Adv. | -.17 (1.54) | .12† (1.70) |
| | E. Dynamism | Efficiency | . 04 (0.18) | .26** (2.47) |
| | Product Inno. | Efficiency | -.05 (0.33) | |
| $R^2$, SI Cap. | | | .47 | .33 |
| $R^2$, Market Perf. | | | .22 | .52 |
| $R^2$, Comp. Adv. | | | .27 | .60 |
| $R^2$, Efficiency | | | .13 | .31 |

**Notes:** Comp. Adv.: Competitive Advantage; Corp. S. Inno.: Corporate Service Innovativeness; E. Dynamism: Environmental Dynamism; Market Perf.: Market Performance; Product Inno.: Product Innovation Orientation; Top M. Com.: Top Management Commitment; SI Cap.: Service Innovation Capabilities. Values of t were calculated with bootstrapping procedure with 5000 samples of 87 cases. Significance level: † = $p < 10$ %; * = $p < 5$ %; ** = $p < 1$ %.

## Table 4-VII. Results of OLS Analyses with Competitive Advantage as Dependent Variable

| | n=87 | | | | n=121 | | | |
|---|---|---|---|---|---|---|---|---|
| **Variables** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 1** | **Model 2** | **Model 3** | **Model 4** |
| Intercept | 4.2**(.59) | 3.9**(.81) | 2.2**(.70) | 2.0**(.74) | 4.4**(.53) | 2.7**(.64) | .82†(.44) | .64 (.44) |
| Firm size (log) | .03 (.08) | .03 (.08) | .03 (.07) | .01 (.07) | .08 (.06) | -.01 (.06) | -.04 (.03) | -.06 (.04) |
| Firm age (log) | -.03 (.12) | -.01 (.13) | .10 (.12) | .11 (.12) | -.20† (.12) | -.08 (.12) | .01 (.07) | .03 (.07) |
| Industry: Financial services | .25 (.43) | .21 (.44) | .13 (.39) | .13 (.38) | .48 (.35) | -.01 (.31) | .15 (.19) | .21 (.20) |
| Industry: Logistics | .20 (.44) | .15 (.44) | .24 (.40) | .21 (.41) | .33 (.35) | -.05 (.28) | .23 (.22) | .20 (.21) |
| Industry: IT services | -.03 (.39) | -.10 (.13) | .21 (.39) | .14 (.40) | .19 (.35) | -.64*(.34) | -.08 (.22) | -.09 (.21) |
| Environmental dynamism[b] | | .10 (.13) | -.06 (.10) | -.07 (.11) | | .33**(.12) | .14 (.09) | .11 (.09) |
| Product innovation orientation[b] | | -.02 (.10) | -.16*(.08) | -.18*(.09) | | .30**(.10) | .03 (.07) | -.02 (.06) |
| Service innovation capabilties[b] | | | .57**(.10) | .50**(.11) | | | .76**(.08) | .60** (.09) |
| Top management commitment[b] | | | | .01 (.11) | | | | .04 (.07) |
| Corporate service innovativeness[b] | | | | .13 (.11) | | | | .25**(.07) |
| $R^2$ | .02 | .02 | .30 | .31 | .05 | .26 | .66 | .70 |
| $R^2$ change | | .01 | .28** | .02 | | .21** | .40** | .04** |
| F | 0.32 | 0.29 | 4.75 | 4.2 | 1.01 | 4.83 | 34.07 | 33.73 |

**Notes**: [a] Unstandardized coefficients are given; robust standard errors in parentheses. [b] Mean-centered. Significance level: † = p < 10 %; * = p < 5 %; ** = p < 1 %.

**Table 4-VIII. Results of OLS Analysis with Efficiency as Dependent Variable**

| | n=87 | | | | n=121 | | | |
|---|---|---|---|---|---|---|---|---|
| **Variables** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 1** | **Model 2** | **Model 3** | **Model 4** |
| Intercept | 2.7** (.68) | 2.0** (.84) | .86 (.82) | .24 (.89) | 2.5** (.52) | .84 (.57) | -.23 (.49) | -.55 (.50) |
| Firm size (log) | .12 (.08) | .10 (.08) | .10 (.08) | .11 (.08) | .15* (.06) | .05 (.06) | .03 (.05) | .03 (.05) |
| Firm age (log) | -.03 (.12) | .01 (.13) | .09 (.12) | .11 (.12) | -.12 (.12) | .01 (.11) | .06 (.09) | .07 (.09) |
| Industry: Financial services | .14 (.44) | .01 (.45) | -.04 (.42) | .02 (.41) | .56 (.37) | .07 (.35) | .16 (.30) | .23 (.30) |
| Industry: Logistics | .40 (.39) | .27 (.40) | .33 (.39) | .37 (.39) | .21† (.34) | .28 (.30) | .44† (.26) | .44† (.26) |
| Industry: IT services | -.28 (.38) | -.45 (.36) | -.24 (.38) | -.23 (.39) | .66 (.52) | -.62† (.34) | -.29 (.28) | -.28 (.30) |
| Environmental dynamism[b] | | .15 (.12) | .04 (.12) | .01 (.11) | | .32** (.12) | .21† (.11) | .18† (.10) |
| Product innovation orientation[b] | | .03 (.11) | -.06 (.11) | -.12 (.14) | | .31** (.09) | .15† (.08) | -.12 (.09) |
| Service Innovation capabilties[b] | | | .39** (.10) | .27** (.12) | | | .44** (.09) | .29** (.12) |
| Top management commitment[b] | | | | .18 (.14) | | | | .13 (.10) |
| Corporate service innovativeness[b] | | | | .09 (.13) | | | | .14 (.12) |
| $R^2$ | .09 | .11 | .22 | .25 | .09 | .29 | .42 | .44 |
| $R^2$ change | | .02 | .12** | .03 | | .20 | .13** | .02 |
| F | 2.36* | 2.29 | 4.10 | 3.62 | 2.71 | 7.26 | 16.30 | 15.78 |

**Notes**: [a] Unstandardized coefficients are given; robust standard errors in parentheses. [b] Mean-centered. Significance level: † = p < 10 %; * = p < 5 %; ** = p < 1 %.