Stimulating Service Innovation in Healthcare: Insights from a Broader Perspective

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vorgelegt
von
Bettina Kriegl
aus
Bad Reichenhall

Dekan: Prof. Dr. Claas Christian Germelmann

Erstberichterstatter: Prof. Dr. Herbert Woratschek

Zweitberichterstatterin: Prof. Dr. Andrea Raab

Drittberichterstatter: Prof. Dr. Claas Christian Germelmann

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To my parents

and in memory of my grandfather

Abstract

Healthcare decision-makers are under constant pressure to deliver high-quality care with limited resources. An aging population, a sharp increase in chronic diseases, reduced financial resources, higher patient expectations, and the COVID-19 pandemic further complicate this situation and underscore the need for continuous innovation in healthcare.

In this thesis, service innovation is defined and analyzed according to Service-Dominant Logic and from a service ecosystem perspective. The research objectives are specified as follows: 1) to examine how service innovation emerges in the workplace of healthcare professionals and identify relevant operant resources, 2) to evaluate healthcare organizations' use of social media platforms as a venue for service innovation, and 3) to explore how healthcare professionals drive service innovation by influencing and shaping institutions. To address these three research objectives, three empirical studies were conducted.

Study 1 used a mixed methods design to examine the innovative work behavior of chief physicians as an outcome of value co-creation leading to service innovation. The results showed that collaboration with actors inside and outside one's organization is a significant and meaningful influencing factor for chief physicians' innovative work behavior.

Study 2 examined the role of social media as a venue for service innovation. A comparison of the Facebook presence of German and U.S. hospitals showed that in both countries, exchange with and by patients and other actors on the platform is hardly promoted, so that the potential of social media for creative idea generation and problem solving is not exploited.

Study 3 took into account the fact that service innovation is embedded in service ecosystems. A qualitative study in the context of rehabilitation examined how physicians and therapists perceive the influence of institutions on their situated actions and how they actively engage in implementing changes that differ from existing institutions. Findings revealed that healthcare professionals use practices of bypassing, advocating, constructing normative networks, legitimizing, enabling work, and embedding and routinizing to drive incremental, internal radical, external radical, and joint radical service innovation.

The results of the three empirical studies have been incorporated into a total of nine scientific and transfer papers included in this thesis. Taken together, they conclude that service innovation needs to be understood more broadly and thus offers healthcare organizations and their employees a variety of opportunities for action.

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Abbreviations

FLE	Frontline employee
GDL	Goods-Dominant Logic
IWB	Innovative work behavior
SDL	Service-Dominant Logic

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Chapter 1: Introduction

> *"Innovation has nothing to do with how many R&D dollars you have. When Apple came up with the Mac, IBM was spending at least 100 times more on R&D. It's not about money. It's about the people you have, how you're led, and how much you get it."*
>
> *Steve Jobs in Fortune, Nov. 9, 1998.*

1.1 Motivation

1.1.1 A New Conceptualization of Service Innovation

Service innovation is a key driver of economic growth. It plays an increasingly important role in developing and sustaining business performance and competitiveness (Carlborg *et al.*, 2014). Therefore, research calls for more insights on how to stimulate service innovation in different contexts (Ostrom *et al.*, 2015).

The literature on service innovation has grown considerably over the last thirty years and encompasses different meanings in different research fields and schools of thought (Gustafsson *et al.*, 2020). The assimilation, demarcation, and synthesis approach (Coombs and Miles, 2000) is commonly used to analyze, classify, and understand service innovation (e.g., Carlborg *et al.*, 2014; Drejer, 2004; Droege *et al.*, 2009; Vence and Trigo, 2009), reflecting the evolution of the concept over time.

Traditionally, innovation research has focused on technological, R&D-based breakthroughs by manufacturing firms (Drejer, 2004; Toivonen and Tuominen, 2009). The basic idea of the assimilation approach is that services and innovation in services are similar to manufacturing and innovation in manufacturing. That is, the models and theories originally developed for manufacturing innovation research can also be applied to services (Coombs and Miles, 2000). According to the assimilation approach, all services depend largely on technologies developed by manufacturing firms (Pavitt, 1984). Thus, operand resources, i.e., tangible assets such as raw materials and machinery (Vargo and Lusch, 2004), are the main source of innovation.

In contrast, the demarcation approach argues that services and innovation in services are very different from manufacturing and innovation in manufacturing (Coombs and Miles, 2000). Service innovation research anchored in this approach relies on specifically developed models and theories that consider the unique characteristics that distinguish services from physical tangible goods, namely inseparability, heterogeneity, intangibility, and perishability (IHIP; Zeithaml *et al.*, 1985).

The assimilation and demarcation approaches are inspired by Goods-Dominant Logic (GDL), leading to incomplete knowledge about the true nature and impact of service innovation (Ordanini and Parasuraman, 2011). Organizations with a GDL perspective innovate and create value for their customers, not jointly with them (Lusch *et al.*, 2007). That is, service innovation focuses mainly on internal processes without involving customers and other actors as active participants and contributors of operant resources, i.e., intangible assets such as knowledge and skills (Vargo and Lusch, 2004).

The limitations of the assimilation and demarcation approaches have led to calls for more appropriate frameworks that incorporate important, under-researched aspects of service innovation and do not simply reflect the dichotomy between goods and services (Drejer, 2004). The synthesis approach integrates insights from service-oriented demarcation research with those from goods-oriented assimilation research to develop theories broad enough to capture innovation in both services and manufacturing (Gallouj and Savona, 2010). Therefore, the synthesis approach is fruitful for the study of service innovation (Drejer, 2004).

One research direction consistent with the synthesis approach to service innovation is Service-Dominant Logic (SDL; Vargo and Lusch, 2004, 2008a, 2016). SDL outlines a perspective of value creation in which value is co-created by multiple actors in a collaborative and interactive process (Vargo and Lusch, 2004). In contrast to GDL, actors are not seen in their dyadic roles as producers and consumers, but in a more general sense as actors in a system of other actors (Vargo and Lusch, 2011). SDL marks a turning point for the understanding of value creation that many scholars have called for in recent decades (e.g., Grönroos, 1994; Heskett and Schlesinger, 1991; Hunt and Morgan, 1995).

The central principle of SDL is that service, defined as the application of competences for the benefit of another party, is the fundamental basis of all social and economic exchange (Vargo and Lusch, 2004). The use of the singular term ‘service’ outlines a shift in value thinking from operand to operant resources. While services in GDL represent units of output, service in SDL describes a process of doing something for and in connection with someone. From this perspective, goods are vehicles or mechanisms for service provision. SDL thus represents an innovation perspective that eliminates the distinction between goods and services and enables actors across multiple disciplines, sectors, and levels to integrate resources (Vargo and Lusch, 2008b).

Building on SDL, Lusch and Nambisan (2015, p. 161) defined service innovation as "the rebundling of diverse resources that create novel resources that are beneficial (i.e., value experiencing) to some actors in a given context". The authors outlined their broader view of service innovation through a tripartite framework consisting of (1) value co-creation, (2) service platforms, and (3) service ecosystems. This perspective enables organizations to take proactive steps to stimulate service innovation (Lusch and Nambisan, 2015) and serves as the theoretical foundation for this thesis. The three concepts and their implications for service innovation research are briefly described below.

The first concept of the tripartite framework motivates the study of the very process of *value co-creation*. In value co-creation, value is assumed to be co-created by multiple actors through the integration of resources (Vargo and Lusch, 2004). Actors can play distinct roles in this process and proactively support it by creating new organizational mechanisms and changing internal processes. This requires examining the activities underlying resource integration and the implicit actor roles (Lusch and Nambisan, 2015).

Service platforms act as infrastructures that facilitate the interaction of actors and resources (Fu *et al.*, 2017). They serve as a venue for service innovation because the exchange of resources among many interacting actors can lead to innovative solutions (Lusch and Nambisan, 2015). Therefore, service innovation research also needs to examine how organizations configure and use service platforms (Tronvoll and Edvardsson, 2020).

Service ecosystems are relatively self-contained, self-adjusting systems of resource-integrating actors linked by shared institutions and mutual value creation through service exchange (Vargo and Lusch, 2016). The ecosystem perspective emphasizes the role of institutions (e.g., laws, regulations, social norms, and customs) as "rules of the game" (North, 1990, p. 3). More specifically, institutions are "regulative, normative, and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life" (Scott, 2014, p. 56). They influence value co-creation and thus service innovation by providing guidance on what is considered a valuable resource in a particular context and how such resources can be accessed, adapted, and integrated (Akaka *et al.*, 2012). Service innovation is always associated with the formation and reformation of institutions (Vargo *et al.*, 2015), which makes the study of institutions, their influence, and their change a promising field of research.

1.1.2 Service Innovation in Healthcare

Global healthcare spending is expected to increase at a compound annual growth rate of 3.9% between 2020 and 2024, significantly higher than the 2.8% growth rate over the 2015-2019 period (Economist Intelligence Unit, 2020). All developed countries face major challenges as pressure on budgets increases due to an aging population and the associated increase in demand for chronic disease management and elder care. In addition, spending is being fueled by rising customer expectations and advances in medical treatment. COVID-19 further accelerates this trend across the ecosystem (Deloitte, 2021).

Because of these pressures, the need for service innovation in healthcare is particularly urgent (Berry, 2019). Service innovation can help healthcare organizations address and overcome challenges and concerns arising from the changing context. Several authors have argued that service innovation can have significant benefits, including increased mental and physical well-being and cost savings (e.g., Joiner and Lusch, 2016; McColl-Kennedy *et al.*, 2017a; Thakur *et al.*, 2012).

However, healthcare is a unique service setting that makes service innovation challenging. First, customers may be unwilling or unable to engage in innovation and change processes. Healthcare is a service that people need but do not necessarily want. It is the presence or possibility of a disease that forces someone into the role of patient. For this reason, many people react with reluctance (Berry and Bendapudi, 2007). In addition, the combination of complexity and importance makes it difficult for patients to participate in service innovation. In some service settings, such as computer repair, the service is complex but not potentially life-changing or life-threatening. Healthcare is both complex and consequential (Berry *et al.*, 2015).

Second, healthcare is a highly institutionalized system consisting of relationships among resource-integrating actors, including patients and their families, healthcare professionals, hospitals, insurers, professional associations, government agencies, and the media (Frow *et al.*, 2016). That is, service innovation occurs in a context of diffuse power structures and divergent goals resulting from the co-existence of multiple, often competing and conflicting institutions (Verleye *et al.*, 2017).

The aspects just explained make healthcare a complex but fruitful field of service research. The development of service research in healthcare (Table 1) can be traced back to Berry and Bendapudi (2007), who urged service scholars to include healthcare in their research activities and identified promising avenues for future research. Much of the work to date has focused on the process of value co-creation and, in particular, co-creating value with customers. Customer value co-creation can be defined as "benefit realized from integration of resources through activities and interactions with collaborators in the customer's service network" (McColl-Kennedy *et al.*, 2012, p. 370). As one of the first scholars to address this research topic, Nambisan and Nambisan (2009) provided a concise and coherent theoretical framework for analyzing customer value co-creation in online communities. Based on the two dimensions of knowledge activity and leadership, they identified four distinct models and discussed their implications for healthcare organizations. In a study of two private oncology and hematology clinics, McColl-Kennedy *et al.* (2012) uncovered what patients actually do to co-create value. The authors identified five groups of customer value co-creation practices, resulting in a typology of practice styles and related them to quality of life. Sweeney *et al.* (2015) demonstrated the transformative potential of customer value co-creation by examining its influence on quality of life, service satisfaction, and behavioral intentions in a large-scale survey.

An institutional view of service innovation has also attracted some research interest. For example, Kukk *et al.* (2016) studied how the pharmaceutical firm Roche influenced the healthcare system in England to create a market for the personalized cancer drug Herceptin. They showed that institutional change can be preceded by a range of innovation system-building activities that do not directly target institutional change but are necessary for institutional change to occur. Wallin and Fuglsang (2017) examined how new ventures disrupt institutions by introducing digital innovations into healthcare markets. The authors showed that new ventures are involved in a very complex and dynamic process consisting of institutional sensemaking, theorization of change, and modification of institutions.

Recent work has explored service design and artificial intelligence as promising ways to foster service innovation. For example, Patrício *et al.* (2019) presented three research projects showing how service design can enable service innovation to improve well-being. And Leone *et al.* (2021) showed that technology service providers and customers in the B2B healthcare ecosystem (i.e., hospitals, healthcare systems, and social service organizations) can only generate high-value service innovation if they use different types of artificial intelligence.

Author(s)	**Research aim**	**Research type**	**Empirical base**
Nambisan and Nambisan (2009)	Providing a concise and coherent theoretical framework for analyzing customer value co-creation in online communities	Conceptual	N/A
Elg *et al.* (2011)	Developing an understanding of how patients experience their health problems and how to develop innovative ideas for healthcare services	Empirical	*14* patient diaries
Gill *et al.* (2011)	Identifying and describing key themes underlying client orientation, client involvement, provider empowerment, and client empowerment in community-based elder care	Empirical	*29* interviews
Elg *et al.* (2012)	Examining the process of patient co-creation and different mechanisms through which healthcare providers can learn from patients	Empirical	*53* patient diaries
McColl-Kennedy *et al.* (2012)	Delving deeper into what healthcare customers actually do when they co-create value	Empirical	*4* focus groups, *20* interviews, field observations
Pinho *et al.* (2014)	Exploring the concept of value co-creation from multiple actors' perspectives in a national electronic health records service project	Empirical	*4* focus groups, *13* interviews
Hardyman *et al.* (2015)	Explaining the importance of studying value co-creation as a basis for further empirical analysis of patient engagement in micro-level encounters	Conceptual	N/A
Karlsson and Skålén (2015)	Studying frontline employees' contribution to service innovation in four different organizations, including a hospital	Empirical	*55* interviews, field observations
Stewart Loane *et al.* (2015)	Examining social support as the mechanism through which consumers co-create and experience different types of value in online communities	Empirical	*636* online posts

Sweeney *et al.* (2015)	Exploring customer effort in value co-creation activities and demonstrating its influence on quality of life, service satisfaction, and behavioral intentions	Empirical	*20* interviews, *1,008* questionnaires
Joiner and Lusch (2016)	Explaining why the shift to SDL is critical for healthcare customers and providers to better co-create value	Conceptual	N/A
Kukk *et al.* (2016)	Providing insights into how the pharmaceutical firm Roche acted as an institutional agent by influencing the healthcare system in England to create a market for the personalized cancer drug Herceptin	Empirical	*15* interviews, secondary data
Beirão *et al.* (2017)	Uncovering factors and outcomes of value co-creation at the micro, meso, and macro levels	Empirical	*48* interviews
McColl-Kennedy *et al.* (2017a)	Investigating customer value co-creation practices and modeling the impact on well-being	Empirical	*20* patient diaries, *1,131* questionnaires
McColl-Kennedy *et al.* (2017b)	Synthesizing findings from healthcare research with those from service research to identify key conceptualizations of the changing role of the healthcare customer	Conceptual	N/A
Wallin and Fuglsang (2017)	Exploring how new ventures aim to disrupt institutions by introducing digital innovations into healthcare markets	Empirical	*21* interviews, secondary data
Pop *et al.* (2018)	Proposing a typology of institutions that enable or constrain customer centricity and value co-creation and providing case study evidence on how pharmaceutical firms react to and induce institutional change	Empirical	*11* interviews, field observations, secondary data
Sajtos *et al.* (2018)	Understanding the role of boundary objects as part of institutional work in realizing resource integration and value creation through analysis of the implementation of a case-mix system within the New Zealand healthcare system	Empirical	*7* interviews

Gallan *et al.* (2019)	Explaining micro-to-meso relationships of well-being and providing a theoretical framework linking patient experience to community well-being	Conceptual	N/A
Patrício *et al.* (2019)	Illustrating different ways that service design can enable healthcare innovation to improve wellbeing	Empirical	Narratives of *3* research projects
Leone *et al.* (2021)	Understanding how different types of artificial intelligence-based solutions help firms co-create value	Empirical	*4* interviews, *15* user reviews, secondary data
Vink *et al.* (2021)	Building a systemic understanding of service design as a foundation for actors' efforts to achieve targeted, long-term change in service systems	Conceptual	N/A

Table 1. Literature review on service research in healthcare

The literature review shows that a growing stream of work is moving away from an output-based focus on innovation toward a service perspective. However, there are still some knowledge gaps that require further research to better understand service innovation and its management in healthcare. For example, Karlsson and Skålén (2015) pointed out that frontline employees (FLEs), i.e., employees with constant customer contact, such as healthcare professionals, are central to service innovation but have been largely neglected. In addition, there is a need for research on digital platforms as a way to co-create creative ideas and solutions to problems with a large number of partners and actors. A more comprehensive understanding of service innovation is also of great benefit to managers who want to address the challenges of modern healthcare by developing new or modified services from the customer perspective.

The overall research aim of this thesis is to contribute to the body of knowledge on service innovation in healthcare by considering and addressing the tripartite framework consisting of 1) value co-creation, 2) service platforms, and 3) service ecosystems (Lusch and Nambisan, 2015). Against the background of the above, this aim is specified as follows:

Research objectives

RO1: Examining how service innovation emerges in the workplace of healthcare professionals and identifying relevant operant resources

RO2: Evaluating healthcare organizations' use of social media platforms as a venue for service innovation

RO3: Exploring how healthcare professionals drive service innovation by influencing and shaping institutions

1.2 Thesis Organization

To achieve the defined research objectives, three empirical studies were conducted. *Study 1* examined the innovative work behavior (IWB) of chief physicians in hospitals. IWB describes "the intentional creation, introduction and application of new ideas within a work role, group or organization, in order to benefit role performance, the group, or the organization" (Janssen, 2000, p. 288). This behavior is a result of value co-creation (Kao *et al.*, 2015) through the efforts of employees and customers (Jaakkola and Alexander, 2014) and leads to service innovation. Since it is not yet fully understood how IWB can be promoted in the context of healthcare (Carlucci *et al.*, 2020), the contribution of this study was to identify relevant antecedents. A research model was established, assuming that IWB is primarily influenced by human, relational, and organizational resources. Specifically, it was hypothesized that proactive personality, collaborative competence, and innovation climate are positively related to IWB, resulting in the following research question:

Research question of study 1

RQ1: What is the relative influence of proactive personality, collaborative competence, and innovation climate on the IWB of chief physicians in hospitals?

The study was based on an exploratory sequential mixed methods design (Creswell and Plano Clark, 2017). First, 10 chief physicians were interviewed by telephone in October 2019 about their working conditions and behaviors. The qualitative data were analyzed and served as the basis for developing the quantitative survey instrument. Between July and August 2020, a total of 3,711 questionnaires were mailed to employees from 1,264 hospitals, of which 442 completed questionnaires were eligible for statistical analysis. The hypothesized relationships were tested using structural equation modeling.

Study 2 examined the social media platform Facebook as a venue for service innovation, addressing the central theme of service platforms. Social media is "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" (Kaplan and Haenlein, 2010, p. 61). Social media platforms that are constantly updated with a variety of new content can attract followers and help not only to build a good reputation, but also to share interesting information and engage customers and the surrounding community in meaningful conversations to find new solutions to problems. With 2.9 billion monthly active users worldwide, Facebook is the largest social media platform (Facebook, 2021).

The overall contribution of the study was to derive recommendations for a successful media presence on Facebook by comparing the Facebook activities of German and U.S. hospitals. U.S. hospitals were used for comparison, as they are considered progressive in terms of their social media presence. For example, the Mayo Clinic, a medical center in Rochester, Minnesota, has established a Social Media Center – the first of its kind – to coordinate and focus the clinic's various social media initiatives and programs (Mayo Clinic, 2010). The study specifically addressed the following research questions:

Research questions of study 2

RQ2a: How do German and U.S. hospitals differ in terms of the content and types of posts on self-run Facebook pages?

RQ2b: How can German hospitals improve and expand their media presence on Facebook?

A total of 2,879 Facebook posts from 36 German and U.S. hospitals were collected over a period from January to September 2017. The data material was evaluated in a quantitative content analysis according to a coding guide.

Study 3 did justice to the fact that service innovation is embedded in service ecosystems. Service ecosystems emphasize the importance of shared organizational structures and principles to facilitate the integration of resources and exchange of service among actors (Lusch and Nambisan, 2015). This study was conducted in a rehabilitation context and focused on understanding how healthcare professionals perceive the influence of institutions on their innovative actions and how they actively engage in implementing changes that differ from existing institutions, which led to the following research questions:

> **Research questions of study 3**
>
> *RQ3a:* What institutional elements have a facilitating or constraining influence on healthcare professionals' innovation efforts in rehabilitation clinics?
>
> *RQ3b:* What institutional work practices do healthcare professionals use to drive what types of service innovation?

The primary data source was 28 interviews with physicians, nurses, therapists, and clinic management. These were supplemented by field observations and secondary data. To answer the first research question, portions of the data were analyzed deductively using Scott's (2014) framework of institutional pillars and carriers. The thematic analysis focused on identifying the institutional elements that enable service innovation and those that constrain it. The second substudy relied on an abductive theorizing process (Dubois and Gadde, 2002, 2014) with an embedded multiple case study design (Yin, 2018) that examined individual service innovation projects initiated by healthcare professionals as embedded cases.

A total of nine papers emerged from the three studies. Table 2 summarizes the research purpose and approach of the studies and lists the resulting publications. The author of this thesis, Bettina Kriegl, was significantly involved in all nine papers as first author. In *Paper I*, she conceived and designed the study with valuable assistance from Herbert Woratschek. Andrea Raab led the qualitative data collection. Bettina Kriegl collected the quantitative data, conducted the analysis, and wrote the manuscript. The final version of the paper was read and approved by the co-authors. *Papers II–IV* were developed and directed by Bettina Kriegl, with helpful revisions by the co-authors.

In *Paper V*, Bettina Kriegl was responsible for study design, data collection, and data coding. Lawrence Fitzgerald acted as second coder, performed the statistical analysis, and wrote the draft manuscript. Andrea Raab and Bettina Kriegl reviewed the results and made revisions. All authors approved the final version of the paper.

Papers VI and VII were initiated by an intensive scientific discourse between Herbert Woratschek, Andrea Raab, and Bettina Kriegl. The latter conceived and designed the study in close coordination with the co-authors. Bettina Kriegl was also responsible for collecting and analyzing the data and for writing and revising the manuscript. Herbert Woratschek accompanied the rounds of revisions from a scientific perspective, and Andrea Raab provided valuable input on the managerial implications. *Papers VIII and IX* were written by Bettina Kriegl, taking into account feedback from the co-authors.

The thesis is organized as follows: *Chapter 1* presents the motivation and theoretical positioning of the thesis. Then, the research objectives and questions are presented. *Chapters 2–4* contain the papers of the research portfolio, organized by the three inter-related elements of service innovation: value co-creation, service platforms, and service ecosystems. For consistency, the papers have been adapted to the layout of this thesis. *Chapter 5* summarizes the main findings and draws conclusions. The appendix contains a list of articles submitted or published during the doctoral period.

Study	Central theme	Research objective	Research question(s)	Research approach	Empirical base	Papers
1	Value co-creation	*RO1:* Examining how service innovation emerges in the workplace of healthcare professionals and identifying relevant operant resources	*RQ1:* What is the relative influence of proactive personality, collaborative competence, and innovation climate on the IWB of chief physicians in hospitals?	Mixed methods	*10* interviews, *442* questionnaires	I, II, III
2	Service platforms	*RO2:* Evaluating healthcare organizations' use of social media platforms as a venue for service innovation	*RQ2a:* How do German and U.S. hospitals differ in terms of the content and types of posts on self-run Facebook pages? *RQ2b:* How can German hospitals improve and expand their media presence on Facebook?	Quantitative	*2,879* Facebook posts	IV, V
3	Service ecosystems	*RO3:* Exploring how healthcare professionals drive service innovation by influencing and shaping institutions	*RQ3a:* What institutional elements have a facilitating or constraining influence on healthcare professionals' innovation efforts in rehabilitation clinics? *RQ3b:* What institutional work practices do healthcare professionals use to drive what types of service innovation?	Qualitative	*28* interviews, field observations, secondary data	VI, VII, VIII, IX

Table 2. Overview of the studies conducted in this thesis

Chapter 2: Value Co-Creation

2.1 Paper I: "Antecedents of Innovative Work Behavior Among Leading Physicians: Empirical Evidence from German Hospitals"

Authors: Bettina Kriegl
Herbert Woratschek
Andrea Raab

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2.1.1 Abstract

Healthcare professionals' IWB plays a key role in the development and implementation of innovative solutions in hospitals. However, relevant antecedents of IWB have not been fully captured to date. This study empirically examines the relationships between proactive personality, collaborative competence, innovation climate, and IWB. Hypotheses were tested using a sample of 442 chief physicians from 380 German hospitals. The results indicate a positive and significant influence of proactive personality, collaborative competence, and innovation climate on IWB, with collaborative competence having a stronger influence on IWB than innovation climate. Managers should note that important resources for IWB are accessible through a variety of actors and relationships. To leverage these resources and thus promote IWB, more emphasis should be placed on an employee's network.

2.1.2 Introduction

In healthcare, innovations are the source of every improvement in the quality of service and life (Flessa and Huebner, 2021). Healthcare professionals can make a significant contribution to the innovation process with their experience and knowledge (Busch-Casler *et al.*, 2021). To exploit this innovation potential, the focus should be on the innovative work behavior (IWB) of professionals. This behavior can neither be mandated nor taken for granted, but depends on the right antecedents, which have not yet been fully captured (Carlucci *et al.*, 2020).

Here we examine the IWB of chief physicians in German hospitals. Change projects in the German healthcare system seem to be particularly challenging, as suggested by the Bertelsmann Stiftung, which evaluated 17 EU and OECD countries according to the Digital Health Index, with Germany ranking second to last (Thiel *et al.*, 2018). Innovations in healthcare typically relate to products (innovations in clinical procedures), processes (innovations in production or delivery methods), or structures (new business models) (Varkey *et al.*, 2008). One reason why systematic planning, management, and control of change in German hospitals has so far been rather low is that innovations are primarily associated with product innovations, which does not do justice to the importance of creating more effective and efficient healthcare delivery models (Schultz *et al.*, 2019). Internal inefficiencies, such as poor patient flow and inadequate resource utilization, are among the major transformative challenges that can be addressed with lean practices and digital technologies (Tlapa *et al.*, 2022).

Another obstacle to successful innovation activities is that innovation in German hospitals is seen as purely a matter for chief executives. Therefore, the central role of chief physicians is necessary, who actively drive innovation processes with their position and expertise (Schultz *et al.*, 2019). In their role as hybrid managers, having both a leadership and a clinical dimension, this requires chief physicians to balance the daily needs of their department with the needs of their frontline staff and with the strategic directions of their organization (Burgess *et al.*, 2015). On the one hand, this combination and confrontation of different values and priorities can unleash significant potential for innovation, but on the other hand, it can also lead to tensions and conflicts that cause innovations to fail.

We draw on Resource-Advantage (R-A) theory and Service-Dominant (S-D) logic to theoretically and empirically examine chief physicians' IWB and its antecedents. As far as we know, we are the first to apply this theoretical background to hospital innovation management, while it has already been used in the context of healthcare customer experiences (James *et al.*, 2017).

R-A theory advocates the use of resources as a means to formulate, create, and sustain competitive advantage and performance, defining resources as the "tangible and intangible entities available to the firm that enable it to produce efficiently and/or effectively a market offering that has value for some market segment(s)" (Hunt, 2000, p. 138). The core argument is that valuable, rare, imperfectly imitable, and non-substitutable resources lead to sustainable competitive advantages of organizations and firms. R-A theory has become a central paradigm in strategic planning, which also concretizes the more recent developments in management and marketing toward S-D logic. In S-D logic, resources are divided into operand (those on which an action is performed) and operant resources (those that act on other resources), with operant resources seen as the central driver of economic exchange and value creation. Thus, S-D logic provides a general theory that is made concrete by R-A theory. For R-A theory, operand resources are typically physical (e.g. equipment), and operant resources are typically human (e.g., the skills of individual employees), organizational (e.g., cultures), informational (e.g., competitive intelligence), and relational (e.g., relationships with customers) (Hunt, 2004).

Central to S-D logic is the idea that service, defined as the application of competences for the benefit of another party, is the fundamental basis of exchange. That is, service is exchanged for service. This service-for-service exchange is driven by the integration of resources and the joint creation of value, referred to as value co-creation. The literature on S-D logic emphasizes the importance of operant resources. Although operand resources contribute to the co-creation of value, without the application of operant resources, value co-creation cannot emerge (Vargo and Lusch, 2004).

In line with Kao *et al.* (2015) we argue that IWB is an outcome of value co-creation and propose a research model (Figure 1) in which human, relational, and organizational resources influence IWB. We identify human resources as proactive personality, relational resources as collaborative competence reflected in external work, cross-functional, frontline employee, and customer collaboration, and organizational resources as innovation climate. We assume that the antecedents are independent of each other, as we want to investigate which types of operant resources have the stronger influence on IWB. Below is a detailed description of each construct as it was intended for use in this research.

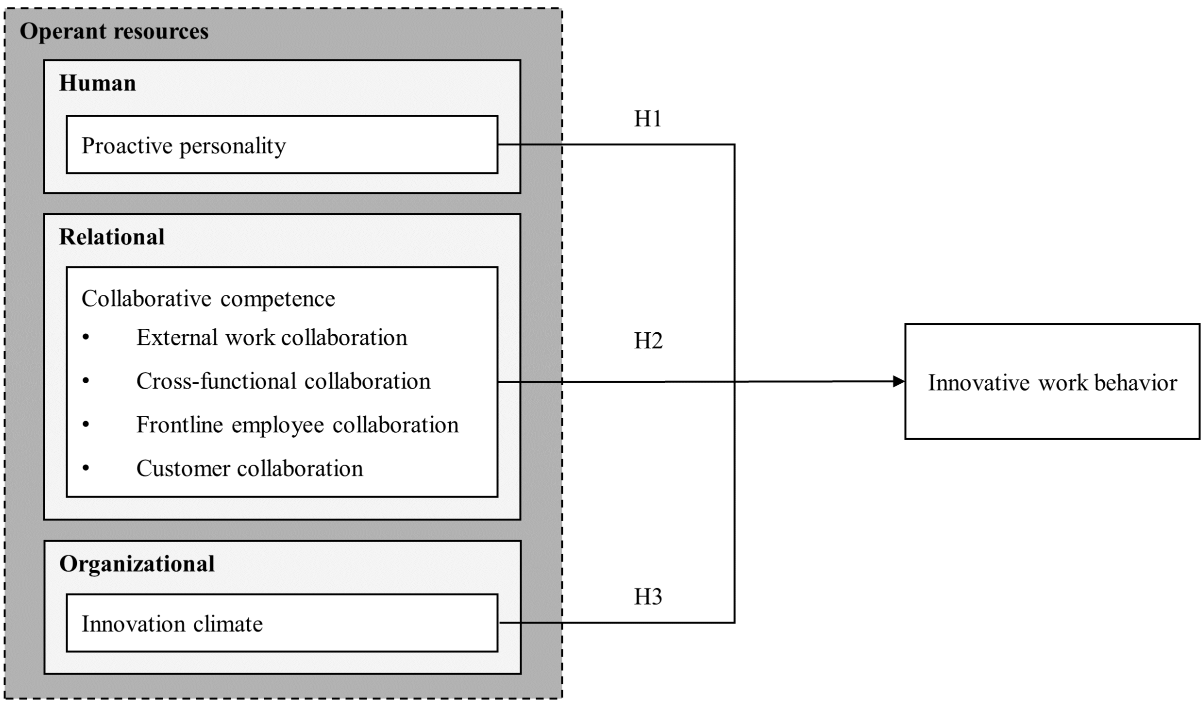


Figure 1. Research model

2.1.3 Theoretical Background

Innovative work behavior

Innovation activities are usually not part of the job description of chief physicians. Therefore, it is necessary to capture individual innovation performance with a specific measurement model. The concept of IWB is well suited for this purpose (Schreyögg *et al.*, 2014).

IWB refers to the intentional creation, introduction, and application of beneficial novelty within a work role, group, or organization (Janssen, 2000). In healthcare, IWB may emerge as incremental adjustments to existing processes, services or products, or as entirely new practical solutions, leading to benefits such as better functioning of the organization itself or achieving appropriate individualized solutions for each patient (Kessel *et al.*, 2012).

Much of the work on IWB theoretically distinguishes between different dimensions. We conceptualize IWB as a complex behavior involving idea generation, promotion, and realization (Janssen, 2000): An employee identifies work-related problems, shortcomings, or emerging trends and generates new ideas for which the support of others is mobilized before the employee implements the idea by creating a new prototype or model.

As the development and implementation of innovative ideas is characterized by discontinuous activities rather than sequential phases, individuals may engage in any combination of these behaviors at any given time (Scott and Bruce, 1994). All facets of IWB depend on a chief physician's operant resources, which can be integrated, created, and reconfigured. We propose three primary types of drivers that lead to IWB: proactive personality, collaborative competence, and innovation climate.

Proactive personality

Proactive personality refers to a person's stable tendency to take the initiative in a variety of actions that affect the environment (Bateman and Crant, 1993). It can be considered an important predictor of IWB. In a recent study examining proactive personality in the early days of the COVID-19 pandemic at a hospital in Wuhan, China, it was found that having a proactive personality was a tremendous benefit to healthcare professionals working to combat this new disease. Proactive physicians and nurses were able to reshape their work to make better use of their personal strengths. This, in turn, led to higher job performance and greater staff well-being (Yi-Feng Chen *et al.*, 2021).

Theoretically, these findings can be explained by the fact that proactive people are relatively unconstrained by situational forces (Bateman and Crant, 1993). They are motivated to "identify opportunities and act on them, show initiative, take action, and persevere until meaningful change occurs” (Crant, 2000, p. 439). Proactive personality is particularly important for innovation performance when employees work under decentralized conditions without close supervision (Crant, 2000), as is the case with leading physicians in hospitals. We therefore hypothesize that proactive personality is positively associated with IWB (*Hypothesis 1*).

Collaborative competence

Collaboration is becoming increasingly important in healthcare and is reflected in sector-specific concepts such as interprofessional collaboration. The World Health Organization defines it as “multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care” (WHO, 2010, p. 7). In this study, collaboration is considered a relevant influencing factor on chief physicians’ IWB.

Collaborative competence enables chief physicians to build and leverage relationships with other actors. Building on the R-A theory idea of basic and higher-order resources, competences are operant resources that bundle basic resources (Madhavaram and Hunt, 2008). We therefore conceptualize collaborative competence as a hierarchy of composite relational resources that includes external work, cross-functional, frontline employee, and customer collaboration.

External work collaboration is the frequency and closeness of contacts chief physicians have with individuals or groups outside the hospital. One of the key factors in IWB is recognizing the benefits of collaboration with research, industry, and other healthcare providers (e.g., referring physicians, rehabilitation clinic staff etc.). Chief physicians who have such contacts are exposed to diverse views and ideas that stimulate their own creativity. Access to new information and diverse external work groups facilitates processes that promote IWB, including exploration of opportunities, sources of ideas, and support for implementation (de Jong and den Hartog, 2010).

Cross-functional collaboration refers to “the degree to which the lateral cross-functional interactions are frequent and close” (Luo *et al.*, 2006, p. 71). Multidisciplinary teams provide a comprehensive view of problems and are therefore extremely useful in designing and implementing innovations in hospitals (Labitzke, 2014).

Employees working at the frontline of a hospital (e.g., nursing staff) take on a special role in innovation processes and are therefore considered separately. Owing to their proximity to healthcare customers, frontline employees are a crucial source of customer feedback and innovative ideas. Previous research has shown that involving frontline employees in idea generation or application improves the quality of healthcare service innovations (Mu *et al.*, 2018).

Customer collaboration refers to "information and feedback on specific issues" and "extensive consultation with users" (Alam, 2002, p. 255). Although customers always play an active role in service offerings by contributing their own resources to any service activity (Vargo and Lusch, 2004), customer collaboration is an often overlooked source of knowledge (Blazevic and Lievens, 2008). This is especially true in healthcare, where patients have long been seen in a relatively passive role, essentially as recipients of what a healthcare provider does for them (McColl-Kennedy *et al.*, 2017b). An empirical study of disease-related innovation has challenged this role, demonstrating that individuals affected by rare diseases can be a tremendous source of innovation for those similarly affected (Oliveira *et al.*, 2015).

In summary, collaborative competence, consisting of external work, cross-functional, frontline employee, and customer collaboration, enables chief physicians to draw relevant resources for idea generation, promotion, and realization from a network of multiple actors. We therefore postulate that collaborative competence is positively associated with IWB (*Hypothesis 2*).

Innovation climate

Climate is defined as "peoples' perceptions of, or beliefs about, environmental attributes shaping expectations about outcomes, contingencies, requirements, and interactions in the work environment" (Hunter *et al.*, 2007, p. 70). An organization characterized by an innovation climate emphasizes creativity and innovative change, supports members to act independently in generating and implementing new ideas, tolerates diversity among members, and provides key resources (e.g., time) for innovation (Scott and Bruce, 1994).

Although the current literature provides conflicting evidence on the influence of innovation climate on IWB depending on the research context, there is good reason to assume a positive relationship in German hospitals. Albrecht and Hall (1991) argued that proposing new ideas is perceived as risky because it represents a change in the existing order. New ideas invite evaluation by other organizational members and can lead to conflict. This is especially true in hierarchical work structures such as those prevalent in German hospitals. In an organization where risk-taking, freedom, and trust prevail, creativity is encouraged (Shanker *et al.*, 2017). We therefore hypothesize that innovation climate is positively associated with IWB (*Hypothesis 3*).

2.1.4 Method

Sample and data collection

Our sampling frame consisted of all 1264 hospitals in Germany drawn from a list published by the Bertelsmann Stiftung in cooperation with the umbrella organizations of the most important patient and consumer organizations. These were general hospitals, specialist hospitals, and university hospitals. Special cases, such as day and night clinics, were excluded from the study owing to their special organizational structure.

Data were collected by self-reports in a simultaneous mixed-mode design, that is, respondents could choose between an online questionnaire and a paper-and-pencil questionnaire to counteract selection bias. To achieve some degree of generalizability, we used a self-programmed bot to generate a total of approximately 9000 e-mail addresses from which participants from all possible medical departments (e.g., ophthalmology, gynecology and obstetrics, cardiac surgery, internal medicine, pediatrics, neurology, and orthopedics) were randomly selected. We sent invitations to participate in the survey to a maximum of three chief physicians from all hospitals in our sampling frame. The invitation informed them that the survey would capture various aspects of the organizational culture prevalent in their hospital. Participation was voluntary, and confidentiality was guaranteed.

A total of 3711 questionnaires were sent out. We received 385 online questionnaires and 57 paper-and-pencil questionnaires, for a total of 442 questionnaires from 380 hospitals. The percentage distribution of questionnaires measured by hospital size was as follows: 39.9% of questionnaires came from hospitals with up to 299 beds, 25.9% from hospitals with up to 499 beds, 20.9% from hospitals with up to 799 beds, and 13.4% from hospitals with 800 or more beds. Overall, 3.8% of responses were from university hospitals. The proportion of chief physicians from university hospitals among hospitals with 800 or more beds was 18.6%. Respondents were predominantly male (88%), with an average age of 54.7 years (SD = 6.2) and an average organizational tenure of 12.5 years (SD = 9.2).

Measures

Since this study was conducted in Germany, the survey instrument was in German. Using the method of parallel translation, the items were first translated into German by one person and then translated back into English by a second person to ensure that the meanings of the items were correctly translated from English into German. The suitability of the German version of the questionnaire was supported and verified by interviews with 12 healthcare professionals.

All constructs were collected as multi-item measures. To avoid acquisition bias, both positively and negatively worded items were included. We rated each item on a 7-point Likert scale ranging from “strongly disagree” to “strongly agree.” Owing to the sensitive nature of some questions, forced responses would have compromised the reliability of our data. Therefore, respondents were offered the option “I cannot judge” for each question.

Proactive personality was assessed using three items adapted from Bateman and Crant (1993). As proactive personality is a personality variable composed of basic personality traits, the selected items measured different facets of proactive personality, namely a preference for novelty over routine, intellectual curiosity, and assertiveness (Major *et al.*, 2006). A sample item is “I am always looking for better ways to do things”.

Collaborative competence was modeled as a second-order construct formed by four first-order factors: external work, cross-functional, frontline employee, and customer collaboration. We measured external work collaboration by adapting a scale developed by de Jong and den Hartog (2010). Our measure included four items reflecting a chief physician’s contacts with individuals or groups outside the hospital, for example, “I share close ties with people from universities or other research institutions”. To measure the lateral social interactions between functional areas within a hospital, we employed three items from the scale of Luo *et al.* (2006). A sample item is “All departments frequently discuss common problems”. An adapted version of this scale was used to assess interactions with frontline employees within the department, that is, medical and nursing staff with intensive patient contact. To measure customer collaboration, we used a scale developed by Bettencourt (1997). Since the primary role of customers in innovation is that of a feedback provider, our measure included three items reflecting the involvement of customers in service improvement. Here, the items referred to both patients and their relatives, as relatives are considered second-order customers. A sample item is “When patients and their relatives experience a problem, they let us know so we can improve service”.

Innovation climate was operationalized using the climate for innovation scale developed by Scott and Bruce (1994). The scale included two key dimensions, namely support for innovation and resource supply. While support for innovation captures the extent to which individuals see the organization as open to change, supportive of new ideas, and tolerant of member diversity, resource supply captures the extent to which resources devoted to innovation are perceived as adequate. The two dimensions were measured with three items each and used additively to measure the construct of innovation climate. Sample items are “Our hospital is concerned with change and transformation" and "There is adequate time available to pursue creative ideas here".

IWB was assessed using nine items based on Janssen's (2000) scale for individual innovative behavior in the workplace context. Three items each related to idea generation, promotion, and realization. Owing to content inappropriateness, one of the items capturing idea realization was replaced by an item from the scale of Scott and Bruce (1994). Thus, respondents provided self-reports on the following nine items: (1) creating new ideas for difficult issues, (2) searching out new working methods, techniques, or instruments, (3) generating original solutions for problems, (4) mobilizing support for innovative ideas, (5) acquiring approval for innovative ideas, (6) making important organizational members enthusiastic about innovative ideas, (7) transforming innovative ideas into useful applications, (8) introducing innovative ideas into the work environment in a systematic way, (9) investigating and securing funds needed to implement new ideas. Following Scott and Bruce (1994), Janssen (2000), and de Jong and den Hartog (2010), we designed the dimensions of idea generation, idea promotion, and idea realization additively to create an overall scale of IWB.

We chose self-reports to measure IWB as employees have much more information about the contextual and intentional background of their work activities. Therefore, self-reports of IWB may be more nuanced than reports from supervisors. Moreover, like other forms of subjective performance appraisals, supervisor ratings are highly susceptible to idiosyncratic interpretations and thus may vary between different raters Janssen (2000). These arguments are particularly relevant in the healthcare context, where innovative activities are not considered the primary task of employees but rather occur as part of daily work. Clinic management rarely has the opportunity to observe their employees during these activities and are not adequately trained to assess individual innovation performance.

To control for the possibility that occupational differences could lead to misleading relationships, organizational tenure (in years) was included as a relevant control variable in our analysis. We define organizational tenure as length of employment at a hospital and hypothesize that IWB is positively influenced by work-related learning and experience. Over the course of long tenure, physicians acquire knowledge about a hospital's processes, structures, and policies that enables them to innovate (Ng and Feldman, 2013).

Common method bias

As the dependent and independent variables were derived from the same respondents, we took several steps to minimize and test for the presence of common method bias. First, we took several procedural precautions, as recommended by Podsakoff *et al.* (2003). For example, we paid attention to the balance of question order. Second, we performed Harman's single factor test with principal axis factoring (PAF) as an extraction method to examine whether most of the variance could be explained by a single factor. The results revealed multiple distinct factors, with the first unrotated factor accounting for only 25% of the total variance extracted.

For further confirmation, the common latent factor technique was used to capture the common variance between all observed variables in the model. We added an unmeasured latent factor that was uncorrelated with other latent variables, restricted to equal factor loadings and a variance of one. We found that the common factor explained less than 8% of the variance, which is well below the recommended level. In summary, the results suggested that common method bias was not a serious concern in our data.

2.1.5 Results

Measurement properties

We tested our measurement model using exploratory factor analysis (EFA) via SPSS and confirmatory factor analysis (CFA) via Amos. The results of CFA showed a good global fit (CMIN = 1160.89; df = 413; $p < 0.001$; CMIN/df = 2.81; RMSEA = 0.06).

According to the research suggestions of Bagozzi and Yi (1988) factor loadings for each observed item of each latent construct should exceed 0.50. With two exceptions, the factor loadings ranged from 0.51 to 0.91 ($p < 0.001$). The two exceptions were reverse-coded items, and the factor loadings were just below the threshold of 0.50, at 0.46 and 0.48 ($p < 0.001$), respectively. Thus, all items were good measures of their constructs.

Measures of composite reliability (CR) and average variance extracted (AVE) indicated good convergent validity. The values of CR and AVE for four of the seven constructs were above the recommended thresholds of 0.60 and 0.50, respectively (Bagozzi and Yi, 1988; Fornell and Larcker, 1981). For the constructs of proactive personality, external work collaboration, and customer collaboration, AVE was below 0.50. However, as the CR was higher than 0.60, the convergent validity was still adequate (Fornell and Larcker, 1981).

Finally, we examined the discriminant validity using a correlation matrix (Table 3). The square root of the AVE of each latent construct was above its vertical and horizontal correlation values (Fornell and Larcker, 1981). Therefore, discriminant validity was satisfactory.

Construct	1	2	3	4	5	6	7	*Mean*	*SD*
PP	**0.74**[a]							*5.34*	*1.08*
EWC	0.64	**0.67**						*5.74*	*0.93*
CFC	0.51	0.42	**0.53**					*4.95*	*1.13*
FEC	0.37	0.26	0.37	**0.74**				*4.86*	*1.45*
CUC	0.34	0.28	0.18	0.45	**0.75**			*5.48*	*1.30*
IC	0.37	0.38	0.22	0.37	0.53	**0.65**		*4.83*	*1.13*
IWB	0.32	0.21	0.13	0.49	0.32	0.46	**0.72**	*4.27*	*1.30*

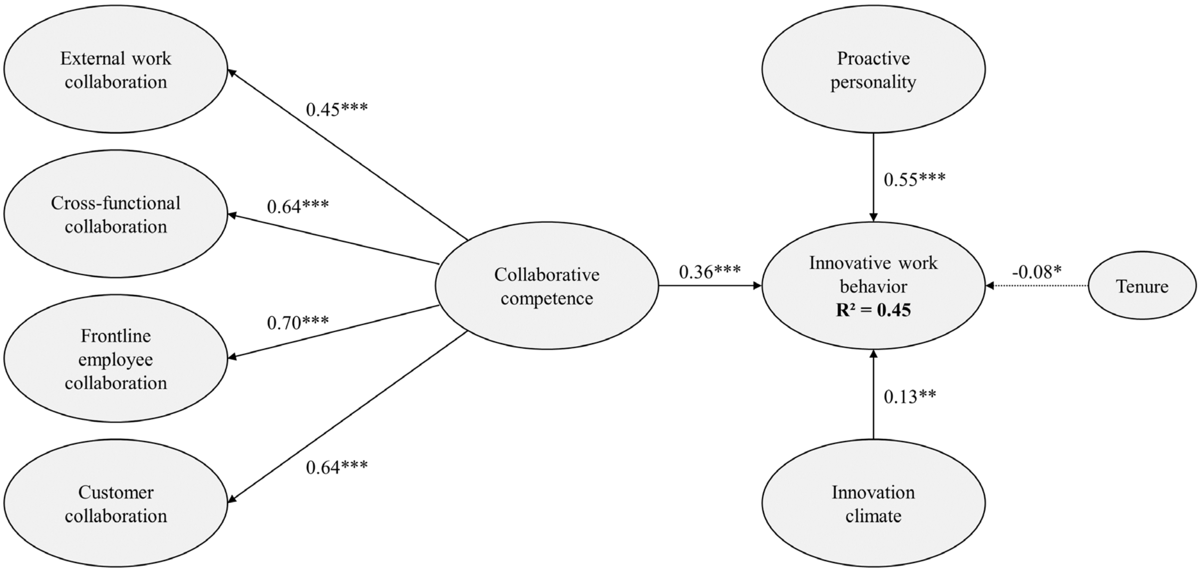
Note: n = 442. PP = proactive personality; EWC = external work collaboration; CFC = cross-functional collaboration; FEC = frontline employee collaboration; CUC = customer collaboration; IC = innovation climate; IWB = innovative work behavior. [a]Values in the diagonal are the square root of the average variance extracted (AVE).

Table 3. Correlation matrix and summary statistics

Collaborative competence was modeled as a second-order construct. As can be seen from the path loadings of external work, cross-functional, frontline employee, and customer collaboration (Figure 2), each of these four dimensions of collaborative competence was significant ($p < 0.001$) and meaningful ($\beta = 0.45 – 0.70$), demonstrating the plausibility of the proposition that collaborative competence is a higher-order resource that includes external work, cross-functional, frontline employee, and customer collaboration.

Structural model

We used SEM with Amos to test our hypotheses H1–H3. The reported global fit indices (CMIN = 1425.46; df = 457; $p < 0.001$; CMIN/df = 3.12; RMSEA = 0.07) confirmed a satisfactory fit of our research model in Figure 2. The investigated paths were all significant and in the expected direction. That is, proactive personality ($\beta = 0.55$, $p < 0.001$), collaborative competence ($\beta = 0.36$, $p < 0.001$), and innovation climate ($\beta = 0.13$, $p < 0.01$) are significant predictors of IWB, supporting H1, H2, and H3. Proactive personality represented the most relevant influence, followed by collaborative competence. Regarding R2, the predictors explained nearly half (45%) of the variance in IWB.



Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.1$.

Figure 2. Results of structural model

2.1.6 Discussion

We developed and tested a research model hypothesizing that proactive personality, collaborative competence, and innovation climate influence IWB among hospital employees. A survey of 442 chief physicians from 380 German hospitals revealed a positive relationship between proactive personality and IWB. Employees who had a greater preference for novelty, intellectual curiosity, and assertiveness showed higher levels of IWB. Thus, our study represents an extension of previous research that provided evidence that proactive physicians and nurses tend to perform at higher levels (Hu *et al.*, 2021; Yi-Feng Chen *et al.*, 2021).

In addition, we found that innovation climate is another important predictor of chief physicians' IWB. The greater the support for innovation and the better the resource supply in hospitals, the higher the level of IWB expressed, which is consistent with other studies that have already shown that an organizational climate conducive to innovation has significant effects on nurses' innovation behavior (Lv *et al.*, 2021; Weng *et al.*, 2015).

Finally, our study was the first to uncover the influence of a multi-faceted network on innovation at the individual level. Based on a comprehensive concept of collaboration we found that collaborative competence is a significant and meaningful determinant of IWB. Indeed, multi-actor collaboration had a significantly stronger impact on IWB than did innovation climate. The more intense the collaboration was with customers, frontline employees, employees from other departments, and people outside the hospital, the higher the respondents' agreement with statements about IWB. Our findings are thus consistent with previous research calling for greater intra- and inter-organizational collaboration to drive healthcare innovation (Chatterji *et al.*, 2008; Goes and Park, 1997; Williams, 2011; Zhou *et al.*, 2021).

Interestingly, the study also showed that organizational tenure was weakly negatively correlated with IWB. This is surprising in that a number of existing studies have confirmed that tenure is positively associated with IWB (Liu *et al.*, 2016; Ng and Feldman, 2013). One explanation for this negative correlation could be that chief physicians have high status. With high status and longer tenure, they have real power, so they are more likely to think conventionally and maintain the status quo.

Limitations and avenues for future research

Although this study provides valuable insights into the antecedents of IWB among leading physicians, it has some limitations that suggest avenues for future research. First, the study was conducted with employees from German hospitals. Differences in cultural contexts might influence our results. Therefore, we encourage researchers to study the proposed model in a broader international sample to ensure comparability of results and to control for country-specific confounding variables (e.g., differences in medical education).

Second, we used the constructs of proactive personality, collaborative competence, and innovation climate to represent human, relational, and organizational resources, respectively. However, this conceptualization may not be sufficient to fully cover the scope of the three operant resources. In addition, there are other operant resources (e.g., informational resources) that were not considered in our study. Further development of resource indicators that influence IWB remains a task for future studies.

Third, our study was primarily concerned with making statements for the totality of all chief physicians in German hospitals, without taking a closer look at individual groups. For further research, we recommend the use of multigroup analyses to identify possible differences in the relevance of antecedents and IWB level among chief physicians.

Finally, our study included self-reported data. It may be fruitful to consider third-party assessments in future studies. As justified above, supervisor ratings can have their pitfalls in specific research contexts such as healthcare. We therefore recommend using raters who can closely observe employees' work behavior. In particular, evaluations by colleagues, subordinates, and customers may be of interest.

Recommendations for managerial practice

Clear implications can be derived from the results of our study for hospital managers who want to tackle the promotion of IWB among their chief physicians. First, we assign a high strategic importance to human resource management in hospitals. In addition to rigid indices such as educational background and professional skills, human resource management should also evaluate personality traits when recruiting and training staff, with particular preference given to individuals with a preference for novelty, intellectual curiosity, and assertiveness. Furthermore, proactivity can be actively promoted by setting innovation targets in annual agreements that can be captured by measurable indicators (e.g., the number of projects involved). Finally, it should be taken into account that employees with longer tenure tend to stick to familiar and traditional solutions, which affects innovation performance. It is therefore important to train and prepare talented junior employees for a position of responsibility at an early stage.

Second, IWB requires employees to collaborate with multiple actors. Our findings revealed that collaborative competence can be modeled as a second-order construct that reflects external work, cross-functional, frontline employee, and customer collaboration. Managers should consider the multi-faceted nature of collaboration and address it comprehensively. To encourage internal collaboration, (digital) workflow tools such as the tumor board can be used so that different disciplines can discuss diagnoses and develop individual treatment plans. In addition, managers should give their employees the opportunity to network with external actors. In many regions, regional networks for specific specialties or sectors have already been formed, in which chief physicians can also become involved. To successfully involve patients in IWB, appropriate communication channels must be established, and incentives created. Digital offerings that provide patients with a community to design and optimize service offerings in addition to a medical consultation and support program have proven successful here.

Finally, we encourage managers to create an innovation-friendly climate. The main task of healthcare professionals is to treat and care for patients, which involves high risks and time pressure. As a result, healthcare professionals tend to be risk-averse, have an increased need for control, and treat uncertainties with suspicion. This makes it all the more important to set signals and incentives to create a working environment in which employees enjoy being innovative. In particular, the resources necessary for IWB, such as time and budget, should be made available. Thematically focused and time-limited idea campaigns/competitions can not only promote creative work, but also establish a feedback and error culture in the hospital. Table 4 summarizes the key points for promoting IWB among hospital employees.

Key finding	Managerial implication
Proactive personality has a positive influence on IWB.	Personnel selection and career development should take into account personality traits in addition to rigid metrics such as job skills.
Organizational tenure is negatively related to IWB.	Junior physicians should be prepared and trained for leading positions at an early stage. Attention should be paid to a diverse age structure to ensure not only the experience of older employees but also a climate conducive to innovation by younger ones.
Collaborative competence reflects external work, cross-functional, frontline employee, and customer collaboration.	Chief physicians may have multi-faceted relationships that must be valued and used strategically. This requires that chief physicians are motivated to open their networks to other employees.
Collaborative competence has a positive influence on IWB.	Hospital management should support physicians in expanding and intensifying their network by providing online and offline platforms.
Innovation climate has a positive influence on IWB.	Hospital management should provide adequate resources for innovation and create an appropriate feedback and error culture by introducing new processes.

Table 4. Summary of key managerial implications

2.2 Paper II: "Service Innovation in the Workplace: How Does It Emerge?"

Authors: Bettina Kriegl
Herbert Woratschek
Andrea Raab

Published in *SMAB Relevant Management Insights*, 2021, No. 27, pp. 1–4.

How does service innovation emerge and what are relevant antecedents? To answer this question, we briefly review the findings from key empirical studies. Furthermore, we provide new insights from our own research (Kriegl *et al.*, 2023a).

Employees at all levels are needed to develop, promote, discuss, modify, and implement new ideas (Scott and Bruce, 1994). IWB is expressed in the intentional creation, introduction, and application of new ideas (Janssen, 2000) and leads to service innovation.

Table 5 shows the antecedents of IWB according to the state of the literature prior to our study. So far, studies have mainly focused on personality traits, leadership styles, and organizational climate.

Considering the logic of value co-creation (Woratschek, 2020), IWB requires different types of collaboration. Collaboration has the power to drive service innovation in the workplace because everyone brings unique knowledge, abilities, and skills to the table. When people collaborate, new ideas emerge as unique perspectives intermingle. Many organizations have already recognized the importance of collaboration. The perhaps most well-known example is Apple, which brought together experts from different departments across the business to develop the revolutionary iPhone (Boutchard, 2021).

The aim of our pre-study on the IWB of hospital employees was therefore to identify relevant types of collaboration. The results are presented in Table 6. The interviews show very clearly that IWB is positively influenced by collaboration with customers, FLEs, employees of other departments, and people outside the organization.

If you want to know how decisive the influence of collaboration is in relation to other antecedents, such as proactive personality and innovation climate, please read Kriegl *et al.* (2021b). Details on the study can be found in our scientific publication Kriegl *et al.* (2021a).

Author(s)	**Research context**	**Approach**	**Antecedents**
Scott and Bruce (1994)	US industrial company	Dyads of self and external assessment (n=172)	Problem-solving style, leader-member exchange, climate for innovation
Axtell *et al.* (2000)	Beverage manufacturer in England	Self-assessment (n=148)	Self-efficacy, support for innovation
Seibert *et al.* (2001)	University in the US	Dyads of self and external assessment (n=180)	Proactive personality
Yuan and Woodman (2010)	US companies from different industries (information technology, computer systems design, manufacturing)	Dyads of self and external assessment (n=238)	Leader-member exchange, support for innovation
Kao *et al.* (2015)	Hair salons in Taiwan	Dyads of self and external assessment (n=269)	Self-efficacy, transformational leadership, climate for innovation
Shanker *et al.* (2017)	Listed Malaysian companies	Self-assessment (n=202)	Climate for innovation
Woods *et al.* (2018)	Financial company in the UK	Dyads of self and external assessment (n=146)	Openness to experience, conscientiousness
Nazir *et al.* (2020)	Pakistan companies from different industries (information technology, manufacturing, financial services, pharmaceuticals and healthcare)	Dyads of self and external assessment (n=397)	Paternalistic leadership, leader-member exchange
Khan *et al.* (2021)	Pakistan service companies	Self-assessment (n=689)	Servant leadership

Table 5. Literature review on the antecedents of innovative work behavior

Collaboration	**Definition**	**Anchor quote**
External work collaboration	The degree to which the contacts with individuals or groups outside the organization are frequent and close	“In [city], there was a lot of contact with the technical subjects at the university in terms of innovative techniques and how to use those techniques for medical purposes.” (E4)
Cross-functional collaboration	The degree to which the cross-functional interactions are frequent and close	“As a multidisciplinary subject, we are constantly in exchange with other departments. And of course, new approaches are always emerging from these contacts.” (E4)
Frontline employee collaboration	The degree to which the interactions with frontline employees are frequent and close	“My work is made easier by the fact that I have an incredibly great team. They all work closely together and among them are creative minds who also come to me on their own initiative and make suggestions.” (E5)
Customer collaboration	The behavior of customers indicating active and responsible involvement in the governance and development of the organization	“Feedback is invaluable. Not everything patients ask for is really innovative. But you definitely have to listen to them and then decide what direction we could go.” (E10)

Table 6. Types of collaboration

To put it in a nutshell:

1. IWB is expressed in the intentional creation, introduction and application of new ideas.
2. Personal and organizational antecedents in particular have been identified as conducive in previous studies.
3. The logic of value co-creation points out that the collaboration of different people has been neglected so far.
4. Service innovation is a collaborative process, so the knowledge and skills of other actors also play an important role.
5. Empirical findings show four types of collaboration conducive to IWB: external work collaboration, cross-functional collaboration, FLE collaboration, and customer collaboration.

2.3 Paper III: "Personality, Collaboration, or Climate: What Most Fosters Innovative Work Behavior? – Empirical Findings in German Hospitals"

Authors: Bettina Kriegl
Herbert Woratschek
Andrea Raab

Published in *SMAB Relevant Management Insights*, 2023, No. 45, pp. 1–3.

Research by McKinsey showed that 94% of executives believe that people, organizational culture, and climate are the most important drivers of innovation (Barsh *et al.*, 2008).

The purpose of a large-scale survey of hospital employees was to examine the influence of differences in proactive personality, collaboration, and innovation climate on employees' innovative work behavior. The main purpose of the study is to find out what most fosters innovative work behavior. Below is a brief description of the antecedents included in our research model. For more details on the study, see Kriegl *et al.* (2023a).

Antecedents of innovative behavior

1. Proactive Personality

Proactive individuals can free themselves from circumstantial pressures, identify opportunities, take initiatives, and thus influence the environment to create meaningful change (Crant, 1995). Several researchers have examined several potential outcomes of proactive personality in the work context. For example, Kim *et al.* (2009) showed that proactive personality is positively associated with the development of valuable new ideas.

2. Collaboration

Collaboration includes working with customers, frontline employees, employees of other departments, and people outside the organization (Kriegl *et al.*, 2021). Collaboration enables employees to draw on relevant resources from a network of people with different knowledge and problem-solving approaches when developing and implementing ideas.

3. Innovation Climate

Innovation climate refers to an organizational climate that is open to change and supportive of new ideas (Scott and Bruce, 1994). Previous studies have consistently shown that such a work environment encourages employees to engage in innovative activities (e.g., Shanker *et al.*, 2017).

Results

The results confirm the relevant influence of proactive personality and innovation climate on innovative work behavior from previous studies. Moreover, the study introduced collaboration as a significant and meaningful antecedent condition. Indeed, collaboration is much more influential than innovation climate.

What do we learn from this? By focusing on getting the most out of collaboration with customers, frontline employees, employees of other departments and people outside the organization, managers can get greater value from existing resources without launching a large-scale change management program. Existing networks of employees should be analyzed, such as the frequency and extent of interactions. This information can help create an effective network for collaboration.

To put it in a nutshell:

1. Proactive people actively seek to bring about change in their environment.
2. Collaborative employees can draw on relevant resources from a network of people.
3. Innovation climate is an atmosphere in the organization that fosters service innovation.
4. Proactive personality, collaboration, and innovation climate have a significant positive impact on employees' innovative work behavior.
5. Collaboration plays a much greater role than innovation climate.
6. Before embarking on major projects to change organizational culture and climate, managers should explore the potential of collaboration.

Chapter 3: Service Platforms

3.1 Paper IV: “A Cross-National Comparison of Hospitals’ Use of Social Media as a Venue for Service Innovation”

Authors: Bettina Kriegl
Andrea Raab
Herbert Woratschek

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In recent years, social media has also reached the healthcare industry (Kordzadeh, 2016). Hospitals and other healthcare providers can use social media platforms such as Facebook to drive service innovation.

Theoretical background

Social media platforms can be designed as service platforms. Service platforms are defined as a modular structure that includes intangible and tangible resources and facilitates the interaction of actors and resources. They serve as a venue for service innovation because the exchange of resources among many interacting actors can lead to innovative solutions (Lusch and Nambisan, 2015). Parker *et al.* (2017) used the term “platform ecosystem” when analyzing innovations. They showed how Apple, Google, and Microsoft use external ecosystems for service innovation and how the locus of value creation shifts from inside the organization to outside, often enabled by platforms in ecosystems.

When innovation is viewed as a platform, value is created through collaboration among multiple actors (Vargo and Lusch, 2004). The core of the platform view is the shift from resource control to resource orchestration, from internal optimization to external interaction, and from a focus on customer value to a focus on ecosystem value (van Alstyne *et al.*, 2016). Thus, the platform view of innovation goes beyond individual innovations to facilitate a range of innovation efforts (Tronvoll and Edvardsson, 2020).

The question is how hospitals configure and apply social media platforms to orchestrate collaboration among multiple actors to achieve service innovation. In a study, we compared the Facebook presence of German and U.S. hospitals.

Results of comparison

Table 7 provides information on the selected hospitals and the data collected from each hospital’s self-hosted Facebook pages.

Hospital name	Number of posts
Capio Mathilden Hospital Büdingen	53
Marien Hospital Papenburg Aschendorf gGmbH	71
Psychosomatische Klinik Windach	43
Schmerzklinik Kiel	67
Märkische Kliniken	255
Krankenhaus Maria Hilf GmbH	57
Klinikum Mittelbaden	58
Kliniken St. Elisabeth	136
Katholisches Klinikum Essen	518
	1,258
Mad River Community Hospital	84
Children's Hospital New Orleans	311
The Queen's Medical Center Hawaii	46
VA Central Iowa Health Care System	216
North Big Horn Hospital District Wyoming	127
Moses Taylor Hospital	13
Mercy Medical Center Baltimore	187
Holland Hospital Michigan	268
Greenview Regional Hospital Kentucky	369
	1,621

Table 7. Sample characteristics

Hospitals shared a total of 2,879 posts on their Facebook pages. Posts were analyzed using a coding system consisting of three main categories: (1) call to action, (2) type of post, and (3) content of post.

A key finding of the study is that calls to action prompting Facebook users to respond (e.g., sharing experiences) were hardly used in both countries. Of the total of 1,251 German posts studied, seven contained a call to action. Among the 1,621 U.S. posts, twelve did. Hospitals thus prefer unidirectional communication with different audiences on Facebook, leaving opportunities to share resources and promote service innovation untapped.

Regarding the type of posts (Figure 3), both countries differed significantly in the subcategories of event and video. Significant differences were also found in the content of posts (Figure 4): self-promotion, entertainment, disease, third-party advertising, healthy lifestyle, and health policy.

Overall, the results suggest that German hospitals use Facebook primarily for advertising and information purposes, whereas U.S. hospitals entertain and educate their users about health topics.

To put it in a nutshell:

1. The use of social media can drive service innovation.
2. Social media platforms are service platforms.
3. Service platforms facilitate the exchange of actors and resources and therefore serve as a venue for service innovation.
4. A platform perspective on innovation emphasizes resource orchestration, external interaction, and ecosystem value.
5. Both German and U.S. hospitals use Facebook primarily for unidirectional communication, leaving opportunities for service innovation untapped.
6. While German hospitals primarily inform and advertise, U.S. hospitals entertain and educate about health topics.

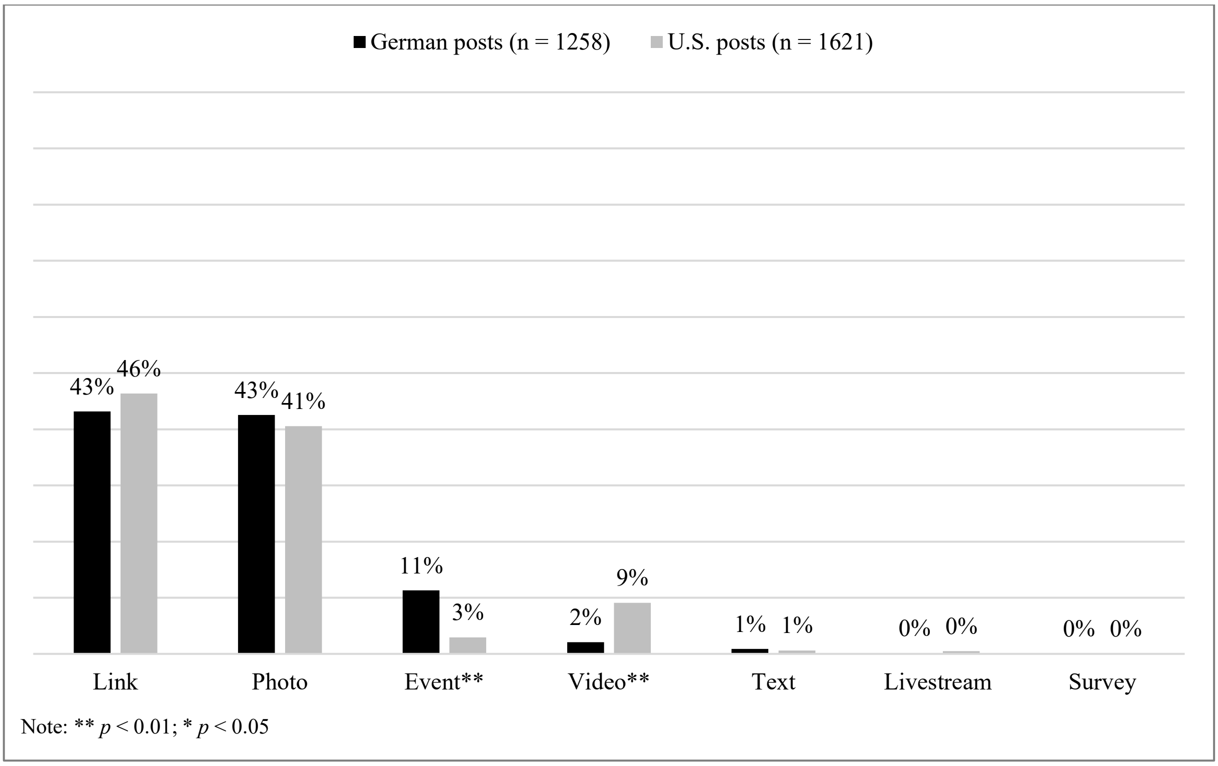

Figure 3. Frequency distribution of type of Facebook posts in percent

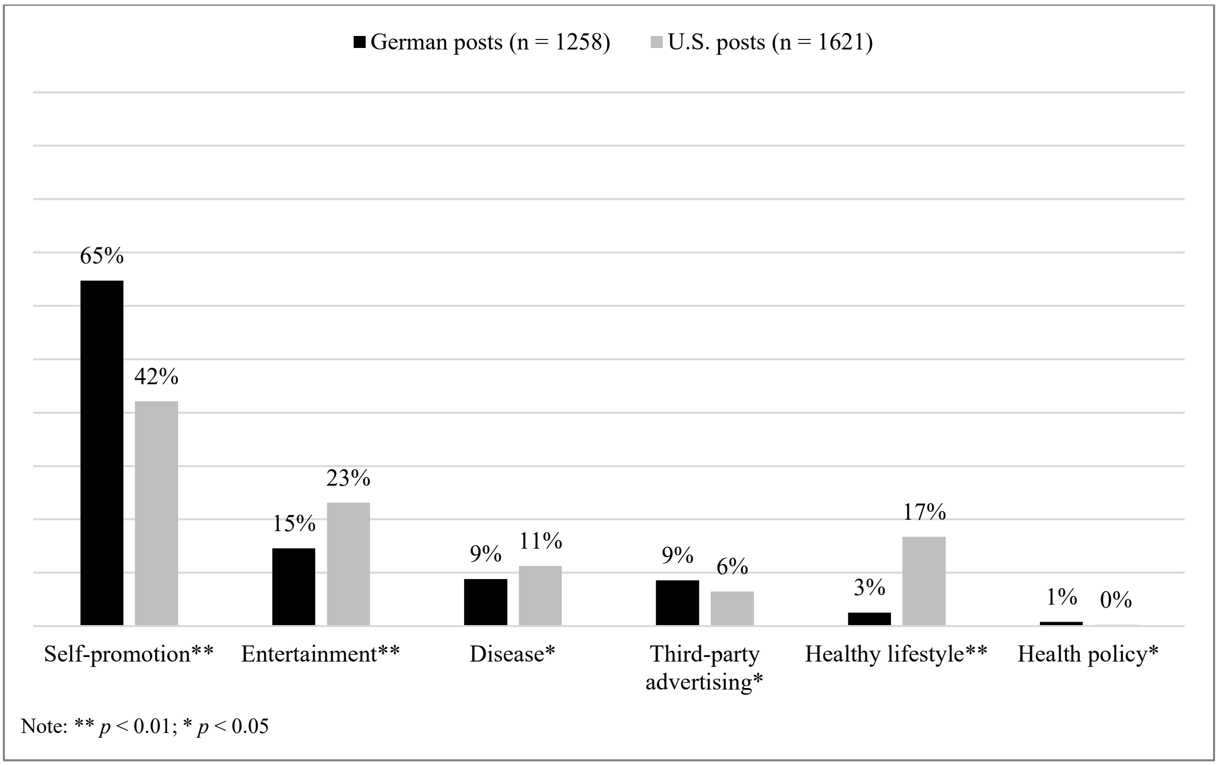

Figure 4. Frequency distribution of content of Facebook posts in percent

3.2 Paper V (in German): "Zeigt Euch!"

Authors: Bettina Kriegl
Lawrence Fitzgerald
Andrea Raab

Published in *Führen und Wirtschaften im Krankenhaus*, 2018, Vol. 35 No. 7, pp. 624–626. A short version of the paper was published in *Management & Krankenhaus*, 2018, Vol. 37 No. 7–8, p. 16.

3.2.1 Einleitung

Soziale Netzwerke bieten vielfältige Nutzungsmöglichkeiten, um die Kommunikation nach außen zu verbessern. Ein Vergleich mit US-amerikanischen Kliniken zeigt, wie auch Krankenhäuser hierzulande noch besser werden können.

Für viele deutsche Unternehmen ist es selbstverständlich, in den sozialen Medien, allen voran auf Facebook, vertreten zu sein. Doch wie ist es um die Präsenz deutscher Krankenhäuser auf Facebook bestellt? Welche Inhalte und welche Arten von Beiträgen werden geteilt? Werden sogenannte „Calls to Action" genutzt, um Nutzer zu einer sofortigen Handlung aufzurufen und somit die Interaktion zwischen Krankenhaus und ihren Zielgruppen – Patienten, Angehörigen, potenziellen Mitarbeitern, Einweisern etc. – zu intensivieren? Und wie schlagen sich deutsche Krankenhäuser im Vergleich zu den Häusern in den USA? Die THI Business School widmete sich im Rahmen eines Projektseminars Marketing und einer Abschlussarbeit des Studenten Lawrence Fitzgerald unter der Leitung von Frau Bettina Kriegl und Prof. Dr. Andrea Raab diesen Fragen.

3.2.2 Methodik

Zur Überprüfung der Medienpräsenz der Krankenhäuser auf Facebook wurden lediglich von den Kliniken selbst betriebene Facebook-Seiten berücksichtigt. Fan-Pages fanden keine Beachtung. Für die Stichprobenauswahl wurden beide Länder in regionale Gebiete aufgeteilt: Deutschland gemäß der Bundesländer, die USA nach Küsten und Himmelsrichtungen in acht Gebiete. Die Ziehung der Stichprobe erfolgte durch eine proportional geschichtete Zufallsauswahl.

Der Erhebungszeitraum erstreckte sich vom 1. Januar bis zum 30. September 2017. Um feststellen zu können, welche Inhalte und welche Arten von Beiträgen die Krankenhäuser teilen, wurde ein Codierungssystem mit folgenden drei Kategorien entwickelt:

- Call to Action (ja / nein)
- Art des Beitrags (Livestream / Textbeitrag / Umfrage / Externer Link / Foto / Video / Veranstaltung) und
- Inhalt des Beitrags (Krankheit / gesunder Lifestyle / Unterhaltung / Gesundheitspolitik / Werbung für das eigene Krankenhaus / Werbung für andere Gesundheitseinrichtungen).

Mit Hilfe einer Software zur computergestützten qualitativen Daten- und Textanalyse wurden die einzelnen Beiträge codiert. Insgesamt wurden 1.258 Beiträge deutscher und 1.621 Beiträge US-amerikanischer Krankenhäuser analysiert. Zur weiteren Untersuchung der Themen gesunder Lifestyle und Unterhaltung wurde eine Frequenzanalyse durchgeführt, um so die am häufigsten genannten Wörter zu ermitteln.

3.2.3 Ergebnisse

Die Studie zeigt, dass 38 Prozent der deutschen Krankenhäuser über eine selbstbetriebene Facebook-Seite verfügen, während die Zahl bei den US-amerikanischen Krankenhäusern bereits bei 90 Prozent liegt. Calls to Action, die die Nutzer zu einer sofortigen Reaktion, beispielsweise in Form von Kommentaren, provozieren sollen, finden in beiden Ländern kaum Anwendung. Sowohl in Deutschland als auch in den USA liegt der Anteil gerade einmal bei ein Prozent.

Mit Blick auf die Art der geteilten Beiträge unterscheiden sich beide Länder signifikant hinsichtlich der Subkategorien Veranstaltung und Video. Während die deutschen Kliniken beim Teilen von Veranstaltungen mit 11,3 Prozent aller deutschen Beiträge führend sind, liegen die USA hier bei nur etwa drei Prozent. Bei den Videos lässt sich hingegen ein umgekehrter Trend feststellen. Hier liegen die USA mit 9,1 Prozent deutlich vor den deutschen Krankenhäusern (Figure 5).

Bei den Inhalten der Beiträge können für sämtliche Ausprägungen signifikante Unterschiede nachgewiesen werden (Figure 6). Mit 64,7 Prozent fokussieren sich deutsche Krankenhäuser inhaltlich überwiegend auf Werbung für das eigene Krankenhaus. Dies beinhaltet Informationen zu den medizinischen Leistungen, Abteilungen sowie zum Personal. Die amerikanischen Krankenhäuser bewerben sich selbst hingegen in einem deutlich geringeren Umfang. Hier liegt der Anteil bei 42,1 Prozent.

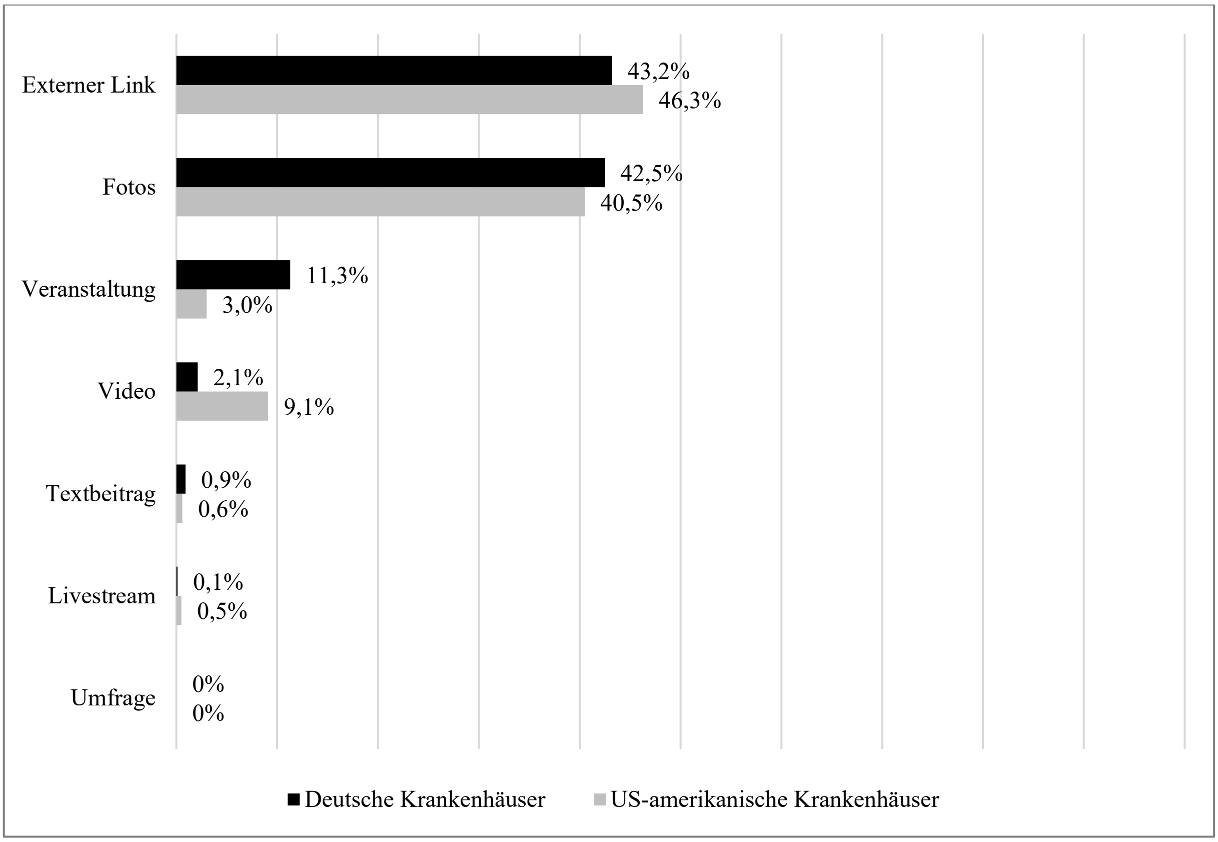

Figure 5. Art der von Krankenhäusern auf Facebook geteilten Beiträge

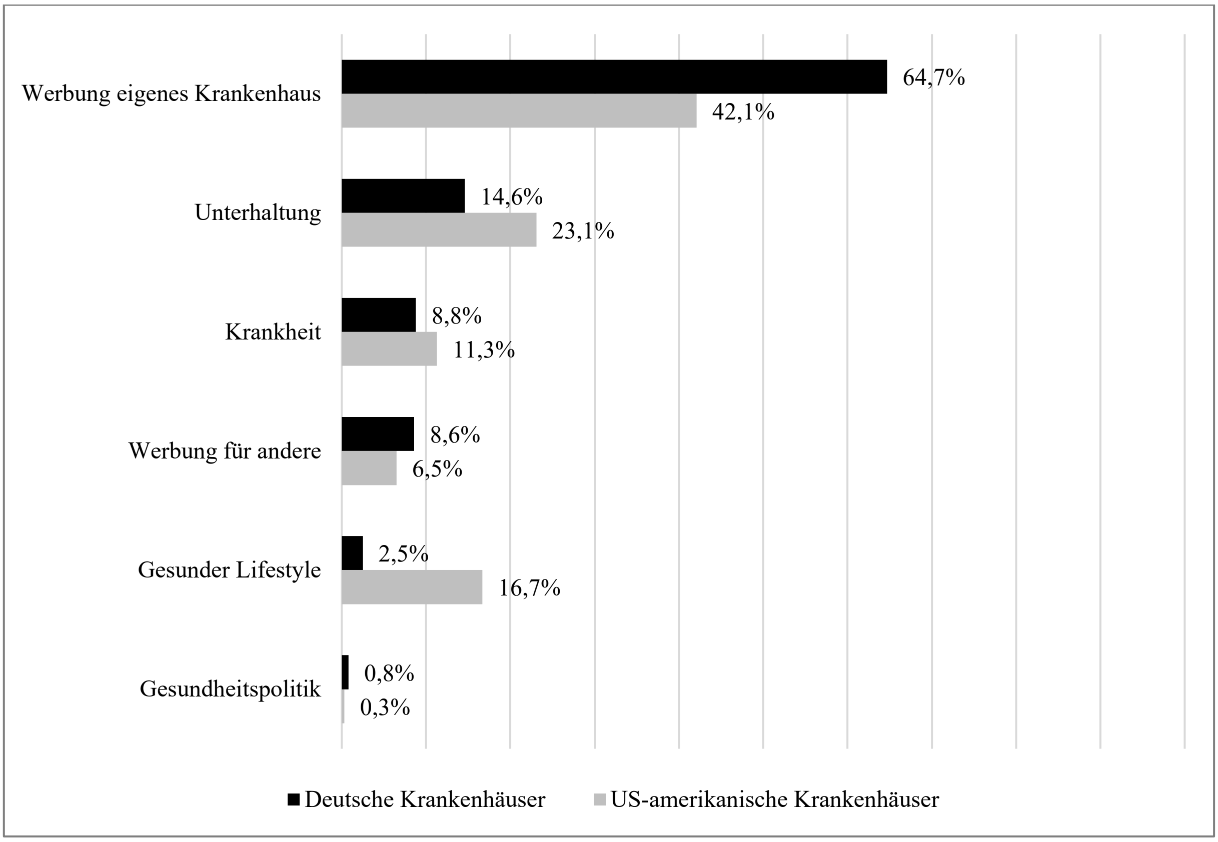

Figure 6. Inhalt der von Krankenhäusern auf Facebook geteilten Beiträge

Der Werbeanteil für andere Gesundheitseinrichtungen liegt bei deutschen Kliniken mit 8,6 Prozent knapp über den Kliniken in den USA. Bei Beiträgen rund um gesunden Lifestyle liegen die US-amerikanischen Krankenhäuser deutlich vorn. 16,7 Prozent der Beiträge beschäftigen sich mit diesem Thema. Besonders die Begriffe „Day“ (n = 48) und „Months“ (n = 30) deuten auf die in den USA bekannten Awareness Days hin, die häufig zum Anlass genommen werden, um die Öffentlichkeit über Krankheiten aufzuklären oder um zu einer gesunderen Lebensweise zu bewegen. Der Anteil der deutschen Beiträge liegt hier lediglich bei 2,5 Prozent.

Bei den Beiträgen zum Thema Unterhaltung liegen die USA mit 23,1 Prozent ebenfalls vor Deutschland. Zusätzlich bleibt festzuhalten, dass sich die US-amerikanischen Beiträge hier deutlich abwechslungsreicher gestalten. „Day“ (n = 73), „Ticket“ (n = 65) sowie „Sugarplum“ (n = 53) bilden die drei häufigsten genannten Begriffe. Letztere weisen auf eine amerikanische Benefizveranstaltung hin, die durch regelmäßige Beiträge auf Facebook beworben wird. Bei den deutschen Beiträgen ist der Begriff „Gisela“ hervorzuheben. Hierbei handelt es sich um die Markenbotschafterin der Märkischen Kliniken aus Lüdenscheid, die als positives Beispiel herangezogen werden kann, um zu zeigen, wie ein erfolgreicher Einsatz von Facebook aussehen kann.

Gesundheitspolitik spielt bei den Krankenhäusern beider Länder kaum eine Rolle. Während der Anteil der deutschen Beiträge bei 0,8 Prozent liegt, beläuft sich der US-amerikanische Anteil auf 0,3 Prozent. Beim Thema Aufklärung über entsprechende Krankheiten zeigen sich die Kliniken in den USA aktiver als in Deutschland. Mit 11,3 Prozent liegen sie vor den untersuchten Kliniken aus Deutschland, die auf 8,8 Prozent kommen.

3.2.4 Diskussion

Eine Präsenz in den sozialen Medien und damit auch auf Facebook dient natürlich keinem Selbstzweck, sondern ist in erster Linie dazu da, um Zielgruppen anzusprechen und für sich zu gewinnen beziehungsweise auch zu binden. Für die meisten Bürger ist das Krankenhaus entweder ein No-Interest-Product oder es wird mit negativen Emotionen assoziiert. Wenn es gelingt, positive Eindrücke zu vermitteln, kann die Barriere, sich für die örtliche Klinik zu interessieren, durch eine Präsenz in den sozialen Medien gesenkt werden.

Vor diesem Hintergrund bleib festzuhalten, dass deutsche Krankenhäuser im Vergleich zu den US-amerikanischen Kliniken beim Einsatz sozialer Medien noch zurückhaltend sind. Dies zeigt aus quantitativer Sicht die Zahl der durchschnittlich geteilten Beiträge. Während deutsche Kliniken innerhalb der ersten neun Monate des Jahres 2017 im Durchschnitt 140 Beiträge teilten, waren es bei den US-amerikanischen Krankenhäusern 180 Beiträge.

Mit Blick auf die Inhalte fällt auf, dass der Werbeanteil für das eigene Krankenhaus bei deutschen Häusern weit über dem der US-amerikanischen liegt. Diese Art von Beiträgen kann aufgrund ihrer selbstreferenziellen Wirkung auf Internetnutzer schnell uninteressant wirken. Für das Management eines deutschen Krankenhauses lassen sich deshalb folgende Empfehlungen ableiten, um sichtbar und erlebbar zu werden:

1. Präsenz in den sozialen Medien zeigen

Obwohl das Internet als Gesundheitsratgeber Nummer eins fungiert, liegt die Zahl der auf Facebook offiziell vertretenen Krankenhäuser in Deutschland noch unter 40 Prozent. Doch an den sozialen Medien führt heute kein Weg mehr vorbei. Viele Menschen verbringen einen Großteil ihrer Zeit in sozialen Netzwerken wie Facebook, Twitter und Co., um sich zu Gesundheitsthemen auszutauschen. Ein Krankenhaus, das sich dort nicht präsentiert, ist für diese Zielgruppe quasi nicht existent.

2. Anteil der selbstreferenziellen Beiträge senken

Knapp zwei Drittel der deutschen Beiträge zielen darauf ab, das eigene Krankenhaus zu bewerben. Um die Beiträge für Nutzer interessanter zu gestalten, bietet es sich an, die Themen stärker auf gesunden Lifestyle zu fokussieren. Hierfür müssen nicht zwangsläufig eigene Inhalte generiert werden. Möglich ist auch das Teilen von Inhalten bereits bestehender Gesundheitsportale. Anlass können die vor allem in den USA bekannten Awareness Days sein, wie beispielsweise der Weltherztag, der jedes Jahr am 29. September stattfindet.

Aber auch unterhaltende Beiträge sollten auf den Facebook-Seiten von deutschen Krankenhäusern mehr zum Einsatz kommen. Diese können durchaus auch relevante Inhalte fernab von medizinischen Themen enthalten und trotzdem, etwa aufgrund eines regionalen Bezugs, für die Zielgruppe spannend sein. Vorstellbar ist beispielsweise eine Bewerbung von und Beteiligung an lokalen Veranstaltungen.

3. Die eigene Marke stärken

Eine starke Marke kann dabei helfen, Vertrauen zu den Nutzern aufzubauen und das Qualitätsversprechen in den Vordergrund zu rücken. Einfallsreiche, witzige oder auch zum Nachdenken anregende Beiträge können dabei helfen, sich den Zielgruppen gegenüber offen zu zeigen und in einen Dialog zu treten (Stichwort: Patient Engagement). Durch gelungene Beiträge ist es zudem möglich, dass Nutzer diese durch die Teilen-Funktion weiter verbreiten und somit als Multiplikator agieren.

Wie ein viraler Facebook-Beitrag aussehen kann, zeigt das Praxisbeispiel der Märkischen Kliniken aus Lüdenscheid. Während des Untersuchungszeitraums fanden sich auf deren Facebook-Seite regelmäßig Beiträge, die Bilder von Schwester Gisela, einer kleinen gelben Quietsche-Ente, zeigen. Dabei handelt es sich um die Markenbotschafterin der Märkischen Kliniken, die von Mitarbeitern in den Urlaub mitgenommen und vor Sehenswürdigkeiten fotografiert wird. Anschließend werden die Bilder mit einem kurzen Reisebericht auf Facebook geteilt.

Es finden sich aber noch weitere positive Beispiele auf der Facebook-Seite des Krankenhauses. So werden unter anderem regelmäßig Beiträge geteilt, in denen Auszubildende kurz schildern, wieso sie sich für ihren Beruf entschieden haben. Damit kann die Präsenz eines Krankenhauses auf Facebook auch sehr wirkungsvoll für das Ausbildungsmarketing genutzt werden.

Chapter 4: Service Ecosystems

4.1 Paper VI: "Institutional Influences on Healthcare Service Innovation: Lessons from German Rehabilitation Clincs"

Authors: Bettina Kriegl
Herbert Woratschek
Andrea Raab

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A previous version of the paper was double-blind peer reviewed and accepted for the *1st RNI Conference* in Naples, Italy, 2019.

4.1.1 Abstract

In view of the growing need for rehabilitation worldwide due to demographic changes and health trends, healthcare organizations are facing increasing pressure to innovate. This study focuses on the institutional dynamics shaping service innovation in orthopedic rehabilitation settings in Germany. Using Scott's framework of institutional pillars and carriers, we conduct a multiple case study analysis. Based on interviews with physicians and managers from six different clinics, conducted in two rounds and supplemented by secondary data analysis, we investigate the influence of regulative, normative, and cultural-cognitive institutions on healthcare service innovation. By distinguishing between the various institutional barriers and facilitators, our research provides valuable insights for healthcare practitioners and managers, equipping them with the necessary knowledge to effectively navigate and utilize the institutional environment.

4.1.2 Introduction

There is a significant and growing need for rehabilitation worldwide. The availability of accessible and affordable rehabilitation is necessary for many people with health conditions to remain as independent as possible, participate in education, be economically productive, and perform meaningful life tasks (WHO, 2017). In 2019, at least one out of three people worldwide suffered from conditions that would benefit from rehabilitation. Compared to 1990, this represents a 63% increase, with musculoskeletal conditions (e.g., neck pain, bone fractures, and rheumatoid arthritis) showing the highest need for rehabilitation (Cieza *et al.*, 2020). Current demographic and health changes are responsible for this trend, forcing rehabilitation providers to innovate their services.

Our study takes a unified and multidimensional approach to innovation, synthesizing insights from both service-oriented demarcation research and product-oriented assimilation research. We define service innovation “as the rebundling of diverse resources that create novel resources that are beneficial (i.e., value experiencing) to some actors in a given context” (Lusch and Nambisan, 2015, p. 161). This broad perspective allows for a holistic examination of innovation in both services and manufacturing (Gallouj and Savona, 2010). By expanding our focus beyond product-oriented innovations such as new technologies and drugs, we aim to shed light on the complex landscape of innovation in healthcare organizations.

In line with this approach, we align our research with Service-Dominant Logic, which advocates a more dynamic and holistic understanding of co-creation of value in service innovation (Vargo *et al.*, 2015). Service-Dominant Logic assumes that a service, defined as the application of competencies for the benefit of or with other actors, is the fundamental basis of any exchange. It emphasizes the relational and collaborative nature of value creation and views service innovation as a co-creation process that involves the reconfiguration of resources, actors, and institutions within a service ecosystem. This perspective emphasizes the importance of institutions as coordination mechanisms within service ecosystems that guide actors in their efforts to co-create value and innovate (Vargo and Lusch, 2004, 2008a, 2016).

Institutions (e.g., laws, regulations, social norms, habits, and rituals) are “the rules of the game” (North, 1990) that govern actors’ behavior and interactions. They influence resource integration, value co-creation, and service innovation by providing guidelines for what is considered a valuable resource in a given context and how such resources can be accessed, adapted, and integrated (Akaka *et al.*, 2012). Studies have already shown the importance of institutional context in enabling and constraining change in healthcare (Laurell, 2018; Dam and Waardenburg, 2020; Denis and van Gestel, 2016).

This article is part of a larger research project that focuses on the promotion of healthcare service innovation. The aim of this study is to investigate the institutional influences that either enable or hinder service innovation in healthcare organizations. By delving into the legal frameworks, social norms, and cultural beliefs that prevail in these organizations, we want to uncover the institutional dynamics that shape service innovation practices. We explore how the institutional context affects the capacity and capabilities to innovate, with the ultimate aim of informing strategies to improve service delivery and patient care. To this end, we conduct a cross-case analysis of six German healthcare organizations providing orthopedic rehabilitation services.

4.1.3 Theoretical Framework

To analyze the institutional context, we use Scott's (2014) framework of institutional pillars and carriers presented in Table 8. There are three analytical categories for institutions called institutional pillars: regulative elements, normative elements, and cultural-cognitive elements. While regulative institutions gain their power through coercion, morality is the mechanism for enforcing normative institutions, and imitation is the mechanism for enforcing cultural-cognitive institutions. Each of these institutional elements, whether regulative, normative, or cultural-cognitive, uses the following carriers to be effective: symbolic systems, relational systems, activities, and artifacts.

Symbolic systems include the full range of rules, values, norms, classifications, schemas, and frames used to guide behavior. Relational systems are patterned interactions associated with actors' social positions. In the regulative and normative pillars, these are governance systems that emphasize either the regulative (power) or normative (authority) aspects of these institutions. In the cultural-cognitive pillar, relational systems are represented by structural isomorphism and identities. Looking at activities related to the three pillars, the regulative pillar includes supervisors' monitoring and sanctioning behavior, and actors' compliance and non-compliance behavior. Activities related to the normative pillar are jobs, roles, and routines, while predispositions and scripts perform this task in the cultural-cognitive pillar. Finally, artifacts are objects made by humans. While in the regulative pillar the objects conform to prescribed specifications, in the normative pillar they conform to conventions and norms. All kinds of symbols (e.g., an article of clothing, a word, a gesture, or a body posture) are assigned to the cultural-cognitive pillar.

We use Scott's (2014) framework of institutional pillars and carriers as the theoretical basis for this study due to its relevance, scope, and analytical depth in uncovering institutional influences. The three institutional pillars provide a holistic understanding of the ways in which regulations, norms, and cultural beliefs influence the behaviors and interactions of actors within healthcare organizations. In addition, the emphasis on carriers allows for a granular analysis of organizational practices that provides insights into the formal and informal mechanisms through which institutions exert influence. Scott's (2014) framework, which has been applied and empirically validated across many disciplines, thus provides a robust theoretical lens for examining the institutional dynamics that drive service innovation in German rehabilitation clinics.

	Pillars		
	Regulative	*Normative*	*Cultural–cognitive*
Symbolic systems	Rules Laws	Values Expectations Standards	Categories Typifications Schemas Frames
Relational systems	Governance systems Power systems	Regimes Authority systems	Structural isomorphism Identities
Activities	Monitoring Sanctioning Disrupting	Roles, jobs Routines Habits Repertoires of collective action	Predispositions Scripts
Artifacts	Objects complying with mandated specifications	Objects meeting conventions, standards	Objects possessing symbolic value

Table 8. Scott's framework of institutional pillars and carriers

4.1.4 Methods

Research approach and context

Our aim in this study is exploratory, driven by the recognition of the unique complexity within the German rehabilitation system and the limited understanding of how the institutional context influences service innovation. While previous research recognizes the importance of institutional factors in healthcare (Kulkov *et al.*, 2023; Carrera *et al.*, 2023) , a gap remains in comprehensively exploring their specific impact on service innovation in this context. Therefore, we use a qualitative research approach with a case study methodology to explore this under-researched area. Our research questions aim to shed light on the intricate interplay between institutional context and service innovation in German rehabilitation. We aim to understand how regulative, normative, and cultural-cognitive institutions shape the innovation landscape in German orthopedic rehabilitation clinics. By focusing on six clinics, we aim to capture a broad range of institutional characteristics and practices to enable a comprehensive cross-case analysis.

In an international comparison, rehabilitation in Germany is characterized by a number of unique features. First, it has developed as a third independent healthcare sector alongside inpatient acute care and outpatient care. Second, the German rehabilitation system is characterized by a diversity of funding agencies and responsibilities. According to the principle of uniform risk distribution, the costs of a rehabilitation measure are borne by the social insurance agency that also bears the risk of failure of the measure (e.g., pension insurance, health insurance, or accident insurance). The German rehabilitation system is thus made up of different funding agencies, financing bases, and benefit requirements. Third, rehabilitation is usually provided as a compact, three-week, all-day inpatient service in rehabilitation clinics. Other unique features are the strong specialization by indication (e.g., cardiology, neurology, orthopedics) and the interdisciplinary composition of the rehabilitation team.

We selected six German rehabilitation clinics with different institutional characteristics to obtain rich and diverse data: a public academic teaching facility (A), a private academic teaching facility (B), a private rehabilitation clinic of a large clinic group (C), two closely cooperating public rehabilitation clinics (D/E), and a private city clinic with a hotel-based management system (F). Table 9 provides detailed information on the case clinics and reveals differences in key organizational dimensions.

	Clinics					
	A	*B*	*C*	*D*	*E*	*F*
Owner	Public	Private	Private	Public	Public	Private
Number of beds	102	230	119	198	162	60
Academic teaching facility	Yes	Yes	No	No	No	No
Funding agencies listed by occupancy	Statutory accident insurance, private health insurance, self-payers	German pension insurance, statutory and private health insurance, German Armed Forces, statutory accident insurance, self-payers	German pension insurance, statutory and private health insurance, self-payers	German pension insurance, statutory health insurance, self-payers	German pension insurance, statutory health insurance, self-payers	Statutory and private health insurance, German pension insurance, self-payers, statutory accident insurance, German Armed Forces

Table 9. Case clinic information

Data collection

Data were collected from two sources: interviews and documentary evidence. Eleven semi-structured interviews were conducted between April and October 2018 with physicians and (hybrid) managers of the selected rehabilitation clinics. The interviews were conducted in person on site, which allowed us to gain insight into each case clinic. We selected interviewees from different hierarchical levels, as each of these sources is likely to have a distinct perspective on the institutional context. The interviews followed a thematic guide that addresses regulative, normative, and cultural-cognitive institutions. For example, the following questions were asked: Which laws and guidelines have a considerable influence on your work? Who does have an influence on these rules? How and by whom is this influence exercised? With which internal and external actors are you in mutual exchange? In what form does this exchange take place? Please describe the prevailing understanding of roles between you and your patients. Who does determine this role assignment and how?

In a second round of interviews, conducted by telephone from May to August 2019, the results were discussed with all study participants. Respondents received a summary of the results in advance. In the phone calls, they were asked to comment and critique the results. This allowed us to conduct participatory validation and sense-checking. In addition, the results served as input for the semi-structured set of questions that we used to learn more about the institutional influences on healthcare service innovation. Respondents were asked to assess which institutions are critical to improving existing service offerings and processes or introducing new ones, and how they can influence these issues. Broad questions were designed to collect narratives about changes and improvements that respondents either initiated and/or were involved in. The improvements mentioned included process changes, the expansion of therapy services and the development of completely new rehabilitation concepts. Case-specific follow-up questions were asked as needed to obtain further details. The interview guide was used flexibly depending on the informant's position in the clinic and their knowledge of the topics being studied. In both rounds, interviews lasted between 30 and 90 minutes. In total, approximately 1050 minutes of interview material was available for analysis. Table 10 summarizes the key information about the interviews.

Finally, secondary data, such as legal texts, were also collected. Documentary evidence plays an explicit role in confirming and expanding information from different sources (Yin, 2018) and was therefore used to complete the analysis of our empirical data.

Clinic	Expert	Position	Date of 1st interview	Date of 2nd interview
A	E1	Chief physician	18.04.2018	08.05.2019
B	E2	Senior physician	15.05.2018	07.05.2019
B	E3	Chief physician	17.05.2018	21.05.2019
C	E4	Senior physician	28.05.2018	22.05.2019
C	E5	Chief physician	28.05.2018	07.05.2019
C	E6	Assistant physician	29.05.2018	19.08.2019
D/E	E7	Medical director	21.06.2018	07.05.2019
D	E8	Senior physician	21.06.2018	08.05.2019
E	E9	Assistant physician	21.06.2018	20.05.2019
E	E10	Senior physician	28.06.2018	17.05.2019
F	E11	Site manager	04.10.2018	07.05.2019

Table 10. Interview information

Data analysis

All interviews were recorded and subsequently transcribed verbatim, resulting in approximately 255 single-spaced pages of text. Since case study researchers should define constructs in advance (Eisenhardt, 1989), we structured the analysis using Scott's (2014) framework of institutional pillars and carriers. The thematic analysis focused on identifying the institutional elements that enable service innovation and those that constrain it.

To ensure that coding was not arbitrary or random, but achieved some level of agreement and reliability, two researchers coded the data independently. The few disagreements between coders were resolved through discussion. Despite specific coding categories, most empirically observed institutional forms do not have a single element at work, but various combinations of elements. We have separated them as sharply as possible, but some degree of overlap remains.

4.1.5 Results

Table 11 provides an overview of the identified institutional elements that influence service innovation in German rehabilitation clinics. In the following, the institutional enablers and constraints are explained along the regulative, normative, and cultural-cognitive pillars.

	Pillars		
	Regulative	*Normative*	*Cultural–cognitive*
Symbolic systems	Legal foundations of rehabilitation, such as the delimitation of responsibilities for the provision of rehabilitation services depending on the statutory rehabilitation goal Introduction of a law to strengthen health promotion and prevention (Prevention Act) Strict data protection laws	Holistic view of the patient Different and contradictory normative role expectations of clinic staff Lack of a uniform data standard	Prevailing misunderstanding of rehabilitation in politics and society as a recreational vacation instead of help for self-help
Relational systems	Regulative authority of funding agencies to define rehabilitation services and quality standards for providers	Flat hierarchies Consideration of the patient as an equal partner and source of innovative ideas	Specialization by indication Interdisciplinary composition of the rehabilitation team
Activities	Consistent quality monitoring by funding agencies with sanctions (e.g., non-occupancy) in case of deficient performance Clinical measures, structures, and processes to ensure and monitor compliance with legal requirements	Obtaining patient feedback Regular team meetings Networking activities with other clinics, suppliers, etc.	
Artifacts	Technical features to support compliance management (e.g., in the therapy prescription program)	Hardly established digital solutions that embody normative processes (e.g., the electronic health record)	White coat as a symbol of professional ethics and social status Addressing the patient as a rehabilitant or guest

Table 11. Institutional elements enabling and constraining service innovation in German rehabilitation clinics

Regulative enablers and constraints

From the regulative perspective, clinic staff are influenced by many diverse types of rules established by social organizations such as the state. In general, some elements of the regulative system are seen as constraints to be managed and others as impetus for innovation.

Most laws are taken for granted. Clinic staff feel trapped in an ever-tightening corset of regulations and know little about how to use the regulative space flexibly, creatively, and purposefully. As a result, their innovation efforts are significantly hampered:

> *"Legislators want better care for patients and prevent this through ever higher legal hurdles. [...] I always have the feeling of having one foot in jail. That does not make it any easier." (E1)*

However, new laws can also be an impetus for innovation. The shift in the general institutional logic of healthcare from curing medical problems to preventing them has led to policy decisions such as the introduction of the Prevention Act. This change in thinking has prompted healthcare actors to launch innovation projects. For example, Rehabilitation Clinic C has introduced an electronic aftercare program that patients can download to their mobile devices. The idea behind this is that:

> *"[...] patients can use the app to exercise at the rehabilitation clinic. The therapists put together an appropriate exercise program that continues after discharge." (E5)*

In Germany, funding agencies have the authority to define rehabilitation services and quality standards for providers. This consistent quality monitoring with sanctions (e.g., non-occupancy) for a rehabilitation clinic with deficient performance has resulted in everyday work being characterized by measures, structures, and processes to ensure compliance. Compliance management activities include regular reviews of rules for timeliness, standardized patient satisfaction surveys, real-time monitoring, and the use of standardized treatment packages. Technical features, e.g., in the therapy prescription program or document management system, support these activities. Clinic staff see the regulative power of funding agencies as an obstacle to patient-centered care:

> *"I used to have more scope of action and could set priorities. [...] I could use the available resources as I saw fit. Today, we must meet the requirements whether the patient needs it or not." (E4)*

However, these restrictions are not perceived as equally problematic in all rehabilitation clinics. The site manager of the private Rehabilitation Clinic F described the difference between private and public clinics as follows:

> *"There is a significant difference when you are controlled by someone who pays the costs. We must constantly look at how we get our guests here. The others get them delivered directly. [...] I know of only one rehabilitation clinic – and I know several – that is as concerned with brand and service as we are." (E11)*

Normative enablers and constraints

From the normative perspective, innovative action is enabled or constrained by values, norms, and standards. Among the normative elements that favor service innovation there is a holistic view of the patient. This is because a comprehensive approach means thinking unconventionally, i.e., considering direct and indirect treatment fields and market segments. In this way, integrated and individualized value propositions can be made to patients:

> *"Our strength is that we look beyond the boundaries of orthopedic rehabilitation. We deal not only with the physical problem, but also with psychological and social problems. We try to provide individualized value propositions to our patients." (E4)*

Clinic staff are the interface between clinic management, funding agencies, and patients. Therefore, they are exposed to different and sometimes conflicting normative role expectations. Some of these roles are formal and endow actors in a particular position with rights, responsibilities, and access to resources, empowering them to innovate. Other roles have emerged informally over time through interactions and expectations, paralyzing them in their actions. Clinic staff, for example, often feel conflicted between medical and business goals:

> *"We can offer a lot in our clinic. But many rehabilitation measures are not listed in the concepts of the funding agencies. Now I am in a dilemma. Either I do it anyway and do not get reimbursed, or I do not do it even though I could." (E1)*

The values and norms represented in rehabilitation are reflected in the prevailing system of authority. The cooperation between different medical and non-medical professional groups on an equal footing plays a key role in all clinics studied. Creative solutions can best be achieved by a pluralistic, heterogeneous team with complementary characteristics. Actors, especially those occupying a position on the periphery of a rehabilitation clinic, such as therapists and assistant physicians, often have innovative ideas because of their proximity to patients, their alternative ways of working, and their looser integration into the existing institutional environment. The problem for those on the periphery, however, is that they have little power to implement their ideas:

> *"Flat hierarchies help. Therapists and other employees who have no decision-making power often have innovative ideas. The management level is far away from the day-to-day business and therefore does not know the problems of the employees and patients. It is good when peripheral actors dare to suggest improvements. This has already triggered some good projects in our clinic." (E2)*

Patients' experiential knowledge is also a valuable resource for service innovation. In a situation in which one's own life is determined or even threatened by an illness, the patient often becomes an expert in his or her own right. To learn from patients and perceive them as a serious source of ideas, viewing the patient as an equal partner is a crucial normative element. It is precisely in a trusting relationship that patients are willing to provide knowledge and information to improve their own treatment or the range of services in general. Regular events such as *"The patient has the word!" (E4)* facilitate the exchange of resources and give all actors in a rehabilitation clinic the opportunity to contribute to innovate ideas.

Furthermore, Rehabilitation Clinic A is aware that service innovation is most likely to result from interaction with actors from the entire ecosystem. Engaging in networking activities is therefore part of the deeply rooted routines. This includes regular participation in congresses, close contact with research institutions, and keeping track of the latest developments:

> *"We spend a lot of time at training courses and congresses. […] We regularly give providers of medical devices and digital solutions the opportunity to present their offerings. They present their innovations to us, and if we are interested, they leave them in our clinic, and we try them out. For example, since Monday we have a new medical device for hand therapy." (E1)*

The main normative constraint for all rehabilitation clinics studied is the lack of a uniform data standard. Such agreements serve to ensure interoperability. Technologies that embody normative processes (e.g., the electronic health record) are therefore hardly established. This makes it difficult to share the most important resources for service innovation – knowledge and information – between actors.

Cultural-cognitive enablers and constraints

In Germany, there is considerable inertia in transforming the general idea of rehabilitation from a recreational vacation to helping people help themselves. Originating from the spa system of bygone times, patients still view rehabilitation as a *"tango-fango event" (E2)*. However, the problem of misunderstanding rehabilitation is not limited to patients. Policy makers and healthcare actors like resident physicians without rehabilitation experience also mistakenly believe that rehabilitation is second-class medicine that leads to a professional dead end for colleagues. Prejudices like these hinder the future-oriented and innovative development of rehabilitation.

> *"The general idea of rehabilitation is slow to change. Knowledge about modern rehabilitation is limited among physicians in acute care. […] I see a big problem in the misconception of rehabilitation in society, also in politics, where there is little knowledge about rehabilitation." (E5)*

A unique feature of the German rehabilitation system, as explained above, is specialization by indication. This organizational structure is viewed critically, as it leads to little exchange of actors from different medical disciplines. The medical director of Rehabilitation Clinic D and Rehabilitation Clinic E even described his organizations as a *"monoculture" (E7)*, which contradicts the holistic view of the patient.

Symbols are central to organizations because they are interwoven with specific practices and meanings. The symbol par excellence in healthcare is the white coat, which symbolizes professional ethics and social status.

> *"There is no rational reason to wear a white coat. But in our culture, it has been practiced for decades. So, it has something to do with stability. […] I also wear a white coat because it is part of our culture. If the white coat is missing, a certain respect is also missing" (E10)*

In line with the changing role of the patient from passive to active, clinic staff need to provide advice and respond to patients' needs. They should motivate patients to contribute to their own health and well-being through various value co-creation activities (McColl-Kennedy *et al.*, 2012). Therefore, some clinic staff members see the white coat as a barrier and try to avoid this artificial distance by replacing it with a casual look.

The way the patient is referred to is also a crucial symbol that guides actors' behavior. The medical client has always been referred to as 'patient' to emphasize dependence and need for help. In Rehabilitation Clinic D and Rehabilitation Clinic E, the term *"rehabilitant" (E8)* is used to emphasize that the healing process has already begun and that the patient is in a process of learning and working. Rehabilitation Clinic F tries to apply an economic concept to the physician-patient-relationship with its vocabulary:

> *"The term 'patient' is found in every concept of health insurance. As we have changed our general institutional logic to a service-oriented, hotel-based management system, we have thought a lot about how we want to be referred to in the role of the patient. In doing so, we clearly came up with the term 'guest' and even more with the term 'customer' because we are service-oriented." (E11)*

The symbolic significance of the way patients are addressed should not be underestimated. Patients are treated, customers are served. Symbolic language influences the perception of the social position, rights, and duties, which in turn affects innovative action.

4.1.6 Discussion

Theoretical contribution

There is a move in the literature away from an output-based view of innovation towards a service perspective. This work extends our understanding of the influence of institutional context on healthcare service innovation by providing an empirical examination of how regulative, normative, and cultural-cognitive institutions shape the mechanisms through which actors collaborate and innovate. We consider both the field-level structures, the organizations involved, and the actors working within and across these organizations. This allows for multi-level analysis and, more importantly, consideration of how higher-level institutions influence micro-processes (Scott, 2010).

While our study focuses primarily on clarifying how institutions influence healthcare service innovation, it also sheds light on the role of healthcare professionals and managers in shaping the institutional environment over time. Institutions are pressured by actors who recognize their constraining characteristics for more efficient outcomes (Beckert, 1999). Therefore, the detailed pillar-carrier-analysis is a prerequisite for institutional work (Lawrence and Suddaby, 2006).

By distinguishing between the various institutional barriers and facilitators, our research provides valuable insights for healthcare practitioners and managers, equipping them with the knowledge necessary to effectively navigate and leverage the institutional environment. Our work thus extends the existing literature on healthcare service innovation, which recognizes the significant potential of the institutional work done by organizations (Kukk *et al.*, 2016; Wallin and Fuglsang, 2017) and individuals (Go Jefferies *et al.*, 2019a; van Dijk *et al.*, 2011).

Managerial and policy implications

Strengthening medical leadership autonomy is an essential prerequisite for promoting healthcare service innovation. Medical leadership and engagement in roles beyond medical expertise are important factors in the performance and future of a healthcare system (Spurgeon *et al.*, 2015). However, this requires a degree of autonomy and influence. As our case study shows, these competencies can be severely limited by restrictions imposed by insurance companies and financial policies. We found that the degree of innovation varies across healthcare organizations, with payers playing a critical role. Clinics that are heavily dependent on pension insurance and subject to strict regulations have lower levels of innovation compared to others. As the healthcare literature shows, regulations aimed at standardizing practices can reduce uncertainty and encourage innovation (Kessel *et al.*, 2012). However, excessive control by payers leads to burdensome documentation requirements for healthcare professionals that leave little room for innovation. In addition, the punitive nature of sanctions for non-compliance dampens the motivation. Reducing the regulative constraints imposed by funding agencies can foster a culture of innovation and flexibility in healthcare organizations. Shifting control from punitive to constructive control can promote service innovation by creating a more supportive and collaborative environment for healthcare professionals. This constructive approach could involve providing feedback and guidance rather than punishment, incentivizing innovative work behaviors, and involving healthcare professionals in the development of regulations to ensure that they are practical and supportive of innovative practices.

However, our case study also identified individuals who challenge the status quo and seek to interpret the regulative framework more liberally, i.e., to change the rules of the game. These ‘game changers’ have interdisciplinary skills, take inspiration from different industries, and use their experience and networks to integrate resources. Recognizing and supporting these employees in healthcare organizations is critical to fostering innovation. Leadership should create a culture that values creativity and risk-taking, while offering formal programs and professional development opportunities that focus on interdisciplinary collaboration. Open channels of communication should be established to facilitate the exchange of ideas and support for those who drive innovation.

Although patient involvement in healthcare innovation is increasingly important, patients are often excluded from active participation in the development and implementation of innovation (Han *et al.*, 2013; Ocloo and Matthews, 2016). To change this dynamic, a fundamental shift in the way patients are viewed is needed. For meaningful collaboration to occur, both patients and providers need to redefine their roles and norms. Our study reveals the influence of symbols as a catalyst for this change. To encourage open dialog, information sharing, and collaboration, symbols that inhibit the active role of the patient (e.g., the white coat) should be abolished and symbols that encourage the active role of the patient (e.g., being called a guest) should be introduced.

Interaction between actors outside the healthcare system (e.g., medical technology companies) and healthcare professionals is essential for service innovation, as noted in numerous case studies (Lettl, 2007; Smith and Sfekas, 2013). Our study has shown that this form of exchange predominantly takes place as uncoordinated collaboration initiated by individual staff members. Communication and integration platforms offer all actors in a healthcare system the opportunity to network. The establishment of formal cooperation structures, such as permanent partnerships or innovation hubs, facilitates structured collaboration between healthcare professionals and external actors and promotes continuous dialog and problem solving.

Limitations and further research

We acknowledge that our study has some limitations that suggest opportunities for further research. First, our study focused on rehabilitation clinics in Germany. Studies in other sectoral and national contexts are recommended to refine, extend, and compare our findings. Second, although this study includes a comprehensive analysis of data from interviews and secondary sources, we do not claim that the list of institutional elements is exhaustive. Third, our findings primarily highlight the enabling and constraining influence of the existing institutional context on service innovation. While our study offers some insights into possible ways of shaping the institutional context to promote service innovation, it does not address the specific institutional work practices required for such change. Further qualitative studies can explore the institutional work practices that healthcare actors can use to contribute to institutional change and thus service innovation.

4.1.7 Conclusions

In summary, our study highlights the significant role of the institutional context in fostering healthcare service innovation in German rehabilitation clinics. By empirically examining regulative, normative, and cultural-cognitive institutions, we identify challenges such as limited medical autonomy and technological interoperability barriers. Furthermore, our findings emphasize the importance of strategic partnerships and patient participation in promoting innovation. We argue for aligning regulative, normative, and cultural-cognitive institutions to effectively support change. Drawing on Scott's framework of institutional pillars and carriers, we provide a comprehensive understanding of how these elements interact to enable or hinder innovation. Going forward, concerted efforts to reform institutional structures and foster a culture of innovation in healthcare are essential.

4.2 Paper VII: "How Frontline Employees Drive Service Innovation Through Institutional Work: A Case Study in Healthcare"

Extended Abstract

Authors: Bettina Kriegl
Herbert Woratschek
Andrea Raab

Submitted

A previous version of the paper was double-blind peer reviewed and accepted for the *49th EMAC Annual Conference* in Budapest, Hungary, 2020.

4.2.1 Purpose

Both researchers and practitioners recognize the importance of FLEs to organizational success and innovativeness (Singh, 2000). FLEs are privileged to have a distinct perspective on what may contribute to service innovation. Customer needs are an important input for developing new solutions and redesigning existing ones. However, they are often tacit, and therefore, not easily captured (Matthing *et al.*, 2004). FLEs provide a key contact, sometimes the only, with customers (Wilson *et al.*, 2016). Therefore, FLEs are a valuable source of customer feedback and innovative ideas (Engen and Magnusson, 2015). They make important contributions by understanding customers' problems and suggesting new or refined value propositions (Cadwallader *et al.*, 2010). Moreover, as boundary spanners, FLEs know how to support both their customers and the business strategy. Hence, they are well positioned to contribute to customer-friendly service innovation in line with the organization's strategic direction (Åkesson *et al.*, 2016).

Service innovation, as a process of changing resource-integrating practices, entails the re-configuration of institutionalized rules (Vargo *et al.*, 2015). This raises the question of how FLEs embedded in the highly institutionalized setting of healthcare organizations can disrupt these very same institutions and innovate, alluding to the tension between agency and institutions (Seo and Creed, 2002). The purpose of this study is to develop a better understanding of how FLEs act as institutional agents. Bartram *et al.* (2020) similarly focused on the implementation of lean management initiatives in hospitals. While the authors examined how FLEs respond to service innovation, our study analyzes how FLEs actively drive it. Specifically, we draw on SDL and institutional theory to examine how ordinary employees at the frontlines of healthcare perceive the influence of institutions on their situated actions and how they participate in implementing changes that differ from existing institutions.

4.2.2 Methodology

The study relied on an abductive theorizing process (Dubois and Gadde, 2002, 2014) with an embedded multiple case study design (Yin, 2018). Six case clinics providing rehabilitation services in Germany were selected on the following three main criteria: 1) the expected richness of the case, 2) the organizational context – here, the aim was to sample cases from different organizational contexts, and 3) the expected likelihood of gaining access to FLEs. Individual service innovation projects initiated by FLEs were categorized by the degree of internal and external change following Samuelsson *et al.* (2019) and studied as embedded cases.

Case study data were collected in three phases (Figure 7). In the first phase, the study focused on understanding rehabilitation as a complex system. Between April and October 2018, 11 semi-structured interviews were conducted with FLEs and clinic managers from the selected rehabilitation clinics. A second source of data stemmed from direct human observations. The first author worked as a trainee in two case clinics for one week each and participated in visits, team meetings, medical examinations, therapies, and information events. This was important for directly observing the routines, events, and conversations in which the various institutions were lived out on a daily basis. Finally, secondary data were also gathered, such as legislative texts, clinic documents, and online analyses.

In the second and third phases, our fundamental approach to data collection aimed to understand how FLEs perceive the influence of institutions on their situated actions and how these actors can, in turn, influence institutions. First, follow-up telephone interviews were conducted with all FLEs from the first phase between May and August 2019. As all second-phase interviewees were physicians, we conducted additional interviews with therapists and nurses from December 2020 to February 2021.

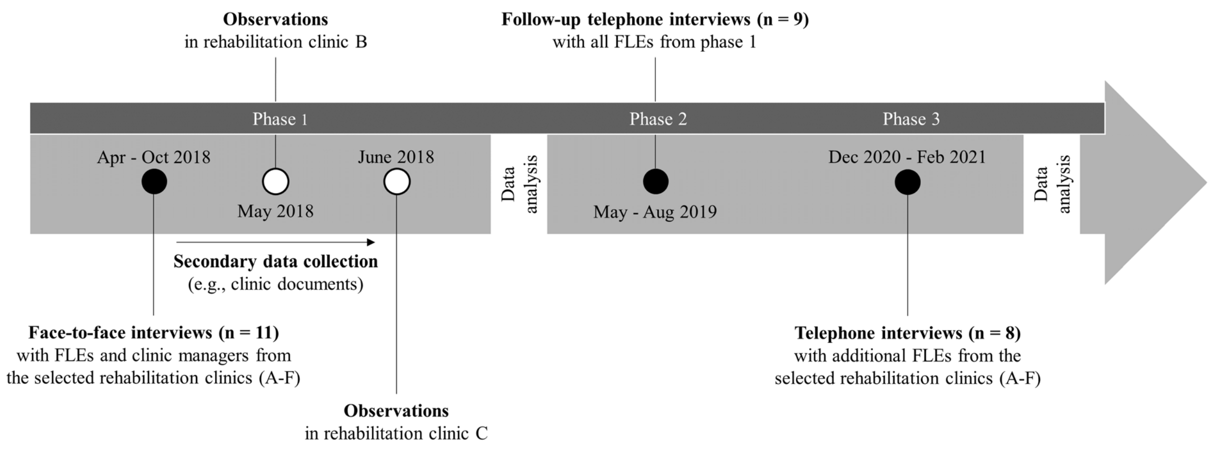

Figure 7. Data collection timeline

To ensure that the theorizing process prioritized the empirical world, as expected in studies using abductive theorizing (van Maanen *et al.*, 2007), the initial coding of the data followed the principles of grounded theory (Glaser and Strauss, 1967). The process began by going through the data line by line and assigning open codes related to the actual phenomenon of institutional work and the related questions of who is involved (actors), why the phenomenon occurs (impact of institutions), and what it is for (service innovation). We then employed axial coding. This was not a linear but an iterative process as we moved among the data, emergent patterns, and literature until the data were refined into adequate conceptual themes (Eisenhardt, 1989). Finally, the categories organized from axial coding were selected and integrated into coherent and meaningful expressions. The complete data set was coded using MAXQDA qualitative data analysis software. After analyzing the individual cases, a cross-case analysis was conducted to compile the results and derive further conclusions on the influence of institutional multiplicity.

4.2.3 Findings

The data provide empirical evidence that FLEs engage in various forms of institutional work practices driving different types of service innovation (Table 12). In addition, we examined how institutional logics operate in the lived experience of FLEs. All informants painted a clear picture of simultaneously meeting patient needs and insurance company requirements as the greatest tension in their daily work, alluding to the conflict between logics of care and management. This "corset" was imposed on all case clinics and their employees. However, we observed that FLEs dealt with this conflict differently and that service innovation crucially depended on how FLEs creatively interpreted and applied institutional logics when faced with this conflict. That is, innovative FLEs did not consider institutional logics, or parts of them, as competing and conflicting per se, but rather sought to manage them situationally through skillful practices.

Institutional work practices observed	Illustrative example	Type(s) of SI affected			
		ISI	IRSI	ERSI	JRSI
Bypassing regulative institutions	Bypassing insurance company regulations by exploiting a regulatory gray area to offer individualized therapy	X			
Bypassing normative institutions	Using the short official channels to procure small-scale therapy equipment	X			
Lobbying for resources	Applying for funding from clinic management	X	X	X	X
Promoting agendas	Engaging in the German Society for Medical Rehabilitation (DEGEMED) to promote a new medical/occupational-oriented rehabilitation concept				X
Proposing new or attacking existing regulations	Engaging in the Commission for Guidelines of the German Society for Rehabilitation Sciences (DGRW) to anchor a new medical/occupational-oriented rehabilitation concept in guidelines				X
Enabling exchange through formal and informal mechanisms	Organizing regular presentation rounds to give the healthcare industry the opportunity to showcase their novelties				X
Initiating inter-organizational cooperation projects	Collaborating with a startup company to evaluate and implement a digital solution for the treatment of phantom pain			X	X
Involving research	Evaluating a new medical/occupational-oriented rehabilitation concept with scientific support				X
Initiating intra-organizational cooperation projects	Initiating a cooperation project between physiotherapy and IT for the digital recording of therapy services	X	X		
Rational persuading	Demonstrating the therapeutic and economic benefits of standup paddling as a new form of therapy	X		X	X
Consulting	Introducing the idea of a veggie day to improve clinic food service to co-workers and seeking for feedback	X		X	X
Strategic alliance building	Aligning with a powerful physician known for being open to innovative therapies to push for the introduction of hippotherapy			X	
Diverting resources	Adapting internal processes to ensure the spatial and personnel resources necessary for the implementation of large-scale therapy equipment			X	X
Creating rule systems	Determining the medical requirements patients must meet to participate in standup paddling			X	
Providing access to key information	Providing information necessary for the organizational change in the dispensing of therapy plans	X			X
Creating frameworks for action	Creating descriptions and templates for the billing of an app-based mirror therapy				X
Training of other actors	Training co-workers in bouldering as a new form of therapy			X	X

Notes: SI = service innovation, ISI = incremental service innovation, IRSI = internal radical service innovation, ERSI = external radical service innovation, JRSI = joint radical service innovation

Table 12. Institutional work practices of frontline employees

4.2.4 Limitations and Future Research

Our research approach was exploratory and qualitative to gain rich insights into FLEs' institutional work, but we do not analyze underlying intentions. Recognizing that FLEs' perceptions of value may vary subjectively over time (Edvardsson *et al.*, 2011), we encourage researchers to conduct in-depth longitudinal case studies to answer the question of why FLEs engage in institutional work and what factors influence intentionality over time. Furthermore, while all FLEs experience competing and conflicting institutional demands, there are differences in frontline work in terms of autonomy, time pressures, and resource opportunities. Future research can address how job conditions influence FLEs' efforts and ability to reconfigure institutionalized rules.

4.2.5 Practical Implications

A better understanding of the institutional work of FLEs influences service innovation performance. Our results summarized in Table 12 provide guidance, albeit indirect, on how to pave the way for frontline service innovation. For example, FLEs seemingly go to great lengths to gain legitimacy for new ideas. That is, FLEs should be given the opportunity to present their innovative ideas to their colleagues and supervisors to find supporters. Management initiatives that promote awareness and recognition of service innovation, such as sharing success stories and awarding innovation prizes, can also help. Furthermore, our results on the influence of institutional multiplicity on frontline service innovation show that management has the challenging task of breaking down functional and hierarchical silos, and enabling cooperation and interaction among actors with different views while developing a tolerance for ambiguity of institutions.

4.2.6 Originality

Our findings make three main contributions to the literature on frontline service innovation and institutional theory. First, our cases reveal that FLEs build relationships and interactions with peers and management that provide them with forms of institutional work to implement incremental service innovation. Radical service innovation, on the other hand, where both the service provider and the customer view the value proposition as new, requires networking activities with actors from parts of the ecosystem that follow different institutional logics, enabling creative tensions. Our study thus provides evidence for Topal's (2015) relational model of institutional work, which assumes that actors' positions of power and their frames of meaning cause actors to engage in certain types of relationships and interactions that give institutional work a particular form.

Second, we add to research on service innovation in healthcare that recognizes the great potential of institutional work performed by individuals by showing that FLEs' response to institutional multiplicity differs from other actors such as customers. While patients engage in adaption processes (Go Jefferies *et al.*, 2019b), FLEs exploit institutional voids and generate creative tensions to enable service innovation.

Third, to the best of our knowledge, this is the first study to examine how FLEs experience and use institutional multiplicity to co-create service innovation. Recent studies have already revealed such frontline processes to give meaning to patient collaboration in everyday work (Dam and Waardenburg, 2020), negotiate decision making in courtrooms (McPherson and Sauder, 2013), facilitate vertical collaboration within organizations (Andersson and Liff, 2018), pursue positional gains within an organizational hierarchy (Currie and Spyridonidis, 2016), or differentiate performance according to different contextual expectations (Smets *et al.*, 2015).

4.3 Paper VIII: "Employee-Driven Service Innovation: A Typology – Empirical Findings from Projects in Rehabilitation Clinics"

Authors: Bettina Kriegl
Herbert Woratschek
Andrea Raab

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For a long time, innovation has been viewed from a company- or output-centered perspective (Selander *et al.*, 2013). However, shifting the value creation process to a logic of value co-creation (Woratschek, 2020) is an essential part of today's view of service innovation. Service innovation is now seen as a process of multiple actors exchanging and combining resources in novel ways (Perks *et al.*, 2012).

Types of service innovation

Distinct types of service innovation need to be managed and developed differently. This is because successfully putting service innovation into practice requires the right amount and type of resources (Koskela-Huotari *et al.*, 2016). The distinction between incremental and radical service innovation is one of the most common categorizations in service research (Snyder *et al.*, 2016).

Considering the specificities of the public sector, Samuelsson *et al.* (2019) created a finer typology of service innovation. They categorized service innovation according to the degree of internal and external change. The internal dimension indicates the extent to which a service innovation leads to more efficient and cost-saving effects. The external dimension indicates the extent to which a service innovation leads to better service or well-being for external actors such as customers. Service innovation can have either low or high impact in both dimensions, resulting in four types of service innovation: incremental, internal radical, external radical, and joint radical.

Employee-driven service innovation

In a qualitative survey of physicians, nurses, and therapists in rehabilitation clinics, we identified several service innovation projects initiated by frontline employees and categorized them according to Samuelsson *et al.* (2019). The results are shown in Figure 8.

Degree of external change		Minor (Degree of internal change)	Major (Degree of internal change)
	Major	*External radical service innovation* • New therapy services (e.g., standup paddling)	*Joint radical service innovation* • New large devices for therapy (e.g., a coaching car) • Digital solution for phantom limb pain treatment • New rehabilitation concepts (e.g., medically occupationally oriented rehabilitation)
	Minor	*Incremental service innovation* • Improvements in clinic catering • Changes in procedures (e.g., in the issuance of treatment plans) • Individualized therapy offers • New small devices for therapy (e.g., gymnastic bands)	*Internal radical service innovation* • Digital recording of therapy services with smartphones

Figure 8. A typology of employee-driven service innovation projects in rehabilitation clinics

To put it in a nutshell:

1. Traditionally, service innovation is viewed from a company- or output-centered perspective.
2. The logic of value co-creation points out the relational and collaborative nature of service innovation.
3. The reason for a typology of service innovation projects is that they need to be managed and developed differently.
4. Usually, a distinction is made between incremental and radical service innovation.
5. A finer distinction can be made between incremental, internal radical, external radical, and joint radical service innovation.
6. The fine-grained categorization is particularly applicable to service innovation in the public sector, such as healthcare.

4.4 Paper IX: "Frontline Service Innovation: Looking at the Bright Side of Role Conflict"

Authors: Bettina Kriegl
Herbert Woratschek
Andrea Raab

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In service management, FLEs are critical in enabling organizations to identify efficiencies and opportunities. In a recent survey of 464 executives from 16 industries in North America, Europe, and Asia Pacific, nearly 90% said success depends on FLEs (Harvard Business Review, 2020).

FLEs have frequent and close contact with the customer base in service industries, such as retailing, banking, and healthcare. They are in direct contact with customers. Therefore, they know more about customer needs than employees beyond the frontline. Customer needs are a valuable source of information for organizations. However, they are usually tacit and difficult to capture (Matthing *et al.*, 2004). FLEs are thus a valuable source of customer feedback and innovative ideas (Engen and Magnusson, 2015). Moreover, as boundary spanners, they can contribute to customer-friendly service innovation in line with the strategic direction of the organization (Åkesson *et al.*, 2016).

The other side of the coin, however, is that it is precisely this position between the organization and the world that makes frontline work particularly prone to role conflict. Employees may face a conflict between what the job requires and their own values. Sometimes conflicts arise because there are incompatible expectations and requirements on behalf of customers. The most common conflict is probably between the two "bosses", the organization and the individual customer.

From an institutional theory perspective, conflicts arise because individuals and organizations are embedded in multiple institutional logics. Institutional logics are systems of cultural elements (values, beliefs, and normative expectations). People, groups, and organizations base their behavior on these logics. The institutional logics help them to better understand and evaluate their everyday activities in time and space (Haveman and Gualtieri, 2016).

Autonomous groups with different institutional logics have different goals, interests, and values. Consequently, when they meet at the frontline, tensions often arise. For example, healthcare providers may be conflicted between what is appropriate from a medical perspective (professional logic), what meets the patient's wants and needs (care logic), and what clinic management deems efficient (management logic).

Most managers see role conflict as a threat to job performance. Up to 30% of a manager's time is spent trying to avoid conflict in the workplace (Ford, 2017), which is a huge waste of money. Research suggests that avoiding conflict can cost an organization nearly $8000 per day (Menon and Thompson, 2016).

In a qualitative study in the context of healthcare, we found that role conflict does not per se have a negative impact on FLEs' innovation performance. Rather, it depends on how FLEs work with the institutional logics available to them as tools for conflict resolution. That is, innovative FLEs do not see institutional logics or parts of them as competing or conflicting per se but try to balance them situationally.

An example: An informant wanted to introduce standup paddling as a new form of therapy in the interest of the patients (care logic). However, this improvement of the therapy offer was very costly and therefore collided with the principles of economic efficiency (management logic). He succeeded in resolving the conflict and convincing the decision makers by highlighting the therapeutic benefit (professional logic) and the unique selling proposition (market logic). As a result, the FLE introduced a service innovation in the form of a new therapy. At the same time, the manager logic changed.

What do we learn from this? Managers should encourage FLEs to collaborate and interact. Innovation-friendly managers remove their employees' fear of functional and hierarchical silos. Cross-functional and cross-hierarchical team composition enables and facilitates service innovation. It is important that managers and FLEs tolerate ambiguous institutional logics rather than immediately avoiding or rejecting them.

To put it in a nutshell:

1. FLEs are crucial for organizational success and innovativeness.
2. Institutional logics are defined as systems of values, beliefs, and normative expectations that guide actors' cognition and behavior.
3. FLEs are embedded in multiple institutional logics and therefore face a variety of conflicts that can potentially disrupt innovation efforts.
4. FLEs deal with the same conflict differently.
5. Innovative FLEs use the institutional logics at their disposal as tools to balance conflicts.
6. Management can foster employee-driven service innovation by shaping institutional multiplicity through interaction and collaboration.
7. At the same time, care should be taken to ensure that there is some tolerance for ambiguity in the organization, especially at the frontline.

Chapter 5: Conclusions

This thesis had three research objectives: 1) to examine how service innovation emerges in the workplace of healthcare professionals and identify relevant operant resources, 2) to evaluate healthcare organizations' use of social media platforms as a venue for service innovation, and 3) to explore how healthcare professionals drive service innovation by influencing and shaping institutions.

Chapter 2 focused on the activities of healthcare professionals that have a critical influence on service innovation. Specifically, the IWB of chief physicians in hospitals was investigated with the aim of identifying relevant antecedents. The results of the main quantitative study showed that employees who have a greater preference for novelty, intellectual curiosity, and assertiveness exhibit higher levels of IWB. In addition, the climate of innovation in the hospital is another important predictor of IWB among chief physicians. Finally, our study was the first to uncover that collaborative competence, defined as working with actors inside and outside one's organization, is a significant and meaningful determinant of IWB, even more meaningful than innovation climate. Previous studies have focused on the influence of human and organizational resources, so this study can be viewed as contributing to the importance of relational resources in the emergence and promotion of IWB.

Chapter 3 examined hospitals' use of Facebook as a platform for sharing information, knowledge, experiences, ideas, and other resources to promote service innovation. A comparison of the Facebook presence of German and U.S. hospitals revealed significant differences in the type and content of posts shared. While German hospitals primarily promote their own hospital with information about medical services, departments, and employees, U.S. hospitals try to attract followers with topics related to a healthy lifestyle and general entertainment. Due to the more appealing content, they succeed much better than German hospitals. However, the results also showed that hospitals in both countries are not using the potential of social media to find creative ideas and solve problems. The Facebook platform is used almost exclusively for one-way communication, without promoting exchange from and with patients and other actors. So-called calls to action are suitable for this purpose, in which, for example, patients are actively invited to report on their experiences with a hospital stay or a particular therapy approach.

Chapter 4 took an institutional view of service innovation and examined, in the context of rehabilitation, which institutional elements have a facilitating or inhibiting influence on healthcare professionals' innovation efforts and which institutional work practices healthcare professionals use to drive which type of service innovation. Deductive analysis of the interview material using the framework of institutional pillars and carriers suggested that it is essential to view the institutional context as an interplay of the individual institutional elements. Service innovation must be driven and supported by the regulative, normative, and cultural-cognitive pillars, as institutions are both constraining and facilitating. The abductive theorizing process with a multiple case study design identified forms of institutional work that healthcare professionals use to drive incremental, internal radical, external radical, and joint radical service innovation, demonstrating the significant role that healthcare professionals play in initiating and implementing service innovation. Healthcare professionals, while embedded in highly institutionalized environments, use practices of bypassing, advocating, constructing normative networks, legitimizing, enabling work, and embedding and routinizing to disrupt these same institutions and create and maintain new ones.

In summary, this thesis took a SDL perspective on service innovation and used three studies to show how service innovation can be promoted by healthcare organizations and their employees. German healthcare organizations have a significant innovation gap compared to other countries. One reason for this is that innovation is often seen as purely medical or medical technology innovation, largely developed by the healthcare industry. This thesis has shown that innovation should be understood more broadly and offers healthcare organizations and professionals a wide range of opportunities for action. However, the generalizability and transferability of the empirical findings may be limited because the empirical material relates to the German healthcare system, which is characterized by a number of peculiarities in both European and non-European comparisons. Studies in other national contexts are encouraged to refine and possibly extend the findings. Future research should also focus on other key actors in the healthcare system and their potential as innovators (e.g., referring physicians).

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Appendix: List of Publications

Kriegl, B., Fitzgerald, L. and Raab, A. (2018), “Zeigt Euch!”, *Führen und Wirtschaften im Krankenhaus*, Vol. 35 No. 7, pp. 624–626.

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